

## NOTES

### *Chapter 1*

1. In 2009, the state had installed over 9,000 megawatts (MW) of wind energy and got 12% of its electricity from wind energy.
2. Solar Energy Industries Association, *Solar State by State*, Q3 2018.
3. In 2016, carbon emissions from the Texas electric power sector totaled 207.5 million metric tons of carbon dioxide compared to 219.6 million metric tons in 1999. US EIA, *Energy-Related Carbon Dioxide, Emissions by State, 2005–2016*, February 2019; World Resources Institute, CAIT—US States Greenhouse Gas Emissions, 2014.
4. Juliet Eilperin, “Climate skeptic group works to reverse renewable energy mandates,” *The Washington Post*, November 24, 2012.
5. Gabe Elsner, “The Campaign Against Net Metering: ALEC and Utility Interests’ Next Attack on Clean Energy Surfaces in Arizona,” Energy and Policy Institute, November 18, 2013.
6. Of course, interest groups are not the only causes behind polarization. Scholars examining this issue closely have shown evidence for a number of other factors. Explanations can be external to the legislature, for example, an increasingly polarized electorate, growing money in politics or growing income inequality; or the causes may be internal to a given legislature, for example, institutional rule changes (Roberts & Smith 2003; Theriault 2008; Barber & McCarty 2016). Some suggest that southern realignment, wherein white southerners sorted into the Republican Party due to racial policy, is an important driver (Abramowitz & Saunders 1998; Valentino & Sears 2005). Other explanations are also emerging. For instance, research tackles the role of partisan media in polarization (DellaVigna & Kaplan 2007; Gerber et al. 2008; Hopkins & Ladd 2012; Prior 2013). And some scholars argue convincingly that growing economic inequality is a key driver of polarization (McCarty et al. 2006; Gelman 2009). Still, many of these issues interact with interest group behavior. Thus, interest groups should be understood as a key part of contemporary polarization.
7. US Energy Information Administration, “Annual Energy Review—Total Energy,” 2012; International Energy Agency, “Data and statistics—Total primary energy supply by source,” 2019.
8. International Energy Agency, “Global Energy Demand Grew by 2.1% in 2017, and Carbon Emissions Rose for the First Time Since 2014,” March 22, 2018; International Energy Agency, “Global Energy Demand Rose by 2.3% in 2018, Its Fastest Pace in the Last Decade,” March 26, 2019.
9. “The Use of Energy in the United States Explained: Energy Use for Transportation,” US EIA, May 10, 2019; “Frequently Asked Questions,” US EIA, March 1, 2019.
10. REN21, “Renewables 2018 Global Status Report,” June 14, 2019.
11. “Electricity Explained: Electricity in the United States,” US EIA, April 19, 2019.

12. Congressional Research Service, “The Value of Energy Tax Incentives for Different Types of Energy Resources,” March 19, 2019.
13. David Coady, Ian Parry, Nghia-Piotr Le, and Baoping Shang, “Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates,” International Monetary Fund, May 2019.
14. Corrie Clark, “Renewable Energy R&D Funding History: A Comparison With Funding for Nuclear Energy, Fossil Energy, Energy Efficiency, and Electric Systems R&D,” Congressional Research Service, June 18, 2018.
15. Ibid.
16. ARPA-E, “ARPA-E Budget,” <https://arpa-e.energy.gov/?q=arpa-e-site-page/arpa-e-budget>; Erin Smith and Addison Stark, “ARPA-E at 10,” Bipartisan Policy Center blog, April 8, 2019.
17. There was a smaller 10% investment tax credit that preceded the 2005 law.
18. Congressional Research Service, “The Value of Energy Tax Incentives for Different Types of Energy Resources,” March 19, 2019.
19. RPS policies are usually implemented with a trading mechanism. Companies that produce electricity from renewable energy sources may receive a Renewable Energy Credit that can be traded to utilities that need to comply with the standard. Through trading, lower-cost technologies and projects should theoretically prevail.
20. Some of these policies are voluntary goals rather than binding policies; see Figure 1.2.
21. Ohio, however, still enacted its RPS as part of a later restructuring reform in 2008.
22. North Carolina Clean Energy Technology Center, “The 50 States of Solar: 2018 Policy Review and Q4 2018 Quarterly Report,” January 2019.
23. Small-scale, distributed solar is more accepted than large-scale projects.
24. Kathryn Cleary, Karen Palmer, and Kevin Rennert, “Clean Energy Standards,” *Resources for the Future*, January 2019.
25. Steve Clemmer, Jeremy Richardson, Sandra Sattler, Dave Lochbaum, “The Nuclear Power Dilemma,” Union of Concerned Scientists, November 2019.
26. Michael Scott, “Nuclear Power Outlook,” US EIA, May 7, 2018.
27. According to one study, around 60% of the potential hydropower resources in the United States are already developed. M. Bowman, “EIA Projections Show Hydro Growth Limited by Economics not Resources,” <http://www.eia.gov/todayinenergy/detail.cfm?id=17051>.
28. US EIA Annual Energy Outlook 2019 Projections and the Oak Ridge National Laboratory New Stream-Reach Development Resource Assessment (NSD).
29. In some parts of the United States, such as the Northeast, imports of Canadian hydropower may be important. That said, Canada may also want to use these resources to decarbonize its own grid.
30. Letter from the Secretary of Energy Steven Chu, October 12, 2009.
31. US Government Accountability Office, “Advanced Fossil Energy: Information on DOE Provided Funding for Research and Development Projects Started from Fiscal Years 2010 through 2017,” report to the ranking member, Subcommittee on Energy, Committee on Energy and Natural Resources, US Senate. GAO-18-619. September 2018.
32. “Natural Gas: Natural Gas Prices,” US EIA, June 28, 2019.
33. These estimates are in part a function of assumptions about methane versus carbon dioxide global warming potentials (Edwards & Trancik 2014).
34. This simple benchmark is broadly in line with more detailed targets developed by others. For example, one study suggests we need 37.3% clean energy by 2017 (Williams et al. 2014). Hence, if anything, my metric provides a marginally easier target for states to meet.
35. “Frequently Asked Questions: What Is U.S. Electricity Generation by Energy Source?,” US EIA, March 1, 2019.
36. Ray Chen, “Natural Gas and Renewables Make Up Most of 2018 Electric Capacity Additions,” US EIA, May 7, 2018.
37. Paul Hockenos, “Carbon Crossroads: Can Germany Revive Its Stalled Energy Transition?” *YaleEnvironment360*, December 13, 2018.
38. “Electricity: Detailed State Data,” US EIA, June 28, 2019.
39. Ibid.
40. Ibid.

41. Ibid.
42. Counting behind the meter solar put Arizona's renewables closer to 7%. EIA "Arizona Profile Analysis," January 17, 2019.
43. Between 2016 and 2017, renewables grew by an average 1.2 p.p. If we extrapolate this rate outward, we find 39% renewable energy sources by 2045 when the nuclear plant begins shutting down.
44. "Electricity: Detailed State Data."
45. Ibid.
46. Ibid.
47. Bloomberg New Energy Finance, "New Investment in Clean Energy."
48. Wind Europe, "Wind Energy in Europe in 2018," <https://windeurope.org/about-wind/statistics/european/wind-energy-in-europe-in-2018/>; World Wind Energy Association, "Wind Power Capacity Worldwide Reaches 600 GW, 53,9 GW Added in 2018," February 25, 2019, <https://wwindea.org/blog/2019/02/25/wind-power-capacity-worldwide-reaches-600-gw-539-gw-added-in-2018/>.

## Chapter 2

1. This chapter benefited enormously from previous research on policy feedback I undertook with Alex Hertel-Fernandez and Matto Mildenberger.
2. A third mode, of policy stability without change, could also be identified. However, since I am considering policy change, I do not examine these cases. In addition, the notion of policy drift problematizes the idea that policy can be considered stable since the nature of the problem the policy is addressing is usually in continuous flux.
3. For an example of research that does examine when policy feedback ends, see Mettler (2011), which examines federal aid for education that ended during the financial crisis despite support.
4. "Vital Statistics on Congress: Data on the U.S. Congress, Updated March 2019," Brookings Institution, March 4, 2019.
5. Michelle Singer, "Under the Influence," CBS, *60 Minutes*, March 29, 2007.
6. Jennifer Pahlka, "Fixing Government: Bottom Up and Outside In," The Long Now Foundation, February 1, 2017.
7. Interview 97, renewable energy advocate at a nongovernmental organization, March 19, 2015, multiple cases.
8. According to sexual harassment expert Marty Langelan, "Title IX turned out to be the legislative equivalent of a Swiss Army knife. . . . It opened up opportunities in so many areas we didn't foresee." Change was also slower than predicted, "Dr. Sandler said later that she had been naive in guessing how quickly change would come." She initially thought, she said, that "it would only take a year or two for all the inequities based on sex to be eliminated." Over time, she kept lengthening that prediction, until, she said, she finally realized that true change "would take more than my lifetime to accomplish." Katharine Seelye, "Bernice Sandler, 'Godmother of Title IX,' Dies at 90," *New York Times*, January 9, 2019.
9. Z. Bryon Wolf, "The Senate Voted on a Tax Bill Pretty Much Nobody Had Read," CNN, December 2, 2017.
10. Jim Tankersley, "Tucked Into the Tax Bill, a Plan to Help Distressed America," *New York Times*, January 29, 2018.
11. Matthew Gardner, Steve Wamhoff, Mary Martellotta, and Lorena Roque, "Corporate Tax Avoidance Remains Rampant Under New Tax Law," Institute on Taxation and Economic Policy, April 2019.
12. Ibid.
13. Ibid.
14. Still, perceptions remain crucial in this stage. If actors anticipate that regulation will be implemented and shift their resources or create new incentives and information, they may act before it is implemented (Rittenhouse & Zaragoza-watkins 2017). But if interest groups believe they can block implementation, then they will not respond to these potential changes.
15. Code for America, "2017 Impact Report"; Code for America, "2018 Impact Report; Code for America, "Healthy Communities." Nonetheless, the number of total people receiving benefits

from these programs has slightly declined since 2015: California Department of Social Services, “CalFresh Data Dashboard,” May 2, 2019, <https://www.cdss.ca.gov/inforesources/Data-Portal/Research-and-Data/CalFresh-Data-Dashboard>

16. Michael Isaac Stein, “The Energy Industry’s Secret Campaign to Get Us to Build More Power Plants,” *The Nation*, May 14, 2019.

### Chapter 3

1. As quoted in Hubbard (1916, 339).
2. Matthew Wald, “Pro-Coal Ad Campaign Disputes Warming Idea,” *New York Times*, July 8, 1991.
3. Matthew Belvedere, “Like the New EPA Chief, Southern Company’s CEO Doesn’t See CO<sub>2</sub> as Main Reason for Climate Change,” CNBC, March 28, 2017.
4. Notably, the New York attorney general’s case against Exxon for climate denial names Rex Tillerson. Anecdotally, when I sat next to a utility executive at a dinner in 2013, he was still claiming that mercury did not really affect human health. Heck, he used to play with that mercury as a kid—clearly that hadn’t affected his IQ.
5. Agis Salpukas, “70’s Dreams, 90’s Realities; Renewable Energy: A Luxury Now. A Necessity Later?,” *New York Times*, April 11, 1995; “National Debate Topic 1997–98: Renewable Energy: Are Renewable Energy Sources Viable Alternatives to Fossil Fuels?” *Issues & Controversies*, Infobase, August 29, 1997.
6. Steven L. Clemmer, Alan Noguee, Michael C. Brower, & Paul Jefferiss, “A Powerful Opportunity Making Renewable Electricity the Standard,” Union of Concerned Scientists, January 1999.
7. Note, this figure excludes hydropower. Technically, hydropower projects built after 1992 were eligible for the program, but in practice almost all of the US hydropower is much older, so very little would have counted toward the targets. US EIA, “Hydroelectric Generators Are Among the United States’ Oldest Power Plants,” March 13, 2017; “Electricity: Detailed State Data,” US EIA, June 28, 2019.
8. Tom Kenworthy, “A Renewable Energy Standard: The Proof Is in the States,” Center for American Progress, May 19, 2009; David Roberts, “The Faint Silver Lining of the Waxman-Markey Clean-Energy-Mandates Cloud,” *Grist*, June 17, 2009.
9. The trend toward large, centralized plants was further amplified during World War I (Hughes, 1983).
10. Some argue this story may not be exactly true, but it still captures the move away from flat charges toward volumetric charges (Yakubovich et al. 2005).
11. NELA became the EEI in 1933 (Bradley 1996). The EEI remains an extremely influential industry association for private utilities. In the 1890s there was also a smaller association called the Association of Edison Illuminating Companies, which involved a group of utility executives from Edison-related companies (Yakubovich et al. 2005).
12. US EIA, “Average Retail Price of Electricity to Ultimate Customers by End-Use Sector,” *Electric Power Monthly*, July 24, 2018.
13. US EIA, “U.S. Economy and Electricity Demand Growth Are Linked, but Relationship Is Changing,” <http://www.eia.gov/todayinenergy/detail.cfm?id=10491>
14. International Energy Agency & Organisation for Economic Co-operation and Development, *Worldwide Trends in Energy Use and Efficiency*, 2008.
15. This structure still exists to some extent today, through rate differences across classes of customers. Large industrial consumers consistently pay lower rates for electricity than commercial customers, who pay less than residential customers.
16. Technically, the reference was made to a secret nuclear fusion project, not fission technology. But it was said without explaining its context, leading most to interpret it as a reference to conventional nuclear fission.
17. With the second oil crisis in 1979, the Carter administration also worked on synthetic fuels (Breetz, 2013). However, this chapter focuses on efforts before the crisis.
18. Co-generators, however, could use any fuel source such as natural gas.
19. One year earlier, in 1977, the Federal Power Commission was renamed the Federal Energy Regulatory Commission, and its powers and mandate were both expanded significantly.

20. With this decision, they ignored the risk of arbitrage, wherein QFs would have an incentive to draw excess power from the grid so that they could sell it at a higher price, for a profit.
21. However, 14 states actually had higher average rates (Devine et al. 1987). As Chapter 5 explains, other factors helped to explain the renewables boom in California.
22. I use the terms “deregulation” and “restructuring” interchangeably in this chapter. Critics tend to prefer the term “deregulation,” while proponents prefer “restructuring.” Of course, the use of each term is a political choice, which seeks to emphasize a particular point of view. And even after so-called deregulation, there is still in truth a regulated market overseen by government—albeit a different type of regulation.
23. The law required large wholesale wheeling (using utility transmission lines for sales) but not smaller, retail wheeling. However, states could set up retail wheeling if they wanted to. Hirsh (1999a, 243–244) has an extensive discussion on the topic.
24. In part, the US Navy drove nuclear investments (Cowan 1990). Overall, the military has been an important incubator for new energy technologies (Velandy 2014).
25. Steven Mufson and Lisa Rein, “Maryland Adopts Plan for Energy Efficiency,” *Washington Post*, July 21, 2007.
26. Center for Climate and Energy Solutions, “Decoupling Policies,” March 2019, <https://www.c2es.org/document/decoupling-policies/>
27. While the Renewable Energy and Energy Efficiency Technology Competitiveness Act was passed in 1989, this law set broad targets for energy technology innovation without specific incentives or mandates.
28. It is clear that environmental constraints are more important than supply constraints for fossil fuels. There are enough fuels on the planet for many centuries, but the climatic consequences of continuing to burn these fuels would be disastrous for human civilization.
29. This trend was also present in natural gas prices before the shale gas boom.
30. Biomass is one renewable source that does require fuel and creates carbon emissions. New hydropower can also release methane. The construction of steel for wind turbines also produces greenhouse gases.
31. *EPRI Journal*, September 1977, Issue 7, <https://www.documentcloud.org/documents/3540308-EPRI-1977-Journal-No-7.html#document/p15/a353329>
32. Matthew Wald, “Pro-Coal Ad Campaign Disputes Warming Idea,” *New York Times*, July 8, 1991.
33. 1991 Information Council on the Environment Climate Denial Ad Campaign, <http://www.climatefiles.com/denial-groups/ice-ad-campaign/>
34. Global Climate Coalition Membership, circa 1993. <http://www.climatefiles.com/denial-groups/global-climate-coalition-collection/membership-lists/>.
35. Intermountain Rural Electric Association (IREA) Internal Memo, July 17 2006.
36. The Energy Policy Act of 1992 also created the Renewable Energy Production Incentive, which was very similar to the PTC but applied to nonprofit entities, such as municipal utilities and rural electric cooperatives, rather than for-profit companies. The law also made a 10% investment tax credit for solar and geothermal permanent.
37. The Energy Foundation was created by Pew, Rockefeller, and Hewlett. While these large funders did not constrain the EF’s funding decisions, regional funders did constrain the funding geographically. Interview 100, foundation employee, October 31, 2018, multiple cases.
38. Interview 100, foundation employee, October 31, 2018, multiple cases.
39. This policy is also called a “public goods charge.” Interview 64, renewables association employee, February 26, 2014, California.
40. Interview 100, foundation employee, October 31, 2018, multiple cases.
41. Interview 98, renewable energy advocate at an NGO, March 6, 2016, California; interview 100, foundation employee, October 31, 2018, multiple cases.
42. However, the advocates built in a trading mechanism in an attempt to have it fit more easily with the restructuring agenda.
43. Interview 97, renewable energy advocate at an NGO, March 19, 2015, multiple cases.
44. Interview 97, renewable energy advocate at an NGO, March 19, 2015, multiple cases.

45. Tom Starrs. Washington State University, “A Presentation by Keynote Speaker Thomas J. Starrs.”
46. This law also required state PUCs to consider net metering and interconnection rules, creating a PURPA interconnection standard.
47. US Department of the Treasury, “Overview and Status Update of the §1603 Program,” April 1 2017.
48. S. Kan et al., *U.S. Solar Market Insight Report*, 2014.
49. Juliet Eilperin, “Climate skeptic group works to reverse renewable energy mandates,” *The Washington Post*, November 24, 2012.
50. Tom Stanton, “Status Report on Distributed Energy Resources and Evaluating Proposals and Practices,” National Regulatory Research Institute, September 2015.
51. From \$3.80/W in 2008 to \$0.86/W in 2012 (Kind 2013).
52. Gabe Elsner, “The Campaign Against Net Metering: ALEC and Utility Interests’ Next Attack on Clean Energy Surfaces in Arizona,” Energy and Policy Institute, November 18, 2013.
53. ICF, “Review of Recent Cost-Benefit Studies Related to Net Metering and Distributed Solar,” May 2018.
54. North Carolina Clean Energy Technology Center, “The 50 States of Solar: 2015 Policy Review and Q4 2015 Quarterly Report,” February 2016; North Carolina Clean Energy Technology Center, “The 50 States of Solar: 2018 Policy Review and Q4 2018 Quarterly Report,” January 2019.
55. Tom Stanton, “Review of State Net Energy Metering and Successor Rate Designs,” National Regulatory Research Institute, May 2019.
56. North Carolina Clean Energy Technology Center, “The 50 States of Solar: 2018 Policy Review.”
57. Although, changes in who controls the government could still undermine publicly owned assets ability to promote renewables.
58. EEI had total operating revenues of \$364 million in 2017 compared to AWEA’s \$21 million of revenue in 2016 and the Solar Energy Industries Association’s \$7.5 million of membership dues revenue in 2017.
59. Author’s own research based on publicly available information.

#### *Chapter 4*

1. Interview 47, renewable energy advocate at a nongovernmental organization (NGO), February 12, 2014, Texas.
2. Bureau of Economic Analysis, “Regional Data: GDP and Personal Income.”
3. The American Council for an Energy-Efficient Economy scored Texas twenty-fifth on its 2018 score sheet despite the Department of Energy’s evaluation that Texas has the potential for 87.3 megawatt (MW) hours in electricity savings by 2035—the largest sum in the United States (<https://www.energy.gov/eere/slsc/us-energy-efficiency-potential-maps>).
4. Interview 53, former commissioner, February 18, 2014, Texas.
5. The Public Utilities Regulatory Act was amended through SB 373. At the time, companies like Enron were pushing for transmission access so that they could profit off of the new electricity market. This law began the transition to a competitive wholesale generation market and required utilities to allow generators to use their transmission infrastructure at a fair cost (Dyer 2009).
6. The process actually started prior to 1995 but was put on pause several times as the PUC awaited direction from the legislature.
7. In practice, the IRP events were planned from 1996 until 1999, suggesting that not all utilities held these public opinion exercises before the IRP process was abandoned due to SB 7 and impending deregulation.
8. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
9. Interview 53, former commissioner, February 18, 2014, Texas.
10. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
11. In late 1996, the PUCT also transformed the Electric Reliability Council of Texas (ERCOT) into an independent system operator, further shifting the system toward competition. In an



- attempt to resist state regulation, the electric utilities' themselves established ERCOT in 1970, and today the ERCOT system covers about 75% of the Texas grid (Dyer, 2011).
12. Interview 56, former commissioner, February 20, 2014; interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
  13. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
  14. Interview 49, political staff, February 13, 2014, Texas.
  15. Initially, the PUCT regulated rural electric cooperatives as well as investor-owned utilities; but after deregulation, cooperatives stopped being subject to PUC rules.
  16. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
  17. Interview 53, former commissioner, February 18, 2014, Texas.
  18. Interview 41, renewables association employee, February 10, 2014; interview 57, former commissioner, February 20, 2014, Texas.
  19. Bloomberg News, "Enron Acquires Zond, a Major Wind Power Company," *New York Times*, January 7, 1997.
  20. Interview 45, renewable energy advocate at an NGO, February 11, 2014, Texas.
  21. Interview 41, former politician, February 6, 2014, Texas.
  22. The final provisions required cuts of 50% from 1997 by 2003 for nitrous oxide and 25% over the same period for sulfur dioxide. These provisions applied to grandfathered plants, built before the Texas Clean Air Act was passed, particularly in the Dallas area (Hudson & Rowe 2005).
  23. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
  24. For more on the Energy Foundation, see <https://www.ef.org/about-us/>
  25. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
  26. According to the Energy Foundation's 1998 990-PF form, in 1998, EDF was given \$110,000 to work on renewables and conservation advocacy and \$150,000 to work on air pollution.
  27. Interview 45, renewable energy advocate at an NGO, February 11, 2014, Texas.
  28. Interview 45, renewable energy advocate at an NGO, February 11, 2014, Texas.
  29. Interview 45, renewable energy advocate at an NGO, February 11, 2014; interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
  30. Given the conflicts over how to calculate a baseline for the percentage of renewables, the RPS was changed to a capacity, rather than a generation, target. A capacity target requires a certain amount of infrastructure to be built; for example, if each wind turbine is 1 MW, 3,000 turbines would need to be built for a 3,000-MW target. In contrast, most RPS policies use a generation target, which requires a certain percentage of electricity to be *produced* from renewable energy sources. The move toward a capacity target suggests opponent interest groups' influence in watering down the proposal.
  31. The amendment read, "Each retail electric provider, municipally owned utility, and electric cooperative operating in the state shall obtain a minimum of 1.65 percent of its annual capacity requirements from renewable energy technologies by January 1, 2003, 2.15 percent of its annual capacity requirements from renewable energy technologies by January 1, 2005, 2.75 percent of its annual capacity requirements from renewable energy technologies by January 1, 2007, and 3 percent of its annual capacity requirements from renewable energy technologies by January 1, 2009."
  32. Interview 45, renewable energy advocate at an NGO, February 11, 2014, Texas.
  33. Interview 53, former commissioner, February 18, 2014, Texas.
  34. According to the Energy Foundation's 1998 990-PF form, in 1998 Public Citizen was granted \$100,000 to work on its "Cleaner Air Comes From Cleaner Energy Campaign."
  35. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
  36. Ibid.
  37. Ibid.
  38. TREIA Membership Directory, November 1999.
  39. For example, in the TREIA spring 1997 newsletter, the chief executive officer of BP indicated his support for action on climate change; however, he still maintained some skepticism toward policy solutions and drew a contrast to environmentalist policy preferences.
  40. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
  41. The TREIA Newsletter, spring 1997, p. 5.

42. EDF, “Clean Energy for the Energy Capital of the United States: Houston Light & Power Customers Voice Strong Opinions in Deliberative Poll,” February 4, 1998, <https://www.edf.org/news/clean-energy-energy-capital-united-states-houston-light-power-customers-voice-strong-opinions-d>
43. TREIA newsletter, winter 1996–7, p. 3.
44. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
45. These efforts included corresponding with Rabe, who did not disclose sufficient detail on the bureaucrat for legitimate reasons of confidentiality, 24 interviews with Texan advocates and opponents involved with the RPS, and archival research on hundreds of documents.
46. US Department of Energy, WINDEXchange, “U.S. Installed and Potential Wind Power Capacity and Generation,” <https://windexchange.energy.gov/maps-data/321>
47. A number of other factors also helped enable Texas’s large transmission investment. Gas prices were rising throughout 2004 and 2005, reaching \$7.30/mcf in July 2005, when the RPS expansion bill passed. There was a concern at the time over increasing electricity supply diversity, given the almost exclusive reliance on coal and gas. Both poor air quality in the large cities and high gas prices made additional wind investment, including in transmission capacity, welcome. And given that Texas’s electricity grid is largely isolated likely helped spur the competitive renewable energy zone (CREZ) investment. With few interconnections, it would be difficult for Texas to export its wind energy (Rabe 2004). To balance the system, then, Texas would have to increase its own ability to absorb the intermittent wind energy. In addition, the isolated grid insured that most of the benefits, for example, reduced transmission congestion, would go to Texas companies. This reduced coordination problems since transmission investments can have geographically dispersed benefactors and beneficiaries (Baldick & Kahn 1993). For these reasons, a large transmission bill was easier to pass in Texas than other states.
48. The Steering Committee of Cities Served by Oncor and the Texas Coalition for Affordable Energy, “The Story of ERCOT,” February 2011.
49. Electric Reliability Council of Texas, “Transmission Issues Associated With Renewable Energy in Texas; Informal White Paper for the Texas Legislature, 2005,” March 28, 2005.
50. Senator Fraser’s letter to the PUCT, December 6, 2006.
51. US Department of Energy, WINDEXchange, “U.S. Installed and Potential Wind Power Capacity and Generation.”
52. In early 2009, FPL changed its name to NextEra Energy Resources. In 2014, it was the largest owner and operator of renewable energy projects (wind and solar) in North America. The wind farm implied in this passage is Horse Hollow.
53. The project is located in Taylor County and Nolan County. All of Taylor County was in Senate District 24 in 2005; around one-quarter has been redistricted out of that district since then.
54. While this initial bill did not pass, in a special session it was revised as SB 20 and successfully passed.
55. For one example, see John Smithee, Comments on Project 31852, February 16, 2006.
56. J. Malewitz, “\$7 Billion CREZ Project Nears Finish, Aiding Wind Power,” *Texas Tribune*, October 14, 2013.
57. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.

## Chapter 5

1. Interview 51, clean energy company employee, February 14, 2014, Texas.
2. Dave Levitan, “Picking Winners: Obama Budget Shifts Tax Incentives Toward Renewables,” *InsideClimate News*, April 15, 2010.
3. The exception was small municipal utilities’ service areas that operated outside of the deregulated market and RPS policy.
4. Interview 45, renewable energy advocate at a nongovernmental organization (NGO), February 11, 2014, Texas.
5. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
6. Ibid.



7. In part, this may be because the renewable energy groups were poorly engaged with the process surrounding SB 20 and SB 533, often neglecting to testify on the bill at all.
8. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
9. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
10. Texas Association of Manufacturers, press release “Manufacturing Veteran Tony Bennett Named President of Texas Association of Manufacturing,” August 27, 2012, <https://manufacturetexas.org/press/manufacturing-veteran-tony-bennett-named-president-of-texas-association-of-manufacturing>
11. The TIEC has also previously used the name “Texas Industrial Consumers.”
12. This list comes from the fact that if the TIEC participates in a PUC rate case, it must list the members it is representing for the case.
13. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
14. Interview 51, clean energy company employee, February 14, 2014, Texas.
15. Ibid.
16. Interview 55, lobbyist for renewables industry, February 18, 2014, Texas.
17. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
18. Interview 102, lobbyist for renewables industry, March 8, 2019, Texas.
19. Interview 45, renewable energy advocate at an NGO, February 12, 2014, Texas; interview 49, political staff, February 13, 2014, Texas; interview 50, political staff, February 13, 2014, Texas; interview 54, lobbyist for renewables industry, February 18, 2014, Texas; interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
20. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
21. The TAM lobbyist also represents the TIEC before the PUCT.
22. In the Texas Renewable Energy Industries Association’s (TREIA’s) August 2005 newsletter, the renewable advocates celebrated the passage of SB 20. Their only concern focused on how to count renewable energy credits and not the far more consequential use of “target” versus “goal.”
23. In the case of Representative Blake, there was a proposed biomass facility in his district.
24. Compliance premiums for non-wind technologies, which would essentially grant solar projects additional renewable energy certificates (RECs).
25. Interview 57, former commissioner staffer, February 20, 2014, Texas.
26. Interview 43, renewable energy advocate at an NGO, February 11, 2014, Texas.
27. T. Evilsizer, *Industries Storm States Over Climate Change*, National Institute on Money in State Politics, 2009.
28. The commission’s incentives included allowing small generators to aggregate to meet the 10-MW minimum for RECs and fossil fuel generators to repower with renewable fuel and receive RECs. Neither of these rules would spur solar development.
29. Interview 58, lobbyist for oil and gas industry, February 21, 2014, Texas.
30. An updated list can be found on the PUCT website under Filings for Case 35113.
31. Solar Energy Industries Association, “Texas Solar,” 2019, <https://www.seia.org/state-solar-policy/texas-solar>
32. Interview 50, political staff, February 13, 2014, Texas.
33. Interview 57, former commissioner staffer, February 20, 2014, Texas.
34. Instead, two small renewable energy–related bills passed: a property-assessed clean energy law and a small bill which clarified that solar installations would not raise a building’s tax valuation. While these laws would remove some barriers, they were not the critical enabling legislation necessary to build a solar industry in Texas. They were incremental, status-quo policies that did not require the legislature or administration to take action to transform the electricity system.
35. Interview 54, lobbyist for renewables industry, February 14, 2014, Texas.
36. M. J. Bradley, “Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States,” June 2019.
37. Interview 47, renewable energy advocate at an NGO, February 12, 2014, Texas.
38. Interview 54, lobbyist for renewables industry, February 18, 2014, Texas.
39. The exception to the rule is the municipal utilities in San Antonio and Austin, which have both created their own policies to drive solar uptake in their service territories.

40. For an explanation of the current state of Texas net metering and distributed generation policy, see the National Renewable Energy Laboratory's website: <https://www.nrel.gov/solar/rps/tx.html>
41. Adam Burke, "In Sunny Nevada, a Defeat for the Solar Industry," *Marketplace*, February 23, 2016; Nichola Groom, "Nevada Reinstates Key Solar Energy Policy," *Reuters*, June 15, 2017.
42. According to the Solar Energy Industries Association, Texas was fourth in 2017 and sixth in 2018.
43. Tim Sylvia, "Five Texas Munis Partner to Add 500 MW of Solar," *PV Magazine*, September 20, 2018.
44. Titiaan Palazzi and Dan Seif, "Why Distributed Solar Is Winning in Texas," *GreenBiz*, February 28, 2018.

## Chapter 6

1. Coral Davenport and Eric Lipton, "How G.O.P. Leaders Came to View Climate Change as Fake Science," *New York Times*, June 3, 2017; Jane Mayer, "Covert Operations," *New Yorker*, August 23, 2010.
2. Interview 86, renewable energy advocate at a nongovernmental organization (NGO), November 10, 2014, Kansas.
3. Koch Industries and the Kansas Chamber of Commerce were at the forefront of funding a far-right wave in the 2010s. Governor Brownback and his political allies solicited their funding to primary moderate Republicans. Mark Binelli, "Rogue State: How Far-Right Fanatics Hijacked Kansas," *Rolling Stone*, June 12, 2013.
4. According to the Department of Energy, Kansas had installed 113 megawatts (MW) of wind power capacity in 2001.
5. Interview 92, utility employee, November 12, 2014, Kansas.
6. Westar Press Release, "Westar Launches Kansas' Largest Wind Energy Program," October 1, 2007.
7. One of the bills was HB 2479.
8. Interview 87, lobbyist for the renewables industry, November 10, 2014, Kansas.
9. Specifically, Governor Sebelius suggested that wind farms should not be developed in the area through a voluntary ban in the area bounded by the roads US-24, US-77, US-400, K-99, and K-4.
10. Kansas Energy Council Staff, "KCC Staff Wind Study: A Benefit Cost Study of the Governor's 2015 Wind Challenge (1,000 MW by 2015)," October 2008.
11. Interview 94, renewable energy advocate at an NGO, November 13, 2014, Kansas.
12. Sarah Kessinger, "Sebelius Calls for Renewable Energy Mandates," *Salina Journal*, February 2, 2008.
13. One version of the bill, SB 148, passed in 2007, included an RPS.
14. Interview 94, renewable energy advocate at an NGO, November 13, 2014, Kansas.
15. Interview 92, utility employee, November 12, 2014, Kansas.
16. Originally, Sunflower wanted to build two 700-MW plants, so this represented a reduction. Sunflower also agreed to take on new energy efficiency programs and to increase its renewables faster than other utilities (20% by 2016) as part of the settlement agreement.
17. Siemens also likely relocated in Kansas because of a secondary bill, SB 108, also passed in 2009. This bill amended the Economic Revitalization and Reinvestment Act to allow wind and solar manufacturing companies to apply for up to \$5 million in bonds.
18. Interview 92, utility employee, November 12, 2014, Kansas.
19. Interview 92, utility employee, November 13, 2014, Kansas.
20. Interview 87, lobbyist for renewables industry, November 11, 2014, Kansas.
21. Earthjustice, "Groups Ask Kansas Supreme Court to Overturn Sunflower Coal Plant Permit," August 15, 2011.
22. The last new coal plant to come online occurred in Virginia in 2012. T. Cormons, "A Sad Day for VA — Wise County Coal Plant Fires Up," *Appalachian Voices*, August 11, 2012.
23. The Kansas legislature passed another bill in the 2013/2014 session to attempt to ease the plant's permitting process in Kansas. Whether it will proceed remains to be seen, particularly

- given the federal Clean Power Plan. In 2017, the company's board suggested a "remote" chance that the Holcomb plant would be built. P. Hancock, "Holcomb Power Plant Unlikely to Be Built, Company Says; \$93 Million Already Spent," *Lawrence Journal-World*, September 18, 2017.
24. In 2005, he voted for an amendment to the Energy Policy Act of 2005, to create a federal RPS. In 2007, along with 32 other senators, he co-sponsored S.CON.RES.3, which created a target of 25% renewable energy by 2025.
  25. Governor Sam Brownback, Kansas State of the State, January 12 2011.
  26. Governors' Wind Energy Coalition, Letter to Congress, November 15, 2011.
  27. Rick Plumlee, "Deal Limits Flint Hills Wind Farm Expansion," *Wichita Eagle*, May 7, 2011.
  28. US EIA, [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a)
  29. D. G. Tuerck, P. Bachman, and M. Head, *The Economic Impact of the Kansas Renewable Portfolio Standard*, 2012.
  30. G. Elsner, *Heartland Institute Pushes Flawed Analysis Attacking Kansas RPS*, Energy & Policy Institute, March 26, 2014.
  31. In June 2013, Dennis Hedke wrote an editorial in the *Wichita Eagle* entitled "Climate Science Isn't Settled."
  32. The Heritage Foundation is a conservative think tank that has been a major actor in the climate denial movement (Oreskes & Conway 2010).
  33. Andy Marso, "Koch works behind scenes on renewable energy bill." *The Topeka Capital-Journal*, February 26, 2013.
  34. Ibid.
  35. Interview 88, politician, November 11, 2014, Kansas.
  36. Interview 92, utility employee, November 13, 2014, Kansas.
  37. This wind energy PAC also gave money to Governor Sam Brownback's campaign. Governmental Ethics Commission, "Campaign Finance Receipts & Expenditure Report," January 10, 2014, [http://ethics.ks.gov/CFAScanned/House/2014ElecCycle/201401/H122JJ\\_201401.pdf](http://ethics.ks.gov/CFAScanned/House/2014ElecCycle/201401/H122JJ_201401.pdf)
  38. Compared to the Kansas Chamber of Commerce's \$360,000 in contributions, the Kansas New Energy Economy PAC had just over \$45,000 in 2013 according to the Kansas Governmental Ethics Commission.
  39. Since the Kansas legislative session runs for 2 years, the bill only died in committee in May 2014, along with the other anti-RPS bill.
  40. National Institute on Money in State Politics.
  41. Dennis Hedke and Forrest Knox, "Rep. Dennis Hedke and Sen. Forrest Knox: Renewable Mandate Driving up Energy Costs," *Wichita Eagle*, May 20, 2014.
  42. Senate Bill No. 82, Amended, p. 1, February 28, 2013.
  43. Kimberly Svaty, "Wind Energy in Kansas: House Energy & Environment Committee," The Wind Coalition, January 21, 2015.
  44. Interview 94, renewable energy advocate at an NGO, November 12, 2014, Kansas.
  45. Bryan Lowry, "Brownback's Office Clarifies His Position on Renewable Energy Standards," *Wichita Eagle*, July 23, 2014.
  46. Kansas Corporation Commission, Retail Rate Impact Report 2014, March 1, 2014.
  47. James M. Taylor, "Kansas Renewable Mandates Causing Skyrocketing Electricity Prices," The Heartland Institute, January 24, 2014.
  48. Interview 92, utility employee, November 12, 2014, Kansas.
  49. Suzanne Goldberg, "Leak Exposes how Heartland Institute Works to Undermine Climate Science," *The Guardian*, February 15, 2012.
  50. Elliot Negin, "Unreliable Sources: How the Media Help the Kochs and ExxonMobil Spread Climate Disinformation," *Huffington Post*, June 3, 2013.
  51. Interview 93, renewable energy advocate at an NGO, November 13, 2014, Kansas; interview 94, renewable energy advocate at an NGO, November 13, 2014, Kansas.
  52. Interview 94, renewable energy advocate at an NGO, November 12, 2014, Kansas.
  53. Judy L. Thomas and Bryan Lowry, "How Kansas Lawmakers Keep You From Finding out What They're Doing — Until It's Too Late," *Kansas City Star*, December 1, 2017.

54. Ibid.
55. Interview 86, renewable energy advocate at an NGO, November 10, 2014, Kansas.
56. The question wording was, “In 2009 the Kansas Legislature passed a comprehensive energy bill that requires Kansas utility companies to generate 20 percent of their electricity from renewable sources by the year 2020. Do you support or oppose that law?” Support was even higher when citizens were asked in general if they supported renewables: 91% indicated support.
57. Support from Democrats was even higher, at 82%.
58. Most people said that it would have no effect, rather than that it would decrease their likelihood of voting for the candidate.
59. Initially, this bill was unrelated to renewable energy policies, but it was gutted and amended in March 2014, becoming a substitute bill in the Senate. The Senate Committee on Utilities, where Senator Apple remained the chair, sponsored the new version of the bill.
60. In Kansas, Speaker of the House Ray Merrick has served on the ALEC board and chaired Kansas’s chapter. Similarly, Senate president Susan Wagle, current board member, has served as a national chair. In Ohio, Speaker of the House William Batchelder and Senate president Keith Faber had ALEC membership.
61. Interview 88, politician, November 11, 2014, Kansas.
62. The Koch-affiliated group AFP also funded a television ad encouraging Kansas residents to oppose the RPS and contact their legislators or Governor Brownback. Americans for Prosperity, “AFP-Kansas RPS Repeal Ad: Details and Sources,” January 29, 2014.
63. Koch Industries, <http://www.followthemoney.org/entity-details?eid=1457&default=contributor>
64. Kansas 2012, Election Overview, <http://www.followthemoney.org/election-overview?s=KS&y=2012>
65. Bryan Lowry, “Kansas AFP Director Acknowledges Informal Contact With Group Behind Energy Mailings,” *Wichita Eagle*, May 9, 2014.
66. Andy Marso, “AFP State Leader Admits Link to Group Opposing Renewable Energy Law: Americans for Prosperity State Director Says His Role Was Personal, Not Connected to AFP,” *Topeka Capital-Journal*, May 8, 2014.
67. Ibid.
68. Estimates suggest AFP spent \$387,000, the Kansas Senior Consumer Alliance spent \$40,000, and the Chamber of Commerce spent \$18,000. The Wind Coalition and the Wind Works for Kansas campaign spent around \$60,000. See *Wichita Business Journal*, “Top List of Lobbyists 2014”; Government of Kansas, “Summary of Expenditures Reported by Registered Lobbyists,” April 2014; “Wind war’s total: Nearly half a million dollars,” *Topeka Capital-Journal*, May 24, 2014.
69. Interview 94, renewable energy advocate at an NGO, November 12, 2014, Kansas.
70. Interview 93, renewable energy advocate at an NGO, November 12, 2014, Kansas.
71. Ibid.
72. Republican representatives Russ Jennings and Tom Sloan were both targeted for not supporting the repeal efforts. Scott Rothschild, “Fight Over Renewable Energy Continues in GOP Primary,” *Lawrence Journal-World*, June 15, 2014.
73. Andy Marso, “Rep: Koch Using Kansas Chamber to Retaliate on Renewable Energy,” *Topeka Capital-Journal*, June 16, 2014.
74. Email correspondence from Representative Scott Schwab, June 12, 2014, to “Kansas Chamber of Commerce Friends.” Full text available at <http://www.dailykos.com/story/2014/06/16/1307511/-KS-House-Republican-Kochs-Lobby-Unfairly-Has-Questionable-Lobbying-Practices>
75. According to the Kansas Governmental Ethics Commission.
76. Koch Industries gave \$3,400 directly to Apple. The Kansas Chamber of Commerce gave him \$4,148, and the Kansas Republican Senatorial Committee gave him \$16,850, <https://www.followthemoney.org/entity-details?eid=13011941>
77. This estimate was for a 100-MW farm, <http://www.kansas.com/news/politics-government/article20465616.html>
78. KS 79-201, [http://www.ksrevisor.org/statutes/chapters/ch79/079\\_002\\_0001.html](http://www.ksrevisor.org/statutes/chapters/ch79/079_002_0001.html)

79. Interview 86, renewable energy advocate at an NGO, November 10, 2014, Kansas.
80. Bryan Lowry, “Compromise Reached for Softened Kansas Renewable Energy Standards,” *Kansas City Star*, May 4, 2015.
81. Ibid.
82. Ibid.
83. Andy Marso, “Property Tax Change Part of Largely Symbolic Renewable Energy Bill,” Kansas Health Institute, May 12, 2015.
84. *Hutchinson News*, “Siemens Gamesa Announces Mass Layoff at Hutchinson Plant,” August 18, 2017, <http://www.hutchnews.com/news/20170818/siemens-gamesa-announces-mass-layoff-at-hutchinson-plant>
85. Center for Public Integrity analysis based on National Renewable Energy Laboratory and US Energy Information Administration (EIA) data, <https://publicintegrity.org/environment/statehouses-not-the-sun-drive-solar-energy-gaps/>
86. US EIA, “Electricity: Electricity Data Browser,” <https://www.eia.gov/electricity/data/browser/>

### Chapter 7

1. My best estimate of the solar industry’s political spending during the period covered in this chapter is \$28 million, which is 50% smaller than APS’s estimated spending of \$55 million.
2. James R. Wrathall and Elias B. Hinckley, “Arizona Update: Solar Controversies Causing Market Upheaval,” Association of Corporate Counsel, March 4, 2015.
3. APS contributed an estimated \$425,000 to elect Mark Brnovich.
4. Terry Tang, “Arizona AG Accused of Bias Against Clean Energy Initiative,” Associated Press, September 18, 2018.
5. APS generated 7.7% renewable energy in 2018. Pinnacle West Capital Corporation, “2018 Annual Report.” Tucson Electric Power has been more compliant and generated 14% from renewables in 2018. Tucson Electric Power, “Green (Energy) Acres,” <https://www.tep.com/renewable-resources-2/>
6. APS also devotes resources to lobbying the Arizona legislature, some portion of its \$350,000 to \$700,000 annual lobbying expenditure. It also focuses on the executive branch more broadly. Most recently, APS has seen favorable outcomes under Governor Ducey. He appointed two commissioners aligned with APS earlier in his tenure and, in June 2019, selected another commissioner who has ties with APS. Peter Aleshire, “APS Finally Discloses Massive Political Spending,” *Payson Roundup*, April 5, 2019; Iulia Gheorghiu, “Arizona Commissioner Tobin Resigns, Following Frustrations With Staff as ‘Sixth Commissioner,’” *Utility Dive*, May 31, 2019.
7. As Article 15, Section 3, outlines, “The corporation commission shall have full power to, and shall, prescribe just and reasonable classifications to be used and just and reasonable rates and charges to be made and collected, by public service corporations within the state.”
8. Lou Gum, “ACC Ethics in Question, Says Former Commissioner,” KAWC News, August 16, 2018.
9. US Energy Information Administration, “Arizona: State Profiles and Energy Estimates,” <https://www.eia.gov/state/?sid=AZ#tabs-4>.
10. Salt River Project, “Facts About SRP,” <https://www.srpnet.com/about/facts.aspx>
11. Ryan Randazzo, “Solar Advocates Hope to Oust SRP Board Members,” *The Arizona Republic*, March 1, 2016; Ryan Randazzo, “SRP System for Electing Leaders Criticized as Unfair and Undemocratic,” *The Arizona Republic*, June 6, 2019; SRP, “SRP Governance and Elections,” <https://www.srpnet.com/elections/Default.aspx>
12. This occurred through the integrated resource planning process. The total target was 17 megawatts (MW). According to a bureaucrat involved in the program, the target was 10 MW for APS, 5 MW for TEP, and 2 MW for other smaller utilities. Interview 28, commission staffer, January 24, 2014, Arizona.
13. Several interview subjects noted the importance of Commissioner Jennings in passing the standard. At that time, the commission consisted of two Democrats and one Republican, with Jennings able to marshal votes from his colleagues. Democratic commissioner Weeks was



also supportive. Interview 25, renewable energy advocate at a nongovernmental organization (NGO), January 22, 2014, Arizona; interview 28, commission staffer, January 24, 2014, Arizona; interview 34, former renewables association employee, January 30, 2014, Arizona.

14. "Arizona Restructuring Suspended," <http://www.eia.gov/electricity/policies/restructuring/arizona.html>
15. The policy was first proposed in April 1999 as the "environmentally-friendly portfolio standard" and later renamed the "environmental portfolio standard." The rulemaking process began in May 2000.
16. ACC decision number 62506, May 4, 2000.
17. Interview 28, commission staffer, January 24, 2014, Arizona.
18. Arizona Corporation Commission, Decision number 69127, November 14, 2006.
19. Arizona Corporation Commission, *Commissioners Approve Rules Requiring 15 Percent of Energy From Renewables by 2025*, November 1, 2006.
20. AriSEIA worked with Commissioner Kris Mayes and a supportive staffer. Interview 34, former renewables association employee, January 30, 2014, Arizona.
21. National Conference of State Legislatures, "State Renewable Portfolio Standards and Goals," February 1, 2019.
22. Interview 34, former renewables association employee, January 30, 2014, Arizona.
23. The proceeding started earlier, as part of electricity restructuring in 1999, with support from several new, competitive energy companies including Enron and New Energy Ventures and the Distributed Energy Association of Arizona. It also developed while the REST was being developed, in April 2005. Part of the impetus for action was the Energy Policy Act of 2005, which included an NEM standard that states could either adopt as is or modify.
24. Ed Taylor, "Valley Businesses See Sunnier Days for Solar," *East Valley Tribune*, March 8, 2006.
25. Interview 28, commission staffer, January 24, 2014, Arizona. Additionally, a former commissioner involved in both policies noted that the NEM received far less debate. Interview 32, former commissioner at ACC, January 27, 2014, Arizona.
26. Notably, even SRP followed the docket, likely because it realized any NEM decision would also likely affect its plans.
27. Arizona Public Service Company's Comments to Staff's Request for Written Comments to Proposed Net Metering Rules, January 4, 2008.
28. R.W. Beck Inc., *Distributed Renewable Energy Operating Impacts and Valuation Study*, prepared for Arizona Public Service, 2009.
29. ACC Meeting Minutes, "Net Metering Workshop," September 7, 2006.
30. Arizona Corporation Commission, "ACC Approves 'Net Metering' to Offset Consumer Costs for Renewable Energy," October 20, 2008.
31. Some customers with tax liability could already combine the state and federal policies. But in practice, solar leasing made this arrangement accessible to far more people.
32. See Chapter 3 for an explanation of electricity wheeling.
33. By 2014, SolarCity provided 34% of installations—the clear market leader. Daniel Gross, "The Miracle of SolarCity," *Slate*, July 31, 2015.
34. APS application to open NEM docket, July 12, 2013.
35. EIA Form 826 detailed data. APS data are for 2013 because no data are available for it in 2012.
36. According to one news report and the Center for American Democracy, ACC chair Bob Stump participated in ALEC. Commissioner Bob Burns is a former Arizona ALEC state chair. In addition, another commissioner who was elected before 2012, Brenda Burns, was on ALEC's board for 9 years and was national chair in 1999. D. A. Barber, "The Battle for a Solar Arizona: Arizona Is Being Sucked Into a War Over Residential Solar Energy," *Tucson Weekly*, September 26, 2013.
37. APS also knew that former ALEC-affiliated commissioners such as Bob Stump were more favorable to their policies. Energy and Policy Institute, "Attacks on Renewable Energy Policy by Fossil Fuel Interests 2013–2014," May 2014.
38. An APS spokesperson asserted that the company was a proud member of ALEC due to its pro-business stances. Luige del Puerto, "Months After Publicly Leaving ALEC in 2012, APS Quietly Rejoined," *Arizona Capital Times*, November 7, 2013. Moreover, APS has historically supported ALEC-affiliated legislators because of their anti-solar stances. The trend is no



- different for the ACC candidates. Lee Fang, “Arizona GOP Candidate Debbie Lesko Copied and Pasted Bills Written by Lobbyists,” *The Intercept*, April 19, 2018.
39. Robert Anglen and Ryan Randazzo, “2 Utilities’ Cash Went to 3 ACC Campaigns,” *The Arizona Republic*, November 5, 2013.
  40. *Ibid.*
  41. Some researchers suggest that public financing reduces the influence of money in elections and the influence of interest groups (Malhotra 2008). Even a small contribution could undo the intent of public financing laws.
  42. Commissioner Gary Pierce was formerly a representative in the House. Arizona Corporation Commission, “Commission Names Jodi Jerich as Executive Director,” January 3, 2013.
  43. While the ACC staff appeared to act more in line with the public interest prior to 2014, the staff now appears to be aligned with the utilities, at times being at odds even with commissioners. Gheorghiu, “Arizona Commissioner Tobin Resigns.”
  44. ACC Decision number 73636.
  45. Despite eliminating support for new solar projects, APS made it clear that it still wanted the renewable energy credits for use in compliance with the RPS target. In other words, while it wasn’t paying for the renewables anymore, it still wanted to own them to meet requirements under the renewable energy policy.
  46. Herman K. Trabish, “A Sneak Attack on Commercial Solar in Arizona,” *Greentech Media*, February 25, 2013.
  47. Ryan Randazzo, “Officials Consider Altering Renewable Mandate,” *The Arizona Republic*, February 7, 2013.
  48. *Ibid.*
  49. Edison Electric Institute, *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business*, January, 2013.
  50. Navigant Consulting report prepared for APS, *Net Metering Bill Impacts and Distributed Energy Subsidies*, December 2012.
  51. A report from the Lawrence Berkeley National Laboratory suggests that unnecessary infrastructure for natural gas shifts costs to customers. Galen Barbose, *Putting the Potential Rate Impacts of Distributed Solar Into Context*, January 2017.
  52. Navigant Consulting report prepared for APS, *Net Metering Bill Impacts*, 1.
  53. This discussion occurred in APS’s docket on its renewable energy charges on customer’s bills, E-01345A-12-0290. The decision number is 73636.
  54. Interview 32, former commissioner, January 27, 2014, Arizona.
  55. Interview 34, former renewables association employee, January 30, 2014, Arizona.
  56. The founding members of TASC were SolarCity, Sungevity, Sunrun, Verengo, Solar Universe, and REC solar.
  57. 60 Plus Association, *Seniors Group Releases TV Ad Highlighting Terry Goddard’s Devotion to Obama Agenda*, October 24, 2014.
  58. Rachel Finkel, “60 Plus Association,” FactCheck.org, June 23, 2014, <https://www.factcheck.org/2014/04/60-plus-association-2>; Miriam Wasser, “Koch Brothers Help Fund Anti-Grand Canyon Monument, Pro-Uranium Mining Efforts in Arizona, Tax Documents Show,” *Phoenix New Times*, April 18, 2016.
  59. Rod Kuckro, “APS Admits to Bankrolling Anti-solar TV ads,” *Utility Dive*, October 22, 2013.
  60. Ryan Randazzo, “Expense of Solar Battle in Millions,” *The Arizona Republic*, November 6, 2013.
  61. *Ibid.*
  62. SAIC report prepared for APS, *2013 Updated Solar PV Value Report*, May 2013.
  63. Interview 32, former commissioner, January 27, 2014, Arizona.
  64. The trend of disparate results from NEM cost and benefit studies is common across the country. A study commissioned by the Department of Energy outlined how many studies use different value categories and different “classes” such as utilities or consumers or society at large as the main unit of analysis: ICF, “Review of Recent Cost–Benefit Studies Related to Net Metering and Distributed Solar,” May 2018.
  65. The governor appoints RUCO directors, and thus, depending on the governor’s relationship with APS, the RUCO is not immune to capture.

66. Indeed, the next director of the RUCO would have a texting relationship with APS employees: Ryan Randazzo, “Texts Show Close Ties Between Arizona Consumer Advocate, APS,” *The Arizona Republic*, September 8, 2016.
67. ACC Docket number E-01345A-13-0248.
68. According to APS at that time, average bills were \$150.91 in the summer and \$121.72 in the winter, <https://www.aps.com/en/residential/accountservices/serviceplans/Pages/standard.aspx>
69. The original proposal included a provision for leased systems to be non-transferable after a home is sold. Fearing continued backlash, APS moved its position to grandfathering all existing customers. Interview 31, renewable energy advocate at an NGO, January 27, 2014, Arizona.
70. The cap on APS’s payments would be per unit of power such that the cost of power would be the same as or lower than that purchased from a solar power purchase agreement.
71. They argued that the Lost Fixed Cost Recovery program covered this issue.
72. Several interview subjects argued that the RUCO intervened because the advocates were able to leverage support for rooftop solar among some conservatives. Interview 30, renewable energy advocate at an NGO, January 27, 2014, Arizona; interview 32, former commissioner, January 27, 2014, Arizona.
73. Editorial Board, “Finally, a Fair Way to Resolve Arizona’s Solar Squabble,” *The Arizona Republic*, October 30, 2013.
74. Sandy Bahr and Refugio Mata, “New Charges on Rooftop Solar Approved Today by AZ Corporation Commission Will Threaten Arizona’s Clean Energy Freedom Economy,” *The Sierra Club*, November 14, 2013.
75. Interview 31, renewable energy advocate at an NGO, January 27, 2014, Arizona.
76. Interview 52, commissioner, February 17, 2014, Arizona.
77. APS, “APS Solar Communities,” <https://www.aps.com/en/ourcompany/aboutus/investmentinrenewableenergy/Pages/aps-solar-communities.aspx?src=solarcommunities>
78. Peter Fairley, “Utilities and Solar Companies Fight Over Arizona’s Rooftops,” *IEEE Spectrum*, June 19, 2015.
79. Ryan Randazzo, “Candidates for Corporation Commission Differ on Corporate Support,” *The Arizona Republic*, June 30, 2014.
80. Ryan Randazzo, “Little–Forese Team Wins Corp. Commission Republican Primary,” *The Arizona Republic*, August 26, 2014.
81. Howard Fisher, “Arizona Public Service Details how It Spent \$10 Million on Elections,” *Tucson.com*, May 19, 2017.
82. Howard Fisher, “APS Admits Spending Millions in 2014 Election of Energy Regulators,” *Arizona Capitol Times*, March 29, 2019.
83. ACC Docket number E-01345A-19-0043.
84. TUSK Campaign Finance Report, *2014 Post-General Election Report*, December 4, 2015.
85. Under prior estimates, in 2014 the commission election was the seventh most expensive race in the state’s history. Mary Jo Pitzl and Rob O’Dell, “Outside Money Played Huge Role in Arizona Elections,” *The Arizona Republic*, November 8, 2014.
86. APS spends between \$350,000 and \$700,000 annually on lobbying costs. Email records also show extensive policy correspondence between APS lobbyists and the ACC. See ACC Docket number E-01345A-19-0043; David Pomerantz, “Arizona Commissioner Andy Tobin Texted APS Lobbyists Frequently, Including About Open Rate Case,” Energy and Policy Institute, October 29, 2018; David Pomerantz, “Arizona Commissioner Justin Olson Answered Questions About Arizona’s Energy Policy by Copying Parts of an APS Memo Verbatim, Emails Show,” Energy and Policy Institute, October 18, 2018.
87. The whistleblower alleged that he was offered a promotion in exchange for his silence. Brahm Resnik, “Whistleblower Alleges Wrongdoing at Arizona Agency,” *12News*, February 20, 2015.
88. Specifically, the APS Foundation donated \$180,000 to ASU in 2013. Subsequently, the ASU Foundation gave \$100,000 to Save Our Future Now, one of the major groups that paid for ACC election advertisements. This was an odd donation: it was the only grant that the ASU Foundation gave out that year that was not to the university or a charity. Jacob Fenton, “ASU Foundation Links Utility Funds to Anti-solar Push,” Sunlight Foundation, March 10, 2015.

89. “Bill Post to Retire at Pinnacle West, Don Brandt to Step In,” *Phoenix Business Journal*, January 21, 2009.
90. Customers could minimize their charge by reducing how much peak-demand power they took from the grid.
91. Ryan Randazzo, “SolarCity Sues SRP for Antitrust Violations,” *The Arizona Republic*, March 3, 2015.
92. Joseph Barrios, “TEP Proposes More Equitable Credits for New Solar Power System Users,” *Tucson Electric Power*, March 25, 2015.
93. Under the current policy, APS net metering customers were paying \$0.70/kW, and this new request would in effect increase that to \$3/kW for future customers.
94. Residential customers have to pay a \$2.23 monthly meter fee, which has increased from the previous \$2 fee. TEP had proposed an increase to \$3.50. David Wichner, “New Tucson Electric Power Solar Customers to Get Lower Credits for Excess Electricity,” *Arizona Daily Star*, September 12, 2018.
95. Jeff St. John, “Salt River Project Asks Supreme Court to Take Up SolarCity Antitrust Case,” *GreenTechMedia*, September 13, 2017.
96. Ryan Randazzo, “Arizona Corporation Commission’s Robert Burns Subpoenas APS, Pinnacle West,” *The Arizona Republic*, August 25, 2016.
97. Robert Walton, “Newly-Elected Arizona Commissioner Prepares to Subpoena APS Over Political Spending,” *Utility Dive*, February 28, 2019.
98. Ryan Randazzo, “APS Refuses Request to Disclose Political Contributions,” *The Arizona Republic*, December 31, 2015.
99. ACC Docket number E-01345A-19-0043.
100. The election of Democrat Sandra Kennedy in 2018 and more support from Republican Body Dunn, elected in 2016, has meant that the majority of commissioners are in favor of APS campaign contribution disclosure. Howard Fisher, “APS Admits Spending Millions in 2014 Election of Energy Regulators,” *Arizona Capitol Times*, March 29, 2019.
101. Jeremy Duda, “APS Docs Reveal It Funded 2014 ‘Dark Money’ Effort Supporting Commissioner’s Son,” *AZMirror*, April 2, 2019.
102. The public record reveals that there were a number of emails related to the deal and co-conspirators willing to testify for the government. Pierce was accused of accepting a bribe and real estate deal from a water company in exchange for a more favorable rate case. At that point, APS had not been named as being under investigation. Jacques Billeaud, “Prosecutor: Gary Pierce Bribery Case Grew From Larger Probe,” *Associated Press*, July 5, 2017.
103. Ryan Randazzo, “Poll: Arizona Voters Say Utility Regulators Have Been ‘Corrupted,’” *The Arizona Republic*, September 8, 2017.
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109. Julia Pyper, “Does Nevada’s Controversial Net Metering Decision Set a Precedent for the Nation?” *GreenTechMedia*, February 4, 2016; Robert Walton, “Indiana Will Phase Out Retail Rate Net Metering,” *Utility Dive*, May 4, 2017; John Weaver, “Net Metering Drives Rooftop Solar Resurgence in Nevada,” *PV Magazine*, May 7, 2018.
110. Jason Berry, “Phoenix-Area Homeowners Rush to Install Solar Before APS Changes Rates,” *AZ Family*, June 15, 2017.
111. Pinnacle West, “Powering Growth, Delivering Value,” slide 30, September 26, 2018.
112. Ryan Randazzo, “SRP Elections: 2 Solar Candidates Unseat Incumbents,” *The Arizona Republic*, April 4, 2018.

113. APS, “2012 Integrated Resource Plan: Filed in Compliance With A.A.C. R14-2-703,” March 2012; Paul Smith, “2014 Integrated Resource Plan: Arizona Department of Environmental Quality Stakeholder Meeting,” June 2, 2015; APS, “2017 Integrated Resource Plan: Filed in Compliance With A.A.C. R14-2-703,” April 2017.
114. Jonathan Oosting, “Consumers Energy: Settlement Won’t Stop Political Spending by Parent Company,” *The Detroit News*, February 26, 2019.
115. Carolyn Kormann, “The Battle for Solar Energy in the Country’s Sunniest State,” *The New Yorker*, October 24, 2018.
116. At the same time of the ballot initiative, Commissioner Andrew Tobin drafted an energy modernization plan that would increase the RPS to 80% renewables and nuclear energy by 2050. Ultimately, Tobin was, however, not able to garner support from enough commissioners for his proposal. Steven Mufson, “The Hottest Fight in American Politics? Arizona’s Smackdown Over Solar Power,” *The Washington Post*, November 2, 2018; Julia Pyper, “The Battle Over Arizona’s Clean Energy Mix,” *GreenTechMedia*, September 23, 2018.
117. Ryan Randazzo, “Arizona Clean-Energy Ballot Measure Supporters Say Attorney General Undermined Proposal,” *The Arizona Republic*, September 18, 2018.
118. *Ibid.*
119. Ballotpedia, “Arizona Proposition 127, Renewable Energy Standards Initiative (2018),” [https://ballotpedia.org/Arizona\\_Proposition\\_127,\\_Renewable\\_Energy\\_Standards\\_Initiative\\_\(2018\)](https://ballotpedia.org/Arizona_Proposition_127,_Renewable_Energy_Standards_Initiative_(2018))

## Chapter 8

1. Interview 76, commission staffer, November 3, 2014, Ohio.
2. At the time this group was called the American Tradition Institute.
3. Whereas the national party had already begun polarizing on renewable energy, some states were slower. GOP state party control across the nation on opposing renewable energy gradually increased. Clare Foran and National Journal, “The Koch Brothers’ Next Frontier,” *The Atlantic*, November 21, 2014.
4. Southeastern Ohio is part of the Northern Appalachian basin, with significant deposits of high-quality, bituminous coal as well as coal-bed methane. Mining began in the state in the early nineteenth century. However, Ohio’s coal tends to be higher in sulfur content, and therefore mining declined to about half of its peak production in 1970. D. L. Crowell, *History of Coal Mining in Ohio*, 2005.
5. US Energy Information Administration (EIA), “Ohio: State Profile and Energy Estimates—Profile Analysis”; US EIA, “Weekly U.S. Coal Production,” [http://www.eia.gov/coal/production/weekly/tables/weekly\\_production.cfm](http://www.eia.gov/coal/production/weekly/tables/weekly_production.cfm)
6. For example, a 266-megawatt (MW) coal plant in Niles, Ohio, operated from 1954 until 2012, and several steel manufacturing plants were co-located in the town to access cheap energy. Many coal, steel, and iron manufacturing plants were also located along the Ohio River.
7. That said, coal consumption in the industrial sector has declined. In 2016, the sector consumed 112.3 trillion Btu, compared to 248.2 trillion Btu in 1990. US EIA, “State Energy Consumption Estimates 1960 Through 2016,” Table CT6, Ohio.
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9. J. Koncelik, “EPA’s Long Anticipated Ozone Decision,” *Ohio Environmental Law Blog*, December 1, 2014.
10. J. Koncelik, “Retirement of Coal Power Plants Accelerates,” *Ohio Environmental Law Blog*, October 2, 2014.
11. US EIA, “State Nuclear Profiles,” <https://www.eia.gov/nuclear/state/archive/2010/ohio/>
12. US Nuclear Regulatory Commission, “NRC Issues Preliminary Risk Analysis of the Combined Safety Issues at Davis-Besse,” September 20, 2004, <https://web.archive.org/web/20061003054919/http://www.nrc.gov/reading-rm/doc-collections/news/2004/04-117.html>
13. E. W. Hill, K. Kinahan, and A. Immonen, *Ohio Utica Shale Region Monitor*, Cleveland, 2014.

14. US EIA, “Ohio State Energy Profile,” Available online at: <https://www.eia.gov/state/print.php?sid=OH>
15. At the time, SEIA was called the Solar Alliance.
16. Realtors were also large contributors. National Institute on Money in State Politics, information via [followthemoney.org](http://followthemoney.org).
17. Interview 78, lobbyist for renewables industry, November 4, 2014, Ohio.
18. Interview 78, lobbyist for renewables industry, November 4, 2014, Ohio.
19. Ibid.
20. Secretary of State 2010 election results, <http://www.sos.state.oh.us/sos/elections/Research/electResultsMain/2010results/20101102sos.aspx>
21. Interview 78, lobbyist for renewables industry, November 4, 2014, Ohio.
22. Interview 84, political staff, November 5, 2014, Ohio.
23. Interview 77, lobbyist for heavy industry, November 3, 2014, Ohio; interview 84, political staff, November 5, 2014, Ohio.
24. “About IEU-Ohio,” [http://www.ieu-ohio.org/about\\_us.aspx](http://www.ieu-ohio.org/about_us.aspx)
25. Interview 75, renewable energy advocate at an NGO, November 3, 2014, Ohio.
26. Interview 76, commission staffer, November 3, 2014, Ohio.
27. Interview 75, renewable energy advocate at a nongovernmental organization (NGO), November 3, 2014, Ohio.
28. These payments in lieu of taxes would apply to advanced energy projects built before 2017 and large renewable energy projects built between 2009 and 2011.
29. In 2007, before the RPS was passed, there were 112 MW installed; by 2010 there were 231 MW installed. US EIA, “Ohio: State Profile and Energy Estimates,” <http://www.eia.gov/state/data.cfm?sid=OH>
30. LBNL RPS compliance data, Ohio 2009.
31. “Wind Energy Opposition and Action Groups,” <https://www.wind-watch.org/allies.php>
32. There is extensive email correspondence between Senator Seitz and several anti-wind activists. As he says at one point in June 2014, “Who would ever have believed that when the two of you wandered into my Senate office some seven years ago as complete strangers, we would have come to this point in our efforts?!”
33. Tom Stacy and other anti-wind groups have been directly linked with fossil fuel interests, including the Koch Brothers and Americans for Prosperity. Energy and Policy Institute, “Analysis: Americans for Prosperity Anti-Wind Letter, June 2014,” June 16, 2014.
34. Dave Anderson, “Tom Stacy: A Top Anti-Wind Activist Who Got Paid by a Fossil Fuel Funded Group,” Energy and Policy Institute, April 2, 2018.
35. Christa Marshall and Evan Lehmann, “AEP Move to Stop Carbon Capture and Sequestration Project Shocks Utilities, Miners,” *New York Times*, July 15, 2011.
36. Moreover, nuclear energy has met a powerful enemy in oil and gas companies that seek to preserve natural gas’s strong hold on the market. The American Petroleum Institute has opposed state subsidies for nuclear energy and sent mailers for Ohioans to contact their legislators. Russell Gold, “Oil-Gas Lobby Opposes State Subsidies for Nuclear Power Producers,” *Wall Street Journal*, April 25, 2017.
37. Interview 77, lobbyist for heavy industry, November 3, 2014, Ohio.
38. Ohio Manufacturers’ Association, “OMA Supporting Common Sense Energy Efficiency Rules,” May 22, 2009, <http://www.ohiomfg.com/communities/energy/oma-supporting-common/>
39. In addition, the Mercatus Center, a right-leaning think tank affiliated with George Mason University and known for market-based and deregulatory stances, wrote a report attacking Ohio’s energy efficiency targets in 2014.
40. American Tradition Institute and the Beacon Hill Institute, “The Cost and Economic Impact of Ohio’s Alternative Energy Portfolio Standard,” 2011.
41. Interview 79, politician, November 4, 2014, Ohio.
42. US EIA, “Ohio’s Fuel Mix for Power Generation Is Changing,” <https://www.eia.gov/todayinenergy/detail.php?id=5030>
43. While the model legislation was finalized in 2012, it was developed in the years prior and likely influenced Senator Jordan between 2010 and 2011.



44. Senator Jordan would reintroduce this bill in subsequent years, and it would again make no progress.
45. Governor John Kasich letter to Energy Summit participants, September 2011.
46. Interview 80, renewable energy advocate at an NGO, November 4, 2014, Ohio.
47. Bill Seitz, “Seitz: The Case Against Clean Energy Mandates,” *The Enquirer*, January 9, 2017.
48. Tom Knox, “Seitz on Renewable-Energy Freeze: ‘I Don’t Think We’re Likely to Resume Our March up Mandate Mountain,’” *Columbus Business First*, September 10, 2015.
49. “William Seitz’s Campaign Finances,” Vote Smart, <https://votesmart.org/candidate/campaign-finance/45594/william-seitz#.XKSQxZhKg2w>
50. AEP gave \$2,500 in 2009 and \$19,000 in 2012. “Electric Utilities Contributions to Seitz, William J (Bill),” National Institute on Money in State Politics, information via [followthemoney.org](http://followthemoney.org).
51. Innovation Ohio, “Rate of Return: What Will Ohio’s Electric Utilities Get for Campaign Cash?” December 3, 2013.
52. Matt Kasper, “The Repeated Effort by Ohio ALEC Members to End the State’s Clean Energy Law,” Energy and Policy Institute, September 17, 2015; interview 80, renewable energy advocate at an NGO, November 4, 2014, Ohio; interview 95, politician, December 8, 2014, Ohio.
53. Interview 82, utility employee, November 5, 2014, Ohio.
54. Ohio Manufacturers’ Association, “Senate Bill 58—Increases Electricity Costs: Bad for Ohio Manufacturers,” <http://www.ohiomfg.com/senate-bill-58/>
55. Tom Knox, “Bill Seitz on His Opposition to Energy Mandates, and His Work With ALEC,” *Columbus Business First*, September 12, 2014.
56. In addition to changing the renewable energy and advanced energy targets, the bill would decrease the onus for utilities to meet efficiency targets. Efforts taken by customers to increase energy efficiency that met federal requirements count, even if the utility did not initiate the work. Infrastructure fixes to transmission and distribution would also count if they cut how much energy the lines lost. As such, any further work would likely be in excess of requirements and could more easily be used to meet future targets.
57. Utilities such as Duke Energy and Florida Power and Light Company teamed up with Koch-funded groups to oppose the initiative. Energy and Policy Institute, “Special Interests Behind Anti-Solar Ballot Initiative Consumers for Smart Solar,” November 16, 2015.
58. Tom Knox, “Business Group Poll Says Ohio Voters Want Energy Efficiency Mandates Changed,” *Columbus Business First*, April 28, 2014.
59. “Six years ago, when the Ohio legislature passed the law mandating reductions in electricity consumed, certain assumptions were used to justify the law, many of which were wrong. For example, legislators assumed electricity would be in short supply and new electric generation would be expensive. But today, there’s ample low-cost electricity and will be for years to come. Knowing this . . . should the Ohio state legislature, taking into account the new information, go back and change the law?” Knox, “Business Group Poll Says”; 72% agreed.
60. Email correspondence between Chris Prandoni at Americans for Tax Reform and Senator Seitz, Thursday May 8, 2014.
61. As another example, the Ohio Advanced Energy Economy released research on the cost savings from the renewable standard. Tom Knox, “Energy-Efficiency Mandates Would Save \$4B by 2025, Group Says,” *Columbus Business First*, April 24, 2014.
62. “Show Me Electric Utilities Contributions to Faber, Keith Lloyd,” National Institute on Money in State Politics, information via [followthemoney.org](http://followthemoney.org).
63. Joe Vardon and Dan Gearino, “Kasich Urges Changes in ‘Green Energy’ Bill,” *The Columbus Dispatch*, May 3, 2014.
64. The bill treated the energy efficiency targets in the same way—a 2-year freeze and reconsideration by the committee.
65. Interview 84, political staff, November 5, 2014, Ohio.
66. John Funk, “TV and YouTube Spot by Opponents of Ohio SB 310 Claims Energy Efficiency and Renewable Freeze Would Threaten Jobs, Raise Bills,” *Cleveland.com*, May 20, 2014; interview 75, renewable energy advocate at an NGO, November 3, 2014, Ohio.
67. Tom Knox, “Big Manufacturers Urging Lawmakers to Keep Energy-Efficiency Benchmarks,” *Columbus Business First*, April 8, 2014.



68. John Funk, “Ohio Senate Bill 310 Derailed; Coalition Favoring Efficiency and Renewable Energy Proposes Another Compromise,” *Cleveland.com*, May 21, 2014.
69. Memo from Senator Seitz, “Thoughts on Energy Reform Legislation and Next Steps,” May 30, 2014.
70. Joanna Foster, “Ohio Churches Fight to Save Renewables and Energy Efficiency,” *ThinkProgress*, May 22, 2014.
71. AWEA Press Release, “Gov. Kasich Should Veto Wind Energy-Killing Provision of H.B. 483 That Jeopardizes \$2.5 Billion Investment in Ohio,” June 9, 2014.
72. Interview 78, lobbyist for renewables industry, November 4, 2014, Ohio. A number of other respondents named Julie Johnson as an influential anti-wind advocate. Interview 84, political staff, November 5, 2014, Ohio; interview 95, politician, December 8, 2014, Ohio. See as well, Holly Zachariah, “Wind-Farm Operator Upset With Energy Law,” *Columbus Dispatch*, June 15, 2014.
73. Those involved suggest that bills favorable to utilities, when timed during campaign season, act as a signal to indicate shared alignments. Interview 84, political staff, November 5, 2014, Ohio. AEP gave Faber about \$25,000 in 2012, \$18,500 in 2016; FirstEnergy gave \$23,000 in 2012 and then \$31,500 in 2016. National Institute on Money in State Politics, information via followthemoney.org.
74. FirstEnergy gave about \$11,000 in 2010 and \$24,000 in 2014, and AEP gave \$8,500 in 2010 and \$24,000 in 2014 to Governor Kasich’s campaigns.
75. National Institute on Money in State Politics, information via followthemoney.org.
76. AWEA, Wind Energy Foundation and Renewable America Report, *Blowing in the Wind: Ohio’s Overly Restrictive Wind Setback Law Is Putting Billions in New In-State Investment at Risk*, 2017.
77. Ohio Public Utilities Commission, “How Does Ohio Generate Electricity?” 2019.
78. Efforts in 2017 to change the wind setback rules were blocked. Randazzo and Seitz’s relationship remained close, with Seitz calling on Randazzo for detailed talking points and a push to influence the House Speaker. For more, Scott Peterson, “Powerful Lobbyist Steered Seitz Effort to Block Ohio Wind Power Jobs,” April 16, 2018.
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80. Clean Jobs Midwest, 2016, Report.
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83. Dave Anderson, “Insider Emails: Polluter Lobbyists Behind Clean Energy Standards Freeze in Ohio,” *Energy and Policy Institute*, December 9, 2016.
84. *Ibid.*
85. Gabe Elsner, “Ohio Energy Study Committee Relied Upon Flawed Testimony,” September 30, 2015, *Energy and Policy Institute*; Brian Maffly, “USU business school courts billionaire ideologue,” *The Salt Lake Tribune*, September 8, 2010.
86. “Follow the money behind attacks on clean energy in Ohio,” *Energy and Policy Institute*, December 28, 2016.
87. Kathiann M. Kowalski, “Ohio bill would relax wind setbacks — and clean energy standards,” *Energy News*, June 26, 2018.
88. John Funk, “PUCO rejects deal to have ratepayers subsidize a coal-fired power plant,” *The Plain Dealer*, January 12, 2019.
89. David Roberts, “This Ohio utility has an innovative plan to save coal power: force customers to buy it,” September 3, 2015, *Vox*; Neil Waggoner, “Don’t Bail Out Dirty Coal Plants,” August 28, 2014, *The Sierra Club*; Kathiann M. Kowalski, “FirstEnergy touts benefits of plan critics decry as ‘bailout,’” August 14, 2014, *Energy News*.

90. Darren Sweeney, "AEP Ohio, Sierra Club defend settlement in Ohio PPA plan," December 22, 2015, *SNL Generation Markets Week*.
91. John Finnigan, "Ohio Failed to Protect Customers and Markets – So Federal Regulators Came to the Rescue," May 2, 2016, EDF.
92. Laura Hancock, "Ohio Supreme Court nixes FirstEnergy electric grid charge," June 19, 2019, *Cleveland.com*; Kathiann M. Kowalski and John Funk, "How affiliate arrangements, subsidies and riders led to higher electric bills in Ohio — even as power prices declined," September 20, 2019, *Energy News*.
93. Dave Anderson, "FirstEnergy's Wall Street investors lobbied for bailout bill in Ohio," August 26, 2019, Energy and Policy Institute; Jeff St. John, "FERC Rejects Energy Secretary Rick Perry's Coal and Nuclear Energy Market Bailout Plan," January 8, 2018, *GreenTechMedia*.
94. Dave Anderson, "Top candidates for Ohio House speaker back bailouts for utilities that back their campaigns," May 10, 2018, Energy and Policy Institute.
95. Ohio Environmental Council, Environmental Defense Fund, and Environmental Law and Policy Center, "Appellants' merit brief of Ohio Environmental Council, Environmental Defense Fund, and Environmental Law and Policy Center," February 2, 2018.
96. Andrew Tobias, "FirstEnergy and its allies, seeking nuclear plant bailout, have spent millions on influence campaign," *Cleveland.com*, April 17, 2019.
97. Andrew Tobias, "Nuclear bailout bill shows how big money can be put to work in the Ohio Statehouse," *Cleveland.com*, May 2019.
98. Kathiann Kowalski, "State lawmaker part of effort to stop Ohio wind project," *EnergyNews*, April 27, 2015.
99. The relationship between Householder and FirstEnergy did not start in 2018—FirstEnergy flew both Householder and his son to Trump's inauguration: Jeremy Pelzer, "FirstEnergy PAC writes big checks to House speaker hopeful Larry Householder, campaign allies," *Cleveland.com*, January 30, 2019.
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101. Interview 107, Renewable energy advocate at an NGO, August 14, 2019, Ohio.
102. Midwest Energy Efficiency Alliance, "Energy efficiency in Ohio: Energy & bill savings for customers, 2009–2017," April 21, 2019.
103. Interview 105, Renewable energy advocate at an NGO, July 19, 2019, Ohio.
104. Interview 106, Journalist, July 22, 2019, Ohio.
105. Interview 107, Renewable energy advocate at an NGO, August 14, 2019, Ohio.
106. Liam Denning, "Ohio's Nuke and Coal Bailout: Throwback Mountain," *Bloomberg*, July 24, 2019.
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113. Kathiann M. Kowalski, "Who's behind the Chinese conspiracy ads against Ohio's nuclear referendum?" *Energy News Network*, September 23, 2019.
114. Andy Chow, "Nuclear Bailout Supporters Clashing With Referendum Petitioners In The Field," *Statehouse News Bureau*, October 1, 2019.

115. Christine Bowen Wright, *Agent Activity & Expenditure Report*, September 20, 2016, [https://www2.jlec-olig.state.oh.us/olac/Reports/AERView\\_Legislative.aspx?id=496368](https://www2.jlec-olig.state.oh.us/olac/Reports/AERView_Legislative.aspx?id=496368); FirstEnergy, *Agent Activity & Expenditure Report*, September 29, 2016, <https://www.documentcloud.org/documents/3232515-First-Energy-2016-Lobbying-Disclosure-Ohio-SB.html>
116. Interview 78, lobbyist for renewables industry, November 4, 2014, Ohio.

### Chapter 9

1. Lyrics from “The 1975” by The 1975. Adapted from Greta Thunberg, “Our House is on Fire,” Speech at World Economic Forum, Davos, January 25, 2019.
2. California’s goal was 1% by 1987 and 10% by 2000, although the latter goal would not be met (Righter, 1996a).
3. These were small turbines: 0.07 megawatts (MW) on average, compared to the 1.5-MW turbines that are routinely installed today.
4. With the tax credits and PURPA avoided cost rates in place, ARCO Solar built solar photovoltaic projects several megawatts in size. Large solar thermal technologies were also pioneered in California at this time, most notably the Solar Energy Generating Stations projects which began construction in 1984 in the Mojave Desert. By 1990, these projects grew to be 350 MW in scale, and they continue to operate today. In addition, the first distributed generation solar projects were built in California in 1993, at Pacific Gas & Electric Company’s (PG&E’s) 500-kW, grid-connected Kerman plant. US Energy Information Administration, “Renewable Energy Annual 1996,” 1997.
5. Michael J. Weiss, “Everybody Loves Solar Energy, but . . .” *New York Times*, September 24, 1989.
6. Most notably, Kenetech, then U.S. Windpower, moved its operations to California from Massachusetts in the early 1980s to capitalize on the booming wind industry (Righter 1996a).
7. Luz International, an important early solar company, went bankrupt in 1991. Kenetech, an important early wind company, went bankrupt in 1996.
8. PG&E Draft Memo, “Proposal: To Remove Non-Utility Programs From Electric Rates and to Fund These From Electricity Surcharges,” April 5, 1995.
9. In 2009, clean energy supplied 31% of the nation’s grid; in 2018, it supplied 37%. BloombergNEF and the Business Council for Sustainable Energy, *2019 Sustainable Energy in America Factbook*.
10. Given that renewable energy is intermittent, this figure may actually be much higher in terms of installed capacity if a high renewables scenario is used when the grid is grown.
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13. Nathanael Johnson, “Breathe Easier: States Are Passing a Butload of Clean Energy Bills,” *Grist*, June 10, 2019.
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16. Ryan Randazzo, “Arizona Clean-Energy Ballot Measure Supporters Say Attorney General Undermined Proposal,” *Arizona Republic*, September 18, 2018.
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18. Sean McElwee, “People Actually Like the Green New Deal,” *The New York Times*, March 27, 2019.
19. David Hasemyer, “Fossil Fuels on Trial: Where the Major Climate Change Lawsuits Stand Today,” *InsideClimate News*, January 6, 2019.

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22. Ivan Penn, “Florida’s utilities keep homeowners from making the most of solar power,” *The New York Times*, July 7, 2019.
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27. Interview 97, renewable energy advocate at a nongovernmental organization (NGO), March 19, 2015, multiple cases.
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29. New Mexico Legislature, *Fiscal Impact Report on Energy Transition Act*, March 7, 2019.
30. Interview 106, journalist, July 22 2019, Ohio.
31. Susie Cagle, “‘Protesters as Terrorists’: Growing Number of States Turn Anti-Pipeline Activism Into a Crime,” *The Guardian*, July 8, 2019.
32. Ibid.
33. Peter Stone, “The Kochs Are Plotting A Multimillion-Dollar Assault On Electric Vehicles,” *The Huffington Post*, February 18, 2016.
34. Matthew Gardner, Steve Wamhoff, Mary Martellotta, and Lorena Roque, “Corporate Tax Avoidance Remains Rampant Under New Tax Law,” *Institute on Taxation and Economic Policy*, April 2019.
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36. California State Auditor, *California Public Utilities Commission. Despite Administrative Weaknesses, It Has Generally Awarded Compensation to Intervenor in Accordance With State Law*, Report 2012-118, July 2013.
37. As the California state auditor found in 2013, in several cases intervenors paid less than \$1 million resulted in savings for ratepayers between \$130 and \$354 million. Ibid.
38. Interview 91, bureaucrat, November 12, 2014, Kansas.
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