Notes & Comments

A Penny Saved is a Penny Not Burned: Renewables, Efficiency, and Conservation as Alternative Means of Reducing Energy Consumption

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I. INTRODUCTION

Policy makers have at least three tools at their disposal to reduce carbon emissions: renewable energy, energy efficiency, and energy conservation.[1] A renewable energy source promises to heat homes and power cars while emitting fewer greenhouse gases than conventional carbon-burning alternatives such as coal and oil.[2] An electric car powered by wind-generated electricity benefits from *renewable energy*. Energy efficiency, meanwhile, refers to technical improvements that result in using less energy without a reduction in consumer enjoyment.[3] A fuel-efficient automobile that covers more miles with less gasoline benefits from *energy efficiency*. Lastly, energy conservation reduces energy consumption when consumers simply adopt habits that use less energy.[4] A motorist who realizes he can use half as much time and energy if he consolidates his weekly grocery shopping from two trips into one engages in *energy conservation*.

In other words, renewable energy means, "Use cleaner energy sources to get the same enjoyment."[5] Energy efficiency means, "Use the same amount of energy, but get *more* enjoyment."[6] Energy conservation simply means, "Use less energy, either by trimming waste or reducing enjoyment."[7] While proper use of each of the three tools has the effect of conserving fossil fuels, for the purposes of this note, "energy conservation" in the sense of energy-saving consumption habits will be kept distinct from the concepts of renewable and energy-efficient technology.[8]

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1. Other tools such as cap-and-trade, carbon taxes, attempts to "clean up" conventional carbon-intensive fuels, and general environmental protection laws have been written about extensively elsewhere and go beyond the scope of this note. In this note, some of these additional tools are considered incidentally, principally in the context of how they can be used to shift the relative price of energy sources in favor of renewables.

2. *See Renewable Energy*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/statelocalclimate/state/topics/renewable.html (last visited Feb. 9, 2015) ("Renewable energy is electricity generated by fuel sources that restore themselves over a short period of time and do not diminish").

3. Brandon Hofmeister, *Bridging the Gap: Using Social Psychology to Design Market Interventions to Overcome the Energy Efficiency Gap in Residential Energy Markets*, 19 SOUTHEASTERN ENVTL. L.J. 1, 7–8 (2010).

4. *Id.* (distinguishing efficiency from conservation).

5. *See supra* note 2.

6. *See supra* note 3.

7. *See supra* note 3.

8. In fact, this note will argue for the need to insist on a much more rigid distinction between conservation and efficiency than is often made.

This note will first analyze each of the three tools independently. The promotion of renewable energy will be analyzed principally through a case study of the Environmental Protection Agency's recently proposed standards for new coal-fired power plants. Energy efficiency will be examined from the perspective of how to remove both market and cognitive barriers to the development of more efficient technologies. Similarly, discussion of energy conservation will focus on removing barriers to conservation. Finally, this note will conclude with recommendations on the proper use of each tool. Because the growth of renewable energy technology is uncertain to keep pace with a projected doubling in global energy demand, energy conservation is no mere sideshow in the push for reduced emissions: it is in fact indispensable.[9] Of the three tools, this note ultimately argues that energy conservation is the most underused.

II. CASE STUDY IN THE PUSH TOWARD RENEWABLES: THE EPA'S PROPOSED EMISSIONS STANDARDS FOR NEW COAL PLANTS

Policy makers may promote renewable energy by purchasing, funding, or otherwise directly encouraging it. For example, section 203 of the Energy Policy Act of 2005 (the "EPAct") requires the federal government to obtain 7.5 percent of its electricity from renewable energy sources starting in fiscal year 2013.[10] The EPAct defines renewable energy as "electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project."[11]

However, policy makers may also promote renewables indirectly by increasing the cost of their nonrenewable alternatives. If renewables are perfect substitutes for nonrenewables—arguably they are, since energy flowing along an electric current has the same characteristics regardless

9. *See* Michael P. Vandenbergh & Jim Rossi, *Good for You, Bad for Us: The Financial Disincentive for Net Demand Reduction*, 65 VAND. L. REV. 1527, 1528-29 (2012); *see also* Nathan S. Lewis & David G. Nocera, *Powering the Planet: Chemical Challenges in Solar Energy Utilization*, 103 PROC. NAT'L ACAD. SCI. 15729, 15729 (2006) ("the world energy consumption rate is projected to double from 13.5 [terawatts] in 2001 to 27 [terawatts] by 2050 and to triple to 43 [terawatts] by 2100"), *available at* http://www.pnas.org/content/103/43/15729.full.

10. Energy Policy Act of 2005, 42 U.S.C. § 15852(a) (2012).

11. *Id.* § 15852(b)(2).

of how it was generated—then decreasing their relative price will result in their increased relative consumption.[12] In other words, increasing the cost of nonrenewable energy simultaneously discourages its use while encouraging use of renewable alternatives. The Environmental Protection Agency's ("the EPA") recently proposed rules for new stationary sources of greenhouse gas emissions illustrate this latter technique.

In January 2014, the EPA published its proposed rules laying out performance standards for new stationary sources of air pollutants under section 111 of the Clean Air Act.[13] The proposed standards[14] effectively require the adoption of carbon capture and storage ("CCS") technology by limiting new coal-fired plants to 1,100 pounds of carbon dioxide for each megawatt-hour of power they produce.[15] CCS technology entails "capturing" carbon dioxide that otherwise would dissipate into the atmosphere and storing it underground.[16] Implementing CCS technology promises to be an expensive undertaking, so much so that the proposed standards may preclude the construction of new coal plants for the foreseeable future.[17]

Even if the EPA's standards for new plants survive all judicial challenges brought against them, the standards may not be necessary to reduce greenhouse gas ("GHG") emissions given the commercial plight in which coal already finds itself with recent competition from natural gas. The problem of "leakage"—namely, that emissions-reducing policies in one jurisdiction will lead to increased emissions in another—is of genuine concern to policy makers but can be mitigated if necessary by the National Environmental Policy Act ("NEPA") and other checks.[18]

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12. For a discussion of the effects of changing the relative price of substitute goods, see JACK HIRSHLEIFER ET AL., PRICE THEORY AND APPLICATIONS 104 (Cambridge Univ. Press 2005).

13. Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1430-01 (proposed Jan. 8, 2014) (to be codified at 40 C.F.R. pts. 60, 70, 71, and 98); *see also* 42 U.S.C. § 7411(a) (defining "standard of performance" and "stationary source").

14. At the time of this writing, the EPA is expected to issue a final rule by mid-summer 2015. Alan Neuhauser, *EPA to Issue Carbon Rules by Summer*, U.S. NEWS & WORLD REPORT, Jan. 7, 2015, http://www.usnews.com/news/articles/2015/01/07/epa-to-complete-clean-power-plan-carbon-rules-by-summer.

15. Mark Drajem, *New Coal Plants Must Capture Carbon Dioxide Output: EPA*, BLOOMBERG, Sept. 20, 2013, http://www.bloomberg.com/news/2013-09-20/new-coal-plants-must-capture-carbon-dioxide-output-epa.html ("Limits for new coal-fired plants would be 1,100 pounds of carbon dioxide for each megawatt hour of power they produce, a standard that can't be met without carbon-capture technology.").

16. *Id.*

17. *See id.*

18. *See infra* Part II.C.

Finally, the EPA's proposed rules are vulnerable to serious and potentially insurmountable political snares.[19]

A. The EPA's Proposed Standards Effectively Requiring Carbon Capture Technology in New Coal-Fired Plants Likely Would be Upheld in Court

The EPA is expected to issue its final rule for new plants along with similar standards for existing and modified plants as part of the EPA's Clean Power Plan.[20] The Clean Power Plan is vulnerable to a number of legal challenges, among them that the forced implementation of the standards impermissibly "commandeers" state governments and that the Plan improperly dictates standards under section 111 of the Clean Air Act for plants already regulated under section 112.[21] The Clean Power Plan's overall vulnerabilities aside, courts' traditional deference to agency action and their reluctance to find regulatory takings suggest that the EPA's proposed standards for new coal-fired plants are likely a valid exercise of authority under the Clean Air Act.

First, the EPA's standards would likely pass a *Chevron* reasonableness test, which requires judicial deference for permissible agency interpretations of a statute.[22] Indeed, the *Chevron* test itself originated from a decision granting deference to another EPA implementation of the Clean Air Act.[23] In developing the standards, the EPA took the economic costs of the coal industry into account[24] as required by section 111 of the Clean Air Act.[25] The EPA's consideration of only those costs and benefits required by statute distinguishes the EPA's standards from its action overruled by the Supreme Court in

19. *See infra* Part II.D.

20. Alan Neuhauser, *EPA to Issue Carbon Rules by Summer*, U.S. NEWS & WORLD REPORT, Jan. 7, 2015, http://www.usnews.com/news/articles/2015/01/07/epa-to-complete-clean-power-plan-carbon-rules-by-summer.

21. Laurence H. Tribe, *The Clean Power Plan Is Unconstitutional*, WALL STREET JOURNAL, Dec. 23, 2014, at A13.

22. Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837, 842–45 (1984).

23. *Id.* at 866.

24. Standards of Performance, 79 Fed. Reg. at 1433 ("[I]n Chapter 5 of the [Regulatory Impact Analysis], we also present an analysis of the project-level costs of a new coal-fired unit with partial CCS alongside the project-level costs of a new coal-fired unit without CCS").

25. Clean Air Act, 42 U.S.C. § 7211(a)(1) (2012). The majority opinion in the *Whitman* case, discussed *infra* notes 26 and 27 and accompanying text, quotes this provision as evidence that the Act requires economic costs to be taken into account.

Whitman v. American Trucking Associations.[26] In *Whitman*, the Court found it "implausible" to maintain that the EPA could consider implementation costs in setting national ambient air quality standards when the pertinent section of the Clean Air Act gave it no authority to do so.[27] The recently proposed coal standards, in contrast, do consider the factors required under the relevant section of the Act, so a court is likely to defer to the EPA's interpretations.

Second, the high economic costs that the proposed rules impose on the coal industry are unlikely to rise to the level required for the rules to be struck down as a regulatory taking under the Fifth Amendment. Generally, a regulatory taking occurs when "government regulation of private property [is] so onerous that its effect is tantamount to a direct appropriation or ouster."[28] The Supreme Court has recognized two categories of *per se* regulatory takings: (1) when regulation amounts to a "permanent physical invasion" of property,[29] and (2) when regulation completely deprives an owner of "*all* economically beneficial us[e]" of property.[30] Outside these two categories, regulatory takings are governed by an "essentially ad hoc, factual inquir[y]" that considers factors such as the extent to which regulation interferes with investment-backed expectations.[31] Whenever a regulatory taking occurs, just compensation is required.[32]

Challenges of environmental statutes and regulations have rarely been successful,[33] in part because all property ownership is subject to governments' substantial enumerated and plenary powers to regulate. In *Lucas v. S. Carolina Coastal Council*, the Supreme Court explored the relationship between state police power and property ownership:

> It seems to us that the property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers . . . . And in the case of personal property, by reason of the State's traditionally high degree of control over commercial dealings,

26. Whitman v. Am. Trucking Ass'n, 531 U.S. 457, 486 (2001).

27. *See id.* at 468.

28. Lingle v. Chevron U.S.A., 544 U.S. 528, 537 (2005) (quoting Agins v. City of Tiburon, 447 U.S. 225, 260 (1980)).

29. *Id.* at 538 (citing Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982)).

30. *Id.* (quoting Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1019 (1992)).

31. *Compare id.* at 538-39 *with* Penn Cent. Transp. Co. v. City of New York, 438 U.S. 104, 124 (1978).

32. *See* Lingle, 544 U.S. at 536-37.

33. *See, e.g.*, Darren Botello-Samson, *The Benchmark of Expectations: Regulatory Takings and Surface Coal Mining*, 22 J. NAT. RESOURCES & ENVTL. L. 1, 2 (2008) (noting the "current insulation from takings attacks enjoyed by surface coal mining regulation").

> he ought to be aware of the possibility that new regulation might even render his property economically worthless (at least if the property's only economically productive use is sale or manufacture for sale).[34]

The value of a new coal plant depends on the feasibility of utilizing coal, the right to extract such coal being "comparable to personal property in so far as [its] only economically productive use is sale or manufacture for sale."[35] Under *Lucas*, then, a court might be unsympathetic with a coal company's regulatory taking claim given that coal plant operation depends on rights comparable to personal property capable of being rendered "economically worthless" by regulation.

The *Lucas* Court held that a "regulation den[ying] all economically beneficial or productive use of land" is categorically a regulatory taking.[36] Under this "total taking" inquiry, members of the coal industry with plans to construct new plants could argue that the EPA's proposed standards *totally* deprive them of their economic expectations.[37] However, because the Court noted that total deprivation of the economically beneficial use of land is an "extraordinary circumstance,"[38] a court would likely hold that coal industrialists still have at least some value in any property they already hold. That outcome is especially likely in the case of yet-to-be-constructed coal plants, where industrialists' economic expectations in their land have not been "investment-backed" by actual construction.[39] Absent a categorical taking, judicial analysis of the EPA's proposed standards would proceed instead under an "essentially ad hoc, factual inquir[y]."[40]

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34. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1027–28 (1992).

35. Patrick C. McGinley, *Bundled Rights and Reasonable Expectations: Applying the Lucas Categorical Taking Rule to Severed Mineral Property Interests*, 11 VT. J. ENVTL. L. 525, 576 (2010).

36. Lucas, 505 U.S. at 1015.

37. *See id.* at 1030 ("When, however, a regulation that declares 'off-limits' all economically productive or beneficial uses of land goes beyond what the relevant background principles [of property and nuisance law] would dictate, compensation must be paid to sustain it"). The "relevant background principles" in any challenge of the EPA's rules would derive from the Clean Air Act, not state property or nuisance law.

38. *Id.* at 1017.

39. *See id.* at 1034 ("The finding of no value must be considered under the Takings Clause by reference to the owner's reasonable, investment-backed expectations").

40. *See* Penn Cent. Transp. Co., 439 U.S. at 124.

B. Coal's Commercial Plight Lessens the Utility of the Proposed Standards

Electric generation in the United States has shifted away from coal in recent years. Cleaner sources of energy such as natural gas are already replacing coal,[41] thus curbing greenhouse gases without EPA intervention.[42] Furthermore, not many new coal plants are planned at present, minimizing the likely reductions in GHGs by the new standards. The more the market for electric generation in the United States drifts from coal of its own accord, the less of an impact the EPA's proposed standards will have in reducing carbon emissions. Indeed, the EPA's own projections predict "negligible CO_2 emission changes" from the proposed standards.[43]

Given the lessened impact the proposed standards are likely to have (assuming recent market trends continue), the government may not have shown that the gain from preventing new coal plants from opening without carbon capture technology will be greater than the immediate economic harm that many claim the standards will cause.[44] The smaller the potential benefits of the standards become, the more significant their economic costs appear.

In other words, costs grow in relative importance as benefits shrink. As benefits of a given policy approach zero, even the largely "theoretical or philosophical" cost of intervention straying into the realm of unwelcome paternalism enters into the cost-benefit calculus.[45] In the case of the EPA dictating technologies for the generation of electricity, the

41. *See* Adam J. Moser, *Pragmatism Not Dogmatism: The Inconvenient Need for Border Adjustment Tariffs Based on What Is Known About Climate Change, Trade, and China*, 12 VT. J. ENVTL. L. 675, 677 (2011). However preferable natural gas may be for its clean-burning qualities, natural gas does not come without its own environmental concerns. *See generally* UNION OF CONCERNED SCIENTISTS, *Gas Ceiling: Assessing the Climate Risks of an Overreliance on Natural Gas for Electricity*, (last updated Oct. 14, 2013), *available at* http://www.ucsusa.org/clean_energy/our-energy-choices/coal-and-other-fossil-fuels/natural-gas-climate-change.html (summarizing the full report, which can be accessed by clicking the link titled "Full Report").

42. *See* Patrick Charles McGinley, *Climate Change and the War on Coal: Exploring the Dark Side*, 13 VT. J. ENVTL. L. 255, 331 (2011).

43. Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1,430, 1,433 (Jan. 8, 2014) (to be codified at 40 C.F.R. pts. 60, 70, 71).

44. For Ronald H. Coase's famous argument that government should bear the burden of proving that "the gain from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the action which produces the harm," see *The Problem of Social Cost*, 3 J. LAW & ECON. 1, 27 (1960).

45. Hofmeister, *supra* note 3, at 52–53 (discussing the minimal risk of paternalism in policies designed to promote energy efficiency).

harm might not even be theoretical: dictating technologies "may freeze the process of competition"[46] that lately has enabled the market to eschew coal in the first place.[47] Whatever the costs of paternalism in the context of renewable energy policy may be, they would be avoided entirely if the EPA's proposed standards for new plants were not adopted.

C. "Leakage" Has the Potential to Erode Domestic Renewable Energy Policy but Can Be Mitigated by NEPA and Other Checks

"Leakage" allows emissions to shift from one jurisdiction to another and inhibits the advancement of clean energy technologies.[48] Thus, if the American policy maker's goal is to reduce carbon emissions on a global scale, then leakage must inform that policy maker's decisions in crafting domestic energy policy.

In many cases, the procedural protections provided by NEPA will act as a check against leakage. For example, the Gateway Pacific Terminal (the "Terminal") is awaiting approval to export coal and other dry commodities from Washington State,[49] threatening leakage of the type described above. As a project undertaken with the aid of the Army Corps of Engineers,[50] the Terminal qualifies as a "[f]ederal action[]" requiring a "detailed statement" of its environmental impact under NEPA.[51] Due to its broad scope, the environmental impact statement adopted for the Terminal will have the effect of slowing down or halting

46. Cass R. Sunstein, *The Storrs Lectures: Behavioral Economics and Paternalism*, 122 YALE L.J. 1826, 1869 (2013). Sunstein describes numerous objections to paternalism and concludes that their weight depends on the factual context in which they are offered. *See id.* at 1868-72. Ultimately, many of the objections to paternalism are based on assumptions over which "[r]easonable people differ." *Id.* at 1878.

47. *See* Moser, *supra* note 41, at 677 (noting the potential "for gas to monopolize future additions to the United States electricity-generating sector for the foreseeable future").

48. *Id.* at 678.

49. *See* Environmental Impact Statement: Gateway Pacific Terminal Overview, EISGATEWAYPACIFICWA.GOV, http://www.eisgatewaypacificwa.gov/about/overview (last visited Apr. 5, 2015).

50. *Id.*

51. National Environmental Policy Act, 42 U.S.C. § 4332(C) (2012). Environmental protection laws in general may be regarded as a "fourth tool" to reduce energy consumption, but for the purposes of this note, they are considered primarily to the extent that they can be used to shift the relative price of energy sources in favor of renewables. *See also supra* note 1.

the project.[52] Furthermore, opposition from local tribes could slow (or possibly even derail) the project.[53] For example, in January 2015 the Lummi Nation challenged the Terminal by invoking its fishing rights under an 1855 treaty, which the tribe argues the Terminal would compromise.[54] In any event, approval of the Terminal is likely years away.[55]

Although exporting coal to industrialized developing countries may prevent those countries' long march toward using more renewables,[56] insofar as these countries' growing demand is inevitable and their immediate ability to switch to renewables politically impracticable, it is preferable to have their coal produced under the watchful eye of the EPA.[57] In that regard, the EPA has a strong incentive to pursue aggressive policies such as its proposed carbon capture standards for new coal-fired power plants.

Regardless, any encouragement offered to developing countries to curb GHG emissions[58] must not come at the expense of the basic material needs of their people. The experience of the former Soviet Union suggests that the will to implement good environmental policy first requires the fulfillment of basic material needs. The Soviet Union had remarkably strong environmental laws stretching back to Lenin,[59]

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52. *See* Erik Smith, *As State Takes Stand Against Coal, Business and Labor Fear for Economy*, WASHINGTON STATE WIRE (Aug. 2, 2013), http://washingtonstatewire.com/blog/as-state-takes-stand-against-coal-business-and-labor-fear-for-economy/.

53. *See* John Stark, *Feds Still See Wiggle Room in Lummi Nation Position on Coal Terminal*, BELLINGHAM HERALD (Sept. 18, 2013), *available at* 2013 WLNR 22935074.

54. Katherine Bagley, *Losing Streak Continues for U.S. Coal Export Terminals*, INSIDE CLIMATE NEWS (Jan. 12, 2015), http://insideclimatenews.org/news/20150112/losing-streak-continues-us-coal-export-terminals.

55. *See* Ralph Schwartz, *Whatcom Council Rejects Reviewing All Contract Changes for Coal Terminal*, BELLINGHAM HERALD (Feb. 12, 2014), *available at* 2014 WLNR 3933820.

56. *See* Moser, *supra* note 41, at 690–91.

57. *See* David Brett, *Banning Coal Simplistic, Unreasonable and Unwise*, VANCOUVER SUN, Sept. 4, 2013, http://www.vancouversun.com/business/2035/Banning+coal+simplistic+unreasonable+unwise/8870473/story.html (remarking that removing North American coal from Asian markets will encourage coal mining in less safe jurisdictions).

58. *See, e.g.*, Moser, *supra* note 41, at 711 (proposing a GHG-based border tariff to mitigate climate change).

59. Peter M. Langrind, *An Overview of Environmental Law in the USSR*, 11 N.Y.L. Sch. J. Int'l & Comp. L. 483, 484–85 (1990) ("The period between 1924 and 1926 saw the enactment of 139 laws designed to protect the environment. . . . By 1985, some 670 environmental enactments were listed in Volume IV of the USSR Code of Laws. Most importantly, the Soviet Constitution of 1977 was written to enshrine these values as the law of the land.").

but the drive to industrialize at all costs caused them to be ignored.[60] Fulfilling basic material needs while encouraging adoption of renewable energy sources in developing countries may not pose a large dilemma, since renewable energy sources may actually be more economical in some contexts than conventional carbon sources.[61] For instance, in rural areas of developing countries unserved by electric grids, "solar photovoltaic energy can provide basic services such as refrigeration, irrigation, communications, and lighting."[62] Furthermore, in China the wisdom of adopting renewable technologies is accentuated by the fact that at least 300,000 people a year are killed by pollution, suggesting a compelling health reason for China to shift electric generation away from coal.[63] Indeed, China has already taken substantial steps toward adopting cleaner energy with the goal of reducing its fossil fuel use fifteen percent by 2020.[64]

D. Actual and Potential Political Problems Faced by the EPA's Proposed Carbon Capture Standards

The EPA's proposed carbon capture standards face additional political challenges. To the extent that the proposed standards are perceived to be commercially infeasible, they will lead to political pressure for the government to come to coal's aid.[65] Indeed, pressure already exists: Senator Rockefeller of West Virginia claims that complying with the standards will be possible only with "a bigger investment in clean-coal technology and creation of public-private partnerships."[66] The federal government should not put itself in the

60. *Id.* at 485–87. Despite the industry-driven materialistic bent a capitalist democracy shares with a communist republic, a capitalist society's tendency to produce greater wealth for greater numbers of people arguably allows it the luxury of being able to enforce its environmental laws.

61. Richard L. Ottinger, *Renewable Energy Sources for Development*, 32 ENVTL. L. 331, 331 (2002).

62. *Id.* at 338.

63. *China Has No Choice But to Produce Clean Energy*, REXEL ENERGY EFFICIENCY MAG. (June 26, 2012), http://www.electrical-efficiency.com/2012/06/china-has-no-choice-produce-clean-energy/.

64. *China: An Unexpected Leader on the Renewable Energy Market*, REXEL ENERGY EFFICIENCY MAG. (Apr. 13, 2012), http://www.electrical-efficiency.com/2012/04/china-unexpected-leader-renewable-energy-market/.

65. *See* Drajem, *supra* note 15 ("[CCS] isn't yet being used on a commercial scale as the first large-scale plant is under construction by Southern Co. . . . in Mississippi. The plant, which received $270 million in subsidies from the federal government, is facing local opposition and $1 billion in cost overruns.") *Id.*

66. *Id.*

awkward position of being pressured to come to coal's rescue. Any such aid would counteract the push for renewable energy.

Political backlash from climate change skeptics and libertarians against overly stringent rules may also derail efforts.[67] Though at least some in the coal industry will almost assuredly argue that *any* new standard is "overly stringent," the more the EPA takes a moderate stance, the likelier it is to enjoy widespread cooperation with new standards.

In general, government efforts to shepherd energy production toward cleaner technologies face two basic problems: a lack of political will on the one hand and outright hostility on the other. Concerning the lack of political will toward environmental policy generally, Ralph R. Peterson wrote the following:

> The most serious environmental crisis we face stems from waning public confidence and trust in governmental and corporate institutions to do the right thing, particularly when it comes to environmental issues. This lack of consensus and political will to do the right thing has created a kind of environmental policy gridlock that has stalled the evolution of the next generation of United States environmental policies, laws, and science.[68]

Concerning hostility toward policies perceived as too aggressive, several rural counties in northeastern Colorado recently pursued secession from Colorado in part over dissatisfaction with the state's new renewable energy standards.[69] The secession movement floundered without the support of populous Weld County.[70] But its limited success remains a symbol for the fact that renewable energy issues are prone to the lack of consensus to which Peterson attributed the gridlock in national environmental policy.

Coal is dying a natural death in the face of powerful market and community forces. The federal government should take care lest any new rules introduce thorny legal and political issues that will prolong its passing or cause tears to be shed over its decline.

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67. The Intergovernmental Panel on Climate Change's latest findings on the "pause" in global warming for the last fifteen years has given new ammunition to skeptics of anthropogenic global warming. *See* Richard A. Muller, Op-Ed., *A Pause, Not an End, to Warming*, N.Y. TIMES, Sept. 25, 2013, at A27.

68. Ralph R. Peterson, *Government, the Private Sector, and NGO Roles in the Next Generation of U.S. Environmental Policy*, 13 COLO. J. INT'L ENVTL. L. & POL'Y 87, 87 (2002).

69. Monte Whaley, *Counties Split on Secession*, DENVER POST, Nov. 6, 2013, at 4A.

70. Monte Whaley, *51st-staters Turn to Capitol*, DENVER POST, Nov. 7, 2013, at 5A.

III. MARKET FAILURES, COGNITIVE BARRIERS, AND ENERGY EFFICIENCY

Increased reliance on renewable energy and energy-efficient technology share the final result of burning fewer carbon-intensive fossil fuels. Despite this similarity, energy efficiency has long suffered from less support from the nation's regulatory structure than that enjoyed by renewables.[71] Basic accounting practices in the utility industry highlight this disparity. For instance, while the money a utility invests in renewable energy is treated as a capital expense, money invested in energy efficiency measures is typically expensed annually.[72] Because utilities' profits are tied to how much of their expenses they can capitalize, utilities have relatively less incentive to invest in efficiency measures than in renewables.[73]

Accordingly, many opportunities for reduction of energy usage without reduction of consumer enjoyment exist in the realm of energy efficiency. These opportunities primarily relate to market failures and cognitive barriers that prevent consumers from adopting energy-efficient technologies.

A. Energy Efficiency and Traditional Market Failures

As noted above, energy efficiency refers to technical improvements that result in using less energy without reducing consumer enjoyment.[74] Some energy efficiency reforms are geared toward correcting traditional market failures long recognized by economists. Three examples are considered below.

First, information asymmetries can give landlords little incentive to invest in energy efficiency technologies for their properties.[75] Specifically, if a landlord bears the capital costs needed for efficiency improvements but her tenant pays the ongoing energy bills, then the landlord lacks incentive to invest in efficient technologies.[76] Mandatory building codes are one way to sidestep this particular problem.[77] Second,

71. *See* Inara Scott, *"Dancing Backward in High Heels": Examining and Addressing the Disparate Regulatory Treatment of Energy Efficiency and Renewable Resources*, 43 ENVTL. L. 255, 277 (2013).

72. *Id.*

73. *Id.*

74. Hofmeister, *supra* note 3, at 7. Energy conservation, meanwhile, reduces energy consumption simply when consumers choose to use less energy. *Id.*

75. *Id.* at 14. *But see infra* Part IV.B.

76. Hofmeister, *supra* note 3, at 14.

77. *Id.* at 15.

capital constraints, particularly for low-income consumers, might preclude upfront investments in efficient technologies.[78] Public financing for these technologies in low-income households is one possible solution,[79] a solution the U.S. Department of Energy has undertaken with its Weatherization Assistance Program.[80] Finally, negative externalities such as pollution and GHGs[81] are a familiar market failure discussed above in the context of the EPA's proposed carbon capture standards for new coal plants. These externalities appear once again in the context of energy efficiency.[82]

B. Cognitive Barriers and Energy Efficiency

Other energy efficiency reforms tackle various "cognitive barriers" to energy efficiency—barriers that do not fit into the traditional economic paradigm of humans as fully rational, utility-maximizing actors.[83] Loss aversion, the failure to ignore sunk costs, and status quo bias are three helpful examples.[84] Loss aversion refers to the observed human tendency to value losses twice as much as gains, thus distorting economic calculation.[85] As a result of this aversion, the immediate financial loss from investing in energy-efficient technology might unduly deter a consumer from taking advantage of the future energy savings that efficient technology offers. The human failure to properly ignore sunk costs in making investment decisions is another cognitive barrier to energy efficiency.[86] If an inefficient energy product has not reached the end of its useful life, a consumer might not want to invest in a more efficient product—even if the efficient product's payback period is short enough to result in immediate savings—because the consumer does not want to "waste" money he has already spent.[87] Finally, status quo bias

78. *Id.* at 16–17.

79. *See id.*

80. Office of Energy Efficiency & Renewable Energy, *Weatherization Assistance Program*, ENERGY.GOV, http://energy.gov/eere/wipo/weatherization-assistance-program (last visited Mar. 24, 2015).

81. Hofmeister, *supra* note 3, at 17–18.

82. *Id.*

83. *Id.* at 18–19.

84. *Id.* at 19–22. (arguing that these cognitive barriers are a much greater cause of energy inefficiency than the traditionally recognized market failures)

85. *Id.* at 19–20.

86. Hofmeister, *supra* note 3, at 21.

87. Anyone who has mistakenly been delivered a pizza with anchovies instead of pepperoni yet proceeds to eat it without ordering or requesting a new pizza has fallen prey to the sunk costs problem: the utility of consuming the anchovies is quite likely negative, yet the sunk cost of the pepperoni-turned-anchovy pizza creates an

means that the decision not to invest in efficient technologies often is not a decision at all;[88] without external efforts to bring the benefits of energy efficiency being brought to consumers' attention, the status quo prevails.[89]

C. Paternalistic Concerns with Energy Efficiency Standards

Mandatory minimum energy efficiency standards are "effective and objectionable for the same reason—mandates deliberately take away all choice regarding the level of energy efficiency from the consumer."[90] Minimum efficiency standards are a relatively benign example of "soft" paternalism because they encourage consumers to look toward the future and assume personal responsibility for energy consumption.[91] However, some commentators have been careful to warn against even this softer brand of paternalism—paternalism designed not to impose a policy maker's preferences on the masses ("hard" paternalism), but rather to rid the masses of the cognitive barriers preventing them from making choices they would otherwise make to improve their welfare.[92] Because soft and hard paternalism exist along a continuum,[93] the former continually threatens to devolve into the latter.[94]

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unwillingness to "waste" that cost—even though ordering a new pizza would result in a clear economic (and gastronomic!) gain.

88. Hofmeister, *supra* note 3, at 21–22.

89. *See id.*

90. *Id.* at 64.

91. Students of Alexis de Tocqueville may recall his vivid description of the "soft" despotism typical of a modern democracy: "it does not break wills, but it softens them, bends them, and directs them; it rarely forces one to act, but it constantly opposes itself to one's acting; it does not destroy, it prevents things from being born; it does not tyrannize, it hinders, compromises, enervates, extinguishes, dazes, and finally reduces each nation to being nothing more than a herd of timid and industrious animals of which the government is shepherd." ALEXIS DE TOCQUEVILLE, DEMOCRACY IN AMERICA II 4.6, at 663 (Harvey C. Mansfield trans., University of Chicago Press 2002). This unflattering description notwithstanding, in times of "skepticism and equality" like the present, Tocqueville admonishes that "[g]overnments must apply themselves to giving back to men [a] taste for the future" by teaching them that "great successes are found at the end of long-lasting desires." *Id.* II 2.17, at 523–24.

92. Sunstein, *supra* note 46, at 1860; Mario J. Rizzo & Douglas Glen Whitman, *Little Brother Is Watching You: New Paternalism on the Slippery Slopes*, 51 ARIZ. L. REV. 685, 687 (2009).

93. Sunstein, *supra* note 46, at 1859.

94. Rizzo & Whitman, *supra* note 92, at 688.

IV. ENERGY CONSERVATION

Because efforts geared toward efficiency often bring consumers' energy conservation habits to their attention, the line between energy efficiency and conservation can be blurry.[95] Mandatory or voluntary labeling of appliances and electronics with information on energy efficiency is one such example of this blurriness: While most directly an example of energy efficiency, labeling also trains energy consumers to think more actively about their energy conservation habits.[96] The confusion is magnified in that more efficient technologies inevitably "conserve" energy even when consumer habits remain constant.

The tendency to conflate conservation with efficiency is an unfortunate one. Conservation is an indispensable companion to investment in renewable and energy-efficient technologies because improved technology alone is uncertain to keep pace with growing global demand for energy.[97] Accordingly, conflating conservation with efficiency understates conservation's true importance in curbing overall energy consumption enough that available technologies can keep pace with demand.

Additionally, conservation should be emphasized as a concept distinct from efficiency to prevent efficiency concerns from pushing conservation out of consumers' minds entirely. Ironically, energy-efficient technology sometimes vitiates responsible energy conservation. Motion-activated lighting, for instance, might have the effect of conditioning building users not to search for and use light switches. When motion sensors fail, many of them default to the "on" position for safety purposes.[98] In a building full of users trained not to flip switches, a failed motion sensor results in wasted energy until users are retrained to flip the switch or until the sensor is replaced.[99] Though installation of the sensors may not have been prompted by government policies, their conditioning effect does illustrate another potential cost to soft paternalism: If a policy encouraging efficient motion sensors prevents

95. Hofmeister, *supra* note 3, at 8.

96. *Id.* at 78–80.

97. *See* Vandenbergh & Jim Rossi, *supra* note 9, at 1528–29.

98. *See* Campus Infrastructure and Services, UNIV. OF SYDNEY, CIS LIGHTING STANDARD 15 (Aug. 21, 2013), *available at* http://sydney.edu.au/documents/about/working-with-us/cis-forms/CIS_Lighting_Standard_Rev_001.pdf; HESCHONG MAHONE GROUP, OCCUPANCY CONTROLS IN CORRIDORS, STAIRWELLS, AND WAREHOUSES (Mar. 2, 2011), *available at* http://www.h-m-g.com/T24/Lighting/20110224_presentations_Revised/Notes_occsensors.pdf.

99. An additional risk exists that these non-flipping building users will spread their profligate ways to other buildings without motion sensors.

users from learning to associate their behavior with energy savings, soft paternalism may "infantilize" the consumers it is designed to protect.[100]

This example is not meant to imply that energy-efficient technologies should be avoided whenever they vitiate energy-conserving behavior. It merely illustrates the importance of considering energy conservation's function as distinguishable from, and supplemental to, that of energy-efficient and renewable technologies. Simply put, energy-efficient and renewable technologies concern changing how energy is supplied; conservation concerns how energy is consumed on the demand side. Energy policy parlance must not neglect that distinction. Just as Confucius once remarked that the first step to take in successfully administering state affairs is to "insure that names are used properly," so too must a successful energy policy insist on precise, descriptively accurate terms.[101]

There are multiple means available to promote an emissions-reducing ethos of conservation. First, governments can lead by example in their own energy consumption habits. Second, the incentives behind energy consumption ought to be aligned such that, wherever possible, those who pay for consumption also control consumption. Finally, policy makers should consider ways to modify the traditional utility regulatory model to encourage conservation. This list of means is in no way exhaustive; it is intended merely as a starting point for finding ways to encourage consumers to take responsibility for their energy consumption habits.

A. Leading by Example from Energy Conservation in Government Facilities

Governments have at least two good reasons to conserve energy: (1) conserved energy translates into conserved taxpayer money; and (2) governments conserving energy gives private industry and individuals an example to emulate. Alexis de Tocqueville framed the issue of governments leading by example as follows:

> In all times it is important that those who direct nations conduct themselves with a view to the future. . . . In acting so, the heads of democracies not only make public affairs prosper, but by their example they also teach particular persons the art of conducting private affairs.[102]

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100. *See* Sunstein, *supra* note 46, at 1869.

101. THE ANALECTS OF CONFUCIUS: A PHILOSOPHICAL TRANSLATION 13.3, at 162 (Roger T. Ames & Henry Rosemont, trans., Ballantine Publishing Group 1998).

102. TOCQUEVILLE, *supra* note 91, II 2.17, at 521–22.

These two reasons (saving public money[103] and modeling how to save private money by example) remain equally valid independent of policy makers' or the electorate's views on reducing carbon emissions.[104] Accordingly, energy conservation may be pursued either independently from, or in conjunction with, environmental policy depending on the political circumstances.

A simple way governments can lead by example is through keeping use of the terms "efficiency" and "conservation" distinct in statutory and regulatory parlance. Confusion can result otherwise, as with the following statutory definition from Maine: "'Conservation programs' means programs developed by the trust pursuant to this section designed to reduce inefficient electricity use."[105] By first defining its conservation programs in terms of efficiency,[106] the statute initially leaves unclear whether "inefficient electricity use" will be reduced by trimming waste on the demand side or by adopting more efficient technologies on the supply side. Distinguishing conservation from energy efficiency identifies precisely whom or what to hold accountable for energy savings: those encouraging or adopting less wasteful habits on the demand side (conservation) or the energy service companies supplying more energy-efficient technologies (energy efficiency).

Jurisdictions lead by example when they implement energy conservation principles in their own facilities. For instance, Oklahoma subjects all its state agencies and facilities to a "Facilities Energy Conservation Program."[107] The Program requires "centralized effort to gather information pertaining to energy use" and the designation of "knowledgeable personnel to prioritize projects and make recommendations for conservation implementation."[108] The Program's

103. That the federal government may not be the best disciple of thrift does not, of course, excuse it from trying to improve.

104. The same could be said of renewable and energy-efficient technologies insofar as they save public and private money; however, the investments of time and money to develop these technologies introduce additional questions about whether a particular investment is monetarily worthwhile. If a given technology is perceived (whether accurately or not) as not worthwhile, then the supporting policy maker's potential environmental agenda may come under scrutiny for not comporting with economic reality.

105. Me. Rev. Stat. tit. 35-A, § 10110 (2013).

106. Since efficiency can also be defined as "the ability to do something . . . without wasting . . . energy," the statute's wording is not incorrect as a matter of common usage. MERRIAM-WEBSTER, http://www.merriam-webster.com/dictionary/efficiency (last visited Mar. 21, 2014). This note merely argues that this common usage be abandoned in public policy discussions in favor of a narrower, more precise meaning.

107. OKLA. STAT. tit. 27A, § 3-4-106.1 (2012).

108. *Id.* § 3-4-106.1(D)(1).

stated objective is at least twenty percent energy savings by the year 2020 when compared with 2012's utility expenditures.[109]

Oklahoma's statute helpfully distinguishes between behavior- and performance-based conservation efforts.[110] While the former refers to efforts that trim waste by making behavioral changes to how facilities are used, the latter refers to projects by energy service companies ("ESCOs") that implement energy-efficient technologies, the savings of which are used to compensate the ESCOs.[111] The statute also directs cooperation with local utilities "[w]hen reasonably feasible" in implementing demand side management ("DSM"), which involves actions taken by utilities to alter consumers' energy use habits to conserve energy.[112] While the statute does not observe the strict efficiency-conservation distinction drawn for purposes of this Note, it nonetheless employs its terminology in a manner that clearly identifies what is meant in a given context.[113]

B. Aligning Incentives in the Realm of Energy Conservation

Consumer decision-making regarding energy conservation suffers many of the same market failures and cognitive barriers as efficiency decision-making. Insofar as these barriers to rational decision-making persist, consumers will not conserve energy in a manner that maximizes their savings.

For example, information asymmetry plagues conservation and efficiency when third parties underwrite consumers' energy consumption. Because the person who pays for a facility's energy enjoys the strongest incentive to engage in cost-minimizing behavior, energy is best conserved when those who pay for consumption also control consumption. The same landlord-tenant relationship considered earlier

109. *Id.* § 3-4-106.1(D)(3).

110. *Id.*

111. *See* Ann Arney, *Myth Busters: Behavior-Based Energy Efficiency Plans*, REALENERGYWRITERS.COM, http://realenergywriters.com/members-blog/myth-busters-behavior-based-energy-efficiency-plans/ (last visited Mar. 21, 2014); *Compare What Is an ESCO?*, NAT'L ASS'N OF ENERGY SERV. COMPANIES, https://www.naesco.org/what-is-an-esco (last visited Apr. 5, 2015), *with What Is an ESPC?*, NAT'L ASS'N OF ENERGY SERV. COMPANIES, https://www.naesco.org/what-is-an-espc (last visited Apr. 5, 2015) ("Pay for facility upgrades now with future energy and operational savings").

112. OKLA. STAT. tit. 27A, § 3-4-106.1(D)(4) (2012); Steven D. Czajkowski, *Focusing on Demand Side Management in the Future of the Electric Grid*, 4 PITT. J. ENVTL PUB. HEALTH L. 115, 117-18 (2010).

113. Czajkowski notes that utilities' DSM conservation activities "have also been called end-use efficiency to avoid confusion with the term energy conservation." Czajkowski, *supra* note 112, at 130.

regarding energy efficiency[114] illustrates this principle. Making landlords responsible for paying energy bills may indeed encourage them to invest in more energy-efficient technology.[115] However, such an incentive structure has the unfortunate consequence of creating an even greater moral hazard problem by taking away tenants' incentive to conserve.[116] A bill-paying tenant who reduces consumption by a certain monetary amount will always have a greater absolute incentive to save than the bill-paying landlord, the savings of whom first must recover the cost of efficiency improvements. Furthermore, the amount that the cost-minimizing, bill-paying landlord spends on efficiency improvements must be less than the monetary energy savings resulting from the improvements; otherwise, he would not invest. Meanwhile, the rational, bill-paying tenant will always reduce consumption to trim waste, no matter how small.

Consider Liam Landlord, who pays Tricia Tenant's $200 monthly gas bill. Unbeknownst to Tricia, her lease with Liam passes the full $200 monthly bill to her in the form of rent payments. If the amount Liam would spend on efficiency improvements exceeds what he would save for the remaining time he plans to lease Tricia's apartment, he will not pay for those improvements. Nevertheless, assume Liam spends $40 with an ESCO to insulate his copper piping, resulting in efficiency gains that translate into $50 in monthly savings on Tricia's gas bill. Under the locked-in price on her lease, Tricia still pays $200 extra rent for utilities. Liam meanwhile enjoys the $10 in net savings for the first month and the $50 in direct savings in each subsequent month. Tricia still has no incentive of her own to conserve.

Now imagine that Tricia pays the gas bill herself. She conserves gas by setting back her thermostat at night, dropping the monthly bill by $50.[117] The same energy savings were realized as in the first scenario, but in this second scenario Tricia had a greater absolute monetary incentive[118] for personal action in the first month than her landlord: $50 in savings compared to Liam's $10 in savings in the first scenario. Energy is best conserved when those who control consumption also pay for consumption.

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114. *See supra* notes 75–77 and accompanying text.

115. Hofmeister, *supra* note 3, at 14; *see supra* notes 75–77 and accompanying text.

116. Hofmeister, *supra* note 3, at 14–15.

117. This scenario assumes the difference between the tenant's previous and reduced consumption was purely waste, meaning she did not sacrifice her personal utility to achieve cost savings.

118. If Tricia is living paycheck-to-paycheck while Liam is living in the lap of luxury, then she likely derives even more utility from $50 in savings than Liam does.

C. Modifying the Traditional Investor-Owned Utility Model through Net Demand Reduction

Net demand reduction ("NDR") refers to "reductions in the total demand for energy, including electricity."[119] NDR is crucial in reducing global energy consumption because it is uncertain whether the growth of renewables in the coming decades will make up the difference between long-term goals for carbon reduction and a projected doubling of global energy demand.[120]

The traditional regulatory models for American energy utilities are poorly equipped for encouraging NDR.[121] These models emphasize the lowest per-unit consumer prices possible, thus incentivizing utilities to sell as much energy as possible.[122] That incentive can be balanced by "revenue decoupling" to reduce net demand.[123] Revenue decoupling divorces a distribution utility's revenues from its incentives to increase the amount of power it sells to customers.[124] For example, state regulators could decouple utility revenue from the incentive to oversell by extending beneficial rates of return to utilities that meet NDR targets.[125] Another means to decouple revenues is called "decoupling-plus."[126] Decoupling-plus involves utilities offering customers incentives to reduce usage in order to share in NDR rewards.[127] For example, a utility might encourage customers to work with energy service companies or behavioral energy conservation programs.[128] About twenty states have adopted decoupling in some form.[129]

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119. Vandenbergh & Rossi, *supra* note 9, at 1532–33.

120. *Id.* at 1528–29.

121. *See id.* at 1551.

122. *Id.*

123. *Id.* at 1561–62.

124. Vandenbergh & Rossi, *supra* note 9, at 1558. The three main links in the chain from power plant to power outlet are generation, transmission, and distribution. *See id.* at 1544.

125. *Id.* at 1559–60.

126. *Id.* at 1560–61.

127. *Id.* at 1559–60. "Rewards" could come in the form of state regulators extending more beneficial rates to utilities that meet NDR targets. Alternatively, regulators could penalize utilities with lower rates of return for failure to meet targets. *Id.*

128. *See* Vandenbergh & Rossi, *supra* note 9, at 1560 ("For electric distribution utilities, building new base load capacity would no longer be seen as the only guaranteed revenue source. Investing in conservation and efficiency programs would now be seen as equally significant to the bottom line of the firm").

129. *Id.* at 1559.

D. Embracing an Ethos of Conservation

As discussed above, the traditional energy utility model of striving for the lowest per-unit prices possible is often at odds with energy conservation efforts. For utilities to participate in the push to curb energy consumption, somehow their regulatory mandate of "low prices for everyone" must be replaced with a dual mandate of "low prices for everyone, but healthy incentives for those who trim usage through efficient technologies or conservation."[130]

The more this new paradigm replaces the old, the further along the United States will be on the path to embracing an ethos of conservation that will result in significant energy and monetary savings for consumers. Incidentally, the more an ethos of conservation impresses itself upon an energy consumer's mind, the less likely it is that paternalistically mandated energy-efficient technologies will "infantilize" that consumer's ability to make responsible energy choices.[131] In fact, under an ethos of conservation, energy-efficient technologies and behavior-based energy conservation will cease to conflict because the consumer will recognize them as interchangeable means to accomplish the same goal.

Japan provides an instructive example of how an "ethos of conservation" can harmonize efficiency with conservation. As a signatory of the Kyoto Protocol, Japan has long sought to reduce its carbon emissions growth "through voluntary commitments by the private sector, relatively stringent fuel economy standards, energy-efficiency, and individual self-regulation."[132] One subsidized government program to make Japan's electricity consumption more decentralized and efficient led to the installation of more than two thousand one-kilowatt fuel cells in Japanese homes in the three years following the program's adoption in 2005.[133]

Japan's longstanding efforts to reduce the growth of its energy consumption came into sharp focus in 2011, when a tsunami led to the meltdown of the Fukushima nuclear power plant and the resultant shutdown of a substantial proportion of the nation's electric-generating

130. *See supra* notes 123 & 124 and accompanying text (explaining how traditional regulatory models encourage the lowest per-unit prices possible).

131. *See supra* note 102 and accompanying text.

132. Andrew Schatz, *A Tale of Three Signatories: Learning from the European Union, Japanese, and Canadian Kyoto Experiences in Crafting A Superior United States Climate Change Regime*, 70 U. PITT. L. REV. 593, 595 (2009).

133. *Renewable Energy for Japan: A Post-Fukushima Quest*, UNIV. OF PA. WHARTON SCHOOL (Oct. 3, 2013), http://knowledge.wharton.upenn.edu/article/renewable-energy-japan-post-fukushima-quest/.

capacity.[134] Even before the Fukushima disaster in 2010, Japanese energy consumers had a stronger absolute incentive to save: while American residential electricity prices were between ten and fifteen cents per kilowatt-hour, prices in Japan were over twenty cents.[135] These factors led to a national drive for *setsuden* (conserving energy).[136] The need to save was immediate, the threat of rolling blackouts appeared imminent, and the average Japanese consumer likely could have cared less whether national energy savings were achieved using energy-efficient compact fluorescent bulbs or more zealous efforts to turn off the lights when leaving a room. In the region around Tokyo, "heroic efforts" to save energy led to a drop in peak usage in 2010 from sixty gigawatts to forty-nine gigawatts.[137]

Thus, over and above the government energy efficiency policies already in place, the Japanese people were able to alter their work schedules and daily habits to trim peak electricity usage around Tokyo by eighteen percent.[138] This example of heroic efforts[139] in the face of national crisis is admittedly extreme, but on a general level it demonstrates the potential of behavior-based energy conservation to supplement energy-efficient and renewable technologies in effecting substantial reductions in carbon-intensive energy consumption.

V. RECOMMENDATIONS

Having examined renewable energy, energy efficiency, and energy conservation in turn, several observations may be made concerning their use as independent tools for policy makers to reduce domestic carbon emissions or energy consumption.

Regarding renewables, policies that promote renewable energy technology by increasing the relative cost of its conventional alternatives face a handful of pitfalls. Prominent among these pitfalls is opposition from allies of conventional alternatives who foresee the economic costs imposed by environmental regulations.[140] Thus, this particular problem may be avoided by pursuing policies that encourage renewables directly instead of raising the standards imposed on conventional energy

134. *Energy in Japan: Bright Ideas Needed*, ECONOMIST, Sept. 17, 2011, http://www.economist.com/node/21529037.

135. *Id.*

136. *Id.*

137. *Id.*

138. *See id.*

139. *See Energy in Japan*, *supra* note 134.

140. *See supra* Part II.D.

sources.[141] In the meantime, the EPA should consider comments on economic costs carefully before adopting its proposed carbon capture standards for new coal plants—especially considering the reduced utility of regulating new coal-fired plants given coal's diminished importance in the market due to the growth of the natural gas industry.[142] The utility of regulating new coal-fired plants to prevent "leakage" of nonrenewable energy to industrialized developing countries is further reduced insofar as public involvement and environmental protection laws such as NEPA can mitigate the problem.[143]

Meanwhile, energy efficiency policies should concentrate on minimizing cognitive barriers so consumers can exercise their rationality by choosing efficiency. In so doing, these policies should take care not to restrict consumer choice too far, lest consumers be "infantilized"[144] or the policies transgress from encouraging responsible behavior into enforcing policy makers' arbitrary preferences.[145] Efficiency should never be confused with conservation.[146]

Energy conservation boasts several advantages over its alternatives. First, energy conservation deals with behavioral changes on the demand side that consumers can make today; renewables and energy efficiency deal with technological changes on the supply side that must wait for tomorrow. Second, demand-side behavioral changes are a more resilient way to reduce carbon emissions because they are largely immune from periodic drops in fuel prices, an ever-present menace to policies designed to "prod Americans to find alternatives to gas-guzzling automobiles."[147] Revisiting an earlier illustration, the motorist who realizes he can use half as much time and energy if he consolidates his weekly grocery shopping trips[148] will still probably make fewer trips even if low fuel prices encourage him to purchase a nonrenewable, inefficient "gas guzzler." This is so because there is little reason to resume wasteful habits with zero utility once they have been identified.

Third, while monetary savings from energy efficiency investments are split between the buyers and sellers of energy-efficient products, savings from conservation offer greater incentive per unit of consumption reduced because the savings go directly (and completely) to

141. *See supra* Part II.

142. *See supra* Part II.B.

143. *See supra* Part II.C.

144. *See* Sunstein, *supra* note 46, at 1869.

145. *Id.* at 1860.

146. *See supra* Part IV.

147. Josh Mitchell and Amy Harder, *Low Gas Prices Defy Efficiency Goals*, WALL ST. J., Dec. 30, 2014, at A2.

148. *See supra* Part I.

the consumer.[149] However, such savings could also be shared between utilities and consumers by introducing the principles of net demand reduction to the traditional ratemaking regulatory scheme.[150]

All three tools are vulnerable to charges of paternalism insofar as they manipulate the choices consumers make.[151] Though policies promoting renewable energy are designed in part to increase renewables' competitiveness,[152] taking these policies too far could "freeze the process of competition" to an innovation-stifling extent.[153] Energy efficiency mandates are paternalistic in that they "deliberately take away all choice regarding the level of energy efficiency from the consumer."[154] Energy conservation policies are paternalistic insofar as they nudge consumers toward using less energy, thereby "influenc[ing] or alter[ing] people's choices."[155] However, conservation policies can be less restrictive of choice when they merely offer encouragement to reduce consumption instead of dictating both the amount of consumption to be reduced and the means of reducing it.[156] In any case, the costs of soft paternalistic policies are often small and always highly contextual.[157]

For each policy-making tool, state and federal governments should lead by example. The Energy Policy Act of 2005 already requires the federal government to procure 7.5 percent of its electricity from renewable sources.[158] Similarly, more than half of states have adopted mandatory renewable energy purchase requirements.[159] Policy makers should consider adopting more conservation measures that lead by

149. *Supra* Part IV.B.

150. *Supra* Part IV.C.

151. *See* Sunstein, *supra* note 46, at 1854 (identifying "taking steps to influence or alter people's choices for their own good" as the "unifying theme" of paternalistic approaches).

152. *See* HIRSHLEIFER, *supra* note 12, at 104.

153. *See* Sunstein, *supra* note 46, at 1869.

154. Hofmeister, *supra* note 3, at 64.

155. Sunstein, *supra* note 46, at 1854.

156. For example, when Liam Landlord is able to leave Tricia Tenant with the gas bill for her apartment, Tricia can use whatever means at her disposal to save energy. *See supra* Part IV.B. If, on the other hand, Liam's city requires him to adopt certain energy-efficient measures to get a permit to remodel Tricia's apartment, the energy-efficient choices Liam makes are informed by the specific means prescribed by local law. *See, e.g.*, BOULDER, COLO., REV. CODE § 10-7.5-4 (specifying energy-efficient measures applicants can take to earn the "green points" required for residential building permits).

157. *See* Sunstein, *supra* note 46, at 1868.

158. 42 U.S.C. § 15852(a).

159. Scott, *supra* note 71, at 273.

example. Leading by example can occur for all the facilities of a given jurisdiction[160] or on an agency-by-agency basis.

VI. CONCLUSION

Renewable energy, energy efficiency, and energy conservation are formidable tools in the hands of a policy maker seeking to reduce consumption of conventional energy resources. Each tool comes with its own benefits and costs and is appropriate within a given context. However, use of these tools is out of balance. Though renewable- and efficiency-driven policies share a common goal of reducing conventional energy consumption through improved technology, efficiency policies have long suffered disparate regulatory treatment.[161] Furthermore, the close relationship between energy efficiency and conservation has caused conservation to be confused with a type of efficiency when it ought to be regarded as a distinct concept.[162]

Energy conservation is underused relative to its two counterparts. Redoubled conservation efforts are necessary to meet the difference between projected global energy demand and the ramping up of renewable energy sources.[163] Conservation avoids many of the political problems native to renewable energy policy.[164] Finally, conservation is less restrictive of consumer choice than energy efficiency mandates[165]—while at the same time empowering consumers to take reduced energy consumption into their own hands.

160. *See, e.g.*, OKLA. STAT. tit. 27A § 3-4-106.1 *et seq.*

161. Scott, *supra* note 71, at 277.

162. *See supra* notes 105 & 106.

163. Vandenbergh & Rossi, *supra* note 9, at 1528–29.

164. *See supra* Part II.D.

165. *See supra* Part V.