2018

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Michael P. Vandenbergh

Arkansas Law Review

Volume 71 | Number 2 Article 1

December 2018

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Michael P. Vandenbergh
Vanderbilt University

KEYNOTE: MOTIVATING PRIVATE CLIMATE GOVERNANCE: THE ROLE OF THE EFFICIENCY GAP

Michael P. Vandenbergh*

The topic of this symposium, "Environmental Sustainability and Private Governance," is important and timely. In response to the shrinking federal role in environmental protection, many policy advocates have focused on the role of states and cities, but this symposium focuses on another important source of sustainability initiatives: the private sector, including corporations, households, civic and cultural organizations, religious organizations, private hospitals, colleges and universities, and other organizations. States, cities, and other subnational government responses are increasingly important, but the limited geographic reach of subnational governments constrains their ability to address many environmental problems. For instance, although twenty states have set quantified greenhouse gas (GHG) emissions targets and are adopting policies to reduce emissions, almost two-thirds of United States GHG emissions arise from the thirty states that do not have GHG targets.[1] Private governance initiatives offer an opportunity to fill the gap.[2]

I. THE PRIVATE GOVERNANCE RESPONSE TO CLIMATE CHANGE

* David Daniels Allen Distinguished Chair of Law, Director, Climate Change Research Network, and Co-Director, Energy, Environment and Land Use Program, Vanderbilt University Law School. Many thanks to Sara Rollet Gosman and the student editors of the Arkansas Law Review for organizing the 2017 Environmental Sustainability and Private Governance Symposium. Claudia Stantzyk-Guzek and Isaac Gabella provided valuable research assistance.

1. Rocky Mountain Institute, Mapping Non-Federal Action on Climate Change: High-Level Survey of State, City and Corporate Commitments 3 (June 9, 2017).

2. *See* Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129, 141-47 (2013) (defining "private environmental governance" and related terms).

Understanding the role of the private sector is thus essential to exploiting the full range of options for achieving sustainability. In a new book, physicist Jonathan Gilligan and I address the role that the private sector can play in responding to climate change, which we view as the principal threat to sustainability.[3] We make two core arguments.

First, we show why efforts to mobilize support for climate mitigation by reframing the threat posed by climate change are falling short.[4] In our view, much of the current climate skepticism and opposition to government climate mitigation has little to do with the certainty or severity of the problem, and recent efforts to reframe the problem to emphasize different aspects of the threat have barely moved the dial on support for government-mitigation measures.[5] Whether the new framing emphasizes the severity of heat waves and other near-term effects, the importance of sea-level rise and other long-term effects, implications for social justice, or other aspects of the climate problem, efforts to emphasize different aspects of the climate threat have not produced a major shift in support for mitigation in the United States over the last two decades.

We argue for a new approach to framing that is grounded in the idea that beliefs about the climate *problem* are strongly influenced by concerns about the anticipated *response* to the problem.[6] Recent polling shows that between two-thirds and three-quarters of the U.S. population believe that big government is the biggest problem we face.[7] If this large segment of the U.S. population also equates climate mitigation with big government, which it likely does, we should not be surprised that many people engage in confirmation bias and

3. *See generally* MICHAEL P. VANDENBERGH & JONATHAN M. GILLIGAN, BEYOND POLITICS: THE PRIVATE GOVERNANCE RESPONSE TO CLIMATE CHANGE (2017).

4. *Id.* at Preface, Ch. 1, Ch. 7.

5. *Id.*

6. *See id.* at i-ii. Psychologists have described a related phenomenon as "solution aversion." *See* Troy H. Campbell & Aaron C. Kay, *Solution Aversion: On the Relation Between Ideology and Motivated Disbelief*, 107 J. PERSONALITY & SOC. PSYCHOL. 809, 809 (2014) (introducing and discussing "solution aversion"); *see also* Andrew C. Revkin, *How 'Solution Aversion' and Global Warming Prescriptions Polarize the Climate Debate*, N.Y. TIMES: DOT EARTH (Nov. 10, 2014, 4:01 PM), https:// dotearth. blogs. nytimes. com/2014/11/10/how-solution-aversion-and-global-warming-prescriptions-polarize-the-climate-debate/ [https://perma.cc/DSM7-ZRCH].

7. *See* VANDENBERGH & GILLIGAN, *supra* note 3, at i.

motivated reasoning, tossing out climate-science information that is inconsistent with their worldview and rejecting government climate-mitigation measures. In short, our first point is that when seeking to understand belief in climate science and support for climate mitigation, the framing of how we can respond to climate change is as important as the framing of the problem itself. This conclusion, in turn, suggests that the subject of this symposium— private responses to climate change—may provide a way to bypass worldview-based concerns. In turn, this approach may garner more widespread support for climate mitigation among conservatives and libertarians than an exclusive focus on government action, whether federal, state, or local.

Second, we argue that the private sector can provide meaningful levels of emissions reductions: Private initiatives can reduce global carbon emissions by a billion tons per year over the next decade.[8] The billion-ton annual total includes roughly half- a-billion tons of reductions from the corporate sector and half-a- billion tons from the household sector.[9] Although the other private actors mentioned above (e.g., religious organizations, universities, and civic and cultural organizations) can also make major reductions, to simplify the analysis we have not included reductions from other private actors in our billion-ton total.

An example of a private initiative that has already reduced GHG emissions is the effort by CDP (formerly the Carbon Disclosure Project) to push for carbon disclosure from major corporations by leveraging the interest in GHG emissions reductions by global investors with more than $100 trillion in investments.[10] CDP's initiatives increase the pressure on major corporations to disclose and reduce emissions, and, although it is difficult to demonstrate causation, CDP has argued that participating companies have reduced emissions by hundreds of millions of tons. This symposium is being conducted near Bentonville, Arkansas, so it is also appropriate to mention Walmart's 2010 announcement that it would work with the

8. *See id.* at Ch. 1.
9. *Id.*
10. *See id.* at Ch. 5 (identifying initiatives that target corporate GHG emissions).

Environmental Defense Fund (EDF) to reduce 20 million metric tons of GHGs from its supply chain, an effort that resulted in a 28.2 million ton reduction.[11] More recently, Walmart made a commitment, working with EDF and the World Wildlife Fund, to achieve a billion tons of emissions reductions from its supply chain by 2030.[12] Although private initiatives that target households have achieved less notoriety than those that target corporations, these initiatives have included efforts to increase the uptake of efficient LED lightbulbs, efforts to reduce electricity demand through providing comparative information about electricity use in monthly power bills, efforts by companies to increase employees' household energy efficiency, and others.[13] According to a recent study by several economists, in the last several years the U.S. household sector has reduced electricity use for the first time since World War II, and the efficiencies from increased uptake of LED lightbulbs alone are great enough to explain this major shift in household electricity use.[14]

The billion tons of annual GHG reductions that can be achieved through private initiatives will not solve the climate problem or displace the need for a strong government response, but these reductions are roughly equal to eliminating all of the emissions of any one of the top ten emitting countries other than China and the United States. Reductions of this magnitude will buy time, reduce the cost and intrusiveness of more comprehensive government climate-mitigation laws and policies, and reduce the risk that the planet will pass tipping points in the interim. If properly selected and implemented, private initiatives also can facilitate rather than undermine support for federal, state, and local efforts.

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11. *See Walmart Marks Fulfillment of Key Global Responsibility Commitments*, WALMART (Nov. 17, 2015), https:// news.walmart.com/ news-archive/ 2015/ 11/ 17/ walmart- marks- fulfillment- of- key- global- responsibility- commitments [https://perma.cc/NF64-432H].

12. *See Walmart Launches Project Gigaton to Reduce Emissions in Company's Supply Chain*, WALMART (Apr. 19, 2017), https://news.walmart.com/ 2017/ 04/ 19/ walmart-launches-project-gigaton-to-reduce-emissions-in-companys-supply-chain [https://perma.cc/APH7-GKHV].

13. *See* VANDENBERGH & GILLIGAN, *supra* note 3, at Ch. 6 (identifying initiatives that target household GHG emissions).

14. *See* Lucas W. Davis, *Evidence of a Decline in Electricity Use by U.S. Households*, 37 ECON. BULL. 1098, 1098, 1100-01 (2017).

II. THE EFFICIENCY GAP: PERSPECTIVES FROM ENGINEERING AND ECONOMICS

Although the private response to climate change can provide a way to bypass the political gridlock on the climate issue, the emergence of private governance raises questions about the relationship between private action and public action, the extent to which private action yields genuine emissions reductions as opposed to greenwashing, and the distributional justice issues arising from private climate initiatives. My focus here, though, is on why it is plausible to argue that private actors can be induced to make major emissions reductions. Private advocacy groups and other private organizations lack the coercive power and resources available to governments, so why is it plausible to assume that major emissions reductions can be achieved from the private sector in the absence of government action? What types of motivation can private climate initiatives create or rely on induce large-scale emissions reductions from private actors?

One part of the answer is that private initiatives can induce carbon-emissions reductions by closing the energy-efficiency gap. For my purposes here, the energy-efficiency gap is the difference between the energy-efficiency measures that corporations and households could take at negative cost and the measures that they have actually taken to date.[15] Although anthropogenic GHG emissions occur from non-energy-related activities (e.g., use of nitrogen-containing fertilizers and refrigerants), the vast majority of GHG emissions are the result of fossil-fuel-based energy use, so reductions in energy use tend to correspond to reductions in GHG emissions.

If many situations exist in which corporations and households can profit by reducing energy use, private initiatives that target corporations and households should not need the coercive power or resources of government to induce them to act or to accelerate the speed with which they act. Instead, they

15. In their 2012 article, Allcott and Greenstone define the Energy Efficiency Gap as the "wedge between the cost-minimizing level of energy efficiency and the level actually realized." Hunt Allcott & Michael Greenstone, *"Is There an Energy Efficiency Gap*", 26 J. ECON. PERSP. 3, 4 (2012).

simply need to address the reasons why those efficiencies have not already been achieved. This may be no small task, and self-interest is not the only motivation for households and corporations, but it is far easier to harness self-interest than to work against it. A large efficiency gap thus makes it more likely that private initiatives could yield substantial reductions in carbon emissions even absent government action. These initiatives may induce additional efficiency steps by providing information about the efficiency opportunity, overcoming behavioral failures, better aligning incentives between principals and agents, or otherwise overcoming barriers to actions that are in the target's interest. At the same time, if the efficiency gap is small, the opportunity for private initiatives is also small. Motivations other than financial gains can drive GHG emissions reductions by corporations and households even absent a large efficiency gap (e.g., reputation, employee recruitment and morale, investor and lender pressure, anticipation of future regulations, and social and personal norms),[16] but the magnitude of the private opportunity is reduced if the efficiency gap is small. I focus here on corporations and households, but the efficiency gap is also important for other private sector actors, and for states, cities, and other public-sector energy users as well.

The efficiency gap is thus an alluring idea because it maps out the path to an environmental and economic win-win that can increase the size of the private climate-governance opportunity. The efficiency gap could exist because private actors fail to account for some of the social costs of energy use (often referred to as *energy use externalities*, such as the climate harms from carbon emissions associated with energy use) or because private actors fail to make investments in energy efficiency that are profitable to them (often referred to as *investment inefficiencies*).[17] Energy use externalities (e.g., the harms of climate change not accounted for when GHGs are emitted) are important for those who design private initiatives, since better understanding where energy use externalities exist may help private policymakers direct private initiatives toward areas that

16. Michael P. Vandenbergh, *The Drivers of Corporate Climate Mitigation*, ENVTL. F., Jan.-Feb. 2018, at 29, 29.

17. Allcott & Greenstone, *supra* note 15, at 4.

are important for climate mitigation. In addition, corporate managers' and households' concerns about social benefits (such as reducing the climate effects of GHG emissions) may motivate some behavior change, but social benefits typically will be less likely to motivate behavior change than more direct corporate or personal benefits. I focus on investment efficiencies here because my focus is on the extent to which direct energy savings can be achieved by corporations and households.

Uncertainty about the efficiency gap exists in large part because engineers and economists take different approaches to assessing the size of the gap and arrive at very different conclusions, yet they rarely engage with one another. As a result, limited work has been done to bridge the disciplinary differences and to understand which aspects of each camp's approach provide the most accurate view of the size and composition of the gap, what types of initiatives are most promising, and how much effort should be directed toward efficiency-based initiatives as opposed to other climate measures. The first camp, which is made up principally of engineers, often adopts a social perspective (including energy use externalities in the analysis) and leverages the existence of available energy-efficient measures to argue that a substantial, actionable gap exists. The leading study that takes an engineering perspective is the 2009 McKinsey & Co. report *Unlocking Energy Efficiency in the U.S. Economy*.[18] The aim of the report is to determine the social potential for cost-effective energy savings that would result if firms and households were to invest in available, energy-efficient technology. In this approach, investments are optimal if benefits exceed costs, regardless of who bears the investment costs and to whom savings accrue. The value of investments are quantified using net present value (NPV) calculations. The NPV of an investment equals the present, or discounted, value of energy savings subtracted from the costs of investment, installation and

18. *See* HANNAH CHOI GRANADE ET AL., MCKINSEY & CO., UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY (2009), https:// www.sallan.org/ pdf-docs/ MCKINSEY_ US_ energy_ efficiency.pdf [https://perma.cc/WW67-G4RX].

operation costs for example.[19] The inherent uncertainty of the future parameters is accounted for by modeling potential investments against a variety of parameter sets.[20] The 2009 McKinsey & Co. study considered 675 investment opportunities in the United States across a 10-year period from 2010-2020. The report's preferred model found the potential to reduce annual energy consumption by approximately 23% of projected demand in 2020 while saving $130 billion (2009 value).[21] A number of other engineering studies have reached similar conclusions.[22]

Many of these studies suggest that large inefficiencies exist, but their value for our analysis here is limited to the extent they focus on the net social savings (including both energy use externalities and investment inefficiencies), not the savings to the companies or households that would be the targets of these kinds of initiatives (including only investment inefficiencies).

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19. *Id.* at v. Discounting future values—be they costs or savings—requires estimating a set of future parameters, including energy prices, carbon taxes, interest rates and technological learning rates.

20. *Id.* at xii. For other studies, see, e.g., MCKINSEY & CO., PATHWAYS TO A LOW-CARBON ECONOMY: VERSION 2 OF THE GLOBAL GREENHOUSE GAS ABATEMENT COST CURVE (2009), https:// www.mckinsey.com/ ~/ media/ mckinsey/ dotcom/client_service /sustainability/ cost%20curve% 20pdfs/ pathways_lowcarbon_economy_version2.ashx [https://perma.cc/4LFL-JAGZ]; STEVEN NADEL & THERESE LANGER, COMMENTS ON "IS THERE AN ENERGY EFFICIENCY GAP?" (2012), http://aceee.org/files/pdf/white-paper/comments-on-is-there-an-energy-efficiency-gap.pdf [https://perma.cc/2E73-5YS8]; NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, ENERGY EFFICIENCY AS A LOW-COST RESOURCE FOR ACHIEVING CARBON EMISSIONS REDUCTIONS §§ 4-1 to 4-3 (2009), https:// www.epa.gov/ sites/ production/ files/ 2015-08/ documents/ ee_ and_ carbon.pdf [https://perma.cc/G264-LLKK]; DAN YORK ET AL., NEW HORIZONS FOR ENERGY EFFICIENCY:MAJOR OPPORTUNITIES TO REACH HIGHER ELECTRICITY SAVINGS BY 2030 (2015), http:// aceee.org/ research- report/u1507 [https://perma.cc/739T-RQB5]; Andy Gouldson et al., Accelerating Low-Carbon Development in the World's Cities (Sept. 2015) (working paper), http:// newclimateeconomy.report/ 2015/ wp-content/ uploads/ sites/ 3/2015/09/NCE2015_workingpaper_cities_final_web.pdf [https://perma.cc/VHA8-RJAB].

21. GRANADE ET AL., *supra* note 18, at 7-8.

22. *See, e.g.*, WORLD WILDLIFE FUND & CARBON DISCLOSURE PROJECT, THE 3% SOLUTION: DRIVING PROFITS THROUGH CARBON REDUCTION 6 (2013), https://c402277.ssl.cf1.rackcdn.com/publications/575/files/original/The_3_Percent_Solution_-_June_10.pdf [https://perma.cc/UX3M-F5J7] (noting the potential for private sector action to reduce global carbon emissions by 3% per year). A 2015 study by York et al., *supra* note 20, examined the potential for reducing electricity use in the United States between 2015 and 2030. Profiling 18 market ready measures, the study estimated that their use would reduce electricity consumption by 22% in 2030. *Id.* at 9. Most measures would cost less per kWh-of-saved-energy than it would take to supply the same amount by building new natural-gas-fired plants. *Id.* at vi-vii.

In other words, they address whether it would be in the interest of society generally, not in the specific interest of the targeted corporations or households, for these actions to be taken.[23] Nevertheless, the large size of the gap identified by these studies and the large contribution of investment inefficiencies to the analysis[24] suggests that even if these studies include energy use externalities and are somewhat optimistic, a substantial energy-efficiency gap may exist based only on investment inefficiencies.

The second camp, which is made up principally of economists, often focuses on the extent to which an efficiency gap exists based on investment inefficiencies rather than energy-use externalities. By drawing attention to the private investment decisions faced by firms and households, economists shed light on the opportunity for win-win behavior changes and clarify the barriers to socially-preferred investments in energy efficiency that engineers may overlook. The studies that emerge from this camp begin with the assumption that private actors typically behave rationally and function in markets that are generally efficient, and they look for departures from these assumptions that might support an efficiency gap. These studies also tend to be critical of much of the methodology of energy efficiency research and are skeptical about efficiency-gap claims, pointing to empirical studies that suggest that claimed efficiencies are often not achieved in practice. An example is a 2004 study by two leading economists who examined Department of Energy (DOE) audits of small to midsize firms and found that over half of "engineering approved investments" were rejected because of unaccounted-for costs.[25]

Although economists are skeptical about many energy-efficiency-gap claims, they acknowledge that a gap can result

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23. A 2015 working paper from New Climate Economy considered investment opportunities in the world's cities across three sectors; buildings, transport, and waste. Gouldson et al., *supra* note 20. The authors' preferred model found room for reducing 3.7 Gt CO_2e by 2030 (carbon dioxide equivalent) at a net savings of $16.2 trillion (2015 value) through 2015-2050. *Id.* at 16-17.

24. An example of an action that has both energy use externalities and investment inefficiencies is the federal fuel economy standards. As Nadel and Langer note, investment inefficiency accounts for most of the inefficiency addressed by these fuel economy standards. *See* NADEL & LANGER, *supra* note 20, at 4.

25. Anderson & Newell (2004).

from market failures. Three forms of failure receive substantial attention in the literature: imperfect information, split incentives, and liquidity constraints and credit rationing. Imperfect information exists when firms and households are unaware of (or unable to verify) existing energy-efficient investments.[26] Split incentives exist when the agent responsible for making investment decisions is not the one who will recoup the benefits.[27] One important instance of market failure, principal-agent (PA) problems, arises from a combination of these effects. For instance, two parties may contract in conditions of both imperfect information and split incentives if one party (the principal) has insufficient information to hold the second party (the agent) accountable to the former's preferences.[28] Finally, liquidity constraints and credit rationing exist when agents, having insufficient funds and limited access to credit, are unable to afford the upfront costs of otherwise attractive investments. An example would be a household that lacks the capital or access to a lender to enable the purchase of a new heating and cooling system, even if the lower energy costs of the system would allow the household to recoup the initial investment within several years. Although studies by economists have identified reasons why investment inefficiencies might occur and have generated empirical data to support the existence of investment inefficiencies, on balance the literature emerging from this camp casts doubt on the existence of a large efficiency gap and does not attempt to quantify the size of the gap that it believes does exist.

Although engineers and economists rarely engage directly with one another in the literature, a 2012 exchange between leading economists and efficiency advocates provides a valuable example of the differences of opinion on the efficiency gap. The

26. Steve Sorrell et al., *Barriers to Industrial Energy Efficiency: A Literature Review* 6 tbl.2.3 (U.N. Indus. Dev. Org., Working Paper No. 10/2011, 2011), https://open.unido.org/api/documents/4817768/download/Barriers%20to%20industrial%20energy%20efficiency%20-%20A%20literature%20review [https://perma.cc/J7YK-EWE4].

27. *Id.*

28. INT'L ENERGY AGENCY, MIND THE GAP: QUANTIFYING PRINCIPAL-AGENT PROBLEMS IN ENERGY EFFICIENCY 27 (2007), https:// www.iea.org/ publications/ freepublications/ publication/ mind_the_gap.pdf [https://perma.cc/ST7L-CCUH]. Principal-Agent problems in energy efficiency are often discussed under the heading of landlord-tenant problems.

exchange began with a paper in the Journal of Economic Perspectives by economists Hunt Allcott and Michael Greenstone, which concluded that "while investment inefficiencies do appear in various settings, the actual magnitude of the Energy Efficiency Gap is small relative to the assessments from engineering analyses."[29] The paper did not provide an estimate of the gap, but it suggested that many empirical studies of investment inefficiencies were flawed for several reasons, including that many of the studies did not involve rigorous methodological design. Moreover, even where the energy cost savings were clear the energy-efficiency investments were often subject to "other unobserved costs and benefits" that were not accounted for in the study.[30]

Allcott and Greenstone concluded that engineering studies thus may identify as investment inefficiencies decisions that are actually rational responses to hidden costs and risk. These hidden or unobserved costs include costs that are visible to the household or firm but are not accounted for by the studies. One instance of an important unobserved cost for households is the difference in quality between energy-efficient and inefficient goods, such as the comparatively harsh glow of fluorescent lights as compared to incandescent ones. A form of unobserved cost that may be particularly important to corporations is the adoption cost associated with the search for and implementation of energy efficient technology (e.g., disruptions to production, staff replacement and training, etc.).[31] In addition, risk occurs when a choice could have multiple outcomes. The riskier the investment, the more improbable the desired returns and the larger the likelihood these investments will be discounted by a rational agent.[32]

Although Allcott and Greenstone acknowledge that consumers often lack information about energy use and that investment inefficiencies occur, they conclude that "the empirical magnitudes of the investment inefficiencies appear to

29. Allcott & Greenstone, *supra* note 15, at 25.

30. *Id.* at 5.

31. *See* Sorrell et al., *supra* note 26, at 6 tbl.2.3.

32. *See* Florian Knobloch & Jean-Francois Mercure, *"The Behavioral Aspect of Green Technology Investments: A General Positive Model in the Context of Heterogeneous Agents,*" 21 ENVTL. INNOVATION & SOCIETAL TRANSITIONS 39, 42 tbl.1 (2016).

be smaller, indeed substantially smaller, than the massive potential savings calculated in engineering analyses such as McKinsey & Co. (2009)."[33] In addition, given the heterogeneity of consumer investment inefficiencies, they point out that many broad energy-efficiency laws and policies (e.g., federal appliance-efficiency standards) will benefit the consumers subject to inefficiencies, but not those consumers that are not subject to inefficiencies, suggesting that these measures should be tailored to affect those consumers most subject to the investment inefficiencies.[34] Unfortunately, this kind of tailoring can be a difficult task for policymakers.

A public or private policymaker might well conclude, based on the Allcott and Greenstone critique, that initiatives targeting the energy-efficiency gap are far less promising than the engineering studies would suggest and are not worth a major investment. In a departure from the stove-piped dialogue on efficiency, though, energy-efficiency advocates Steven Nadel and Therese Langer of the American Council for an Energy Efficient Economy (ACEEE) responded quickly with a critique of the Allcott and Greenstone study.[35] Nadel and Langer do not pull any punches. They accuse the economists of being "misleading" and suggest that the authors "selectively mine available data to make their points, often ignoring other findings in the various articles they cite."[36] For instance, they argue that Allcott and Greenstone often use only the high-discount-rate scenarios from the papers they review, emphasize the existence of high imputed discount rates by retail consumers, and fail to cite studies that suggest a lower discount rate.[37] A high discount rate will tend to reduce the value of the efficiency gains, which often occur over years or decades, and decrease the size of the efficiency gap. Nadel and Langer identify weatherization and utility demand-side management programs (such as programs to increase the efficient use of electricity in households) as areas that yield larger savings when the analysis uses discount rates that are more realistic in their view.

33. Allcott & Greenstone, *supra* note 15, at 5 (citation omitted).
34. *Id.*
35. *See* NADEL & LANGER, *supra* note 20, at 1.
36. *Id.*
37. *Id.* at 2-4.

Nadel and Langer also critique other aspects of the economists' analysis, including the treatment of split incentives between landlords and tenants, conclusions about consumers' lack of information regarding appliance energy use, and others. For instance, as to the efficiency gap regarding motor-vehicle fuel economy in the U.S., they take issue with the economists' assumptions about the extent to which federal policies are defensible based on investment inefficiencies, how consumers value the cost savings from fuel efficiency and the extent to which government efficiency standards push the development of new technologies, inducing automakers to develop and supply consumers with more efficient vehicles. They also claim that the Allcott and Greenstone critique of government energy-efficiency incentives and standards may be valid in perfectly functioning markets, "but perfect markets are not the environment in which energy efficiency policies are proposed."[38]

III. UNDERSTANDING AND EXPLOITING THE GAP: IMPLICATIONS FOR PRIVATE CLIMATE GOVERNANCE

This is not the place to attempt to resolve the differences between these authors or the camps overall. In addition, many of their disputes are more relevant to discussions of the desirability of particular types of government laws and policies (e.g., taxes, cap and trade systems, and efficiency standards) than to the efficiency gap issue that matters most for private climate governance: understanding the extent to which a large gap exists based on corporate, household and other private sector investment inefficiencies, and thus whether private initiatives face a low hurdle in trying to drive private sector energy use and GHG emissions reductions. What does the debate between engineers and economists suggest on this issue? Is there reason to be optimistic or pessimistic about whether the energy-efficiency gap arising from investment inefficiencies is large enough to enable private climate initiatives to achieve major near-term GHG emissions reductions? In my view, several lessons can be drawn from the debate.

38. *Id.* at 1.

First, there is an urgent need to draw on the existing literature to identify the magnitude of the investment-inefficiency-based component of the energy-efficiency gap. Economists frequently point to shortcomings in non-price-based approaches to the climate problem, but by now it is clear that governments are unlikely to adopt the first-best approach at the global or national level in the near term (a carbon tax). The importance of reducing carbon emissions in the near term and the pervasive government gridlock on climate policy suggest that waiting for first-best solutions is not an adequate response to the climate problem.[39] Instead, it is time to examine, develop, and deploy the most promising second-best responses, and private initiatives are an important, often-overlooked option.[40] The energy-efficiency-gap estimates included in engineering studies suggest that the billion-ton GHG target is not unrealistic. Economists' critiques suggest that the engineering studies overestimate the gap, but economists have yet to develop their own overall estimates of the size of the gap, so it is hard to know whether the billion-ton target is unrealistic based on the economics literature. It is time for an interdisciplinary initiative to resolve differences between the camps where possible, and to identify a range of reasonable estimates of the investment-inefficiency-based energy-efficiency gap that accounts for the perspectives of engineers, economists, and other experts. The literature generated by engineers and economists often assumes that the audience is government policymakers, rather than the private actors who are in a position to develop private energy or climate initiatives. The range of reasonable estimates of the investment-inefficiency-based energy-efficiency gap is important, however, because it could not only inform public policymakers (e.g., federal, state and local government managers), but also private policymakers (e.g., philanthropists, advocacy group managers, and the managers of corporations,

39. *See* Michael P. Vandenbergh & Jonathan A. Gilligan, *Macro-Risks: The Challenge for Rational Risk Regulation*, 21 DUKE ENVTL. L. & POL'Y F. 401, 402, 430-31 (2011).

40. David G. Victor, *Taking the Lead: Faced with Government Inaction, Private Firms Emerge as Major Players in Climate Change Mitigation*, 358 SCIENCE 1547, 1547 (2017) (reviewing VANDENBERGH & GILLIGAN, *supra* note 3); *see also* Richard B. Stewart et al., *A New Strategy for Global Climate Protection*, 120 CLIMATIC CHANGE 1, 1-12 (2013).

colleges and universities, and religious, civic, and cultural organizations), about the overall priority that should be given to efficiency-based initiatives as well as the most promising specific energy-using actions to target.

Second, it is important to gather additional data to fill important holes in our understanding of the investment-inefficiency-based energy-efficiency gap. Given the importance of understanding the magnitude and specific features of the gap, increased overall research support, and support of interdisciplinary research in particular, is warranted. The research could include efforts to provide an interdisciplinary estimate of the investment-inefficiency-based gap and to identify priority areas for additional empirical studies, with a particular focus on identifying and quantifying unobserved costs and responses to risk.

Third, because both the engineering and economics camps tend to focus on corporations and households (often referred to as consumers by economists), the discussion of the investment-inefficiency-based gap misses a number of sectors that are important for assessing the opportunity for private climate governance. For instance, religious organizations operate numerous buildings, have large numbers of employees, and have extensive supply chains, all of which contribute to carbon emissions. These emissions occur at levels that are meaningful on a global scale: Our back-of-the-envelope assessment of the Catholic Church suggests that its worldwide emissions would rank it among the top fifty countries in the world if it were a country.[41] Many private hospitals, colleges and universities, and civic and cultural organizations also are substantial direct and indirect GHG emitters. A complete analysis of the efficiency gap should assess the size of the gap in these sectors and any sector-specific barriers or opportunities.

Fourth, it is important to understand that efficiency opportunities are valuable if they make efficiency investments less costly, even if these investments still have some cost. To support private climate initiatives, efficiency-gap research thus should focus not only on whether inefficiencies exist that would make behavior change profitable, but also whether inefficiencies

41. VANDENBERGH & GILLIGAN, *supra* note 3, at Ch. 9.

exist that would lower barriers to behavior change to the point where other drivers (reputational concerns, investor, lender or supply-chain pressure, employee morale, social and personal norms) become effective. Many private initiatives seek to harness these other drivers, which may tip the balance in favor of action if the monetary cost is low. For instance, a retailer might find that replacing incandescent bulbs with more efficient LED lighting reduces energy costs, but not to the point where the discounted savings exceed the costs of installing new bulbs. The lower costs might enable pressure concerning the firm's environmental reputation and ability to attract and retain high-skill employees to tip the balance, however, inducing the retailer to take the energy- and GHG-reducing step. The academic and policy literatures do not provide a clear answer on the size of the energy-efficiency gap that is defined not just by investments that produce a net cost savings, but also those that substantially lower the cost of reducing carbon emissions, even if there is still some cost.

The fifth and final point relates to timing: To provide an important opportunity for private initiatives, the inefficiencies included in the energy-efficiency gap need not be inefficiencies that would have remained in perpetuity or over many years. To contribute to climate mitigation, private initiatives need only accelerate the uptake of more efficient technologies and practices, they need not induce firms or households to exploit efficiencies that they would have never exploited. Some of the inefficiencies that are potential targets of private climate initiatives may well have been ferreted out and reduced through market incentives at some point, but for the gap to be important for the climate problem, private initiatives need only accelerate the closing of the gap. This is true because time matters for climate change: The longer we remain at elevated levels of GHGs in the atmosphere, the greater the chance we will cross thresholds that will make the problem much more expensive, if not impossible, to address.[42] Although economists typically start with an assumption that markets are efficient, few would argue that markets are instantaneously efficient, and the gap is

42. *See, e.g.*, VANDENBERGH & GILLIGAN, *supra* note 3, at Ch. 2 (analogizing exceedance of GHG atmospheric levels as operating a car in the red zone on its tachometer).

important if it identifies areas where private initiatives can accelerate implementation of efficiency measures that might otherwise have occurred at a later date.

IV. CONCLUSION

If private governance efforts are to contribute meaningfully to sustainability, they should be founded on realistic assumptions about what motivates the targets of private initiatives. Corporate and household motivations are often complex and unclear, but we can be fairly certain that it is easier to motivate behavior change if the desired action is profitable or can be taken at little cost. This is particularly important for private governance initiatives, since the driver of change is a private entity that lacks the coercive power and resources of government. Engineering studies suggest that a very large energy-efficiency gap exists that could provide opportunities for private governance initiatives, but studies by economists cast doubt on the size of the gap. Given the important role of private governance in responding to climate change, it is time to bridge the disciplinary chasm and develop a much more reliable and fine-grained assessment of the energy-efficiency gap.