

Creating “Accidental Environmentalists” in America: Reconsidering Why Green Initiatives Have Fallen Flat

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One of the anomalies of modern ecology is the creation of two groups, each of which seems barely aware of the existence of the other. The one studies the human community, almost as if it were a separate entity, and calls its findings sociology, economics, and history. The other studies the plant and animal community and comfortably relegates the hodge-podge of politics to the liberal arts. The inevitable fusion of these two lines of thought will, perhaps, constitute the outstanding advance of this century.

—Aldo Leopold¹

Perhaps nearly every day the effects of climate change become more obvious. A United Nations (“U.N.”) report, released on March 31, 2014, concluded that the human population will face extreme weather patterns, severe flooding, and drought due to the ancillary effects of climate change.² The U.N. report concluded that world policymakers’ focus should be on “surviving,” not reversing, the ensuing environmental harms.³ Despite this ominous news, U.S. policymakers have failed to provide a sufficient response to the U.N.’s repeated warnings since many scheduled negotiations between big greenhouse gas emitters such as the United States and China have proven unsuccessful, and many responsible parties including the new U.S. Environmental Protection Agency (“EPA”) Chief Scott Pruitt continue to deny its occurrence.⁴ Instead of focusing on

collective strategies to address human contributors, the United States has placed greater emphasis upon generating energy independence⁵—meaning that renewables and many “green” consumer products may not garner the attention needed to reverse the climate change onus.⁶

In tandem with the unpredictable weather patterns brought about by climate change, some traditional energy and material sources also require a significant amount of water for use, which may become problematic in the wake of extended droughts.⁷ These trends increasingly depict the necessity of moving toward a policy that comports more fluidly with shifting environmental concerns.⁸ As the environment changes, so too must our approach.

Despite flagrant evidence decrying the need for a rapid transition to a sustainable economy, America’s decisively antienvironmentalist policies and infrastructure—coupled with tepid consumer demand for green purchases—continue to hinder an appropriate response. Still, environmental decisionmaking has failed to assimilate into the mainstream not because Americans are eager to destroy their homes and their futures, but because current sustainability initiatives are incongruent with the pragmatic, short-term concerns of

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1. This quote was selected to illustrate Aldo’s recognition of the importance of meshing environmental motivators with economics and other indicators affecting environmental policies and outcomes.
2. See Christer Field et al., CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY—TECHNICAL SUMMARY, UNITED NATIONS INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Mar. 31, 2014), http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-TS_FINAL.pdf.
3. *Id.*, at 40-50 (outlining vulnerability and exposure to climate change by region).
4. See, e.g., Max Strasser, *Climate Change: Is Anybody Listening?*, NEWSWEEK (Apr. 1, 2014), <http://www.newsweek.com/climate-change-anybody-listening-239069>; Coral Davenport, *EPA Chief Doubts Consensus View of Climate Change*, N.Y. TIMES (Mar. 9, 2017), <https://www.nytimes.com/2017/03/09/us/politics/epa-scott-pruitt-global-warming.html>.

5. One example is the widespread interest in natural gas drilling pursuant to recent technological advances in horizontal hydraulic fracturing, which have taken precedence over developing the use of green alternatives. See Tom Ashbrook, *Big Solar and Renewable Energy in the Age of Fracking*, NAT’L PUB. RADIO (Feb. 19, 2014), <http://www.wbur.org/onpoint/2014/02/19/solar-energy-renewable-energy-fracking>.
6. See Patti Domm, *U.S. Is on Fast-Track to Energy Independence: Study*, CNBC (Feb. 11, 2013), <http://www.cnbc.com/id/100450133> (discussing possibility of U.S. energy independence); see also *What Is Renewable Energy*, U.S. ENERGY INFO. ADMIN. (May 10, 2013), https://www.eia.gov/energyexplained/index.cfm?page=renewable_home (although in 2016 U.S. renewable energy consumption was ten percent of total energy consumption, renewable energy is more expensive to produce and use than fossil fuel energy, its sources are located in remote areas, can be limited by natural conditions such as cloud cover, low wind, and drought, thereby hindering solar power plants, wind farms, and hydropower plants, respectively).
7. See, e.g., *Clean Energy*, UNION OF CONCERNED SCI., http://www.ucsusa.org/clean_energy (last visited Aug. 8, 2017) (opining on need for clean energy); see also CLIMATE CHANGE 2014, *supra* note 2, at 40.
8. See *id.*

the working populace.⁹ In order to create a more sustainable America, economic and environmental considerations must intermesh. To do so, incentives to purchase “green” consumer products and transition to renewables should become more consumer-centric and should assimilate into the capitalist structure that pervades contemporary American society.¹⁰ These measures will help the average American to adopt a more environmentally friendly lifestyle and incorporate “greener” choices in their day-to-day lives. Hearteningly, public and private support for clean energy forms and green consumer products continues to rise, albeit gradually, thereby suggesting that widespread use of these materials may one day become feasible.¹¹

This Article will focus on the application and limitations associated with three areas implicated in offsetting environmental harms, including: (1) renewables,¹² (2) infrastructure and transportation, and (3) consumer purchases of green products retailed at mainstream stores.¹³ First, a brief review of the U.S. renewables framework will be provided, including an overview of certain mandates and production incentives supporting these products with infrastructure issues also considered as part of this framework. The factors affecting consumer purchases for those items for which a “green” substitute may be available will then be explored. Second, the shortcomings of the current U.S. policy initiatives will be elucidated, incorporating both consumer-centric and market considerations. Lastly, this Article will suggest several recommendations in the hopes of providing an avenue for needed reforms.

I. Background

A. Renewables

The U.S. policy framework governing renewables has proven insufficient to offset problems associated with human contributors to global warming because current U.S. policies acquiesce to the traditional dominance of conventional sources, and thus, have not been effective in altering pre-existing behavioral and investment patterns.¹⁴ The United

States has expended over \$13 billion annually on renewable energy subsidies and has pursued a number of avenues for incorporating “green” initiatives into the policy framework, such as mandating efficiency and green building materials requirements for the design and function of federal buildings, as well as installing production grants for private sector producers.¹⁵ Despite these efforts, early initiatives have been ineffective because policymakers have not placed sufficient emphasis on ensuring that these measures harness the private sector’s ability to reduce costs through mass production and technological advances in order to make green alternatives available to conventional offerings across their consumer base. While the private sector has the capacity to spread renewables and “green” products across the nation, public sector initiatives are unlikely to have such application unless combined with private sector efforts.

Considered broadly, the vast majority of the United States’ energy supply is derived from nonrenewable sources or fossil fuels, such as natural gas, oil, and coal that comprise nearly 86% of the total energy supply.¹⁶ In contrast, renewable sources, such as wind and hydroelectricity, meet only 6% of the nation’s energy demand.¹⁷ Facially, the United States’ reliance on fossil fuels can be explained as the United States merely drawing upon its naturally imbued resources. For instance, U.S. lands are characterized by significant amounts of naturally occurring coal, and have even been dubbed by some as “the Saudi Arabia of coal.”¹⁸ Due to concerns arising from the nation’s energy dependence upon resources derived from the Middle East, many policymakers have pushed for greater reliance on the nation’s domestic resources.¹⁹ However, domestic fossil fuel resources emit significant pollutants,

requests/subsidy/pdf/subsidy.pdf; see also *Federal Financial Support for Electricity Generation Technologies*, U. TEX. ENERGY INST. (Mar. 2017), https://energy.utexas.edu/files/2017/03/UT-Austin_FCe_Subsidies_2017.pdf (outlining federal renewable initiatives); James Conca, *Why Do Federal Subsidies Make Renewable Energy So Costly?*, FORBES (May 30, 2017), <https://www.forbes.com/sites/jamesconca/2017/05/30/why-do-federal-subsidies-make-renewable-energy-so-costly/#702408c3128c>.

9. See SCOTT BEARSE ET AL., FINDING THE GREEN IN TODAY’S SHOPPERS: SUSTAINABILITY TRENDS AND NEW SHOPPER INSIGHTS 2 (2009), <https://www.gmaonline.org/downloads/research-and-reports/greenshopper09.pdf> (providing that “there is an unfulfilled, latent demand for green products that could be realized through increased product development, in-store communication, and product availability”).

10. *Id.* at 11 (“Consumer businesses are missing a substantial opportunity to market and provide greener products [. . .] there are substantial gaps between the market’s readiness for sustainable products and the delivery of those products to the shopper’s market basket.”).

11. See, e.g., Kate Bradshaw, *Activists Press Duke Energy for Clean Alternatives*, ST. PETERSBURG TRIB. (Apr. 2, 2014), <http://tbo.com/pinellas-county/activists-press-duke-energy-for-clean-alternatives-20140402/>.

12. As used here, “renewables” encompass the entire scope of feasible renewable and alternative energy forms, but is applied specifically to the most promising sources such as wind, solar, geothermal, biofuels, and lesser-utilized sources such as algae and hydropower.

13. “Green products” are defined as items made with environmentally friendly materials available for retail to consumers including cleaning products, linens, shower items, clothing, and gardening items, among others.

14. See e.g., *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013*, U.S. ENERGY INFO. ADMIN. (Mar. 2015), <https://www.eia.gov/analysis/>

15. See *id.*; see also American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, § 1101-7002 (2009) [hereinafter “2009 Recovery Act”] (describing renewable energy incentives).

16. U.S. GOV’T ACCOUNTABILITY OFF., GAO-05-414T, MEETING ENERGY DEMAND IN THE 21ST CENTURY: MANY CHALLENGES AND KEY QUESTIONS (Mar. 16, 2005) [hereinafter *Jim Wells Testimony*] (statement of Director Jim Wells), <http://www.gao.gov/assets/120/111415.pdf>.

17. See *U.S. Coal Reserves*, U.S. ENERGY INFO. ADMIN. (Dec. 16, 2013), <http://www.eia.gov/coal/reserves/> (providing that “[a]s of January 1, 2013, the demonstrated reserve base (DRB) was estimated to contain 477 billion short tons”); *Jim Wells Testimony*, *supra* note 16, at 12 (tellingly, the U.S. has at least 250 remaining years of coal reserves to help power the country).

18. See Cathy Booth Thomas, *Is Coal Golden?*, TIME MAG. (Oct. 2, 2006), <http://content.time.com/time/magazine/article/0,9171,1541270,00.html> (discussing coal opportunities); *Jim Wells Testimony*, *supra* note 16, at 12. But see Brad Johnson, *U.S.G.S.: We’re Not the “Saudi Arabia of Coal,”* THINKPROGRESS (June 9, 2009), <http://thinkprogress.org/climate/2009/06/09/174350/not-saudi-arabia-coal/>.

19. Ángel González, *Expanded Oil Drilling Helps U.S. Wean Itself From Mideast*, WALL. ST. J. (June 27, 2012), <http://online.wsj.com/news/articles/SB10001424052702304441404577480952719124264>; see also *Hot Air Alert*, H.R. COMM. NAT. RES. (Feb. 28, 2013), <http://naturalresources.house.gov/news/documentsingle.aspx?DocumentID=321607> (describing that “the United States has been increasing its dependence on oil from one of the most unstable regions of the world [. . .] [d]eveloping our nation’s own energy resources insulates us from the price shocks brought upon by instability in the Middle East.”).

including sulfur oxides, particulate matter, nitrogen oxides, and mercury—thereby continuing to fuel the “greenhouse effect” and contributing to global warming.²⁰

No single U.S. federal agency oversees the nation’s renewables framework. However, four agencies—U.S. Department of Agriculture (“USDA”), U.S. Department of Defense (“DOD”), U.S. Department of Energy (“DOE”), and U.S. Department of Interior (“DOI”)—have been major players in overseeing many of these policies.²¹ Despite lacking formal oversight authority, DOE plays a comparatively large role in overseeing renewables initiatives. Notably, DOE’s Secretary (“Secretary”) reports annually to Congress on the outcomes of renewables initiatives and programs, and is responsible for disseminating information regarding renewables programs to the public.²² The Office of Energy Efficiency & Renewable Energy (“EERE”), housed within DOE, is dedicated to renewables efforts.²³ In addition to the foregoing agencies, the Federal Energy Regulatory Commission (“FERC”) is authorized to oversee hydropower and hydroelectric projects.²⁴

As of 2010, the United States had installed roughly 700 initiatives aimed at promoting the use of renewables in varying capacities across the country.²⁵ Still, despite significant efforts, renewable energy sources remain underutilized and underdeveloped. Indicating that renewables initiatives can likely be made more effective, a recent U.S. Government Accountability Office (“GAO”) report concluded that it could not discern the degree of overlap amongst federal, state, and local renewables initiatives and whether these initiatives are maximally cost-efficient, due to the sheer number of disparate, disjointed efforts.²⁶ This suggests that current policies have not been as effective as they could be in shifting the nation towards renewables efforts. Presently, the United States’ renewables initiatives are largely concentrated

on developing three sources—wind,²⁷ solar,²⁸ and geothermal²⁹—which have shown the most potential for replacing conventional resources.

At the federal level, the regulatory structure governing renewables is, to a great extent, dictated by several key pieces of legislation: the Energy Policy Act of 2005 (“EPAct 2005”),³⁰ the Energy Independence and Security Act of 2007 (“EISA 2007”),³¹ as well as certain Executive Orders and other legislation.³² These will be discussed in detail in subsequent sections.

I. Energy Policy Act of 2005

The EPAct 2005 reinvigorated the federal government’s attempts to incorporate alternative and renewable sources

20. *Sources of Greenhouse Gas Emission*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions> (last visited Aug. 8, 2017); *Jim Wells Testimony*, *supra* note 16, at 18. See generally DRAFT INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2012, U.S. ENVTL. PROT. AGENCY (Feb. 2014), <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2012>.

21. U.S. GOV’T ACCOUNTABILITY OFF., GAO-13-279SP, 2013 ANNUAL REPORT: ACTIONS NEEDED TO REDUCE FRAGMENTATION OVERLAP, AND DUPLICATION AND ACHIEVE OTHER FINANCIAL BENEFITS (Apr. 9, 2013), <https://www.gao.gov/assets/660/653604.pdf> (noting that “the initiatives supported a range of wind issues, such as energy generation from [. . .] activities from basic and applied research to deployment. Under these initiatives, agencies incurred obligations of about \$2.9 billion and provided estimated tax subsidies totaling at least \$1.1 billion for activities specifically related to wind in fiscal year 2011.”).

22. 42 U.S.C. § 7373 (2012).

23. *See About the Office of Energy Efficiency & Renewable Energy*, U.S. DEP’T OF ENERGY, <https://energy.gov/eere/about-office-energy-efficiency-and-renewable-energy> (last visited Aug. 9, 2017) (describing the recent mission of EERE).

24. 42 U.S.C. §§ 7171–72 (2012).

25. U.S. GOV’T ACCOUNTABILITY OFF., GAO-12-260, RENEWABLE ENERGY: FEDERAL AGENCIES IMPLEMENT HUNDREDS OF INITIATIVES 11 (Feb. 27, 2012) [hereinafter *GAO Report on Agencies’ Implementation of Renewable Energy*], <http://www.gao.gov/assets/590/588876.pdf>.

26. *Id.* at 3.

27. Wind power shows significant promise for widespread expansion because of its ability to generate electric power, and the Energy Information Administration (“EIA”) estimates that use of wind energy has increased by about thirty-three percent annually over the past decade although it provided, on average, only three percent of the nation’s energy. See *Electricity Generation From Wind*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/index.cfm?page=wind_electricity_generation (last visited Aug. 9, 2017); see also 42 U.S.C. § 9201 (2000). At the federal level, nine federal agencies have currently initiated eighty-two wind energy projects, though there is evidence that these initiatives have significant potential for expansion. U.S. GOV’T ACCOUNTABILITY OFF., GAO-13-136, WIND ENERGY: ADDITIONAL ACTIONS COULD HELP ENSURE EFFECTIVE USE OF FEDERAL FINANCIAL SUPPORT 5 (May 2013), <http://www.gao.gov/assets/660/652957.pdf>. In addition to the renewables legislation discussed in-text, wind energy initiatives in the United States are also governed by the Wind Energy System Act of 1980, which postulates that the government pursue “an aggressive research, development, and demonstration program to accelerate the widespread utilization of wind energy.” Wind Energy Systems Act of 1980, 42 U.S.C. § 9201(a)(7) (2012). The Act arose out of a motivation to accelerate the transformation of wind energy into a viable technology. *Id.* § 9203 (describing the wind energy systems’ comprehensive management plan per Congressional recommendation). Accordingly, the DOE Secretary is imbued with the authority to set U.S. wind production targets, which are then presented to Congress. *Id.* § 9205(c). The Secretary is also conferred special authority to allocate funding for both public and private sector wind projects. *Id.* § 9201. Among other proposals, one way to increase the use of wind energy is by incorporating wind use targets or similar initiatives into a bundled package alongside other energy sources. *Id.*

28. Like wind, Congress has emphasized the importance of developing solar technology, and has pledged significant federal support for research and development in both private and public sector endeavors. See Solar Photovoltaic Energy Research Development and Demonstration Act of 1978, Pub. L. No. 95-590, 92 Stat. 2513 (current version at 42 U.S.C. § 5581 (2012)). To study solar energy’s viability in U.S. markets, Congress created the Solar Photovoltaic Energy Advisory Committee, which began operations in 1978 and remains in place today. The Committee assists DOE and Congress in reviewing the efficacy of solar initiatives. See *id.* DOE’s Secretary also provides updates to Congress regarding solar energy’s viability and usage. See *id.* § 5589 (describing Secretary’s report).

29. Geothermal is another energy source with significant growth potential even though it currently has a meager presence in renewables initiatives. See U.S. GOV’T ACCOUNTABILITY OFF., GAO-13-189, AGENCIES HAVE TAKEN STEPS AIMED AT IMPROVING THE PERMITTING PROCESS FOR DEVELOPMENT ON FEDERAL LANDS 7 (Jan. 18, 2013) [hereinafter *GAO Geothermal Report*], <https://www.gao.gov/assets/660/651362.pdf>; U.S. GOV’T ACCOUNTABILITY OFF., GAO-06-930T, INCREASED GEOTHERMAL DEVELOPMENT WILL DEPEND ON OVERCOMING MANY CHALLENGES (July 11, 2006), <http://www.gao.gov/assets/120/114362.pdf>.

30. Energy Policy Act of 2005, 42 U.S.C. §§ 15801-16538 (2005) [hereinafter “EPAct 2005”].

31. Energy Independence and Security of 2007, 42 U.S.C. §§ 17001-17386 (2007) [hereinafter “EISA 2007”].

32. See *Key Federal Legislation: Alternative Fuels Data Center*, U.S. DEP’T OF ENERGY, http://www.afdc.energy.gov/laws/key_legislation (last visited Aug. 8, 2017) (providing further information on renewables legislation).

into the nation's energy framework although the majority of these efforts are limited to public sector mandates.³³ Among other efforts, the EAct 2005 directs the Secretary to ensure that at least 7.5% of the total electricity consumed by the federal government (2013 target) comes from renewable sources.³⁴ Federal agencies are also incentivized to use renewables at federal facilities.³⁵ The EAct 2005 provides that as long as it is cost and lifecycle effective, federal buildings should employ energy consumption reductions, utilize sustainable building design, and conserve water.³⁶ Renewables that are used as part of these policies must also be characterized by various favorable environmental characteristics, including avoiding the emittance of certain pollutants into the air.³⁷

2. Energy Independence and Security Act of 2007

EISA 2007 increases the requirements imposed upon federal entities for use of renewables and provides greater ease of financing for renewable projects.³⁸ Building upon the EAct 2005 mandates, EISA 2007 imposes a number of energy-intensive reductions across federal entities and further depicts Congressional desire for the federal government to take a lead in utilizing alternative energy forms in federal buildings and vehicles. Notably, EISA 2007 requires that federal agencies use energy-efficient lighting,³⁹ and to take steps to ensure the lifecycle energy and cost effectiveness of equipment in buildings.⁴⁰ Federal agencies must also lease buildings that carry Energy Star Labeling,⁴¹ apply sustainable design principles to building construction and renovation,⁴² and should power

30% of hot water by solar hot water equipment.⁴³ The DOE oversees fossil fuel energy reductions in federal buildings and has targets of reducing fossil fuel energy in these buildings by 55% in 2010, 65% in 2015, 80% in 2020, 90% in 2025, and 100% in 2030.⁴⁴

3. Executive Orders and Other Legislation

Executive Order ("EO") 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," bolsters EISA 2007's initiatives by requiring that half of total energy used by federal entities be derived from renewables,⁴⁵ and by mandating that further sustainability provisions be incorporated in federal buildings.⁴⁶ EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," also raises the total percentage of energy that must be derived from renewables for federal entities.⁴⁷ EO 13514 was revoked on March 19, 2015, with the publication of a new EO, "Planning for Federal Sustainability in the Next Decade."⁴⁸ The new order, EO 13693 expanded on the energy reduction and environmental performance requirements for federal agencies.⁴⁹ Similarly, EO 13327, "Federal Real Property Asset Management," provides that federal entities incorporate sustainability into their real property acquisitions.⁵⁰ Though not discussed as fully here, the National Energy Conservation Policy Act ("NECPA") also installs a number of energy management requirements.⁵¹ Another federal support initiative for renewable energy is the American Recovery and Investment Act of 2009 (the "2009 Recovery Act"),⁵² which has helped to increase the amount of renewable energy used in the United States following the recent economic downturn.⁵³

In addition to energy-specific legislation, there are also several environmental laws that are relevant to the use of renewables and green products. First, the National Environmental Policy Act of 1969 requires agencies to prepare a detailed statement outlining the significant environmental impacts of "major Federal actions."⁵⁴ This statement, known as an Environmental Impact Statement ("EIS"), assesses the environmental harms of a project, the considered alternatives, and "whether all practicable means to avoid or mini-

33. The EAct 2005 defines "renewable energy" broadly 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." EAct 2005 § 203(b)(2).

34. *Id.* § 203(a)(3).

35. *Id.* § 203(c).

36. *Id.* § 109; See Federal Procurement of Energy Efficient Products, 74 Fed. Reg. 10,830, 10,833 (Mar. 13, 2009) (codified at 10 C.F.R. 436.43) (providing that "[a]gencies should require the procurement of Energy Star and Federal Energy Management Program ("FEMP") designated products in new service contracts as they are re-competed and should, to the extent possible, incorporate such requirements and preferences into existing contracts as they are modified or extended through options").

37. See *Renewable Energy Requirement Guidance for EAct 2005 and Executive Order 13423—Final*, U.S. DEP'T OF ENERGY 5 (Jan. 28, 2009), https://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf (providing that "non-energy attributes of renewable energy include, but are not limited to, the following: (a) any avoided emissions of pollutants to the air, soil, or water such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and mercury; (b) any other pollutant that is now or may in the future be regulated under the pollution control laws of the United States; and (c) avoided emissions of carbon dioxide (CO₂) and any other greenhouse gas, along with the RECs reporting rights to these avoided emissions.").

38. See *Requirements for Renewable Energy on Federal Sites*, U.S. DEP'T OF ENERGY, <https://energy.gov/eere/sunshot/requirements-renewable-energy-federal-sites> (last visited Aug. 8, 2017) (describing changes made by EISA 2007); see also *Renewable Energy Procurement for Federal Agencies*, U.S. DEP'T OF ENERGY, <https://energy.gov/eere/femp/renewable-energy-procurement-federal-agencies> (last visited Aug. 8, 2017) (describing renewable energy procurement program for federal agencies).

39. EISA 2007 § 3313.

40. *Id.* § 434.

41. *Id.* § 435(a).

42. *Id.* § 433.

43. *Id.* § 523.

44. *Id.* § 433(a).

45. See Exec. Order No. 13,423, 72 Fed. Reg. 3919 (Jan. 26, 2007).

46. *Id.*

47. See *Federal Energy Management Laws and Requirements*, U.S. DEP'T OF ENERGY, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, <http://energy.gov/eere/femp/federal-requirements-sustainable-buildings-law-and-regulation>.

48. See *EO 13514 (Archive)—Revoked by EO 13693 on March 19, 2015, Sec. 16(b)*, FEDCENTER.GOV, <https://www.fedcenter.gov/programs/eo13514/> (last updated Mar. 29, 2017).

49. *Id.*

50. Exec. Order No. 13,327, 69 Fed. Reg. 5897 (Feb. 4, 2004).

51. National Energy Conservation Policy Act § 543, 42 U.S.C. § 8253 (1978) (articulating energy performance requirements for Federal buildings).

52. See 2009 Recovery Act.

53. See *EERE Funding Opportunities*, U.S. DEP'T OF ENERGY, <https://energy.gov/eere/funding/eere-funding-opportunities> (last visited Aug. 9, 2017) (outlining renewables funding under Act); see also *GAO Report on Agencies' Implementation of Renewable Energy*, *supra* note 25, at 2 (discussing funding to EERE).

54. 42 U.S.C. § 4332 (1970).

mize environmental harm from the alternative selected have been adopted and, if not, why not.⁵⁵ An EIS is also required for significant changes in land use.⁵⁶ Second, the Endangered Species Act of 1973 seeks to protect endangered and threatened species through federal action.⁵⁷ Third, the National Historic Preservation Act of 1966 protects historic properties from potentially adverse ramifications of new projects.⁵⁸ Other pertinent acts include the Migratory Bird Treaty Act⁵⁹ and the Bald and Golden Eagle Protection Act.⁶⁰

4. Federal Initiatives

As noted above, federal efforts promoting the use of renewables have increased from 2005 to 2007 although recent changes to U.S. climate policy including a retreat from the Paris Climate Agreement have likely altered the landscape of renewables reform.⁶¹ Even so, in addition to installing mandates for federal agencies, certain initiatives are designed to incentivize the private sector to produce “green” alternatives. In order to spur investment and research in renewables, a number of credits, initiatives, and mandates were devised along with earlier legislation. First, the Production Tax Credit (“PTC”) has been one of the most prominent federal initiatives promoting the use of renewables.⁶² Pursuant to the PTC, qualifying producers are provided with a tax credit of varying amounts over ten years as a way to help reduce the costs of producing and implementing renewables into their energy systems.⁶³ The PTC must frequently be extended by Congress thus its future becomes habitually uncertain.⁶⁴ Demonstrating the lack of reliable support for these initiatives, the PTC has been allowed to expire several times since it was enacted in 1992, and the use of renewables has been affected significantly by ups and downs in the turbulent economy.⁶⁵ Second, the Investment Tax Credit (“ITC”) has proven beneficial for promoting the use of renewables in the private sector; the ITC establishes a 30% federal tax credit for residential, commercial, and utility solar technology investors through 2019, as well as a permanent 10% ITC for solar

and geothermal investments.⁶⁶ However, the ITC’s funding has also been unreliable and has been allowed to expire on several occasions.⁶⁷ Third, the Renewable Energy Systems Program, which was later enveloped into the Rural Energy for America Program (“REAP”), provides grants and loans to smaller producers.⁶⁸ These grants can help to offset from 50 to 75% of a project’s total costs in some circumstances, though many of these grants are capped at \$20,000.⁶⁹ Lastly, exemplified by the Million Solar Roofs Initiative, joint projects between federal agencies and private investors are also encouraged under these legislative initiatives.⁷⁰

Coupled with expanding its incentives and credits for outside development, the federal government has also been gradually raising federal renewables efforts by making available to its agencies additional funding to research and cultivate new renewable energy sources. For example, DOE’s EERE received increased funding—from \$440 million in 2008 to \$630 million in 2010—to research and develop technology to more efficiently bring renewables to market.⁷¹ Even more, EERE received an additional \$1.4 billion in funding from the 2009 Recovery Act, which has helped increase the scope of EERE’s initiatives.⁷² Because federal government entities are, when combined, the nation’s largest energy purchaser and directly oversee land management across a variety of contexts, federal agencies also stand to play a crucial role in furthering the use of renewables through their abilities to exercise regulatory oversight.⁷³

Despite the initial allocation of significant funding, the current federal approach is fairly narrow and is not designed for broad application to the mainstream economy. Similar to other federal initiatives, most federal agencies’ individual programs and resources are also limited in scope and are most likely to support solar, wind, and bioenergy initiatives.⁷⁴ Demonstrating this narrow focus, solar energy, the majority of which is derived from photovoltaic technologies, comprises nearly half of all renewables initiatives,⁷⁵ while onshore wind energy efforts comprise

55. GAO *Geothermal Report*, *supra* note 29, at 13.

56. *Id.*

57. 16 U.S.C. § 1531-44 (1973).

58. 16 U.S.C. §§ 470 et. seq. (1966).

59. 16 U.S.C. §§ 703-12 (1918).

60. 16 U.S.C. §§ 668-668d (1978).

61. See Brad Plumer, *What to Expect as U.S. Leaves Paris Climate Accord*, N.Y. TIMES (June 1, 2017), <https://www.nytimes.com/2017/06/01/climate/us-paris-accord-what-happens-next.html>.

62. See *Renewable Electricity Production Tax Credit (PTC)*, U.S. DEP’T OF ENERGY, <http://energy.gov/savings/renewable-electricity-production-tax-credit-ptc> (last visited Aug. 8, 2017) (describing rebate of 2.3¢/kWh for wind, geothermal, closed-loop biomass, and 1.1¢/kWh for other eligible technologies that generally applies to first 10 years of operation).

63. *Id.*

64. *Id.*; see also Hannah Conger, *A Lesson from Cape Wind: Implementation of Offshore Wind Energy in the Great Lakes Should Occur Through Multi-State Cooperation*, 42 LOY. U. CHI. L.J. 741, 748 (2011); *Renewable Energy Tax Incentives: How Have the Recent and Pending Expirations of Key Incentives Affected the Renewable Energy Industry in the United States?: Hearing Before the S. Comm. on Nat. Resources, and Infrastructure*, 112th Cong. 6 (2012) (statement of Ethan Zindler, Head of Policy Analysis, Bloomberg New Energy Finance) (“The [PTC] has expired 3 times in the last dozen years. On each occasion, the result has been a sharp drop in new installations for wind.”).

65. See Conger, *supra* note 64, at 748-49.

66. See Leslie Blodgett, *Geothermal Basic—Policy*, GEOTHERMAL ENERGY ASS’N, http://www.geo-energy.org/geo_basics_policy.aspx (last visited Aug. 8, 2017) (noting that “[a]t the federal level, tax incentives are considered one of the most important incentives for driving growth in renewable energy”); see also *Solar Investment Tax Credit (ITC)*, SOLAR ENERGY INDUS. ASS’N, <http://www.seia.org/policy/finance-tax/solar-investment-tax-credit> (last visited Aug. 9, 2017); *The Energy Credit: An Investment Tax Credit for Renewable Energy*, CONG. RES. SERV., <https://www.taxequitytimes.com/wp-content/uploads/sites/15/2016/10/CRS-2016-ITC-Report.pdf> (Oct. 7, 2016).

67. See Conger, *supra* note 64 at 748-49.

68. Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, § 9006, 116 Stat. 134 (2002) (codified at 7 U.S.C. § 8106).

69. *Id.*; see also *Rural Energy for America Program*, NAT. SUSTAINABLE AGRIC. COAL., <http://sustainableagriculture.net/publications/grassrootsguide/renewable-energy/renewable-energy-energy-efficiency/> (last updated Oct. 2016).

70. See GLENN STRAHS & CAROL TOMBARI, U.S. DEP’T OF ENERGY, *LAYING THE FOUNDATION FOR A SOLAR AMERICA: THE MILLION SOLAR ROOFS INITIATIVE: FINAL REPORT* (2006).

71. See *GAO Report on Agencies’ Implementation of Renewable Energy*, *supra* note 25, at 1-2; see also *Renewable Energy Consumption and Electricity Preliminary Statistics 2010*, U.S. ENERGY INFO. ADMIN. (June 28, 2011), <http://www.eia.gov/renewable/annual/preliminary/> (outlining renewables growth).

72. *GAO Report on Agencies’ Implementation of Renewable Energy*, *supra* note 25, at 2.

73. *Id.* at 3.

74. See *id.* at 16.

75. *Id.* at 18.

an additional 40% of all federal renewables efforts.⁷⁶ Many federal government initiatives have limited market relevancy and research efforts are developed independently of private sector development, as evidenced by the fact that much of the current funding is allocated to federal agencies' own "green" programs.⁷⁷ Accordingly, while limited in resources, funding, and support, the federal government has been supportive of implementing cost-competitive renewables in its buildings.

5. State Initiatives

In addition to federal initiatives, there are a number of incentives at the state level that promote further use and investment in renewable and alternative energy forms.⁷⁸ Most widespread, the Renewable Portfolio Standard ("RPS") has been enacted by twenty-nine states, Washington, D.C., and three territories.⁷⁹ The RPS requires that a certain percentage of utility companies' energy within the state to be derived from renewables, though this percentage varies among states.⁸⁰ There are typically three ways for a utility company to meet requirements under the RPS, including purchasing "credits" for renewable energy, producing renewable energy in-house, or purchasing renewable energy and the "credits" from a third party.⁸¹ Applied at the state level, the RPS has been one of the most effective initiatives promoting the use of renewables.⁸² Illustrative of this success is the fact that the RPS has been credited with driving almost 50% of the recent expansion of wind power in the United States.⁸³

An example of a joint federal-state effort is the State Energy Program ("SEP"), which was created in 1996 and is overseen

by DOE.⁸⁴ Under the SEP, states are allocated funding to develop and implement renewables programs and are overseen by a regional DOE office.⁸⁵ These funds can be applied to state participation in federal programs, such as the Clean Cities Program and Rebuild America, which simultaneously promote economic and environmental improvements.⁸⁶ In addition, states also often have their own tax credits, grants, and loan programs to promote renewables within the state.⁸⁷ For example, some states have reduced sales tax for renewables items and have lowered property taxes on lands utilizing renewables.⁸⁸

Similarly, there are a variety of state incentives that can be employed to help bolster use of renewables in the private sector and for consumers such as tax exemptions and consumer financing options.⁸⁹ For instance, some states have created "green power" programs, whereby consumers may choose to opt-in to an electricity plan in which a certain percentage of their use will be derived from renewables.⁹⁰ However, these programs are typically more expensive than a standard plan and require the consumer to take affirmative steps to enroll.⁹¹ Lastly, many states allow "net metering," meaning that an individual residence or building may install solar or wind technology on their property and credit the electricity produced against their bill, lowering overall costs to the individual.⁹²

6. Local Initiatives

At the local level, governments often foster renewables' use through zoning ordinances, efforts to ease the renewables permitting process, and through devising comprehensive plans promoting green development in certain areas.⁹³ Local governments may enact initiatives to fill in the gaps where federal and state legislation does not apply—for instance, by installing *greener* building codes.⁹⁴ Municipalities have included sustainability and renewables initiatives as part of their comprehensive city planning efforts.⁹⁵ Nevertheless, while state and local governments are crucial in overseeing

76. *Id.* at 19.

77. *See id.* at 3.

78. *See Federal Funding for State and Local Clean Energy Programs*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, <https://energy.gov/eere/wipo/federal-funding-state-and-local-clean-energy-programs> (last visited Aug. 8, 2017).

79. Conger, *supra* note 64, at 749; Renewable Portfolio Standard Policies (Feb. 2017), DATABASE OF STATE INCENTIVES FOR RENEWABLES AND EFFICIENCY, <http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2017/03/Renewable-Portfolio-Standards.pdf> (last visited Aug. 29, 2017); *see also Geothermal Grant and Loan Program*, CAL. ENERGY COMM'N, <http://www.energy.ca.gov/geothermal/grda.html> (last visited Aug. 9, 2017) (providing example of state-level geothermal incentive program).

80. *Id.* at 749-50; *see also* Blodgett, *supra* note 66 ("At the state level, the most important laws are the renewable portfolio standards (RPS) that require utility companies to have a growing percentage of renewable power generation in their mix.").

81. Conger, *supra* note 64, at 749-50.

82. *See Renewable Portfolio Standards*, NAT'L RENEWABLE ENERGY LABORATORY, http://www.nrel.gov/tech_deployment/state_local_governments/basics_portfolio_standards.html (last updated July 6, 2015); *see also Guide to Purchasing Green Power: Renewable Electricity, Renewable Energy Certificates, and On-Site Renewable Generation*, U.S. DEP'T OF ENERGY (Jan. 2016), https://www.epa.gov/sites/production/files/2016-01/documents/purchasing_guide_for_web.pdf. Many states already utilize a variety of renewables and alternative energy sources within a given energy portfolio. States also incorporate a variety of their own initiatives to help spur the use of state-wide alternative energy, including: (1) generating onsite renewable energy (2) purchasing Renewable Energy Certificates ("RECs"), and (3) obtaining renewable energy for its electric utilities from a green price or marketing program.

83. Conger, *supra* note 64, at 750; *see also* Ryan Wisner & Ole Langniss, *The Renewables Portfolio Standard in Texas: An Early Assessment* (U.C. Berkeley, Working Paper LBNL-49107, Nov. 2001), <https://emp.lbl.gov/sites/default/files/report-lbnl-49107.pdf> (finding success in Texas market following increased emphasis on RPS).

84. *State Energy Program*, U.S. DEP'T OF ENERGY, <https://energy.gov/eere/wipo/state-energy-program-0> (last visited Aug. 9, 2017).

85. Sanya Carleyolsen, *Tangled in the Wires: An Assessment of the Existing U.S. Renewable Energy Legal Framework*, 46 NAT. RES. J. 759, 776-77 (2006).

86. *Id.*

87. *Id.* at 777-81.

88. *Id.*

89. *Guide to Purchasing Green Power*, *supra* note 82 (noting that "[m]any states offer financial incentives specifically for consumers that install qualified renewable generation systems. These incentives may take the form of direct payments (rebate), competitive solicitations, consumer financing, or lower taxes (either sales or property tax exemptions)."); *see also Database of State Incentives for Renewables & Efficiency*, U.S. DEP'T OF ENERGY, <http://www.dsireusa.org> (last visited Aug. 9, 2017).

90. Carleyolsen, *supra* note 85, at 779.

91. *Id.*

92. *Id.*

93. *Id.* at 781-82; *see also* Jonathan D. Stoloff et al., *Legal Issues Raised by the Environmental Impacts of Photovoltaic Energy and Wind Energy Conservation Systems*, 11 COLUM. J. ENVTL. L. 379, 412 (1986).

94. *See* Carleyolsen, *supra* note 85, at 781-82.

95. *See id.*; *see also* Charles M. Haar, *The Master Plan: An Impermanent Constitution*, 20 LAW & CONTEMP. PROBS. 353, 362 (1955) (explaining the ways by which city master plans have exerted influence on developers).

and implementing renewables efforts, the interplay between federal, state, and local efforts may be confusing to potential participants.⁹⁶ Some federal and state programs also disavow duplicate use of resources, which could lead some interested participants to stay out altogether.⁹⁷

Considered in the aggregate, the United States' renewables framework is regulated by a myriad of policies, acts, and initiatives, which has led to duplication and overlap of initiatives at the federal, state, and local levels.⁹⁸ As will be elucidated more clearly later, these policies have proven largely ineffective to change behaviors within the private sector or to reduce environmental harms.

B. U.S. Infrastructure

Overseen in large part by the U.S. Department of Housing and Urban Development ("HUD"), the U.S. Department of Transportation ("DOT"), and EPA, U.S. infrastructure remains characterized by suburban sprawl and vast, interlinking highway systems.⁹⁹ The design of today's communities can be traced back to the early twentieth century when widespread use of automobiles began to replace railroad transport.¹⁰⁰ Cars, SUVs, and trucks now accommodate the vast majority of the United States' transport needs, and mass transportation is significantly limited in availability as compared to other first-world nations.¹⁰¹

Particularly, the sprawl found in much of the country increases the adverse environmental externalities associated with Americans' daily lives. Some studies have indicated that while the growth of suburban sprawl has increased dramatically since the mid-1950s, these trends have been recently changing as decaying urban areas are gradually being revitalized through local sustainability initiatives.¹⁰² Nevertheless, many American metropolitan areas remain designed to necessitate reliance upon automobiles for daily transportation, reducing the feasibility of building cost-effective mass

transit systems outside the borders of the city.¹⁰³ Rural and suburban residents are often left without a mass transportation option for entering the city center, one study found that 45% of American homes lacked access to public transportation.¹⁰⁴ In tandem with transport externalities, the relatively larger size of many residential homes and lots also require a significant amount of resources for upkeep, which are typically derived from conventional sources as compared to urban living accommodations, further contributing to environmental waste and emissions.¹⁰⁵ Even more, growing suburban neighborhoods sometimes cause the destruction of formerly untouched rural areas, which further threatens the area's resources and may reduce the availability of untouched natural habitats.¹⁰⁶

Next, transport in the United States is significantly more reliant on automobiles than in other first-world nations, which has further contributed to adverse environmental trends.¹⁰⁷ One reason for the nation's dependence on personal automobiles, coupled with a cheap supply of gasoline, stems from relatively low expenditures on infrastructure improvements—the United States instead allocates a comparatively greater proportion of its discretionary funds on military expenditures (55%) than do peer nations.¹⁰⁸ While China spends 9% of its gross domestic product ("GDP") on infrastructure improvements, and European nations spend on average 5% of their GDP for these efforts, the United States only spends an average of 2.4% of its total GDP on infrastructure maintenance and total development.¹⁰⁹ Despite the Trump Administration's focus on infrastructure investment,

96. Carleyolsen, *supra* note 85, at 770.

97. *Id.* at 786.

98. *Id.* at 770.

99. See generally ANDRES DUANY, ELIZABETH PLATER-ZYBERK & JEFF SPECK, *SUBURBAN NATION: THE RISE OF SPRAWL AND THE DECLINE OF THE AMERICAN DREAM* (2010); see also Angela Glover Blackwell, *Infrastructure Is Not Just Roads and Bridges*, N.Y. TIMES (June 9, 2017), <https://www.nytimes.com/2017/06/09/opinion/infrastructure-public-transportation-broadband.html>.

100. Stephen R. Miller, *Legal Neighborhoods*, 37 HARV. ENVTL. L. REV. 105, 126 (2013).

101. See Jerry Hirsh, *253 Million Cars and Trucks on U.S. Roads; Average Age Is 11.4 Years*, L.A. TIMES (June 9, 2014), <http://www.latimes.com/business/autos/la-fi-hy-automotive-average-age-car-20140609-story.html>; see also Pietro S. Nivola, *Are Europe's Cities Better?*, BROOKINGS INST. (Sept. 1, 1999), <https://www.brookings.edu/articles/are-europes-cities-better/>; Jeffrey R. Kenworthy & Felix B. Laube, *Patterns of Automobile Dependence in Cities: An International Overview of Key Physical and Economic Dimensions With Some Implications for Urban Policy*, 33 TRANSP. RES. PT. A 691, 718 (1999) (comparing automobile reliance with Europe, Asia, and Australia, the authors found that "U.S. cities clearly lead the world in dependence on the automobile").

102. See generally ANDRES DUANY, ELIZABETH PLATER-ZYBERK & JEFF SPECK, *SUBURBAN NATION: THE RISE OF SPRAWL AND THE DECLINE OF THE AMERICAN DREAM* (2010); JEFF SPECK, *WALKABLE CITY: HOW DOWNTOWN CAN SAVE AMERICA ONE STEP AT A TIME* (2012) (describing revitalization and increased walkability of urban areas).

103. See AM. SOC'Y CIV. ENG'RS, 2013 REPORT CARD FOR AMERICA'S INFRASTRUCTURE 86-91 (2013), <http://2013.infrastructurereportcard.org/wp-content/uploads/2013/ReportCardforAmericasInfrastructure.pdf>.

104. *Id.* at 7.

105. See Robert L. Liberty, *Rising to the Land Use Challenge: How Planners and Regulators Can Help Sustain Our Civilization*, 38 VT. L. REV. 251, 267-68 (2013).

106. *Id.*

107. See John Andrew Brunner-Brown, *Thirty Minutes or Less: The Inelasticity of Commuting*, 43 GOLDEN GATE U.L. REV. 355, 361 (2013) (explaining that increased density in cities and expansion of road network in U.S. cities has "encourage[ed] car owners to drive more, [and] more people to buy cars").

108. See Bart Jensen, *Transportation Secretary Urges Infrastructure Spending*, USA TODAY (Feb. 20, 2014, 10:56 AM), <https://www.usatoday.com/story/news/nation/2014/02/20/foxx-transportation-infrastructure/5635399/> (lamenting lack of infrastructure expenditures in United States); *A New Economic Analysis of Infrastructure Investment*, U.S. DEP'T OF TREASURY (Mar. 23, 2012), <https://www.treasury.gov/press-center/news/Pages/03232012-infrastructure.aspx> (discussing economic and environmental benefits associated with public transportation including small reductions in 4.2 billion gallons of gasoline); see also *Freight Railroads Help Reduce Greenhouse Gas Emissions*, ASS'N AM. R.R. (July 2012), <https://www.aar.org/BackgroundPapers/Railroads%20and%20Greenhouse%20Gas%20Emissions.pdf> (providing that "moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent"); cf. Paul Rodderick Gregory, *Infrastructure Gap? Look at the Facts*, FORBES (Apr. 1, 2013), <https://www.forbes.com/sites/paulroderickgregory/2013/04/01/infrastructure-gap-look-at-the-facts-we-spend-more-than-europe/> (author arguing that United States spends more on infrastructure than the European Union yet we do not have a better system in place in comparison, and that problem is not about not enough spending, but waste and corruption).

109. See *Life in the Slow Lane*, THE ECONOMIST (Apr. 28, 2011), <http://www.economist.com/node/18620944>. The United States' relatively larger GDP does not offset the significance associated with this figure, and there is evidence that the United States infrastructure is not sufficiently maintained to accommodate the needs of a growing population. See generally 2013 REPORT CARD, *supra* note 103.

infrastructure expenditures remain of a relatively lower importance on the national agenda compared to bolstering economic growth and international security.¹¹⁰ Nevertheless, creating an effective mass transportation system in the United States would require significant capital expenditures and would require both public and private sector participation.¹¹¹ Policymakers have not yet indicated a willingness to expend funds to develop nationwide mass transit networks suggesting that these trends are unlikely to change in the near future.¹¹²

Suburban sprawl has also spurred sociodemographic inequities affecting access to “green” and sustainable resources.¹¹³ For those residents without access to a personal vehicle, the lack of public transportation may inhibit abilities to secure employment.¹¹⁴ Since many employment opportunities are located within city borders, lack of public transportation outside of urban centers has contributed to demographic changes in metropolitan areas.¹¹⁵ Specifically, wealthier individuals who can afford a vehicle are more likely to reside in the suburbs, whereas poorer individuals are apt to live closer to the city center.¹¹⁶ Longer trips can be similarly problematic because the United States likewise lacks an effective high-speed rail option to traverse the country, although several proposals are underway.¹¹⁷

In order to begin fostering change, the United States has already installed initiatives to help create more sustainable communities.¹¹⁸ For example, the Partnership for Sustainable Communities, an interagency effort by EPA, DOT, and HUD, has engaged in redevelopment initiatives in decaying areas and specifically proposes the use of green building materials, mass transit opportunities, and walkable neighborhoods.¹¹⁹ HUD independently oversees several similar programs, such as the Sustainable Housing Initiative, which promote the economic revitalization of low-income areas while simultaneously promoting “green” development in

the area.¹²⁰ HUD also provides individual grants to outside parties seeking to redevelop communities in a sustainable, environmentally friendly manner.¹²¹ Despite recent efforts, “sustainable” communities still represent the exception and are typically concentrated in urban areas.

Accordingly, U.S. infrastructure and its accompanying suburban sprawl, coupled with a lack of public transportation options outside of urban areas, is designed to discourage environmentally friendly lifestyles among the American public. Furthermore, in addition to macro-level factors reducing the practicability of adopting “green” technologies, at the micro-level, consumers are disincentivized to choose a “green” product when purchasing items needed for daily living. The next section will discuss the factors affecting consumer purchases at the individual level.

C. Consumer Purchasing Behavior

When making purchasing decisions, American consumers are motivated by several predictable considerations including price, convenience, product palatability and packaging, and need.¹²² Despite the uneven demand for renewables and “green” products, American consumers remain, for the most part, concerned about environmental issues.¹²³ Still, consumers must choose their purchases within the confines of a stagnant economy that has been characterized by high levels of unemployment and a reduction in real wages.¹²⁴ A study conducted by S.C. Johnson found that 48% of survey respondents believed that while environmental issues were important, other concerns such as economic security took higher precedence.¹²⁵ “Green” products often also carry a price markup from conventional products, further deterring environmentally friendly purchases.¹²⁶ Though some consumers subscribe to the belief that the right to exploit the environment is God-given,¹²⁷ the environmental senti-

110. See *id.*; see also Glenn Thrush, *Trump’s “Great National Infrastructure Program” Stalled*, N.Y. TIMES (July 23, 2017), <https://www.nytimes.com/2017/07/23/us/trump-infrastructure-program.html> (describing low federal expenditures for infrastructure development).

111. *Id.*

112. *Id.*

113. See Robert Puentes & Adie Tomer, *Transit Access and Zero-Vehicle House*, BROOKINGS INST. (Aug. 18, 2011), <http://www.brookings.edu/research/papers/2011/08/18-transportation-tomer-puentes>.

114. *Id.* (providing map of residents lacking access to both transportation and a personal vehicle).

115. See Edward L. Glaeser & Jordan Rappaport, *Why Do the Poor Live in Cities? The Role of Public Transportation*, 63 HARV. J. URB. ECON. 1, 1 (2006).

116. *Id.*

117. See Eric Jaffe, *Will the U.S. Ever Get High-Speed Rail Anywhere?*, THE ATLANTIC (Oct. 22, 2013), <http://www.theatlanticcities.com/jobs-and-economy/2013/10/will-us-ever-get-high-speed-rail-anywhere/7314/>; see also Tom Zoellner, *Making High-Speed Trains Work in the U.S.*, WALL ST. J. (Jan. 31, 2014, 9:40 PM), <http://online.wsj.com/news/articles/SB10001424052702304691904579349264138993436> (discussing possibility of high-speed trains in the United States).

118. See generally John R. Nolon, *Changes Spark Interest in Sustainable Urban Places: But How Do We Identify and Support Them?*, 40 FORDHAM URB. L.J. 1697 (2013) (providing examples of sustainable development in urban areas).

119. See e.g., *Creating a Sustainable and Inclusive Neighborhood*, PARTNERSHIP FOR SUSTAINABLE COMMUNITIES (June 2012), https://www.sustainablecommunities.gov/sites/sustainablecommunities.gov/files/docs/PAR_case_studies_denver_co1.pdf.

120. See *Sustainable Housing Initiative*, U.S. DEP’T OF HOUS. & URB. DEV., http://portal.hud.gov/hudportal/HUD?src=/program_offices/economic_development/sustainable_housing_initiative (last visited Aug. 8, 2017).

121. See *id.* (outlining HUD’s sustainability initiatives).

122. See SCOTT BEARSE ET AL., *supra* note 9, at 12, 21.

123. See *id.* at 5.

124. See Rebecca Riffkin, *Climate Change Not a Top Worry in U.S.*, GALLUP (Mar. 12, 2014), <http://www.gallup.com/poll/167843/climate-change-not-top-worry.aspx> (comparing consumer concerns regarding the economy with climate change).

125. S.C. JOHNSON CO. & GfK ROPER, *THE ENVIRONMENT: PUBLIC ATTITUDES AND INDIVIDUAL BEHAVIOR—A TWENTY YEAR EVOLUTION 12* (2011), http://www.scjohnson.com/Libraries/Download_Documents/SCJ_and_GfK_Roper_Green_Gauge.sflb.ashx.

126. See, e.g., Wesley Nimon & John Beghin, *Are Eco-Labels Valuable? Evidence From the Apparel Industry*, 81 AM. J. OF AGRIC. ECON. 801 (1999) (describing price markup for organic and no-dye apparel of 33.8 percent); see also Claudia H. Deutsch, *The Cost of An Environmentally Friendly Life*, N.Y. TIMES (Mar. 21, 2007), <http://www.nytimes.com/2007/03/23/business/worldbusiness/23iht-green2.4978078.html> (discussing price of green products).

127. Christopher S. Elmendorf, *Ideas, Incentives, Gifts, and Governance: Toward Conservation Stewardship of Private Land, in Cultural and Psychological Perspective*, 2003 U. ILL. L. REV. 423, 494 (2003), <https://illinoislawreview.org/wp-content/ilr-content/articles/2003/2/Elmendorf.pdf>. Generally, American culture is not decisively antienvironmentalist, though the environment may not be at the forefront of the American public’s thoughts. Still, to some extent, prosperity has long dominated America’s collective consciousness—any shift toward conservationist environmentalism could be seen by some as detracting from fundamentally “American” values. Even more, America has also histori-

ments of many consumers are overridden by more pragmatic considerations.

1. Consumers Often Do Not Consider a Product's Environmental Impact a Dispositive Factor in Their Purchasing Decisions, But Still View "Green" Products Favorably

A number of interrelated factors influence consumer-buying behavior.¹²⁸ As consumers enter a retail store, they generally do so with the intention of satisfying certain material needs.¹²⁹ The retail store chosen by the consumer is typically located within a reasonable proximity from the consumer's home or workplace, and the consumer may be restricted by the product selection made available by nearby retailers.¹³⁰ When consumers are comparing products, they evaluate an item for a variety of favorable characteristics, but the final purchasing decision is swayed by the product's packaging,¹³¹ price,¹³² and functional utility.¹³³ Consumers often look for a familiar brand—one they recognize from previous purchases, a peer's purchases, or advertising—as an indicator of quality, which may then be compared as against the item's price.¹³⁴ Personal preferences such as color may also be considered.¹³⁵ A consumer may choose a "green" product if it is perceived to be a substitute or near-substitute to the conventional item, and the item's "green" marketing may help to increase the product's palatability for some consumers.¹³⁶ However, some consumers are less willing to purchase "green" products due to the product's appearance, smell, and its incongruity with their current needs.¹³⁷ Consumers are usually able to balance these competing factors within minutes.¹³⁸ Accordingly, a product's

cally been more rural in composition, which has caused some Americans—often farmers, ranchers, and fishermen—to perceive the environment from a traditionally utilitarian view. Even today, Americans place greater emphasis upon material prosperity—much of which is derived from the destruction and use of environmental resources—than do many other nations. *Id.* at 437.

128. See Yatish Joshi & Zillur Rahman, *Factors Affecting Green Purchase Behaviour and Future Directions*, 3 INT'L STRATEGIC MGMT. REV. 128, 132-39 (2015), http://ac.els-cdn.com/S2306774815000034/1-s2.0S2306774815000034-main.pdf?_tid=21fb5a66-5a07-11e7-88e2-00000aab0f27&acdnat=1498437414_93146432a0f53ff89e239d7436a17def.

129. *See id.*

130. *See generally Consumers Like to Shop Close to Home: Study*, CSP (Nov. 4, 2016), <http://www.csppdailynews.com/category-news/general-merchandise/articles/consumers-shop-close-home-study>.

131. *See, e.g.*, Georgios Koutsimanis et al., *Influence of Packing Attributes on Consumer Purchase Decisions for Fresh Produce*, 59 APPETITE 270, 270 (2012) (describing role of packaging on consumer food purchases).

132. *See, e.g.* Kelly Kiyoon Lee & Min Zhao, *The Effect of Price on Preference Consistency Over Time*, 41 J. CONSUMER RES. 109, 109 (2014) (discussing role of price in consumer preferences).

133. *See generally Consumer Behavior: How People Make Buying Decisions*, SAYLOR, <https://www.saylor.org/site/wp-content/uploads/2013/02/BUS203-PoM-Ch3.pdf> (last visited Aug. 9, 2017).

134. *See id.* at 5 ("[T]here might be a particular brand that you've purchased in the past that you liked and want to purchase in the future.").

135. *Id.*

136. Sheila Bonini & Jeremy Oppenheim, *Cultivating the Green Consumer*, STAN. SOC. INNOV. REV. (Fall 2008), https://ssir.org/articles/entry/cultivating_the_green_consumer (last visited Aug. 9, 2017).

137. *Id.*

138. *Consumer Markets and Consumer Buyer Behavior*, OHIO U., www.ohio.edu/people/gupta/MKT202Kotler/Chapter%2006.ppt (last visited Aug. 9, 2017).

environmental benefit is a positive factor promoting purchase but is not dispositive in influencing a consumer decision.

2. Consumers Purchasing Renewables and Green Products Are Likely to Be More Educated, Younger, Wealthier, and More Environmentally Conscious Than the Average American Consumer

In tandem with the above indicators, there are a variety of sociodemographic factors influencing an individual's propensity to incorporate green products into his or her purchases. Several studies have found that consumers purchasing green products are more likely to be younger, better educated, and more politically liberal than the average American consumer.¹³⁹ Other factors that contribute to green purchases include: (1) urban residency, (2) occupational prestige, and (3) income.¹⁴⁰ Though less strongly correlated, men tend to be less likely to purchase green items than are women.¹⁴¹

Individual beliefs and values also contribute to environmental purchases, and consumers of green products are typically more aware of environmental issues affecting their local communities.¹⁴² Consumer perceptions that their actions will help to improve the environment is another major driver behind these purchases—researchers have found that consumers' beliefs that it is within their power to help effectuate environmental changes significantly increases green purchases.¹⁴³ Furthermore, research has suggested that certain social factors can affect a consumer's likelihood of purchasing a hybrid or more efficient vehicle, including "whether [his] neighbors adopted [hybrid technology] or whether [his] neighbors have high environmental values."¹⁴⁴ These social factors may also deter purchases—"green" consumer products can connote liberalism, which may isolate conservative consumers.¹⁴⁵

139. *See* Alicia A. Weaver, *Determinants of Environmental Attitudes: A Five-Country Comparison*, 32 INT'L J. SOCIOLOGY 77, 80-102 (2002); *see also* Kent Van Liere & Riley Dunlap, *The Social Basis of Environmental Concern: A Review of Hypotheses, Explanations and Empirical Evidence*, 44 PUB. OP. Q. 181, 182-85 (1980); Robert Jones & Riley Dunlap, *The Social Bases of Environmental Concern: Have They Changed Over Time?*, 57 RURAL SOCIOLOGY 28, 28 (1992).

140. *Id.*

141. *See* Weaver, *supra* note 139; *see also* Paul Stern et al., *Value Orientations, Gender, and Environmental Concern*, 28 ENV'T & BEHAV. 322, 322 (1993); Jean Blocker & Douglas Eckberg, *Gender and Environmentalism: Results From the 1993 General Social Survey*, 78 SOC. SCI. Q. 841, 841 (1997).

142. *See* Weaver, *supra* note 139.

143. Jason D. Oliver & Deborah E. Rosen, *Applying the Environmental Propensity Framework: A Segmented Approach to Hybrid Electric Vehicles Marketing Strategies*, 18 J. OF MKTG. & PRAC. 377, 377 (2010) (outlining factors promoting environmentally friendly purchases).

144. *Id.* (citing Jonn Axsen et al., *Combining Stated and Revealed Choice Research to Simulate the Neighbor Effect: The Case of Hybrid-Electric Vehicles*, 31 RES. & ENERGY ECON. 3, 2009, at 221-38).

145. *See* Joseph B. White, *Do Green Products Turn Off Conservative Consumers?*, WALL ST. J.: CORPORATE INTELLIGENCE (Apr. 30, 2013, 2:46 PM), <http://blogs.wsj.com/corporate-intelligence/2013/04/30/do-green-products-turn-off-conservative-customers/>; *see also* Dena M. Gromet et al., *Political Ideology Affects Energy-Efficiency Attitudes and Choices*, 110 PROC. NAT. ACAD. SCI. 23, 2013, at 9314-19 (describing role of "green" marketing upon conservative consumers).

Other than green products' price markups and misalignment with consumer preferences, there are additional reasons why consumers may decide against a "green" product and be less likely to purchase. Studies have indicated that many consumers do not believe that individual-level green purchases will pay off on a broader scale, especially when compared to larger industrial factors.¹⁴⁶ Similarly, while some companies have begun experimenting with these measures, the "carbon footprint" of most products, an indicator of the product's environmental impacts, is not depicted on the product's packaging.¹⁴⁷ This means that consumers may not be able to discern whether an item is better or worse for the environment compared to an opposing product.¹⁴⁸ Due to these deficiencies, consumers may be unable to perceive green products' functional utility and instead see them as merely status symbols.¹⁴⁹

Therefore, at the individual level, the main drivers of consumer behavior include convenience, price, product palatability, and the product's match with consumer demands. As discussed below, green products currently available on the market have often failed to align with consumer demand, leading to a misalignment between economic and environmental needs.¹⁵⁰ The next section will discuss more fully why "green" options—renewables and green consumer products—have not been successful at both the producer and consumer level.

II. Analysis

A. Why Renewables and Green Consumer Products Have Not Been Competitive

Renewables and green consumer products have not been competitive with their conventional counterparts due in part to a lack of clear government support, which has contributed to market uncertainty and unclear returns on investment.¹⁵¹ Unclear profit potential has quelled private

146. See Tina Mainieri et al., *Green Buying: The Influence of Environmental Concern on Consumer Behavior*, 137 J. Soc. PSYCHOL. 189, 189 (1997); see also Andrew Gilg et al., *Green Consumption or Sustainable Lifestyles? Identifying the Sustainable Consumer*, 37 FUTURES 481, 481 (2005) (extrapolating environmental attitudes to green purchases).

147. See generally *The Carbon Footprint of Packaging*, GREEN BUS. WATCH, <http://greenbusinesswatch.org/blog/the-carbon-footprint-of-packaging> (last visited Aug. 9, 2017).

148. See, e.g., Andrew Martin, *Do Consumers Care About Carbon Footprints?*, N.Y. TIMES: GREEN (Jan. 22, 2009, 10:45 AM), <https://green.blogs.nytimes.com/2009/01/22/do-consumers-care-about-carbon-footprints/>; Brenda Cossman, *Anxiety Governance*, 38 LAW & SOC. INQUIRY 892, 902 (2013) (discussing consumer motivations surrounding carbon footprint); Perrin Cooke, *Green Guide Gaps: Expanding FTC Authority Over Low-Carbon Marketing Claims*, 39 COLUM. J. ENV'TL. L. 105, 143 (2014) (discussing carbon footprint marketing tactics).

149. See James A. Roberts, *Green Consumers in the 1990s: Profile and Implications for Advertising*, 36 J. BUS. RES. 217, 217–18 (1996); Avi Brisman, *It Takes Green to Be Green: Environmental Elitism, "Ritual Displays," and Conspicuous Non-Consumption*, 89 N.D. L. REV. 329, 359–60 (2009) (relating green products to symbol of elitism); see also Jesse McKinley, *After the Silver Spoon, A Green Life*, N.Y. TIMES (Apr. 19, 2009), <http://www.nytimes.com/2009/04/19/arts/television/19mcki.html> (opining on exclusive nature of green purchases and stating that "[i]n a way the green thing has always been quite an exclusive club[.] . . . it was a very exclusive feeling").

150. See SCOTT BEARSE ET AL., *supra* note 9, at 4.

151. See Carleyolsen, *supra* note 85, at 764–65 (describing shortcomings of U.S. renewables framework).

sector development, resulting in fewer research and marketing expenditures for green technologies compared to conventional counterparts.¹⁵² Lower expenditures for green technologies has also affected consumer demand because current offerings are less likely to satisfy consumer preferences and needs. Consequently, in order to rectify the shortcomings of current initiatives, future policies must place heightened emphasis onto two broad areas: (1) stabilizing government support, and (2) generating and sustaining consumer demand by aligning the selection of green products with consumer purchasing preferences and needs.¹⁵³ This analysis will begin with macro-level considerations affecting renewables production and end more narrowly with factors affecting the "average" American's proclivity to purchase green consumer products.

I. Renewables and Green Products Have Not Been Competitive Because the Federal Government Has Failed to Provide Clear Government Support Through Existing Initiatives, Which Has Resulted in Unstable Market Incentives and Deterred New Investments

Considered at the macro-level, renewables and green consumer products have been unable to compete with conventional offerings because the federal government has failed to provide consistent support for green initiatives, leading to unstable market incentives and unpredictable returns for possible private sector entrants. Because investing in the technology and machinery required to pursue mid- to large-scale "green" products is often capital intensive and may require securing a private loan or obtaining other outside funding,¹⁵⁴ unambiguous government support is particularly important to safeguarding and promoting their viability.¹⁵⁵ Lack of consistent support can be particularly problematic for producers seeking to invest in new technologies because project success is particularly uncertain, and may deter some producers altogether.¹⁵⁶ Without government incentives to reduce market uncertainty, potential private sector entrants face uncertain returns for their investment in green technology, which may reduce overall spending for the development of environmentally friendly alternatives.¹⁵⁷

There are several indicia of uneven government support affecting private sector development. Demonstrating fluctuating federal incentives, the PTC and ITC, two of the

152. See e.g., *Barriers to Renewable Energy Technologies*, UNION OF CONCERNED SCI., http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/barriers-to-renewable-energy.html#.Wax6gciGM2w (last visited Aug. 29, 2017) (outlining the obstacles facing renewable energy).

153. *Id.*

154. See, e.g., Lloyd Hitoshi Mayer & Joseph R. Ganahl, *Taxing Social Enterprise*, 66 STAN. L. REV. 387, 396 (2014); Alexandra B. Klass, *Tax Benefit, Property Rights, and Mandates: Considering the Future of Government Support for Renewable Energy*, 20 J. ENV'T & SUSTAINABILITY L. 19, 59–60 (2013) (describing funding needs).

155. See Carleyolsen, *supra* note 86, at 765.

156. *Id.* at 771.

157. See Mayer & Ganahl *supra* note 154, at 396.

main production incentives for green technology, have been allowed to expire several times and were only reenacted after a time lag.¹⁵⁸ Despite having been enacted over twenty years ago, the PTC is seldom renewed for a period beyond several years, which may impinge upon an investor's ability to forecast anticipated returns.¹⁵⁹ Similarly, other renewables support programs have seen funding dramatically reduced or cut altogether in recent years. For instance, the Renewable Energy Production Incentive ("REPI")¹⁶⁰ was allocated a budget of \$4.95 million in fiscal years 2006 through 2008, yet was provided with no budget altogether for fiscal years 2010 through 2014.¹⁶¹ Likewise, funding for the Geothermal Technologies Program ("GTP")¹⁶² has varied from a high of \$68.2 million to a low of \$5 million within recent years,¹⁶³ and funding for the Energy Efficiency and Renewable Energy Technology Deployment, Demonstration, and Commercialization Grant Program has fluctuated from a budget of \$20 million to \$0 within the past five years.¹⁶⁴ The Renewable Energy Research and Development Program¹⁶⁵ has also been defunded from a high of \$520 million in 2008 to \$141.5 million in 2013.¹⁶⁶ These dramatic funding shifts have signaled that the government is not wholly committed to the development of green alternatives, further increasing uncertainty surrounding the viability of green technologies.¹⁶⁷

Uneven government support, evidenced by fluctuating government funding for its main "green" production incentives targeted at bolstering private sector production, has affected investors' willingness to invest in new technologies. Due to the uncertain profit potential of renewables and other sophisticated "green" alternatives, the continued expiration of these green incentives and tax credits has impeded growth and expansion into the mainstream.

2. Renewables and Green Products Have Not Been Competitive Because Policymakers Have Failed to Entice Participation by the Private Sector, Thereby Fostering a Lack of Congruency Between Consumer Demand and Environmentally Friendly Offerings

In tandem with unstable support, because federal policymakers have not been vigilant in designing "green" policies that will entice participation by the private sector, the development of green alternative technologies continues to lag behind conventional counterparts.¹⁶⁸ Since private-sector developers are better positioned to meet consumer demand than are public actors, current failure to entice private-sector participation has allowed the price markup between green and conventional products to persist, restricting the availability of renewables and green products to a smaller subsection of the population.¹⁶⁹

Still, private sector entrants are unlikely to expend additional funding into the market without increased government backing. Despite a lack of market saturation,¹⁷⁰ private sector investors have traditionally perceived the retail and development of "green" alternatives to have low or uncertain profit potential.¹⁷¹ In the short run, investors and producers are typically motivated by immediate profit margins, meaning they may have little financial incentive to allocate additional funding for "greening" their products or choosing environmentally friendly input materials.¹⁷² Nevertheless, the decisions made by industry powerhouses directly affect the product selections that are made available to consumers: producer-side initiatives play a key role in generating market signals in favor of environmental inputs used within products.¹⁷³ Market signals then play a key role in generating consumer demand, as consumers gradually come to expect that the products they purchase comport with environmen-

158. See *Corn Niblets Could Save America From Its Oil Dependency*, HOMESTEADING TODAY, 83 (Aug. 8, 2005), <https://www.homesteadingtoday.com/threads/corn-niblets-could-save-america-from-its-oil-dependency.92241/page-5> (reposting in full *Renewable Energy Tax Credit Saved Once Again, But Boom-Bust Cycle in Wind Industry Continues*, UNION OF CONCERNED SCI. (2004)) (noting inconsistency of PTC funding).

159. *Id.*

160. LYNN J. CUNNINGHAM & BETH A. ROBERTS, RENEWABLE ENERGY AND ENERGY EFFICIENCY INCENTIVES: A SUMMARY OF FEDERAL PROGRAMS, CONG. RES. SERV. 13-14 (2013).

161. See 42 U.S.C. § 13317 (2005) (outlining incentive payments).

162. See Geothermal Energy Research, Development, and Demonstration Act of 1974, 30 U.S.C. § 1101 (1974) (authorizing creation of GTP).

163. CUNNINGHAM & ROBERTS, *supra* note 160, at 4-5.

164. *Id.* at 13.

165. See Department of Energy Organization Act of 1977, Pub. L. No. 95-91, 91 Stat. 565, § 102 (1977) (current version at 42 U.S.C. § 7112 (2012)) (authorizing creation of program).

166. CUNNINGHAM & ROBERTS, *supra* note 160, at 16.

167. See Kevin M. Walsh, *Renewable Energy Financial Incentives: Focusing on Federal Tax Credits and the Section 1603 Cash Grant: Barriers to Development*, 36 SPG ENVIRONS ENVTL. L. & POL'Y J. 207, 208 (2013) (discussing investor uncertainty and current incentives); see, e.g., *Energy Tax Policy and Tax Reform: Hearing Before H. Comm. on Ways and Means*, 112th Cong. 14 (2011) (statement of Neil Z. Auerbach, Managing Partner of Hudson Clean Energy Partners) (providing example of private investor concerns).

168. See, e.g., Stephen Martin & John T. Scott, *The Nature of Innovation Market Failure and the Design of Public Support for Private Innovation*, 29 RES. POL'Y 437, 445 (2000).

169. See, e.g., Carmen Nobel, *How Governments Spur Private Sector Demand for Green Buildings*, FORBES (Feb. 13, 2012), <http://www.forbes.com/sites/hbworkingknowledge/2013/02/13/how-governments-spur-private-sector-demand-for-green-buildings/> (opining on interplay between public and private sector).

170. See, e.g., JOHN KWOKA, AM. PUB. POWER ASS'N, BARRIERS TO NEW COMPETITION IN ELECTRICITY GENERATION: REPORT TO THE AMERICAN PUBLIC POWER ASSOCIATION (2008); U.S. FED. TRADE COMM'N, 2013 REPORT ON ETHANOL MARKET CONCENTRATION, 14 (2013); Ellen Byron & Suzanne Vranica, "Green" Products to Get a Push, WALL ST. J. (Jan. 11, 2010, 12:01 AM), <https://www.wsj.com/articles/SB10001424052748703535104574646863414174656> (describing market potential for environmentally friendly offerings).

171. Carl J. Circo, *Using Mandates and Incentives to Promote Sustainable Construction and Green Building Projects in the Private Sector: A Call for More State Land Use Policy Initiatives*, 112 PENN. ST. L. REV. 731, 740-41 (2008).

172. *Dodge v. Ford Motor Co.*, 170 N.W. 668, 681 (Mich. 1919) ("[A] corporation . . . is put into operation for the purpose of absorbing profits which ought to be distributed to shareholders."). See, e.g., Ron Ashkenas, *Thinking Long-Term in a Short-Term Economy*, HARV. BUS. REV. MAG. (Aug. 7, 2012), <https://hbr.org/2012/08/thinking-long-term-in-a-short> (noting overreliance on profits per quarter).

173. *Jim Wells Testimony*, *supra* note 16, at 8.

tal goals.¹⁷⁴ As “green” inputs are gradually incorporated into existing product lines, the “greening” of brand name items can help to disseminate green products to mainstream consumers who traditionally purchase items containing more conventional inputs.¹⁷⁵

Though government reports have acknowledged the role of the private sector in bolstering federal “green” initiatives, most programs promoting renewables and green products remain executed by federal agencies and other public sector actors.¹⁷⁶ For instance, while the United States sets targets for the use of wind and solar energies, most of these efforts are typically carried out and overseen by federal government agencies, not private developers or through joint public-private sector initiatives, thus demarcating a missed opportunity for increasing success of these efforts.¹⁷⁷ Nevertheless, due to their comparatively larger research and development expenditures, private developers are more likely to have the resources to spearhead major reforms in creating and implementing green technology, and are better equipped to market these sources to the public.¹⁷⁸ Private sector developers have often proven more willing to experiment and test new renewables technology, such as algae, helping to spread the application of these sources to new previously unconsidered avenues.¹⁷⁹

Concurrent to stabilizing support for transitioning to “green” alternatives, the federal government can play a larger role in shaping private sector behavior by *raising targets within the existing incentive structure*. Illustrative of this point is the fact that federal production incentives for renewables do not adequately engage the private sector to place heightened emphasis on the use of renewables but instead acquiesce to the existing dominance of conventional materials, leaving the status quo largely unchecked. Notably, while the federal government has created production incentives targeted at private sector development, such as the PTC and ITC, these initiatives are often not sufficient to offset the uncertain profit and returns potential faced by investors and the tenuous longevity of these programs also reduces their

capacities to induce large-scale transitions to “greener” production methods.¹⁸⁰ Likewise, initiatives targeted at smaller and mid-sized producers, such as the Renewable Energy Systems Program, have also failed to entice a significant number of smaller producers to enter the market due to their narrow application and funding level caps.¹⁸¹ Accordingly, the program has supported only about 5,733 projects servicing only roughly 600,000 households, less than a single major metropolitan area.¹⁸² For these programs to become more efficacious at reducing environmental harms, federal initiatives must be broadened to reach a larger proportion of the population and must provide stronger signals to producers to alter the status quo.

Next, federal green production programs also do not adequately incentivize collaboration amongst the public and private sectors, which has impeded the success of existing “green” projects. Though less frequently utilized, joint public-private initiatives have proven significantly more effective in achieving environmental improvements than either sector working alone. For instance, the Million Solar Roofs Initiative, designed to increase the number of solar-photovoltaic roofs in America to 1 million by 2010, was widely successful in spreading solar power across the nation.¹⁸³ Today, California has a similar state-level program in place where collaborative efforts among the public and private sectors resulted in the drop of retail solar prices by 45%.¹⁸⁴ California’s solar industry has now also grown to provide 43,000 jobs within the state.¹⁸⁵ Another example of a joint public-private sector initiative demonstrating significant efficacy is DOE’s Clean Cities Program, that has promoted the use of renewables and alternative fuels in roughly 100 cities across America since 1993.¹⁸⁶ The program forms partnerships with local coalitions as well as major industry players such as General Motors and large fuel retailers.¹⁸⁷ The Clean Cities Program is estimated to have reduced petroleum usage by over 8.5 billion gallons since its inception; no analogous

174. *Id.* As it pertains to renewable energy, these prices are mostly determined at the market level. *Id.* at 4. Clear market signals in favor of renewables will help to bolster consumer confidence and thereby spur demand. *Id.* at 8.

175. *See id.* (“Energy consumers need clear and consistent signals so that they can make reasoned choices with regard to purchases of energy-consuming equipment that help to determine their long-term energy demand.”); *see also* Glenn Croston, *Green Goes Mainstream*, ENTREPRENEUR (Oct. 27, 2009), <https://www.entrepreneur.com/article/203846> (“As green products enter the mainstream, the mainstream market changes as well.”); Joan Voight, *Green Is the New Black: Levi’s, Nike Among Marketers Pushing Sustainability*, ADWEEK (Oct. 23, 2013), <http://www.adweek.com/brand-marketing/green-new-black-levi-s-nike-among-marketers-pushing-sustainability-153318/>.

176. *GAO Report on Agencies’ Implementation of Renewable Energy*, *supra* note 25, at 24.

177. Circo, *supra* note 171, at 778–79 (opining on role of private sector in sustainability reforms).

178. *Id.*

179. *See, e.g.*, Andrew Herndon, *Exxon Refocusing Algae Biofuels Program After \$100 Million Spend*, BLOOMBERG (May 20, 2013), <http://www.bloomberg.com/news/2013-05-21/exxon-refocusing-algae-biofuels-program-after-100-million-spend.html>; *see also* Kevin Bullis, *Exxon Takes Algae Fuel Back to the Drawing Board*, MIT TECH. REV. (May 20, 2013), <https://www.technologyreview.com/s/515041/exxon-takes-algae-fuel-back-to-the-drawing-board/> (providing example of private sector research).

180. *See supra* Section II.A.2.

181. *See id.*

182. *See* BENJAMIN BOROUGH, ET AL., GEO. WASH. U. CENTER FOR INT’L SCI. & TECH. POL’Y, ASSESSING THE VALUE OF LOAN GUARANTEES AS AN INSTRUMENT FOR SUPPORTING THE DEPLOYMENT OF NEW CLEAN ENERGY TECHNOLOGY 20–21 (2012).

183. *See, e.g.*, G. STRAHS & C. TOMBARI, *supra* note 70 (providing final results of million solar roofs initiative); *DOE Funds for “Million Solar Roofs Initiative,”* 2003 PHOTOVOLTAICS BULL., No. 7, 2013, at 2, [http://dx.doi.org/10.1016/S1473-8325\(03\)00703-X](http://dx.doi.org/10.1016/S1473-8325(03)00703-X) (describing program funding); William A. Spratley, *Solar Rooftops as Distributed Resources*, 11 ELECTRICITY J. 10, 1998, at 40–50, <http://www.sciencedirect.com/science/article/pii/S1040619098001006>.

184. LINDSEY HALLOCK & MICHELLE KINMAN, ENV’T CAL. RESEARCH & POLICY CTR., CALIFORNIA’S SOLAR SUCCESS STORY: HOW THE MILLION SOLAR ROOFS INITIATIVE TRANSFORMED THE STATE’S ENERGY LANDSCAPE 6 (2015), <http://www.environmentalcalifornia.org/reports/cae/california-solar-success-story>; *see About the California Solar Initiative (CSI)*, GO SOLAR CAL., <http://www.gosolarcalifornia.ca.gov/about/csi.php> (last visited Aug. 8, 2017).

185. Stephen Lacey, *California Has More Solar Jobs Than Actors*, GREENTECH MEDIA (Apr. 18, 2013), <https://www.greentechmedia.com/articles/read/California-Has-More-Solar-Jobs-Than-Movie-Actors>.

186. *About Clean Cities*, U.S. DEP’T OF ENERGY, <https://cleancities.energy.gov/about/> (last visited June 28, 2017).

187. *Partnership & Projects*, U.S. DEP’T OF ENERGY, <https://cleancities.energy.gov/partnerships/> (last visited June 28, 2017) (providing list of partnerships).

program has been able to achieve comparable results.¹⁸⁸ As illuminated by the foregoing examples, joint public-private sector initiatives often exhibit significantly more efficacy than independent action promoting the transition to more sustainable measures.

Accordingly, while the United States has earmarked billions of dollars to develop and bring to market new renewables technologies, these applications fail to harness the private sector's ability to innovate and spread these technologies into new markets across the consumer base thus restricting the success of existing efforts.¹⁸⁹

3. Renewables and Green Products Have Not Been Competitive Because State-Level Programs and Bundling Packages Do Not Adequately Accommodate Renewables, Meaning That Conventional Forms Remain the Default

On a slightly smaller scale, coupled with federal initiatives' shortcomings, state-level programs have further reduced renewables' and green substitutes' practicability by failing to adequately incorporate these materials into the state's existing programs and infrastructure supports, and do not place sufficient emphasis on the potential to replace their conventional counterparts. Many green technologies—particular those accompanying renewables—exist outside the bounds of existing regulations and cannot be transported by traditional methods,¹⁹⁰ further reducing the feasibility of “green alternatives” even in locations where they are available.

First, many states' policies do not adequately promote green products to the extent needed to reduce environmental harms. For instance, state-level RPSs have not required sufficiently high targets to incentivize utility companies to shift their portfolios to provide more environmentally friendly offerings.¹⁹¹ Given that RPSs have demonstrated significant efficacy in increasing renewables' use, state-level RPSs are likely to be one of the most promising tools to promote and

maintain the use of sustainable resources within a region.¹⁹² However, current trends indicate that state-level RPSs are not sufficiently strict to promote tangible environmental changes, and some researchers have suggested that the use of renewables will need to make up a significantly greater percentage of total electricity consumption to offset current emissions trends.¹⁹³ Support for installing an RPS requirement also varies considerably from state to state. For instance, while New York recently set a goal, that by 2030, 50% of the total electric energy in the state be derived from renewables,¹⁹⁴ North Carolina currently only requires that 6% of electricity provided by utility companies be derived from renewables.¹⁹⁵ Though this figure is set to increase to 12.5% on or before 2021,¹⁹⁶ the proposed target has been virulently opposed by North Carolina policymakers and industry players, and the RPS's use remains contentious within North Carolina and a number of other states.¹⁹⁷

Coupled with insufficient targets for use, even if they are made available, green alternatives are often not installed and maximally incorporated because the state's infrastructure has not been designed to comport with the unique needs of certain alternative energy forms. Among other deficiencies, many states do not have sufficient infrastructure supports to accommodate the transmission of renewables across the state, which means that private sector investors may be required to expend higher overhead costs than they would for a conventional source.¹⁹⁸ Renewables also often face administrative hurdles that their conventional counterparts do not. As one example, some states have failed to define ways by which alternative energy forms may be connected to the existing utility grids, which may add confusion surrounding the use of new technologies.¹⁹⁹ A number of states also continue to require significant permitting hurdles before an environmental project may commence operations; these hurdles may deter or slow the development of large-scale developments.²⁰⁰

Consequently, policymakers have failed to make strides in developing an infrastructure that better accommodates

188. *Goals & Accomplishments*, U.S. DEP'T OF ENERGY, <https://cleancities.energy.gov/accomplishments/> (last visited June 28, 2017).

189. See, e.g., 2009 Recovery Act, §1603; see also *Treasury, Energy Surpass \$1 Billion Milestone in Recovery Act Awards for Clean Energy Projects*, U.S. DEP'T OF ENERGY (Sept. 22, 2009), <https://energy.gov/eere/geothermal/articles/treasury-energy-surpass-1-billion-milestone-recovery-act-awards-clean> (describing over \$1 billion in awards pursuant to section 1603 of the 2009 Recovery Act); *1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits*, U.S. DEP'T OF TREASURY, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (last visited Aug. 9, 2017).

190. See, e.g., J. COTRELL ET AL., U.S. DEP'T OF ENERGY, ANALYSIS OF TRANSPORTATION AND LOGISTICS CHALLENGES AFFECTING THE DEPLOYMENT OF LARGER WIND TURBINES: SUMMARY OF RESULTS 16 (2014), <http://www.nrel.gov/docs/fy14osti/61063.pdf> (describing transportation challenges associated with wind energy); see also Gregg Maryniak, *Storage, Not Generation, Is the Challenge to Renewable Energy*, FORBES (July 20, 2012), <https://www.forbes.com/sites/singularity/2012/07/20/storage-not-generation-is-the-challenge-to-renewable-energy/>. “Traditional” methods refers to utility grids, wiring, as well as vehicles and tankers.

191. Melanie Grant, *Where Are They Now? A Look at the Effectiveness of RPS Policies*, 3 B.Y.U. L. REV. 849, 859 (2011) (describing the failure to states to achieve RPS targets).

192. See *supra* Section II.A.2.

193. See generally Timothy P. Duane, *Greening the Grid: Implementing Climate Change Policy Through Energy Efficiency, Renewable Portfolio Standards, and Strategic Transmission System Investments*, 34 Vt. L. REV. 711 (2010) (discussing shortcomings in current RPS initiatives).

194. *Staff White Paper on Clean Energy Standard*, N.Y. DEP'T OF PUB. SERV. 1 (Jan. 25, 2016) (describing renewables requirements).

195. *Renewable Energy and Energy Efficiency Portfolio Standard: North Carolina*, U.S. DEP'T OF ENERGY (2012), <http://programs.dsireusa.org/system/program/detail/2660> (includes requirements from 2010 up to 2021).

196. *Id.*

197. See Brad Plumer, *The Biggest Fight Over Renewable Energy Is Now in the States*, WASH. POST: WONKBlog (Mar. 25, 2013), <https://www.washingtonpost.com/news/wonk/wp/2013/03/25/the-biggest-fights-over-renewable-energy-are-now-happening-in-the-states/>.

198. *Id.* At the state and local levels, the private sector is not sufficiently engaged in developing renewables technologies to be incorporated in bundled utility packages. It is often unclear how, or if, renewable technology will be applied to existing electric grid lines, and the environmental permitting process is often unwieldy. Some critics have expressed concern that state-led “green” power programs are often utilized by private sector agency as merely another marketing tactic, with little environmental benefits achieved through these initiatives. Locally, city developers have failed to devise infrastructure changes to better accommodate green technologies.

199. *Id.*

200. *Id.*

green “alternatives” to existing conventional materials, thereby leaving necessary infrastructure changes to be developed and implemented by private sector investors.²⁰¹ Lack of infrastructure supports increase the barriers to entry for potential developers and further disincentivizes renewables from becoming mainstream. Thus, while federal initiatives have not provided the requisite support to ensure the viability of renewables and green products, states have also failed to develop infrastructure supports that promote the transmission of new energy forms, further reducing their viability.

4. Renewables and Green Products Have Not Been Competitive Because Policymakers Have Largely Relied Upon Fines and Tax-Based “Punishments” for Contributing to Adverse Environmental Externalities, Which Are Not Sufficiently Targeted to Reducing Specific Environmental Harms and Often Do Not Promote the Use of Green Substitutes

Renewables and green substitutes have not been assimilated into the marketplace as readily as have their conventional counterparts due to misaligned “punishments” for private sector participants that contribute adversely to environmental degradation.²⁰² The current fine and tax-based system for adverse environmental externalities, most notably those for emissions and dumping, is inadequately tailored to the intended goal of offsetting environmental harms.²⁰³ Instead, transitioning to a mandate-based system, whereby producers whose production methods result in environmental harms will be mandated to offset these harms through affirmative “green” efforts, coupled with existing pecuniary measures, will help to better align the “ends” with the means by which they are sought to be achieved.

Due to the generalized, indirect nature of environmental harms caused by industry activities, market forces alone are unlikely to reduce environmental emissions, and thus, government intervention is widely accepted as one of the most effective methods for controlling externalities.²⁰⁴ A number of federal and state initiatives are already in place to account for negative environmental externalities associated with industry; taxation and regulatory control costs are presently the most utilized options for influencing environ-

mental externalities, though mandates may also be imposed in some circumstances.²⁰⁵

Still, these punishments have not proven fully effective in offsetting environmental harms and promoting the use of green substitutes in part because some of these costs also indirectly drive up the prices of renewables, and are not sufficiently targeted to reducing the harms created through other means.²⁰⁶ Fines and other penalties imposed for adverse environmental externalities may be passed on to the consumer through a process known as “internalizing,” which means that the consequent taxes or fees are incorporated into the prices that the consumer will pay.²⁰⁷ For instance, many utility companies employ a traditional cost-benefit analysis when determining how externality costs will be passed on to consumers without detracting from profit margins.²⁰⁸ While a fine-based structure may appear to incentivize a shift to renewables, the ability of the provider to simply pass along those costs to the consumer may reduce the motivation of those consumers to switch to greener alternatives.²⁰⁹

Further, externality taxes and fines must straddle a precarious territory by being simultaneously broad, yet tailored.²¹⁰ One corresponding drawback associated with the current approach of fining externalities is that the heightened costs to producers may not comport with the actual environmental improvements achieved, leading to deadweight loss and an unnecessary regulatory burden.²¹¹ When regulating externalities, policymakers also face an additional challenge arising from the fact that some materials are already more regulated than others, and thus, such policies may need to be tailored to specific industry needs.²¹² Nevertheless, if regulatory policies are shifted slightly, this misalignment need not occur and can simultaneously be manipulated to help promote the use of green alternatives.

Accordingly, transitioning away from a fine and tax-based system and toward a mandate-based system can help promote the use of green substitutes across a variety of contexts and more readily integrate these products into the existing infrastructure while alleviating the misalignment between “means” and “ends” associated with the current structure. One mandate-based initiative that has already been proposed is imposing heightened “green” standards for building efficiency including LEED building initiatives upon build-

201. See Maryniak, *supra* note 190.

202. See, e.g., *Penalty and Financial Models*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/enforcement/penalty-and-financial-models> (last visited Aug. 9, 2017); see also *Enforcement Basic Information*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/enforcement/enforcement-basic-information> (last visited Aug. 9, 2017).

203. See, e.g., Dave Fehling, *Polluters and Penalties: Will Higher Fines Make a Difference in Texas?*, STATEIMPACT (Feb. 11, 2013, 6:30 AM) (describing increased fines as insufficient to reduce emissions); see also *THE ECONOMICS OF ENVIRONMENTAL REGULATION* 696-97 (Wallace E. Oates, ed., 1996) (using game-theoretic approach to analyze the relationship between polluter behavior and penalties imposed).

204. See generally Forest Reinhardt, *Market Failure and the Environmental Policies of Firms: Economic Rationales for “Beyond Compliance” Behavior*, 3 J. INDUS. ECOLOGY 9 (1999).

205. See Anthony D. Owen, *Environmental Externalities, Market Distortions and the Economics of Renewable Energy Technologies*, 25 ENERGY J. 127, 150 (2004).

206. See Todd J. Zywicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TUL. L. REV. 845, 919-21 (1999).

207. See Jeffrey L. Jordan, *Externalities and Integrated Resource Planning*, 87 J. AM. WATER ASS’N 49, 55 (1995).

208. *Id.*

209. *Id.*

210. See Joseph E. Aldy, *The Case for a U.S. Carbon Tax*, OXFORD ENERGY FORUM 14 (The Oxford Inst. for Energy Stud., Feb. 2013) (noting that, without changes in legislation, “eventually millions of small sources of greenhouse gas emissions—such as apartment buildings, corner grocery stores, and business offices—will need to apply for greenhouse gas emission permits absent new legislation, imposing significant administrative costs on small business and the government”).

211. *Id.*

212. *Id.*

ings owned by private companies.²¹³ Though the LEED program continues to exhibit several deficiencies including the failure to utilize actual environmental improvements and metrics,²¹⁴ similar initiatives that require the use of certain “green” measures and substitutes will help to promote the widespread use of green products and will better align with policy aims of reducing environmental harms. Another example of a mandate-based policy—though created out of differing motivations—is the Clean Water Act’s § 404 permitting scheme for dredge-and-fill operations adversely affecting wetlands.²¹⁵ In order for a permit to be approved, the applicant must demonstrate how it intends to avoid, minimize, or mitigate the harms caused to the surrounding wetlands and ecosystem.²¹⁶ Instead of imposing a financial penalty for wetlands destruction, the applicant shall take affirmative measures to offset the environmental harms caused by the proposed operations.²¹⁷ Though perhaps considered a “green” product only indirectly, mitigation banks sell recreated wetlands to developers who need to purchase new wetlands to offset the destruction of existing wetlands caused by their projects.²¹⁸ A similar type of system could be imposed on other industries in order to reduce environmental harms with current policies.

Correspondingly, one additional way to alter the existing framework to better tailor environmental policies to their intended outcomes would be to subject the private sector to some of the same regulations to which federal entities are already held responsible. For instance, the EAct 2005 and EISA 2007 impose targets on federal buildings yet do not install analogous targets on buildings owned by private companies.²¹⁹ Particularly, EISA 2007 requires that federal buildings incorporate sustainable building designs, including the use of Energy Star technology, energy efficient lighting, and use water conservation technologies; no comparable restrictions are imposed at the federal level upon privately owned buildings.²²⁰ Moreover, federal buildings must reduce their fossil fuel use dramatically within the next two decades, including a 100% reduction by 2030.²²¹ Although private buildings are subject to local building codes, owners of these properties are not comparably incentivized to incorporate

green building products and to meet stringent sustainability metrics.²²² Because these standards are not applied uniformly, new private sector developments have the capacity to offset any environmental advantages associated with conservation measures pursued within federal buildings.²²³ By employing comparable policies for entities owned by individual parties, private developers will be faced with a greater motivation to choose “green” building materials and other products.

Therefore, the misalignment between environmental goals and the current fine and tax-based system has allowed environmental harms to persist and has failed to incorporate green alternatives into building materials and infrastructure development as a way to offset adverse externalities.

5. Renewables and Green Products Have Not Been Competitive Because the U.S. Infrastructure and Transport Network Is Not Designed to Accommodate Their Increased Use, Nor Is an Environmentally Friendly Commute Feasible for Most Americans, Meaning That Consumers Are Generally Dissuaded From Choosing a Hybrid or Greener Fuel for Their Commutes

Alongside deficiencies in federal and state policies, renewables and green products have likewise been unable to serve as adequate substitutes for their conventional counterparts because the U.S. infrastructure is not well equipped to promote environmental decisionmaking in the daily lives of American consumers thereby reducing consumer demand. Correspondingly, because the United States has not installed the necessary infrastructure supports to increase the number of passengers utilizing mass transportation and high-speed rail for their day-to-day commutes from rural and suburban areas to the city center, viable choices for offsetting environmental harms while commuting are largely unavailable to the typical American. Due to a lack of public transportation options, most Americans are compelled to rely upon personal automobiles for daily transport.

In the transportation sector, there are two main ways for consumers to adopt a more environmentally friendly commute: (1) through use of mass-transportation, and (2) by choosing a “greener” vehicle or fuel. As discussed above, U.S. expenditures for mass transport and similar infrastructure development continues to lag behind those of other first world nations—the result of this trend is that existing transport methods necessarily play a larger role in meeting America’s transport demands.²²⁴ As a result, the United States must rely upon existing roadways to a much greater extent than most other nations.²²⁵ Until significant expenditures

213. See Eduard C. Montanya & David W. Keith, *LEED, Energy Savings, and Carbon Abatement: Related but Not Synonymous*, 45 ENVTL. SCI. TECH. 1757, 1757 (2011).

214. *Id.* (suggesting that “[s]tandards such as LEED will enable more cost-effective emissions reductions if they distinguish carbon footprint from energy use, avoid arbitrary cost-ineffective assumptions about best paths for decarbonizing electricity, and close the loop by requiring objective measurements of real-world building performance so we can learn by doing”).

215. 33 U.S.C. § 1344 (2012) (“Permits for dredged or fill material”).

216. 40 C.F.R. §§ 230.1-230.98 (2015).

217. 33 U.S.C. § 1344 (2012) (directing the issuance of compensatory mitigation regulations); see also 33 C.F.R. § 332.2 (2008) (defining compensatory mitigation and mitigation banking).

218. 33 C.F.R. § 332.2 (2008).

219. See EAct 2005 § 109; EISA 2007 § 433–35.

220. EISA 2007 § 433–35 (stating, for example, “no Federal agency shall enter into a contract to lease space in a building that has not earned the Energy Star label in the most recent year”). See *supra* Section I.A.2; see also EAct 2005 § 109.

221. See, e.g., *Green Building Permit Incentives*, SEATTLE DEPT OF CONSTRUCT. & INSPECT., <http://www.seattle.gov/dpd/permits/greenbuildingincentives/> (last visited Aug. 9, 2017) (describing voluntary green building permit initiatives). See *infra* Section I.A.2.

222. See *supra* Section I.B.

223. See *supra* Section I.A & II.

224. See Charles Knutson, *Europe on the Move: Public Transportation Lessons for the U.S.*, GERMAN MARSHALL FUND (July 5, 2013), <http://www.gmfus.org/blog/2013/07/05/europe-move-public-transportation-lessons-us>.

225. See *id.*

for mass transportation across rural and suburban areas are pursued—most likely through a joint effort between public and private sector actors—Americans will have little choice except to drive in a personal vehicle.²²⁶

Given that mass transport requires a capital-intensive outlay, another way that Americans can engage in a more environmentally friendly commute is through adopting more efficient or hybrid vehicles, as well as by fueling their vehicles with a renewable fuel. However, for most Americans, it is not currently feasible to employ these strategies. Notably, the typical American, earning an income of \$28,051 per year, does not have sufficient disposable income to purchase a hybrid vehicle, and even the most cost-effective hybrid vehicles do not save most consumers enough in fuel expenses to offset the vehicle's higher up-front costs.²²⁷ Though varying in price, hybrid vehicles are generally newer and more expensive than the vehicle owned by the typical American,²²⁸ thereby rendering hybrid vehicles as largely luxuries for the affluent. Accordingly, consumer studies have found that the average individual drives a vehicle that is 11.4 years old, whereas the average hybrid vehicle is less than five years old.²²⁹ Consequently, the sale of hybrids has been particularly vulnerable during economic downturns.²³⁰ Notably, during the 2008-2009 economic recession, hybrid vehicles dropped in sales by 7.2% more than did conventional vehicles.²³¹ In 2008, J.D. Power & Associates found that fewer than 3% of all vehicles sold in the United States employed hybrid technology, which is unsurprising in light of the foregoing trends.²³²

However, the impediments to a “greener” commute do not end with vehicle choice. Even if the average American would prefer to fuel his or her vehicle with a renewable fuel source, he or she is likely to find a fueling station retailing these fuels significantly farther away than other gasoline stations.²³³ Once at the fueling station, purer renewable fuels can also be significantly more expensive than their conventional counterparts, thereby causing the “green” choice to become irrational.²³⁴ Consequently, at nearly every junction during the typical American's commute, the existing structure pushes citizens to choose against the environmentally friendly choice. In this regard, “consumer choice” means

little when the choices are stacked heavily in favor of the pollution-emitting option.

Lastly, in addition to reducing the feasibility of a “green” commute, the current suburban culture also makes it difficult for the typical American to pursue a “sustainable” lifestyle due to the comparatively larger materials requirements and high levels of waste associated with suburban homes.²³⁵ The use of green building materials may not be feasible for persons who reside in older, existing homes built with reliance upon conventional materials. This misalignment suggests that only more affluent residents who can afford significant remodeling of their homes will be able to implement green technology and building materials.²³⁶ Coupled with heightened materials requirements, current waste disposal patterns found in many suburban communities weigh against environmentally friendly behaviors. For instance, items sold in retail stores are often heavily packaged, leaving the burden on the consumer to dispose of the resulting waste.²³⁷ Because recycling initiatives are less readily available than are trash facilities, and since recycling also often requires the additional efforts of sorting and rinsing the items, it generally easier for an individual to toss the item in the garbage bin.²³⁸

Therefore, the U.S. infrastructure and transport networks lack both feasible mass transportation forms from suburban areas, where a significant proportion of the U.S. population resides, as well as an affordable, convenient hybrid or fuel-efficient vehicles and corresponding renewable fuels, significantly reducing the typical American's ability to make his commute more environmentally friendly. It is not until mass transportation networks are expanded, and less-emitting fuels and vehicles become cheaper and more widely available, that consumers will be able to choose a green option for transport. Similarly, until waste disposal programs are restructured, recycled products will remain the exception, not the rule.

6. At the Consumer Level, Renewables and Green Products Have Not Been Competitive Because Consumers Are Not Adequately Incentivized to Choose a Green Product, Even When It Is a Substitute to Its Conventional Counterpart

Considered most narrowly, individual consumers are also disincentivized from choosing a green consumer product—such as laundry detergent, cleaning supplies, disposable utensils—to meet their daily shopping needs, thus

226. *See id.*

227. *Compare State & County Quick Facts*, U.S. CENSUS BUREAU, <http://quickfacts.census.gov/qfd/states/00000.html> (last visited Apr. 28, 2014) (this figure represents the average per capita income across the nation averaged during the years 2008-2012), with Jim Gorzelany, *The Most Cost-Effective Hybrid Cars*, FORBES (Nov. 20, 2012) (providing prices of a sampling of hybrid vehicles).

228. *See Gorzelany, supra* note 227.

229. *See Peter Valdez-Dapena, Average U.S. Car Is 11.4 Years Old, A Record High*, CNN MONEY (Aug. 6, 2013) <http://money.cnn.com/2013/08/06/autos/age-of-cars/index.html>.

230. *See id.*

231. Jason D. Oliver & Deborah E. Rosen, *Applying the Environmental Propensity Framework: A Segmented Approach to Hybrid Electric Vehicle Marketing Strategies*, 18 J. MKTG. THEORY & PRACT. 377, 377 (2010).

232. *Id.*

233. *See Alternative Fuels Data Center*, U.S. DEP'T OF ENERGY, <http://www.afdc.energy.gov/locator/stations/> (last visited Aug. 9, 2017); *Access to Alternative Transportation Fuel Stations Varies Across the Lower 48 States*, U.S. ENERGY INFO. ADMIN. (Apr. 30, 2012), <http://www.eia.gov/todayinenergy/detail.cfm?id=6050>.

234. Congress has been reviewing a variety of ways to achieve cost-parity. *See, e.g.*, Biofuels Market Expansion Act of 2013, S. 1563, 113th Cong. (2013).

235. *See generally* Richard Florida, *Why Bigger Cities Are Greener*, CITYLAB (Apr. 19, 2012), <https://www.citylab.com/life/2012/04/why-bigger-cities-are-greener/863/> (explaining why bigger cities are greener than smaller cities and suburban areas).

236. *Going Green a Luxury Good for Rich at Expense of Poor*, INVESTOR'S BUS. DAILY (Mar. 27, 2014), <http://www.investors.com/politics/editorials/only-the-wealthy-can-afford-to-be-environmentalists/>. *See also* Charles W. Schmidt, *Bringing Green Homes Within Reach: Healthier Housing for More People*, ENVTL. HEALTH PERSP. (Jan. 2008), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2199308/>.

237. *See* S.C. JOHNSON CO. & GfK ROPER, *supra* note 125, at 22.

238. *Id.* at 17.

completing the causal chain weighing against environmental decisionmaking at nearly every juncture from a macro- to micro-level.

There are several ways that the average American can adopt a more environmentally friendly lifestyle through his or her daily choices—by purchasing green consumer products and vehicles, recycling initiatives, avoiding products contributing to environmental harms, and by minimizing overall consumption levels of goods.²³⁹ Consumers may also make their homes more environmentally friendly by outfitting their appliances and building materials with a “green” replacement, and by reducing unnecessary waste. However, adopting these changes is often not feasible due to other concurrent burdens. Consumers often already face cost and time demands across a number of other obligations; allocating additional time and resources to affirmatively pursue “green” lifestyle changes is often incompatible with Americans’ fast-paced, budget-crunched lives.²⁴⁰ Moreover, if an individual does choose to actively seek a “green” substitute, he or she may be disappointed to find that the environmentally friendly option is not cost-effective and may be of a lower integrity and functionality when compared to the conventional counterpart.²⁴¹ Like the impracticability of pursuing a “green” commute, this dichotomy sways the rational actor away from green consumer products.²⁴²

Focusing specifically on “green” products and other consumer items, the current “green” offerings are often noncompetitive with their conventional counterparts for a number of reasons including the product’s price, availability, and palatability. Particularly, coupled with the price differential of green products, some consumers have found the scents and colors associated with “green” products to be off-putting.²⁴³ The scents used in “green” cleaning products may differ considerably from the scents used in more conventional cleaning supplies. Though consumer preferences and tastes may change over time as consumers develop familiarity with green products, the current misalignment between “green” offerings and consumer preferences suggests that product designers have not adequately considered the average consumer’s preexisting preferences when bringing “green” products to the market.

Next, mainstream brands have been slow to incorporate “green” inputs into their existing conventional products, which is another way for producers to spur demand for green products. As mentioned above, consumers are likely to look for a familiar brand to demarcate quality

when choosing a product.²⁴⁴ Although mainstream brands do own a number of green brand labels, often these products are retailed and packaged as distinct from the brand’s mainline.²⁴⁵ This separate branding strategy means that consumers looking for an item must choose between the “name” brand or the “green” brand, leading to an “either/or” dichotomy.²⁴⁶ While mainstream brands often rely upon this tactic to increase their profit margins and widen their customer base, this strategy necessitates that consumers face a tradeoff between an item’s perceived quality (where the mainstream label would be preferred) and environmental benefits (where the green option holds an edge). Due to current branding practices, consumers must go out of their way to purchase a “green” option; by placing additional emphasis upon incorporating green inputs into existing product lines, then consumers’ preferences for product quality and environmentalism shall no longer remain incompatible. This transition need not occur abruptly, but instead, as will be discussed more fully in Part III, the use of certain inputs may be phased into existing products through a new form of “green” incentive or rebate provided to participating producers.

In addition, because the veracity of marketing claims has recently come under scrutiny, consumers may not trust whether a particular product lives up to its purported environmental benefits, thereby further contributing to reduced green purchases. For instance, terms such as “all natural” and “non-toxic” are subject to only limited regulation by the Food and Drug Administration (“FDA”) and Federal Trade Commission (“FTC”) and have provided the fodder for several deceptive marketing claims.²⁴⁷ By incorporating “green” inputs into existing mainstream products, in tandem with increased regulatory oversight, the concerns surrounding green marketing claims may be lessened because consumers will no longer have to balance these trade-offs.

The aggregate composition of all the possible choices faced by consumers heavily compels shoppers to continue to engage in behaviors contributing to climate change and other environmental harms. At the individual level, the typical American is disincentivized from adopting a more environmentally friendly lifestyle because many “green”

244. *Id.*

245. *Mainstreaming Green Behaviors Demands Massive New Approach*, OGILVY & MATHER (Apr. 18, 2011) (providing that “[e]xisting green marketing is either irrelevant or even alienating to most Americans. Half of Americans think the green and environmentally friendly products are marketed to “Crunchy Granola Hippies” or “Rich Elitist Snobs” rather than “Everyday Americans.”), <http://www.ogilvy.com/News/Press-Releases/April-2011-Mainstreaming-Green-Behaviors-Demands-Massive-New-Approach.aspx>; see also HEIDI TRAVIS, TRUST: FINDING THE VALUE IN GREEN CONSUMER PRODUCTS, A CASE STUDY COMPARING GREEN CLEANING AND PERSONAL CARE BRANDS (2012), <http://www.sas.upenn.edu/lps/system/files/Travis,+H+2012A.pdf> (concluding that “[m]ainstream brands should work to build green consumer trust through [. . .] valuing ingredient transparency, certifying products, and facilitating health related education”).

246. See OGILVY & MATHER, *supra* note 245.

247. See *Environmental Claims: Summary of Green Guides*, FED. TRADE COMM’N BUREAU OF CONSUMER PROT. (Oct. 2012), <https://www.ftc.gov/tips-advice/business-center/guidance/environmental-claims-summary-green-guides> (providing, as an example, that “[c]laiming ‘Green, made with recycled content’ may be deceptive if the environmental costs of using recycled content outweigh [] the environmental benefits of using it”).

239. See *id.* at 15–17 (providing examples of environmental changes Americans can pursue). Other examples of green consumer products include, but are not limited to, biodegradable sandwich and storage bags, compostable plastics, and gardening materials.

240. *Id.*

241. See generally Annie Pilon, *Study: Consumers May Doubt the Quality of Green Products*, SMALL BIZ TRENDS (Aug. 28, 2014), <https://smallbiztrends.com/2014/08/quality-of-green-products.html>.

242. See *supra* Section II.

243. See JOHNATHAN ESTES, SMART GREEN: HOW TO IMPLEMENT SUSTAINABLE BUSINESS PRACTICES IN ANY INDUSTRY AND MAKE MONEY 123 (John Wiley & Sons Inc., 2009) (“Consumers are prejudiced about the quality of green products, like for example a bathroom cleaner that doesn’t smell like pine, lemon, or ammonia but it gets the job done just as well.”).

products do not comport with preexisting consumer preferences for a product's perceived quality and attractiveness. Even more, current patterns associated with suburban living also promote elevated levels of waste and resource inefficiencies. Outside of the home, it is not cost-feasible or practicable for consumers to rely upon mass-transportation or a hybrid vehicle, as well as renewable fuels, during their day-to-day commute. Inside of the home, consumers are often unable to retrofit their homes with greener building materials and reduce overall waste levels. Thus, consumers, like producers at the macro-level, have little practical incentive to choose the "green" option over its conventional counterpart. In order to compel Americans to adopt a more environmentally friendly way of life, they must be given the tools to "green" their purchases and activities in a cost-effective and more palatable manner.

III. Recommendations

In order to promote the viability of "green" alternatives within the consumer products and energy sectors, policymakers should place greater emphasis upon sustaining consumer demand and considering how to meet consumer needs and preferences more effectively. These combined efforts will help to create "accidental" environmentalists out of people for whom it is suddenly easier, cheaper, and more convenient to choose an environmentally friendly option.²⁴⁸ For instance, U.S. production incentives can become more consumer-centric by requiring GAO to conduct studies analyzing how producer-oriented initiatives will affect consumers, including how production-driven price subsidies will be passed on to consumers at the retail level. Heightened emphasis should also be placed on increasing the geographic availability and convenience of obtaining green products in order to help increase the feasibility of purchasing these items for mainstream consumers. At the macro-level, private sector "green" initiatives targeted at bolstering private-sector development should be expanded significantly and policymakers should simultaneously strive to further promote market competition by mitigating risk for potential market entrants of all sizes.²⁴⁹ These "green" initiatives should be applied at the federal, state, and local level. From a holistic perspective, because of the nation's comparative economic strength and international stance, the United States should work to provide additional assistance to developing nations seeking to develop a more sustainable infrastructure. In light of the foregoing discussion, the following recommendations, ordered from individual-level to macro-level propositions, should be considered as policymakers look to increasingly devise new policies promoting the use of green alternatives to replace conventional products and energy sources:

A. *Policymakers Should Endeavor to Move Past Consumer-Level Collective Action Impediments by Placing Greater Consideration on Factors Motivating Consumer Purchasing Decisions, Thus Creating "Accidental Environmentalists"*

Presently, "green" and sustainable consumer products are often not cost-competitive with their conventional counterparts, meaning that many middle- and low-income individuals may be priced out of the market, and these items may fail to align with preexisting consumer preferences for product design, functionality, and color.²⁵⁰ However, if implemented properly, converting to green alternatives can result in long-term savings for both producers and consumers, while providing additional opportunities for economic growth.²⁵¹ Thus, the aims of sustainability and economic productivity need not be at odds.

Replacing existing products with greener alternatives must become significantly more commonplace for the effects associated with changes in consumption patterns to be realized.²⁵² Consumers are not likely to purchase renewables and "green" products until these offerings become cost-competitive, convenient and are perceived as palatable substitutes to their conventional counterparts.²⁵³ Correspondingly, the current "green" consumer is often an upper-class, liberal, and educated American; and this narrow perception has resulted in a cultural backlash against these products among some population groups.²⁵⁴

Green consumer products can more readily assimilate to conventional society if "green" inputs are incorporated into existing mainstream products while more processed, conventional inputs are phased out concurrently. One method that could be used to foster this shift would be to offer sliding-scale rebates to producers of green products and retail items who can demonstrate that they have switched to certain qualifying environmentally friendly substances. Producers using these rebates would also be able to profit from the growing consumer interest and market demand for green products, which will help to further multiply returns and increase profit potential. Because imposing a mandate on consumer products is difficult due to the diversity of product offerings, a "rebate" or analogous program will help to create a stronger financial incentive to redesign existing product selection with more environmentally friendly inputs. By changing the makeup of existing products, consumers will automatically opt-in to greener purchasing decisions. Encouraging manufacturers to change the inputs into existing products will also likely have the indirect effect of reducing the number of toxic

250. See *supra* Section II.A.1.

251. See, e.g., Christina Gillham, *Can We Afford to Be Environmentally Friendly?*, NEWSWEEK (Mar. 22, 2009), <http://www.newsweek.com/can-we-afford-be-environmentally-friendly-76237> (providing an example in which General Electric "saved \$100 million in energy costs [over a four year period] through water-saving and carbon-reducing initiatives").

252. See *supra* Section II.

253. *Id.*

254. *Id.*

248. *Id.*

249. See Kira R. Fabrizio, *The Effect of Regulatory Uncertainty on Investment: Evidence From Renewable Energy Generation*, 29 J. LAW ECON. & ORG. 765, 790–92 (2013) (finding strong connection between regulatory uncertainty and willingness to invest in renewables).

and carcinogenic inputs used in products, thus promoting human health.

Similarly, because many consumers have preexisting preferences for colors and product appearance, heightened emphasis should be placed upon phasing out some of the “earthy” colors and smells that presently characterize green products, and so that the “mainstream” and “green” product option gradually become similar in appearance and composition to one another. As the “mainstream” and “green” option come to resemble each other, consumers will no longer be forced to choose between environmental and pragmatic considerations when making purchases.

Regarding the energy sector, in order for renewables to gradually replace conventional energy forms, federal policymakers should modify some of the current renewables incentives to become more consumer-centric, thereby promoting purchases of renewables and green products among less affluent consumers who may be deterred by current price differentials. Current tax credits such as the PTC and ITC that provide subsidies to lower the costs of producing renewables demonstrate the need for this shift. Even so, there is no guarantee that these cost reductions will be passed on to consumers.²⁵⁵ In contrast, by focusing on sustaining consumer demand for renewables through consistently lower prices, consumer demand will, in turn, raise the financial prospects for producers to continue investing in and developing newer, more effective products. Likewise, renewables incentives should also be devised to help ensure that these products are more readily available by subsidizing the costs for *retailers* to sell these products at their stores, thus helping to promote greater accessibility of these items.²⁵⁶ While marketplace studies have suggested that there is untapped potential for consumers to convert to “green” energy and other electricity forms, policymakers must work in tandem with producers to make these products cheaper and more readily available to consumers.

Accordingly, in order to bolster the feasibility of renewables and green products in the marketplace, existing production incentives should become more consumer-centric and should more seriously consider the factors motivating the average consumer to convert to green substitutes for conventional products including promoting convenience and reducing the prices associated with green products.

B Policymakers Should Place Greater Emphasis Upon Government-Pushed “Voluntary” Behavior

In his text *Nudge*, Richard Thaler postulates that the sheer design of certain policies can subliminally sway human behavior.²⁵⁷ Consequently, one method for pushing consumers into adopting renewable technologies is to require

that consumers actively opt-out of a given renewable policy if they do not wish to participate thus shifting a policy’s “default” choice. Some forms of existing government mandates work similarly in practice and have proven very effective in altering consumer behaviors. For example, the Renewable Fuel Standard (“RFS”) has gradually raised the percentages of renewables that must be blended into gasoline, including lower-cost versions.²⁵⁸ While consumers have the opportunity of choosing other fuels, it is typically more convenient to purchase the fuel retailed by a local gasoline station. Consumers are often also attracted to the lowest-priced option and because renewable fuels are mixed into lower-cost gasoline, then it becomes significantly easier for consumers to make environmentally friendly choices.²⁵⁹

As applied to other renewables, one possible method for increasing participation is to require producers to offer a default “bundled” energy package comprised of a certain generous percentage of renewable energy forms, while consumers would still be free to select an alternate package.²⁶⁰ By making the conventional counterpart more difficult to obtain, consumers are likely to inadvertently change their behaviors in favor of increased renewables purchases.²⁶¹ This strategy can be applied across a variety of renewables and “green” products contexts—from purchases of recycled paper to use of geothermal heating and has already demonstrated efficacy in shifting consumer preferences.²⁶² Similarly, using a “green” product example, requiring that a certain percentage of office supply paper sold in a traditional store be derived from a certain percentage of recycled materials will likely increase consumer purchases of recycled paper. While consumers have the opportunity to purchase the conventional alternative, the heightened emphasis placed by the retailer upon purchasing recycled paper will help to shape consumer preferences in favor of the recycled option as consumers come to perceive the recycled option as the “default” product.²⁶³ Therefore, devising policies that shift the default protocol to incorporate greater use of renewables will likely help to shift consumer preferences in favor of these items.

certain choices are pre-selected among a list of options and noting that individuals are typically inclined to choose the pre-selected option).

258. See *Program Overview for Renewable Fuel Standard Program*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/renewable-fuel-standard-program/program-overview-renewable-fuel-standard-program> (last visited Aug. 8, 2017) (among other initiatives, the 2007 Act increases the volume of renewable fuel required to be blended into transportation fuel to thirty-six billion gallons by 2022); see also Pipeline Safety: Hazardous Liquid Pipelines Transporting Ethanol, Ethanol Blends, and Other Biofuels, 72 Fed. Reg. 45002 (Aug. 10, 2007) (codified at 49 C.F.R. pt. 452) (stating that “[t]oday, nearly half of all U.S. gasoline contains some ethanol (mostly blended at the 10 percent level or lower”).

259. *Id.*

260. See Kim Jensen, et. al., *Consumer Preferences for Electricity From Bioenergy and Other Renewables*, AM. AGRIC. ECON. ASS’N 5 (2004) (noting opt-in participation rates of green power pricing at one percent).

261. See *supra* Section III.A.

262. *Id.*

263. See generally Daniel G. Goldstein et al., *Nudge Your Customers Toward Better Choices*, HARV. BUS. REV. (Dec. 2008), <https://hbr.org/2008/12/nudge-your-customers-toward-better-choices>.

255. *Id.* Significantly higher prices among sustainable products suggest that consumers largely do not benefit from cost savings by producers.

256. A financial incentive such as a rebate or tax refund to consumers would likely not be effective because consumers are often motivated by short-run factors, and thus any incentive would likely be better placed in the near future.

257. See generally RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISION ABOUT HEALTH, WEALTH, AND HAPPINESS* (2009) (explaining that

C. *Policymakers Should Work to Mitigate Environmental Harms at the Local Level, and Focus on Synthesizing Public and Private-Sector Environmental Initiatives*

Beyond the individual consumer, local communities can likewise play a key role in changing attitudes and promoting environmental initiatives within their immediate municipalities. Consequently, another way to fill in the regulatory gap left by federal and state initiatives, as well as increase the success of existing initiatives, would be for state policymakers to require each local municipality to draft and set forth a city or county-wide master plan addressing the causal factors of environmental harms.

Some researchers have postulated that local governments are best suited to address the ramifications of aggregated individual behaviors.²⁶⁴ Among these, John R. Nolan, a sustainable development professor at Pace University School of Law, proposes that local regulations are particularly attuned to address certain issues, and states that “[l]ocal environmental regulations address this generation’s environmental problems, those associated with the diffuse, diverse, and very local causes of water and air pollution in the twenty-first century: sprawling development patterns, traffic congestion, and the high cost of development.”²⁶⁵ Thus, by strengthening initiatives at the local level, cities and counties can address the individual behaviors that, when aggregated, contribute to larger scale environmental harms and simultaneously address more local matters including reducing materials waste through reuse and recycling initiatives.

Many local governments are already working to address environmental degradation and its impacts in the immediate community with significant success. For instance, several major Florida counties have enacted ordinances and have set into place task forces to focus upon offsetting environmental issues within the region thus demonstrating the feasibility of requiring all municipalities to draft a master plan for mitigating environmental harms.²⁶⁶ Among other efforts, Miami officials created the Miami-Dade County Climate Change Advisory Task Force to advise county planners on ways to reduce the area’s Greenhouse Gas (“GHG”) emissions and adapt to looming environmental changes.²⁶⁷ One such rec-

ommendation required that taxicabs achieve an average fuel efficiency of twenty-eight miles per gallon (“MPG”) or above, preferably through the use of hybrid technology.²⁶⁸ The Task Force also recommended that cleaner fuel sources such as E85 and biodiesel be made more widely available within the county.²⁶⁹ In addition, the plan also calls for a number of mitigation and adaption strategies in order to reduce impacts on the local community, such as redesigning local buildings to conserve energy.²⁷⁰ Considered together, these initiatives can have a significant effect in helping to reduce contributors to environmental harms.

Another example of a local initiative pushing local municipalities to “work within the gaps” of federal and state green initiatives includes New Jersey’s Environmentally Preferable Purchasing (“EPP”), a program applied by cities and local governments.²⁷¹ EPP programs are used to reduce the carbon impacts of building and other projects at the local level. For instance, EPPs can be used to help select project bidders that incorporate “green” building materials and renewables.²⁷² EPPs can also help local governments make connections with vendors and suppliers retailing lower-carbon products.²⁷³

Therefore, in tandem with federal and state efforts, local governments can also play a key role in offsetting environmental degradation by targeting causal factors within the immediate vicinity. Requiring each local municipality to draft and implement a master plan for reducing local environmental harms is one avenue to further cultivate “green” cities.

D. *Policymakers Should Work to Reduce Deadweight Loss by Better Integrating Federal, State, and Local Efforts*

Considering the efficacy of environmental initiatives more holistically, the U.S. renewables framework is presently comprised of a hodgepodge of interrelated, well-intentioned efforts by policymakers acting at the federal, state, and local level.²⁷⁴ As mentioned above, no single federal agency currently oversees the nation’s renewables program.²⁷⁵ Demonstrating the necessity of synthesizing these efforts, GAO conducted a study on the overlap of renewables initiatives but ultimately concluded that the sheer number of initiatives made it impossible to satisfactorily determine the efficacy and overlap of renewables programs.²⁷⁶ Consequently, as the U.S. renewables program expands in order to address burgeoning

264. See generally Katrina Fischer Kuh, *Capturing Individual Harms*, 35 HARV. ENVTL. L. REV. 155 (2011) (opining on the role of local governments in offsetting climate change).

265. *Id.* at 165.

266. See *Florida’s Energy & Climate Change Action Plan*, BROWARD CNTY., <https://www.broward.org/NaturalResources/ClimateChange/Documents/phase2-report08.pdf> (last visited Aug. 9, 2017) (providing list of climate change mitigation plans adopted by Florida counties); see also e.g., CLIMATE CHANGE PLAN FOR ORANGE COUNTY GOVERNMENT, ORANGE CNTY. GOV’T (Sept. 25, 2007), <http://www.broward.org/NaturalResources/ClimateChange/Documents/Orange%20County%20FL%20Climate%20Sustainability%20Plan.pdf> (providing example of county-level plan to reduce emissions contributing to climate change).

267. SECOND REPORT AND INITIAL RECOMMENDATIONS: MIAMI-DADE COUNTY CLIMATE CHANGE ADVISORY TASK FORCE, MIAMI-DADE CNTY. BD. OF CNTY. COMM’RS 3 (Apr. 2008), <https://www.miamidade.gov/environment/library/brochures/08-10-04-ccatf-recommendations.pdf> (opining that “[k]eeping in mind that the most preferable alternative fuel is a moving target in the rapidly expanding fuel market, however, the recommendations call for the County

to consider displacing fossil with alternative fuel at this time, *despite sourcing concerns.*) (emphasis added). *Id.*

268. *Id.* at 3.

269. *Id.*

270. *Id.*; see also FIRST ANNUAL “GREEN GOVERNMENT REPORT,” MIAMI-DADE CNTY. BD. OF CNTY. COMM’RS (May 2007), <http://www.miamidade.gov/govaction/matter.asp?matter=070355&file=true&yearFolder=Y2007>.

271. See GREEN PURCHASING: A GUIDE FOR LOCAL GOVERNMENTS AND COMMUNITIES, N.J. DEP’T OF ENVTL. PROT. (Feb. 2006), http://www.state.nj.us/dep/ops/docs/green_purchasing_guide_local_governments.pdf.

272. *Id.* at 10.

273. *Id.* at 11.

274. See *supra* Section I.A.2.

275. *Id.*

276. *Id.*

environmental issues, more effective and unified oversight at the federal level will likely be needed. Thus, each federal and state agency's jurisdiction and governing authority over certain renewables initiatives should be clarified in order to maximize finite government resources and reduce dead-weight loss associated with overlapping authority and initiatives.²⁷⁷ Additionally, in order to increase oversight and to further help avoid duplication, DOE could be granted oversight authority and become the "lead" agency for renewables efforts. DOE would then oversee the efforts of other federal and state agencies' renewables efforts.²⁷⁸ Because interagency communication can be difficult and time-consuming, internalizing these efforts can help to reduce administrative inefficiencies and reduce duplicative extraneous initiatives that are ineffective in reducing environmental harms.²⁷⁹

Therefore, an additional means of improving the efficacy of current efforts is through streamlining and synthesizing government agency jurisdiction to maximally utilize finite government resources.

E. Policymakers Should Strive to Promote the Cost-Effectiveness of Renewables by Installing More Stringent Production Mandates, by Expanding the Geographic Availability of Renewables, and by Further Promoting the Entrance of Private Market Players

At the federal level, policymakers must be more aggressive in devising and implementing "green" policies that tap into the private sector's abilities to promote cost-parity and expand the customer base for green products. Presently, purchasing renewables and green products are often not cost-effective and typically requires heightened consumer motivation²⁸⁰ and awareness to be able to objectively choose among these items.²⁸¹ When compared against the factors motivating a typical consumer's purchasing behavior, many rational consumers are disincentivized to choose the "green" version of a product, thereby hindering the item's retail potential.²⁸² Similarly, pertaining to renewables, these production facilities are often congregated within certain geographic areas, and high transport costs bar access to renewables for many con-

sumers residing outside of these locales.²⁸³ Although some areas are better suited for the production of certain types of renewables than are others, there are many areas where consumers lack a sustainable option altogether.²⁸⁴

Next, several government reports have concluded that renewables initiatives are unlikely to be maximally effective without increased support from the private sector.²⁸⁵ Fortunately, a number of private sector heavyweights have demonstrated some interest in investing in renewables technologies, suggesting that private sector "green" products may one day become more widespread. For instance, ExxonMobil already offers support products and equipment for wind and geothermal technologies, though its product line is limited in scope.²⁸⁶ Shell has also recently increased investments in wind and solar technology.²⁸⁷ Similarly, in 2013, ConocoPhillips announced it would be working alongside several Colorado universities to complete a \$5 million research project testing the viability of converting algae into an energy source.²⁸⁸ In addition to larger corporate players, smaller renewables companies can likewise play a vital role in reaching markets where larger companies may not find sufficient profit potential to enter.²⁸⁹ Since the renewables market is young and emerging, smaller companies that tend to have comparatively reduced overhead costs may have a greater chance at shaping the market than they would in a more saturated industry.²⁹⁰

In order to promote geographic dispersion, additional federal initiatives should be devised to foster the development of new production facilities in areas traditionally lacking access to renewables. These facilities could be developed based upon a region's comparative strengths in renewables production. Although initiatives such as the REAP program were created to help promote the entrance of new market participants, these efforts will need to be strengthened considerably for tangible environmental and market changes to be realized.

277. *Id.*

278. *Id.*

279. *Id.* Nevertheless, one source opined that inter-agency communication is not a major inefficiency of the current renewables program.

280. See Kim Jensen et. al., *supra* note 260 at 5 (finding that "the reasons a person may support green power but be unwilling to pay a premium include an inability to pay more, a belief that it does not cost more to provide a green product, or a belief that manufacturers should not charge higher prices even if it costs more to make certified products"); see Lori Bird et al., *Green Power Marketing in the United States: A Status Report* (11th ed.), NAT'L RENEWABLE ENERGY LAB. (Oct. 2008) (finding that "retail sales of renewable energy in voluntary purchase markets exceeded 30 million MWh, an increase of 17% from 2008.").

281. See Barbara C. Farhat, WILLINGNESS TO PAY FOR ELECTRICITY FROM RENEWABLE RESOURCES: A REVIEW OF UTILITY MARKET RESEARCH, NAT'L RENEWABLE ENERGY LAB., at 9 (July 1999) (finding "[c]ustomers favor renewable sources of electricity but may know little about them"); see also Georgia Liarakou et al., *Secondary School Teachers' Knowledge and Attitudes Towards Renewable Energy Sources*, 18 J. SCI. EDUC. TECH. 120, 128 (2009) (finding lack of knowledge of wind and solar sources among secondary school teachers).

282. See *supra* Section II.A.6.

283. See Melea Press & Eric J. Arnould, *Constraints on Sustainable Energy Consumption: Market System and Public Policy Challenges and Opportunities*, 28 J. PUB. POL'Y & MKTG. 102, 105 (2009), <http://www.uwyo.edu/mgtmkt/faculty-staff/faculty-pages/docs/arnould/constraints%20on%20sustainable%20energy%20consumption.pdf> (discussing localization of renewables facilities).

284. *Id.*

285. *Id.*; see U.S. GOV'T ACCOUNTABILITY OFF., GAO-14-74, CLIMATE CHANGE: ENERGY INFRASTRUCTURE RISKS AND ADAPTATION EFFORTS 4, 11 (2014), <https://www.gao.gov/assets/670/660558.pdf>.

286. See *Energy Portfolio Diversification*, EXXONMOBIL, https://lubes.exxonmobil.com/lubes/sustainability_productsandprocesses_diversification.aspx (last visited Aug. 9, 2017) (describing support products).

287. See Eduard Gismattulin, *Shell Is Working on "Promising" Renewable Technology*, VOSER SAYS, BLOOMBERG (Nov. 13, 2013), <http://www.bloomberg.com/news/2013-11-13/shell-is-working-on-promising-renewable-technology-voser-says.html> (quoting former Shell CEO Peter Voser as stating "[w]e are investing heavily in R&D solutions at the moment, where we are looking at what part of wind and solar technology delivers a greener and cleaner energy form for the future").

288. See Erin Voegle, *ConocoPhillips Signs Algae Research Agreement*, BIOMASS MAG., <http://biomassmagazine.com/articles/1935/conocophillips-signs-algae-research-agreement> (last visited Aug. 9, 2017).

289. See Sanya Carley & Richard N. Andrews, *Creating a Sustainable U.S. Electricity Sector: The Question of Scale*, 45 POL'Y SCI. 97, 115-16 (2012), <https://link.springer.com/article/10.1007/s11077-012-9152-z> (describing incentives needed for smaller market entrants).

290. See Loren Steffy, *Alternative Energy and Big Oil: Poor Returns Versus "Lies,"* FORBES (June 28, 2013), <http://www.forbes.com/sites/lorensteffy/2013/06/28/alternative-energy-and-big-oil-poor-returns-versus-lies/> (opining on the role of smaller companies in renewables market).

Even more, because many areas lacking access to renewables are simultaneously characterized by stagnant economic growth and high unemployment, these initiatives may also help to spur further economic development in these areas.²⁹¹ For instance, the U.S. government should utilize tax credits and other rebates to incentivize domestic automobile makers to increase efforts to redesign vehicles that can more effectively operate on renewable energy sources—thereby helping to meet environmental and economic goals. Consequently, spreading the production of renewables and green products to new areas will help to increase access to, and availability of, renewables to underserved consumers and may help to invigorate economic growth in some locales. Correspondingly, the “green” market has significant potential for private sector growth, and this growth may help to increase cost-competitiveness, as well as promote consumer awareness of, and access to, green offerings.

F. Policymakers Should Bolster the Trade of Renewables From First- to Third-World Nations

Since developing nations often lack the economic resources and political mobilization to effectively incorporate renewables and “green” products into existing policies, U.S. policymakers should bolster trade initiatives for key infrastructure supports,²⁹² and provide accompanying technical assistance in order to increase access to these materials. Extending environmental efforts internationally is important because U.S. domestic environmental reforms, without more, is unlikely to offset the environmental externalities associated with developing nations that lack the funding to strengthen environmental initiatives within their borders. The United States and other developed nations also serve as a model for those policies created by developing nations, such as India, China, Morocco, and Chile.²⁹³ For a palpable reduction in world environmental harms to occur, the United States must be a first-mover, which may then provide an avenue for other nations to emulate initiatives started in the United States.²⁹⁴

United States efforts to develop and implement alternative energy initiatives will likely influence other nations’ policies as well,²⁹⁵ meaning that the environmental benefits associated with certain U.S. policies have the capacity to be multiplied in effect as other nations increasingly adopt these

technologies for a lower price.²⁹⁶ However, given current trends, this pace is likely to be too slow to adequately address current environmental concerns, such as reducing GHG emissions that contribute to Earth’s warming.²⁹⁷ Since market forces alone are unlikely to provide a sufficient response, improving trading networks for this machinery and technology while offering other forms of assistance, will help developing nations to increasingly incorporate renewables into their existing policies. Placing an increased emphasis upon exporting renewables’ accouterment is not inconsistent with existing U.S. policies, especially because U.S. investors have already placed millions of dollars into the economies of developing nations.²⁹⁸

Therefore, in order to ensure the success of U.S. domestic initiatives with the potential for international ramifications, increased emphasis should be placed on exporting machinery and providing technical assistance as a way of helping developing nations transition to more sustainable infrastructures.

IV. Conclusion

In conclusion, perhaps the average American is not as anti-environmentalist as it may initially appear. A person is likely instead a self-interested actor with short-term gains and rational fallacies pervading his decisions. To help a person become an “accidental environmentalist,” the menu of options must shift to make “green” products more palatable. Considering a new approach to environmental externalities and increasingly incorporating market approaches will promote a harmonious understanding of the U.S. approach to environmental policymaking. This Article sought to explore why renewables and “green” products have fallen flat despite the dedication of immense government funding and resources and found that the lack of consumer-centricity and lack of private sector support thwarted widespread success. For green alternatives to finally take their place in America’s mainstream economy, both consumers and producers must engage in sustainable decisions daily, but the onus falls upon policymakers to make these choices easier.

291. *Id.*

292. Such as machinery, piping, and casing for renewables. See SIMON MÜLLER ET AL., INT’L ENERGY AGENCY, RENEWABLE ENERGY: POLICY CONSIDERATIONS FOR DEPLOYING RENEWABLES (2011).

293. See e.g., Alex Morales, *Renewable Energy Investments Shift to Developing Nations*, BLOOMBERG (June 13, 2013), <http://www.bloomberg.com/news/2013-06-12/renewable-energy-investments-shift-to-developing-nations.html> (describing renewables expenditures in developing nations); see also *Renewable Energy: World Invests \$244 Billion in 2012, Geographic Shift to Developing Countries*, U.N. ENV’T PROGRAMME NEWS CENTRE (June 13, 2013), http://www.ren21.net/Portals/0/documents/Resources/GSR/2013/Press%20release%20short_English.pdf (discussing increased solar and wind installations).

294. See generally Steiner Brandt & Gert Tinggaard Svendsen, *Switch Point and First-Mover Advantage: The Case of the Wind Turbine Industry* (Aarhus Sch. of Bus. Working Paper 04-2, 2004).

295. See generally *Renewable Energy Future for the Developing World*, INT’L SOLAR ENERGY Soc’y (2005), <http://whitepaper.ises.org/ISES-WP-600DV.pdf>.

296. See e.g., Priyadarshi R. Shukla, *The Modeling of Policy Options for Greenhouse Gas Mitigation in India*, 25 AMBIO 240, 247–48 (1996) (describing possible GHG reduction policies).

297. See generally Andrew W. Wyckoff & Joseph M. Roop, *The Embodiment of Carbon in Imports of Manufactured Products: Implications for International Agreements on Greenhouse Gas Emissions*, 22 ENERGY POL’Y 187 (1994).

298. *Id.*

Appendix A

Summary of Issues and Recommendations

Issues

1. Renewables and green products have not been competitive because the federal government has failed to provide clear government support through existing initiatives, which has resulted in unstable market incentives and deterred new investments.
2. Renewables and green products have not been competitive because policymakers have failed to entice participation by the private sector, thereby fostering a lack of congruency between consumer demand and environmentally friendly offerings.
3. Renewables and green products have not been competitive because state-level programs and bundling packages do not adequately accommodate renewables, meaning that conventional forms remain the default.
4. Renewables and green products have not been competitive because policymakers have largely relied upon fines and tax-based "punishments" for contributing to adverse environmental externalities, which are not sufficiently targeted to reducing specific environmental harms and often do not promote the use of green substitutes.
5. Renewables and green products have not been competitive because the U.S. infrastructure and transport network is not designed to accommodate their increased use, nor is an environmentally friendly commute fea-

sible for most Americans, meaning that consumers are generally dissuaded from choosing a hybrid or greener fuel for their commutes.

6. At the consumer level, renewables and green products have not been competitive because consumers are not adequately incentivized to choose a green product, even when it is a substitute to its conventional counterpart.

Recommendations:

1. Policymakers should endeavor to move past consumer-level collective action impediments by placing greater consideration on factors motivating consumer purchasing decisions, thus creating "accidental environmentalists."
2. Policymakers should place greater emphasis upon government-pushed "voluntary" behavior.
3. Policymakers should work to mitigate environmental harms at the local level and focus upon synthesizing public and private-sector environmental initiatives.
4. Policymakers should work to reduce deadweight loss by better integrating federal, state, and local efforts.
5. Policymakers should strive to promote the cost-effectiveness of renewables by installing more stringent production mandates, by expanding the geographic availability of renewables, and by further promoting the entrance of private market players.
6. Policymakers should bolster the trade of renewables from first- to third-world nations.