A Sustainability Critique of the Obama "All-of-the-Above" Energy Approach

by Albert C. Lin*

Throughout his tenure and 2012 re-election campaign, President Barack Obama has touted an "all-of-the-above" energy strategy that embraces domestic sources of energy ranging from natural gas and oil to solar and wind.[1] Although energy production has received the most attention, the strategy also includes measures to increase energy efficiency and modernize energy systems. Some critics have found the all-of-the-above label misleading because the strategy does little to promote coal as an energy option.[2] Others have found the all-of-the-above label troubling because it fails to make difficult policy choices, such as those that favor non-traditional energy production.[3] From the perspective of sustainability, an all-of-the-above energy approach is fundamentally flawed because it focuses on increasing short-term energy supply and other short-term goals rather than on long-term energy supply sustainability. This Article presents a brief sustainability critique of current federal energy policy and suggests possible directions for change.

I. Current Federal Energy Policy

The Obama Administration's all-of-the-above energy strategy certainly has substantial rhetorical appeal: it is simple, connotes a vigorous effort by government to attack a multi-faceted challenge, and embraces numerous and diverse constituencies. The phrase also ostensibly reflects the expansion of domestic oil, natural gas, and renewable energy sources in recent years. An accurate assessment of federal energy policy, however, requires a closer and more expansive examination of the policy's specific components.

The all-of-the-above approach arises within the context of the 2005 Energy Policy Act, which was the last comprehensive energy legislation enacted by Congress.[4] Major components of this law included tax incentives for domestic energy production, including coal, oil, gas, nuclear, and renewables; incentives to increase oil and gas production on public lands; a renewable fuels standard; mandatory electricity reliability standards; new energy efficiency standards for appliances and commercial equipment; and an exemption of hydraulic fracturing from Environmental Protection Agency ("EPA") regulation under the Safe Drinking Water Act.[5]

This Article, however, uses the Obama Administration's Blueprint for a Secure Energy Future ("Blueprint") as a framework for assessing federal energy policy under President Obama. The Blueprint, a 2011 policy document that sets out various current and proposed legislative or executive energy measures, serves as a useful starting point for analysis in that it represents one particular vision for national energy policy.

A. The Blueprint

The Blueprint declares an objective of "mak[ing] ourselves more secure and control[ling] our energy future by harness-

* *Professor of Law, University of California, Davis, School of Law.* *Thanks to The George Washington University Law School and other sponsors of the 2013 J.B. and Maurice C. Shapiro Conference, where I presented remarks on which this Article is based. Thanks also to Dean Kevin Johnson, Associate Dean Vik Amar, and the U.C. Davis School of Law for financial support for this project, and to Lynn Kirshbaum and Christopher Ogata for their research assistance.*

1. *See, e.g.,* The White House, The Blueprint for a Secure Energy Future: Progress Report 1, at 2, 10 (2012) [hereinafter "Progress Report"].
2. *See, e.g.*, Ryan Tracy, *Lawmaker: Obama's "All of the Above" Energy Plan Skips "C" for Coal,* Wall St. J. (May 9, 2012), http://blogs.wsj.com/washwire/2012/05/09/lawmaker-obamas-all-of-the-above-energy-plan-skips-c-for-coal/.
3. *See, e.g.,* Steven Cohen, *President Obama Should Abandon the All of the Above Energy Strategy,* The Huffington Post (Mar. 11, 2013), http://www.huffingtonpost.com/steven-cohen/president-obama-should-ab_b_2852047.html.
4. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).
5. *See* Mark Holt & Carol Glover, Cong. Research Serv., RL33302, Energy Policy Act of 2005: Summary and Analysis of Enacted Provisions (2006); Energy Policy Act of 2005, §322 (amending 42 U.S.C. §300h(d) to exclude from EPA's existing authority to regulate the underground injection of fluids such injection in hydraulic fracturing operations, with the exception of diesel fuel injection). Additionally, the 2007 Energy Independence and Security Act raised motor vehicle fuel economy standards through 2020, established a fuel economy standard for medium- and heavy-duty trucks, extended and increased the renewable fuels standard, and created new efficiency standards for lighting and appliances. *See* Energy Independence and Security Act of 2007, Pub. L. No. 110-140 (2007); *see also* Fred Sissine, Cong. Research Serv., RL34294, Energy Independence and Security Act of 2007: A Summary of Major Provisions 1–2 (2008).

ing all of the resources that we have available and embracing a diverse energy portfolio."[6] The strategy for achieving this objective includes three main components: "develop[ing] and secur[ing] America's energy supplies;" "provid[ing] consumers with choices to reduce costs and save energy;" and "innovat[ing] our way to a clean energy future."[7] Each of these components in turn includes various policy measures.

The first component of the strategy, enhancing supply, is aimed primarily at increasing domestic production of oil and natural gas.[8] As the Administration frequently boasts, U.S. natural gas production is at record levels and domestic oil production is at its highest level since 2003.[9] Much of this increase, however, is due to the widespread deployment of hydraulic fracturing techniques rather than affirmative steps by the federal government.[10] Nonetheless, the limited nature of federal oversight of hydraulic fracturing activities, particularly on private lands, could be regarded as an understated yet important means of supporting domestic oil and gas production.[11] Despite growing concern about the potential health and environmental effects of hydraulic fracturing, the federal government did not begin to regulate air emissions from fractured gas wells until 2012[12] and has yet to issue chemical disclosure requirements for the contents of fracturing fluids.[13] On public lands, the federal government has greater authority over energy development than on private lands. Here, in contrast to overall production trends, oil and natural gas production has not increased dramatically in recent years.[14] The Department of the Interior, however, has initiated reforms in the oil and gas leasing process to encourage more rapid exploration and development of existing leases.[15] In addition, the federal government's proposed offshore drilling plan for 2012–2017 calls for opening up new areas for leasing in the Gulf of Mexico and off the coast of Alaska.[16] The Administration has also pushed various initiatives to expand oil and shale gas production globally.[17] Overall, domestic oil and gas production has expanded dramatically, particularly on private lands, and may grow even further as production on the public lands rises.[18]

The second component of the Blueprint emphasizes reducing energy demand by implementing energy efficiency measures for motor vehicles and buildings.[19] The most important measure for the transportation sector involves the doubling of fuel economy standards for cars and trucks by 2025.[20] These standards will be met in part through increased production of electric vehicles, an effort which the federal government is supporting through funding for battery and component manufacturing and deployment infrastructure.[21] Significant federal funding has also been devoted to biofuels research, high-speed rail, and other public transit projects.[22] With respect to buildings, the Administration has supported a laundry list of programs, including weatherization assistance and the Energy Star program, to encourage retrofits and other projects to increase efficiency.[23] The federal government also has issued new efficiency standards for various appliances and other consumer products.[24] Notably, the Blueprint does not seek to reduce energy demand through conservation efforts even though such efforts could also provide substantial benefits.[25] The Blueprint's third component encompasses various measures that assertedly will promote a "clean energy

6. The White House, The Blueprint for a Secure Energy Future 3 (2011) [hereinafter "Blueprint"].
7. *Id.* at 4.
8. *Id.* at 3.
9. *See* Progress Report, *supra* note 1, at 2.
10. *See* David B. Spence, *Federalism, Regulatory Lags, and the Political Economy of Energy Production,* 161 U. Pa. L. Rev. 431, 433–34 (2013); U.S. Energy Info. Admin., Sales of Fossil Fuels Produced From Federal and Indian Lands, FY 2003 through FY 2011, at 2–4 (2012); Michael Cooper et al., *A Close Look at Some of the More Hotly Disputed Assertions,* N.Y. Times, Oct. 17, 2012, at A14.
11. *See* Michael B. Gerrard, *Federal Executive Actions to Combat Climate Change,* N.Y.L.J., (Mar. 14, 2013) (noting further regulation that EPA could undertake to combat climate change, including direct regulation of methane emissions from fracturing), *available at* http://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=612487; Spence, *supra* note 10, at 449–52 (describing regulatory exemptions from federal environmental law); *id.* at 477–78 (explaining that "the federal government regulates fracking, like other onshore oil and gas operations, relatively lightly").
12. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutant Reviews, 77 Fed. Reg. 49489, 49492 (2012) (setting New Source Performance Standards to reduce fugitive emissions of volatile organic compounds (VOCs) from hydraulically fractured gas wells); Spence, *supra* note 10, at 486 (explaining that regulation of VOCs would reduce methane emissions because regulatory definition of VOCs includes several methane compounds).
13. *See* Brendan J. Murrill & Adam Vann, Cong. Research Serv., R41760, Hydraulic Fracturing: Chemical Disclosure Requirements 2 (2012) (noting that no federal law requires disclosure of chemicals used in hydraulic fracturing); Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 78 Fed. Reg. 31636 (May 24, 2013) (revising previously proposed requirement that hydraulic fracturing operations on public lands disclose chemicals used); Molly Cagle, *Will EPA Expand TRI to the Oil and Gas Extraction Sector?,* Am. C. Envtl. Laws. (Mar. 1, 2013), http://www.acoel.org/post/2013/03/01/Will-EPA-Expand-TRI-to-the-Oil-and-Gas-Extraction-Sector.aspx (speculating whether EPA might apply Toxic Release Inventory requirements to hydraulic fracturing operations).
14. *See* U.S. Energy Info. Admin., *supra* note 10, at 2–4; Cooper et al., *supra* note 10, at A14; *see also* Bureau of Land Mgmt., Summary of Onshore Oil & Gas Statistics (Nov. 9, 2011), *avaiilable at* http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/energy/oil___gas_statistics/data_sets.Par.69959.File.dat/table-01.pdf (showing that number of new onshore oil and gas leases and acres leased has held roughly steady during Obama's first term, and are at lower levels than under President George W. Bush).
15. *See* Progress Report, *supra* note 1, at 4.
16. *See id.* at 4–5.-Bureau of Ocean Energy Mgmt., Dep't of the Interior, Proposed Final Outer Continental Shelf Oil & Gas Leasing Program 2012–2017, at 1–3 (2012).
17. *See* Blueprint, *supra* note 6, at 15–16 (discussing Global Shale Gas Initiative, in which the State Department assists selected countries in assessing and developing potential shale gas, as well as cooperation with Mexico and Brazil to increase oil production).
18. *See* Phil Taylor, *Production Rose on Federal Land Last Year, Fell in Gulf of Mexico,* Greenwire (Mar. 5, 2013), http://www.eenews.net/greenwire/stories/1059977311.
19. Blueprint, *supra* note 6, at 19–20, 25.
20. *See id.* at 20; Progress Report, *supra* note 1, at 6.
21. *See* Blueprint, *supra* note 6, at 20; Progress Report, *supra* note 1, at 7.
22. *See* Blueprint, *supra* note 6, at 21; Progress Report, *supra* note 1, at 8–9, 16.
23. *See* Blueprint, *supra* note 6, at 26–28; Progress Report, *supra* note 1, at 14–15.
24. *See* Gerrard, *supra* note 11; *see also* The White House, The President's Climate Action Plan 9 (2013), *available at* http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf (last visited Sept. 28, 2013).
25. *See* Blueprint, *supra* note 6 at 35–36.

future."[26] These measures include modernizing transmission lines and the national electric grid, supporting the Advanced Research Projects Agency-Energy program, and implementing the renewable fuels standard established by the 2005 and 2007 energy bills.[27] This component of the Blueprint also incorporates the $90 billion devoted by the 2009 Recovery Act to develop and deploy clean energy.[28] This funding has helped spur a doubling of non-hydropower renewable electricity generation.[29] But it also has been the subject of criticisms ranging from its failure to generate the five million jobs that politicians said the funding would create[30] to its support of solar panel manufacturer Solyndra, which underwent a highly publicized bankruptcy.[31] Non-hydropower renewable energy sources, moreover, continue to be responsible for only a small fraction of total electricity generation.[32] In coming years, the share of electricity provided by such sources will likely increase with the authorization of various solar, wind, and geothermal projects on public lands, the finalization of a programmatic Environmental Impact Statement for solar energy development covering six southwestern states, and the offering of wind energy areas for leasing off of the Atlantic coast.[33]

In sum, implementation of the Blueprint has resulted in modest changes to the energy supply mix and to future energy demand, but has not prompted a radical transformation of existing energy systems.

B. Priorities and Objectives Underlying the Blueprint

Although the Obama Administration has undertaken initiatives to enhance domestic energy supply, increase energy efficiency, and promote clean energy, equal attention has not been devoted to each area. Current federal energy policy encompasses a wide array of policy measures, but the core objectives of that policy remain unclear. The President and other officials have articulated a number of goals, such as ensuring the existence of an abundant and reliable energy supply, promoting energy independence, fostering international competitiveness in clean energy technologies, creating jobs, holding down costs for energy consumers, and addressing climate change.[34] These goals are not mutually exclusive, but they can lead to conflicting policy prescriptions. Indeed, a review of energy policy measures, with particular attention to Obama Administration initiatives, suggests that these objectives are hardly of equal significance. Ensuring a sufficient and stable energy supply at low cost and promoting energy independence appear to be the most important goals, an approach consistent with the dominant historical approach to energy policy in the United States.[35] Other objectives—generating employment, ensuring international competitiveness in clean energy technologies, and addressing environmental concerns—are seemingly of secondary importance.[36]

Viewed in its entirety, the all-of-the-above energy strategy is a supply-focused approach that seeks primarily to stimulate domestic energy production. With the exception of coal, virtually all forms of domestic energy—whether oil, natural gas, or renewables—are being strongly encouraged.[37] Even coal has received substantial federal support in the form of investments in carbon capture and storage technologies,[38] despite the dip in consumption caused by the abundance of cheap natural gas.[39] The expansion of domestic energy supplies promises national security benefits as well as more revenues and jobs and reduced price volatility. Unfortunately, a cheap and plentiful supply of fossil

26. *See id.* at 32–43
27. *See* Blueprint, *supra* note 6, at 33–34; Exec. Off. of the President, Nat'l Sci. & Tech. Council, A Policy Framework for the 21st Century Grid: A Progress Report 2 (2013); Bipartisan Policy Ctr., America's Energy Resurgence: Sustaining Success, Confronting Challenges 1, 106–107 (2013) [hereinafter "BPC"] (providing an overview of the Advanced Research Projects Agency-Energy program).
28. *See* Blueprint, *supra* note 6, at 33.
29. *See* BPC, *supra* note 27, at xi.
30. *See* Andy Sullivan, *Analysis: Obama's "Green Jobs" Have Been Slow to Sprout,* Reuters (Apr. 13, 2012, 1:06AM), http://www.reuters.com/article/2012/04/13/us-usa-campaign-green-idUSBRE83C08D20120413; Blueprint, *supra* note 6, at 33 (stating that 224,500 U.S. jobs were created as a result of $90 billion in clean energy investments).
31. *See, e.g.,* Matthew L. Wald, *Solar Firm Aided by Federal Loans Shuts Doors,* N.Y. Times (Sept. 1, 2011), at B1.
32. BPC, *supra* note 27, at 8 (noting that nonhydropower renewable energy sources accounted for 4.7% of U.S. electricity generation in 2011); Phillip Brown & Gene Whitney, Cong. Research Serv., R41954, U.S. Renewable Electricity Generation 8 (2011) (reporting that in 2009, wind was responsible for only 2%, and solar for only 0.02% of U.S. electricity generation).
33. *See* Press Release, Dep't of the Interior, Secretary Salazar to Return Home to Colorado (Jan. 16, 2013) (noting Interior Department has authorized thirty-four solar, wind, and geothermal energy projects on public lands totaling 10,400 megawatts since 2009); Press Release, Dep't of the Interior, Interior Announces First-Ever Renewable Energy Lease Sales on the Outer Continental Shelf (Nov. 30, 2012); Bureau of Land Mgmt., Approved Resources Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States (Oct. 2012); Progress Report, *supra* note 1, at 11.
34. *See* White House Office of the Press Sec'y, Fact Sheet: Obama Administration's All-of-the-Above Approach to American Energy (Mar. 21, 2012); Progress Report, *supra* note 1, at 1; *see also* Daniel Yergin, *America's New Energy Reality,* N.Y. Times (June 9, 2012), at SR9 (analyzing discourse regarding energy independence and economic growth).
35. *See* Joseph P. Tomain, *The Dominant Model of United States Energy Policy,* 61 U. Colo. L. Rev. 355, 375–76, 390–92 (1990); *see also* Lincoln L. Davies, *Energy Policy Today and Tomorrow—Towards Sustainability?,* 29 J. Land Resources & Envtl. L. 71, 74 (2009).
36. Among these secondary objectives, climate change arguably has received relatively little weight. *See* David P. Clarke, *What Happened Last November,* 30 Envtl. F. 1, 10 (Jan./Feb. 2013) (quoting President Obama as stating, "[I]f the message is somehow we're going to ignore jobs and growth simply to address climate change, I don't think anybody's going to go for that."). But President Obama's June 2013 climate change address suggests renewed attention to the issue. *See* President Barack Obama, Address at Georgetown University (June 25, 2013), *available at* http://ens-newswire.com/2013/06/25/president-obamas-climate-change-speech-full-text/.
37. White House, The President's Plan for a Strong Middle Class & a Strong America 2 (2013) ("the President's all-of-the-above energy plan invests in homegrown energy sources—from natural gas to renewables—so that we can reduce our dependence on foreign oil, create good jobs at home, cut the cost of energy for American families and businesses, and take significant action to address climate change") [hereinafter "President's Plan"], *available at* http://www.whitehouse.gov/sites/default/files/uploads/sotu_2013_blueprint_embargo.pdf.
38. *See* Blueprint, *supra* note 6, at 34 (*citing* $3.4 billion in Recovery Act funding for development of carbon capture and storage technologies and convening of interagency task force to facilitate future deployment of carbon capture and storage); Progress Report, *supra* note 1, at 13.
39. U.S. Energy Info. Admin., U.S. Coal Consumption by End-Use Sector, 2006–2012 (2013), *available at* http://www.eia.gov/coal/production/quarterly/pdf/t32p01p1.pdf; Carl E. Behrens, Cong. Research Serv., R40187, U.S. Energy: Overview and Key Statistics 29 (2012).

fuels also has the potential to undermine the establishment of new alternative energy sources and the implementation of energy efficiency measures.

The prioritization of ensuring an ample energy supply at a reasonable cost is reflected not only in the rhetorical emphasis of the all-of-the-above policy and in the United States' continued heavy reliance on fossil fuels, but also in how the federal government has resolved specific situations involving conflicting objectives. One example of the emphasis on supply is the limited federal response to the potential adverse effects of hydraulic fracturing. Specifically, even though the federal government could regulate fracturing fluid injection that threatens drinking water supplies, the Safe Drinking Water Act specifically exempts such activities from federal oversight.[40] In addition, although the Clean Water Act has long governed the discharge of wastewater to waters of the United States, EPA is beginning only now to draft wastewater treatment standards that would apply to hydraulic fracturing.[41] From these examples, it appears that the federal government is willing to consider health and environmental regulation only to the extent that it will not hamper increased fossil fuel production.[42] Another example in which the goal of inexpensive energy has prevailed over other goals is the Obama Administration's reluctance to regulate greenhouse gas ("GHG") emissions from fossil-fueled power plants and petroleum refineries, which are responsible for approximately 40% of U.S. GHG emissions.[43] EPA authority to regulate GHG emissions under the Clean Air Act (including emissions from these facilities) has been clear ever since *Massachusetts v. EPA*.[44] Notwithstanding the Supreme Court's affirmation of this authority, the Obama Administration has proceeded cautiously in regulating GHG emissions, apparently fearful of potential effects on energy supply and costs.[45] In 2010, EPA entered into settlement agreements with states and environmental groups to regulate GHG emissions from these facilities by 2012.[46] EPA missed the deadline and has issued only a proposed rule to govern emissions from new power plants.[47] Although the President recently directed EPA to issue carbon pollution standards that will govern new power plants as well, the content of those standards has not yet been determined.[48]

II. Critiquing Current Energy Policy

Several fundamental criticisms may be made of current federal energy policy: it avoids difficult choices, does not adequately plan for a transition away from fossil fuels, underemphasizes measures to reduce energy demand, does too little to respond to climate change, and does not sufficiently engage the public.[49] To be fair, the Obama Administration faces significant constraints regarding its ability to implement all of its desired policy measures, some of which require Congressional action. Indeed, Administration proposals suggest a desire to move towards a more sustainable energy policy. For example, the President's 2013 State of the Union address called for several new initiatives, including an Energy Security Trust Fund that would use federal oil and gas revenues to support electric and alternative fuel vehicle research, as well as a Race to the Top program that would offer federal funding and assistance to support state policies that encourage energy efficiency.[50] Significantly, the Race to the Top proposal recognizes states' pivotal role in energy policy and could stimulate reforms in energy efficiency programs, building energy codes, utility regulation and ratemaking, and transportation planning.[51] The President has also urged that the renewable energy Production Tax Credit be made permanent[52] and that a national clean energy standard be established.[53] The proposed clean energy standard would require that 80% of electricity be generated from clean energy sources by 2035, a doubling of its current share.[54] Finally, the 2013 State of the

40. Energy Policy Act of 2005, §322 (amending 42 U.S.C. §300h(d) to exclude from EPA's existing authority to regulate the underground injection of fluids such injection in hydraulic fracturing operations, with the exception of diesel fuel injection).
41. *See* U.S. Envtl. Prot. Agency, News Release, EPA Announces Schedule to Develop Natural Gas Wastewater Standards (Oct. 20, 2011) (stating that EPA intends to propose rule for shale gas wastewater in 2014), *available at* http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/91e7fadb4b114c4a8525792f00542001%21OpenDocument.
42. *See* Ari Natter, *DOE Nominee Backs Renewables, But Plans to Take Advantage of Oil, Gas Boom,* 44 Env't Rptr. 1079 (2013); *cf.* Jody Freeman, Editorial, *The Wise Way to Regulate Gas Drilling,* N.Y. Times (July 5, 2012), at A23 (opining that the Obama administration "has been timid about calling for a stronger federal role" in regulating hydraulic fracturing).
43. Jonas Monast et al., *Regulating Greenhouse Gas Emissions From Existing Sources: Section 111(d) and State Equivalency,* 42 ELR 10206, 10206 (Mar. 2012).
44. *See* Massachusetts v. EPA, 549 U.S. 497 (2007).
45. According to one estimate, a requirement that existing power plants reduce emissions by one-quarter over the next 7 years would involve $4 billion in compliance costs, though such costs would be dwarfed by health and environmental benefits ranging in value from $25–$60 billion. *See* Daniel F. Becker & James Gerstenzang, Editorial, *Limiting Carbon Dioxide Pollution by Power Plants,* N.Y. Times (Feb. 26, 2013), http://www.nytimes.com/2013/02/27/opinion/the-right-way-to-curb-power-plant-emissions.html (*citing* Natural Res. Def. Council, Using the Clean Air Act to Sharply Reduce Carbon Pollution From Existing Power Plants 2 (2012), *available at* http://www.nrdc.org/air/pollution-standards/files/pollution-standards-IB.pdf).
46. Monast et al., *supra* note 43, at 10,206 (noting settlements requiring EPA to issue Clean Air Act §111 new source performance standards governing both new and existing sources by May 2012 (for power plants) and November 2012 (for oil refineries)). The settlement agreements are *available at* http://epa.gov/carbonpollutionstandard/settlement.html.
47. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, __Fed. Reg.__ (proposed Sept. 20, 2013)(to be codified at 40 C.F.R. pt. 60). *See* Docket ID: EPA-HQ-OAR-2013-0495, http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposal.pdf.
48. *See* White House, *supra* note 24, at 6; Juliet Eilperin, *It's Official: EPA Delays Climate Rule for New Power Plants,* Wash. Post (Apr. 12, 2013), http://www.washingtonpost.com/blogs/post-politics/wp/2013/04/12/its-official-epa-delays-climate-rule-for-new-power-plants/ (noting EPA plan to begin work on rule governing emissions for existing power plants in fiscal year 2014).
49. Sarah Payne et al., Env't Am. Research & Policy Ctr., The High Cost of Fossil Fuels: Why America Can't Afford to Depend on Dirty Energy 1 (2009).
50. *See* 159 Cong. Rec. S652-53 (daily ed. Feb. 12, 2013) (State of the Union Address by Pres. Barack Obama).; President's Plan, *supra* note 37, at 3.
51. *See* Alliance Comm'n on Nat'l Energy Efficiency Policy, Doubling U.S. Energy Productivity by 2030, at 22 (2013).
52. President's Plan, *supra* note 37.
53. *See* Progress Report, *supra* note 1, at 11.
54. *See id.* at 11. It should be noted that the Obama Administration proposal defines clean energy broadly to include not only "renewable energy sources like wind, solar, biomass, and hydropower; [but also] nuclear power; efficient natural gas; and clean coal." Blueprint, *supra* note 6, at 32. Senator Jeff Bingaman,

Union address also called for climate change legislation and promised further executive action in its absence.[55] A subsequently issued "Climate Action Plan" identifies specific steps that may be taken to reduce carbon emissions and prepare for climate change impacts.[56]

A. *Avoiding Difficult Choices*

The all-of-the-above federal energy policy actually appears to be more of a laundry list than a coherent strategy. An all-of-the-above approach ostensibly possesses the virtues of diversification, but avoids the difficult choices needed to make sound policy.[57] Alternatively, the approach obscures policy choices under a veneer of support for all options.[58] The multiple objectives of the Administration's energy policy may not be mutually exclusive, but they do lie in tension with each other. For instance, ensuring that energy supplies are abundant can conflict with ensuring their reliability if those supplies are volatile or come from abroad. Likewise, minimizing energy prices for consumers is likely to conflict with reducing GHG emissions, at least in the short-term. As illustrated by the potential for plentiful and inexpensive natural gas to undermine renewable energy development,[59] measures with conflicting objectives can undercut each other.

Indeed, an all-of-the-above approach ignores significant differences among energy sources with respect to reliability, cost, and social effects. Of equal importance, each energy source imposes different environmental externalities. Compared to natural gas, the burning of home heating oil produces nearly 40% more carbon dioxide per unit of energy generated, and the burning of coal produces nearly double the amount of carbon dioxide.[60] The hydraulic fracturing process driving the ongoing natural gas boom releases methane, a powerful GHG, in quantities that could undermine the climate advantages of natural gas over other fossil fuels.[61] Renewable sources, in contrast, generate almost no GHGs other than those associated with start-up.[62] Wind, solar, and other renewable energy sources, however, often raise concerns regarding land use, water use, and habitat disturbance.[63] Increased federal subsidies for renewables in recent years[64] suggest an awareness of the environmental differences among energy sources, but such subsidies remain controversial.[65] Recognizing the negative externalities associated with fossil fuels, the Obama Administration at times has advocated the elimination of subsidies for oil and gas production.[66] Yielding to the political appeal of an all-of-the-above approach, however, the Administration has not made such reform a priority.

An all-of-the-above strategy makes sense for providing one specific benefit, and that is the increased sponsorship of research and development of new energy technologies. Here, investment in a diversity of projects is a rational approach because some technologies will presumably fail.[67] With respect to energy policy in general, however, a true strategy requires the clear articulation of policy objectives and the setting of priorities among them. A sustainable energy strategy would focus on meeting present and future energy needs and dealing with the consequences of meeting those needs.

B. *The Lack of a Plan to Transition From Fossil Fuels to Renewables*

Although current energy policy contains several elements that promote renewable energy development, it does little to provide for a transition away from a system reliant on fossil fuels. Over the last four decades, U.S. fossil fuel consumption has continued to increase[68] and the transportation sector remains almost wholly dependent on petroleum.[69] There has been a notable and continuing decline in the ratio of oil and gas consumption to economic growth, however, since 1973.[70] This is arguably a positive achievement. Nevertheless, the cli-

among others, has proposed legislation to create a clean energy standard. *See* Clean Energy Standard Act, S.2146 (2012).

55. White House, *supra* note 24.
56. President's Plan, *supra* note 37.
57. *See* Laurance R. Geri & David E. McNabb, Energy Policy in the U.S.: Politics, Challenges, and Prospects for Change 98 (2011) (suggesting that the U.S. political system "is incapable of setting clear priorities [in energy policy] and thus continues to fund everything").
58. *See* Jonathan Cannon & Jonathan Riehl, *Presidential Greenspeak: How Presidents Talk About the Environment and What It Means,* 23 Stan. Envtl. L.J. 195, 229 (2004) (contending that "we can have it all" rhetoric may "mask policy choices with serious consequences").
59. *See* David B. Spence & Emily Hammond Meazell, *Fuels for Electric Power Generation: Regulatory, Policy, and Economic Pressures, in* Global Climate Change and U.S. Law, 48 (*citing* to SSRN draft) (Michael B. Gerrard & Jody Freeman eds., 2d ed. forthcoming 2013), draft *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2188906.
60. *Carbon Dioxide Emissions Coefficients*, U.S. Energy Info. Admin. (Feb. 14, 2013), http://www.eia.gov/environment/emissions/co2_vol_mass.cfm.
61. *See* Robert W. Howarth et al., *Methane and the Greenhouse-Gas Footprint of Natural Gas From Shale Formations,* 106 Climatic Change 679, 687 (2011) (estimating that shale gas has a GHG footprint at least 20% greater than coal over a 20-year horizon and comparable to that for coal over a one 100-year horizon); *but cf.* Francis O'Sullivan & Sergey Paltsev, *Shale Gas Production: Potential Versus Actual Greenhouse Gas Emissions,* 7 Envtl. Res. Letters 044030 (2012) (estimating actual fugitive emissions to be substantially less than potential emissions, based on techniques used by shale gas producers).
62. *See* Brown & Whitney, *supra* note 32, at 2–3.
63. *See id.* at 38–39.
64. *See* Geri & McNabb, *supra* note 57, at 99; *see also* Molly F. Sherlock, Cong. Research Serv., R41953, Energy Tax Incentives: Measuring Value Across Different Types of Energy Resources (2012) (finding that energy-related tax incentives for renewable fuels have come to exceed such incentives for fossil fuels, though much of the increase involved biofuel incentives that expired in 2012).
65. *See, e.g.,* Bill Snyder, *Solar Power's Bright Future: A Conversation With Stefan Reichelstein on the Economics of Solar Power*, Stanford Univ. (June 6, 2012), http://www.gsb.stanford.edu/news/headlines/Reichelstein-solar-2012.html (explaining that renewable energy (solar in particular) remains rather controversial in the public debate about energy policy).
66. *See* Geri & McNabb, *supra* note 57, at 93; Obama, *supra* note 36.
67. *See* David Biello, *Still in Search of the Energy Unknown: A Q&A With ARPA-E Director Cheryl Martin,* Sci. Am., (Mar. 7, 2013), http://www.scientificamerican.com/article.cfm?id=arpa-e-still-in-search-of-energy-unknown (explaining that it has been "part of the plan" for ARPA-E to stop supporting projects that do not work out as expected).
68. U.S. Energy Info. Admin., Annual Energy Review 4 (Sept. 2011), *available at* http://www.eia.gov/sites/default/files/totalenergy/data/annual/pdf/aer.pdf (last visited Sept. 28, 2013)
69. *See* U.S. Energy Info. Admin., *Natural Gas and Renewable Shares of Electricity Generation to Grow, Coal Still Largest,* Today in Energy (Feb. 10, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=4950. (indicating that as of 2010, coal was responsible for 45% of electricity net generation by fuel, and natural gas was responsible for 24%); Carl E. Behrens & Carol Glover, Cong. Research Serv., R40187, U.S. Energy: Overview and Key Statistics 2–12 (2012).
70. *See* Behrens & Glover, *supra* note 69, at 32–33.

mate change threat demands a dramatic decrease in GHG emissions, not just a gradual decline in the fossil fuel energy intensity of the U.S. economy.[71] Renewable energy is the obvious response, yet its role remains relatively small despite recent growth. As of 2011, renewable sources accounted for 13% of U.S. electricity generation, with non-hydropower renewables accounting for just 4.7%.[72] These percentages represent a small fraction of the potential of renewables; renewable energy sources could satisfy most, if not all, of U.S. electricity generation needs.[73] There are, of course, numerous barriers to the full realization of this potential, including the need for new transmission infrastructure, the intermittency and variability of renewable electricity generation, and cost disadvantages—particularly as fossil fuel energy costs do not reflect health and environmental externalities.[74]

Ultimately, energy and environmental concerns, which historically have been treated as distinct, must be considered together.[75] In integrating these concerns, energy policy should facilitate a transition to an energy system that is sustainable in the long-term and simultaneously ameliorate the near-term adverse effects of that transition.[76] Adopting measures to gradually internalize the full social costs of energy consumption is one step that such a transition should include.[77] While some elements of current policy can assist in a transition to a sustainable energy future (like support for research and deployment of renewables) there is little structure in place to facilitate or guide such a transition.[78]

Current energy policy not only lacks a plan for transitioning beyond fossil fuels, but also fails to provide sufficient long-term certainty for private actors to anticipate such a transition. Developing a mineral resource, undertaking energy efficiency improvements, carrying out renewable energy projects, and other energy-related decisions often require long-term projections, analyses, and investments.[79] Accordingly, policy incentives to encourage desired investment should provided guaranteed assurances over extended periods of time.[80] Incentives designed to overcome initial barriers to entry nonetheless should be phased out once their purposes have been satisfied.[81] The renewable energy Production Tax Credit provides a leading example of a desirable energy incentive that has been undermined by long-term uncertainty.[82] Since it was first created in 1992, the tax credit expired in 1999, 2001, and 2003, and was set to expire on other occasions as well.[83] The Obama Administration has called for making this tax credit permanent, but the prospect for such action is uncertain.[84]

One possible tool for facilitating a long-term transition to sustainable energy is a national renewable portfolio standard ("RPS"), which can provide general direction to market actors to behave in a way that supports policy goals while still allowing those actors to make cost-effective choices.[85] Many states have adopted RPSs that vary widely in their stringency, definition of renewable energy, and other features.[86] A national RPS would offer several advantages over a multiplicity of state RPSs: national coverage, including states currently lacking an RPS; uniformity and therefore greater liquidity and transparency; and lowered geographic barriers to trade and therefore lower costs to achieve renewable energy goals.[87] Critics have raised concerns regarding the costs of RPS requirements.[88] Analyses of state RPSs implemented through 2007 generally found small price increases.[89] The evidence suggests that a national RPS would likely impose modest though geographically variable costs.[90] For example, an evaluation of Senator Jeff Bingaman's 2012 proposed Clean Energy Standard Act, which would have required 80% of electricity to be generated from clean energy sources (defined broadly) by 2035, estimated that such a mandate would raise consumer electricity prices by 18%.[91] Although some analysts suggest that RPSs ultimately may save consumers money by reducing natural gas demand and generating economies of scale for renewable energy,[92] others counter

71. *See* Malte Meinshausen et al., *Greenhouse-Gas Emission Targets for Limiting Global Warming to 2° C,* 458 Nature 1158, 1159–60 (2009) (indicating that policies to reduce emissions are needed in order remain achievable the goal of limiting global warming to a 2 °C increase by 2050).
72. *See* BPC, *supra* note 27, at xi, 8; U.S. Energy Info. Admin., Annual Energy Review 2011, at Figure 8.2a (2012).
73. *See* Brown & Whitney, *supra* note 32, at 9–10.
74. *See id.* at 3–4, 30–40.
75. *See* Davies, *supra* note 35, at 75.
76. *See id.* at 83.
77. *See id.* at 84 (advocating that "prices reflect the true cost of consumption" and that competition be reformulated "to include both (real, holistic) price signals and a scientifically-based assessment of fuels' actual environmental impact").
78. *See id.* at 77–78 (discussing "recurring pattern" in alternative energy policy whereby calls for change are followed by "funding and research, but not mandates or measures with real teeth").
79. *See* Pew Charitable Trusts, Innovate, Manufacture, Compete: A Clean Energy Action Plan 30 (2012).
80. *See* Geri & McNabb, *supra* note 57, at 119; E. Donald Elliott, *Why the United States Does Not Have a Renewable Energy Policy,* 43 ELR 10095, 10097 (Feb. 2013).
81. *See* Brown & Whitney, *supra* note 32, at 40.
82. *See* Geri & McNabb, *supra* note 57, at 119; Alexandra B. Klass, Tax Benefits, Property Rights, and Mandates: Considering the Future of Government Support for Renewable Energy 12–13 (Minn. Legal Studies Research Paper No. 13-11, Feb. 22, 2013) (noting that production tax credit is not a permanent part of the tax code, in contrast to tax preferences for fossil fuels, and concluding that uncertainty surrounding it "drives investment volatility and hurts the industry"), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2222987.
83. *Wind Energy Tax Credit Set to Expire at the End of 2012,* U.S. Energy Info. Admin. (Nov. 21, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=8870.
84. The White House, *supra* note 37, at 3.
85. *See* Lincoln Davies, *Power Forward: The Argument for a National RPS,* 42 Conn. L. Rev. 1339, 1357 (2010)..
86. *See id.* at 1359–62.
87. *See id.* at 1343–44, 1366–67, 1376–81; Christopher Cooper, *A National Renewable Portfolio Standard: Politically Correct or Just Plain Correct?,* Elec. J., Vol. 21, No. 5, 9, 10 (2008). For example, renewable energy certificates would be subject to a single definition and have nationwide validity. *See* Davies, *supra* note 85, at 1364.
88. *See* Davies, *supra* note 85, at 1367–71 (discussing objections to federal RPS proposals on grounds of costs, wealth-transfer, intrusion on state authority).
89. *Id.* at 1384.
90. *See* Jim Rossi, *The Shaky Political Economy Foundation of a National Renewable Electricity Requirement,* 2011 U. Ill. L. Rev. 361, 367 (2011).
91. U.S. Energy Info. Admin., Analysis of the Clean Energy Standard Act of 2012 at 4 (2012). The analyzed proposal would have granted full credits for electricity generated from renewable sources and partial credit for electricity generated from natural gas and clean coal. *id.* at 1. Electricity providers would have achieved RPS requirements by generating their own renewable energy, purchasing renewable energy credits, or paying an alternative compliance payment of 3¢ per kWh. *id.* at 2.
92. *See* Davies, *supra* note 85, at 1374–75.

that the new transmission infrastructure required by renewable facilities would undermine any cost savings.[93]

A national RPS alone would not be sufficient to manage the transition from fossil fuels to renewables. Most notably, RPS requirements do not address GHG emissions associated with motor vehicle use. Although renewable fuels standards can address these emissions, the present federal standard in this area has instead encouraged the production of corn-based ethanol, which itself generates significant GHG emissions and has other detrimental effects.[94] Nor is an RPS alone likely to produce the drastic reductions in coal use necessary to attack climate change.[95] But if combined with other measures, including the reform of infrastructure planning and siting processes,[96] a national RPS can lay the foundation for a transition to a more sustainable energy future.[97]

C. Undervaluing Energy Demand Reduction

Historically, energy policy in the United States has focused on supply.[98] Thanks to the problem of climate change, however, that policy focus must expand to encompass reductions in energy demand as well.[99] Under current policies, increases in electricity use are expected to continue and the expansion of renewables alone is highly unlikely to reduce overall carbon emissions to the extent required.[100]

Increased energy efficiency is the proverbial low-hanging fruit of energy policy.[101] Increased efficiency not only offers substantial cost savings,[102] but can also decrease overall energy demand and thereby generate associated benefits, including reduced environmental impacts, greater grid stability, and improved energy security.[103] Over the last four decades, the amount of energy saved from improved efficiency has exceeded the amount of energy added through increased supplies.[104] Potential energy savings from further efficiency measures are likewise significant. The adoption of cost-effective energy saving measures in the buildings sector over the next 20–25 years, for example, could bolster energy efficiency by 30% and thereby offset projected increases in energy use.[105] Energy losses in the generation, transmission, and distribution of electricity, and not just use, likewise represent promising opportunities for increasing efficiency.[106]

Notwithstanding such opportunities, various barriers hinder the reduction of energy consumption. These barriers include the long lifetimes of capital stock and infrastructure,[107] divergent incentives faced by landlords and tenants in purchasing and using energy-consuming appliances, and the fragmentation of enhanced efficiency opportunities across millions of individual actors who often lack information about those opportunities.[108] Moreover, regulatory decisions affecting energy efficiency are spread across different levels of government: the federal government dominates the setting of product efficiency standards; states regulate retail electricity rates and establish building codes; and local governments make zoning, planning, and building permit decisions.[109]

Governments have an important role to play in reducing barriers to improved energy efficiency. The diverse policy options available include financial incentives like appliance, motor vehicle, and building efficiency standards, time-based electricity pricing, and tax incentives. Other options include weatherization programs, transit-oriented development, and labeling and other information-based techniques.[110] The Obama Administration issued seventeen product efficiency standards between 2009 and 2011;[111] indeed, Professor Noah Sachs contends that "expanding direct government regulation of energy efficiency [through energy product standards] is one of President Obama's principal environmental legacies."[112] But even within this realm of action, more could be done. With respect to motor vehicle standards, for example, the requirement to double previous fuel economy standards by 2025 would still leave U.S. average fuel economy below that of other developed nations.[113]

Within the complex environment of energy demand management, the recent federal emphasis on product stan-

93. *See* Rossi, *supra* note 90, at 377.
94. *See* Klass, *supra* note 82, at 25. For a discussion of policy options to reduce GHG emissions from vehicle use, *see*, *e.g.,* Nat'l Research Council, Policy Options for Reducing Energy Use and Greenhouse Gas Emissions From U.S. Transp. (2011).
95. *See* Rossi, *supra* note 90, at 376.
96. *See id.* at 377–79 (noting that siting decisions "are no longer purely state and local issues and cannot be resolved without some attention to the broader impacts of decisions on regional and national goals[ ]").
97. For example, by articulating standards for a state's recognition of renewable power generated elsewhere, Congress can facilitate market unification for renewable credits. *See* Rossi, *supra* note 90, at 380.
98. *See* Noah M. Sachs, *Greening Demand: Energy Consumption and U.S. Climate Policy,* 19 Duke Envtl. L & Pol'y F. 295, 301 (2009).
99. *See* Michael P. Vandenbergh et al., *Supply and Demand: Barriers to a New Energy Future,* 65 Vand. L. Rev. 1447, 1448 (2012).
100. *See* Michael P. Vandenbergh & Jim Rossi, *Good for You, Bad for Us: The Financial Disincentive for Net Demand Reduction,* 65 Vand. L. Rev. 1527, 1536 (2012).
101. *Cf.* Amory B. Lovins, The Essential Amory Lovins: Selected Writings 108 (Cameron M. Burns ed. 2011) (characterizing increased energy efficiency as "the largest, least expensive, most benign, most quickly deployable, least visible, least understood, and most neglected way to provide energy services").
102. *See* Alliance Comm'n, *supra* note 51, at 27 (estimating that adopting measures to double American energy productivity by 2030 would save the average household $1,039 per year in energy costs, net of investments made to increase efficiency).
103. *See* Noah M. Sachs, *Can We Regulate Our Way to Energy Efficiency? Product Standards as Climate Policy,* 65 Vand. L. Rev. 1631, 1638–39 (2012); John Dernbach, *Stabilizing and Then Reducing U.S. Energy Consumption: Legal and Policy Tools for Efficiency and Conservation,* 37 ELR 10003, 10003–05 (Jan. 2007).
104. *See* BPC, *supra* note 27, at xv.
105. *Id.*; Nat'l Acad. of Sci., Real Prospects for Energy Efficiency in the United States 4–5 (2010).
106. *See* BPC, *supra* note 27, at 69; Lovins, *supra* note 101, at 112–14.
107. *See* Nat'l Acad. of Sci., *supra* note 105, at 6.
108. *See* Sachs, *supra* note 98, at 307–11; Alliance Comm'n, *supra* note 4, at 12; David B. Spence, *Regulation, "Republican Moments," and Energy Policy Reform*, 2011 BYU L. Rev. 1561, 1581–82 (2011).
109. *See* Elizabeth Doris et al., Nat'l Renewable Energy Lab., Energy Efficiency Policy in the United States: Overview of Trends at Different Levels of Government 1–2 (2009).
110. *See* Dernbach, *supra* note 103, at 10015–28; Daniel A. Farber, *Sustainable Consumption, Energy Policy, and Individual Well-Being,* 65 Vand. L. Rev. 1479, 1503–08 (2012); Doris et al., *supra* note 109, at 5-41.
111. *See* Gerrard, *supra* note 11.
112. *See* Sachs, *supra* note 103, at 1644.
113. *See* Steven Hill, *Windmills, Tides, and Solar Besides: The European Way of Energy, Transportation, and Low-Carbon Emissions,* 43 ELR 10102, 10103 (Feb. 2013). A government efficiency standard for standby power consumption by appliances offers another opportunity for further energy savings. *See id.* at 10108.

dard setting is understandable and generally enjoys bipartisan appeal.[114] But efficiency standards alone are of limited effect. Such standards typically apply only to new products and thus offer only gradual improvements in efficiency, and they do not address levels of actual use.[115] Additional policy incentives can address the high cost of replacing or retrofitting existing stock and encourage efficient use.[116] Moreover, states have a potentially pivotal role to play as they regulate utility rates and establish building codes. Accordingly, the Obama Administration's Race to the Top proposal could serve as an important federal tool for leveraging efficiency improvements and reducing energy demand through state policies that incorporate revenue decoupling, performance incentives, and renewable energy credits for conservation and efficiency savings.[117]

D. Responding Inadequately to Climate Change

Climate change is ultimately driving the urgency of developing sustainable energy systems. Yet formal Administration policy statements in Obama's first term largely avoided direct references to climate change, in what likely represented a deliberate choice to avoid a controversial subject.[118] Nonetheless, ongoing initiatives to promote renewable energy appear to be aimed at climate change, as are efforts to regulate GHG emissions from mobile sources.[119] More generally, the Blueprint's clean energy component reflects recognition of the environmental implications of energy policies, and the president's Climate Action Plan repeatedly acknowledges the close relationship between climate and energy matters.[120]

Notably, the Administration's broad definition of clean energy encompasses nuclear energy and natural gas. Both of these specific energy sources are environmentally controversial. Nuclear power generates no carbon emissions, but triggers concerns regarding radioactive contamination and long-term nuclear waste disposal.[121] Rising consumption of relatively cheap natural gas is potentially problematic not only because of the associated carbon emissions, but also because dependence on natural gas can hinder the development of renewable energy, which is typically more expensive.[122]

In the wake of Congress' failure to enact climate change legislation in 2010, further federal action on climate change is most likely to come from the Executive Branch. Regulation of GHG emissions from existing power plants under Section 111(d) of the Clean Air Act is on the horizon, though such rules will surely be challenged, and EPA has not even finalized analogous rules for new power plants.[123] Other energy-related measures that could address climate change and be adopted administratively include direct regulation of methane emissions from hydraulic fracturing operations as well as regulation of GHG emissions from mobile sources other than automobiles and trucks.[124] The Climate Action Plan lists further steps, including acceleration of clean energy permitting on public lands and negotiation of an "ambitious, inclusive and flexible" climate treaty, but the content and effect of such measures remain to be determined.[125]

E. Inadequately Engaging the Public

The transformation to a sustainable energy society can occur in numerous ways, as suggested by energy policy developments in Europe. Relying on varying combinations of wind, solar, hydropower, and other sources, several European nations now generate more than 40% of their electricity via renewables.[126] The rapid shift to renewables in these countries demonstrates not only that such change is possible, but that it can be achieved without sacrificing living standards. In the United States, however, political resistance, cultural barriers, and the comparatively low cost of natural gas have impeded a similar shift.[127] These barriers are not impossible to overcome, as suggested by the widespread adoption of RPSs in the states and the development of renewable energy even in more politically conservative regions of the United States.[128] But these barriers do point to the need for dramatic policy changes and efforts to solicit public engagement and support.

Feed-in tariffs ("FIT") are one possible tool to recruit broad participation by society in renewable energy generation. Under a FIT regime, renewable electricity generators enjoy a guaranteed right to connect to the power grid, and utilities are required to purchase this power at above-market rates.[129] FIT policies have stimulated the widespread deployment of renewable energy installations by hundreds of thousands of households in Western Europe.[130] Determining tariff

114. *See* Richard Cowden, *Special Report: Obama Expected to Take Executive Action While Backing Climate Change Legislation,* 44 Env't Rep. 526, 526 (2013).
115. *See* Dernbach, *supra* note 103, at 10018; Sachs, *supra* note 103, at 1640–41; Sachs, *supra* note 98, at 314.
116. *See* Cowden, *supra* note 114, at 526–28 (discussing various federal legislative or executive actions that could promote energy efficiency).
117. *See* BPC, *supra* note 27, at 70–74; Vandenbergh & Rossi, *supra* note 101, at 1532, 1557 (noting that demand-side management measures tend to focus on shifting timing of electricity rather than total amount of demand, and advocating instead measures that actually decrease carbon emissions) .
118. *See, e.g.,* Blueprint, *supra* note 6; Progress Report, *supra* note 1.
119. *See* EPA & DOT 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62624 (Oct. 15, 2012) ("final rules to further reduce greenhouse gas emissions and improve fuel economy"); Brown & Whitney, *supra* note 32, at 2 (explaining that interest in renewable electricity generation is driven, in part, by concerns about greenhouse gas emissions).
120. *See* Blueprint, *supra* note 6.
121. *Life Cycle Emissions Analysis,* Nuclear Energy Inst. (Sept. 10, 2013), http://www.nei.org/Issues-Policy/Protecting-the-Environment/Life-Cycle-Emissions-Analyses.
122. *See* Spence & Meazell, *supra* note 59, at 48.
123. *See* Gerrard, *supra* note 11, at 1–3; Obama, *supra* note 36, at 3.
124. *See* Michael Gerrard, *Climate Change Action Without Congress,* 126 Harv. L. Rev. F. 160, 162–63 (2013).
125. *See* Blueprint, *supra* note 6.
126. *See* Hill, *supra* note 113, at 10106–07; Elisabeth Rosenthal, *Life After Oil and Gas,* N.Y. Times, Mar. 24, 2013, at SR1.
127. *See* Rosenthal, *supra* note 126, at SR1; Hill, *supra* note 113, at 10119–20.
128. *See* Hill, *supra* note 113, at 10120.
129. *See* Felix Mormann, *Enhancing the Investor Appeal of Renewable Energy,* 42 Envtl. L. 681, 693 (2012); Karlynn Cory et al., Nat'l Renewable Energy Lab., Feed-In Tariff Policy: Design, Implementation, and RPS Policy Interactions 2 (2009).
130. *See* Mormann, *supra* note 129, at 723; Cory et al., *supra* note 129, at 9. In Germany, the FIT has been largely responsible for a tripling of renewables as a

rates has proven to be a challenging task, as rates should be high enough to stimulate substantial investment, but not so high as to impose unreasonable burdens on ratepayers. Moreover, rates should be tailored to encourage a range of renewable energy sources.[131] Compared to an RPS, a federal FIT offers less certainty as to whether renewable energy percentage goals will be achieved, but greater assurance to would-be investors that they will receive an economic payoff.[132] FITs can be a difficult sell for consumers, however, because they can result in higher electricity rates.[133] Nonetheless, FITs may be particularly suited for engaging private households in directly supporting the transition to a more sustainable energy economy because they offer individuals a way to participate in and profit from that transition.[134]

III. Conclusion: Towards a Sustainable Energy Policy

Interestingly, sustainable energy and sustainability in general receive no direct mention among the stated objectives of current federal energy policy. Sustainability has been defined in various ways and is sometimes argued to be a meaningless and unrealistic concept.[135] Nonetheless, the core concern at the heart of sustainability—accounting for future generations and ecological limits while meeting present needs[136]—is one that many critics of the concept would embrace. The goals of current energy policy suggest links to sustainability, of course: implicit in the goal of a reliable energy supply is the expectation that such a supply will be reliable well into the future; clean energy presumably is more sustainable than "dirty" energy; and accounting for climate concerns is essential to developing a sustainable energy system. At the same time, the policy's various shortcomings reflect the fundamental failure to identify sustainability as an explicit goal.

In the context of energy policy, sustainability must be considered with respect to both the desired good, energy, and the negative consequences flowing from the production and use of that good. Stated another way, energy sustainability requires that the rate at which we use energy resources ultimately match the rate at which energy resources are generated and also that waste emissions ultimately fall within the assimilative capacity of relevant ecosystems.[137] The first of these requirements ultimately points toward replacing fossil fuels with renewable energy sources, though perhaps not immediately. Continual discoveries of new fossil fuel reserves and ongoing improvements in extraction techniques suggest that we are not likely to run out of fossil fuels in the near future.[138] The second of these requirements turns out to be more urgent, however, thanks to looming climate change.[139] Our generation of GHG emissions is now exceeding the Earth's ability to assimilate them.[140] We have three basic options for responding: eliminate those emissions, put those emissions in a place other than the atmosphere (e.g., through carbon sequestration or other carbon removal techniques), or cope with the consequences of higher atmospheric concentrations of GHGs (e.g., through adaptation or solar radiation management forms of geoengineering). While we are taking steps to explore or implement the latter options, only the elimination of emissions offers a proven and complete solution. Climate change, not scarcity, demands that we end our reliance on fossil fuels by shifting to renewables and reducing energy consumption.

Ultimately, sustainability will require a radical departure from the policies of the past. Historically, U.S. energy policy has favored "large-scale, high-technology, capital-intensive, integrated, and centralized produc[tion] of energy from fossil fuels" in order to supply abundant and relatively inexpensive energy, complemented by government intervention aimed at preventing the excessive aggregation of market power.[141] Sustainability requires not only the replacement of fossil fuels with renewables, but also a shift away from near-term cost minimization towards policies that meet basic needs and avoid systemic risks.

share of the electricity supply, to 16% in 2009, and an almost 150-fold increase in photovoltaic electricity generation. *See* Volker Oschmann, *A Success Story — The German Renewable Energy Act Turns Ten,* 2010 Renewable Energy L. & Pol'y Rev. 45, 48 (2010).

131. *See* Mormann, *supra* note 129, at 729–32. In addition, policy makers should also consider potential interactions between an FIT and other renewable energy policies. *See id.* at 732–33.
132. *See id.* at 712–13. The economic payoff to investors of an FIT is also more certain than that associated with a production tax credit because its availability is independent of any investor's tax liability. *See id.*
133. *See id.* at 130. In Germany, the FIT appears on a consumer's electric bill as a surcharge of approximately 10% of the retail price for electricity, but this surcharge does not reflect the full social benefits of the FIT. *See* Oschmann, *supra* note 130, at 58.
134. *See* Mormann, *supra* note 129, at 722; *see also* Oschmann, *supra* note 130, at 48 (contending that Germany's FIT has contributed to awareness and popular support for renewable energy).
135. *See* Michael Burger et al., *Rethinking Sustainability to Meet the Climate Change Challenge,* 43 ELR 10342, 10343–44 (Apr. 2013); Scott R. Littlefield, *Security, Independence, and Sustainability: Imprecise Language and the Manipulation of Energy Policy in the United States,* 52 Energy Pol'y 779, 781–82 (2013).
136. *Cf.* World Comm'n on Env't & Dev., Our Common Future 43 (1987) (defining sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"); John Dernbach, Acting as if Tomorrow Matters: Accelerating the Transition to Sustainability 4 (Envtl. L. Inst. 2012).
137. *See* Marilyn A. Brown & Benjamin K. Sovacool, *Developing an "Energy Sustainability Index" to Evaluate Energy Policy,* 32 Interdisc. Sci. Revs. 335, 340 (2007).
138. *See* Jeffrey Rissman, *We Will Not Run Out of Fossil Fuels,* LiveScience (June 14, 2013, 6:23 PM), http://www.livescience.com/37469-fuel-endures.html.
139. *See* Patrick Parenteau, *It's the Biosphere, Stupid,* 43 ELR 10342, 10347–48 (Apr. 2013).
140. *Id.*
141. Tomain, *supra* note 35, at 375–76, 390–91.