The New Insider Trading: Environmental Markets within the Firm

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Environmental law scholarship has failed to appreciate fully the significant parallels between public law rules and private environmental governance—the traditionally "governmental" standard-setting functions that private parties, including business firms, non-governmental organizations, and individuals, have adopted to govern behavior respecting the environment. Recognizing these parallels should affect how we think both about what *methods are best for setting environmental standards—prescription, markets, property rights, informational governance, or hybrid approaches—and* who *should be setting those standards—government regulators, private actors, or some combination of the two.*

This Article examines the use of market approaches (carbon taxes) and hybrid market instruments (emissions trading) in the climate change context. A great deal of legal scholarship has examined both how to design carbon taxes and cap-and-trade systems and the merits of these approaches relative to other methods of public regulation, such as prescriptive rules. There has been virtually no legal scholarship, however, analyzing the adoption by business firms of private market and hybrid instruments to address climate change. By closely examining British Petroleum's use of a private emissions trading scheme and Microsoft's use of a private carbon fee, this Article illuminates some of the common challenges that decision makers face in designing public and private forms of environmental governance, while acknowledging some of the key distinctions. The Article

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concludes by arguing that this new "insider trading" has the potential to reap significant benefits in combating climate change. It is important, however, to remain cautious about its limitations.

I. INTRODUCTION

Environmental law scholarship has not yet fully recognized the significant parallels between public law rules and the many forms of private environmental governance that non-state actors are

adopting to govern behavior respecting the environment.[1] Recognizing these parallels has implications for how policymakers and private actors, including business firms, non-governmental organizations (NGOs), and individuals, should think about *what methods* to use to set environmental standards. Such methods include prescriptive rules, the creation of property rights or entitlements, the creation or enabling of markets, the use of informational governance, or hybrid approaches.[2] Recognizing these parallels also broadens the scope of *who* should be setting standards in a comprehensive regime of global environmental governance—government regulators, private actors, or some combination of the two.[3] Finally, the different options must ultimately be weighed against normative criteria, including effectiveness, economic efficiency, environmental (distributive) justice, potential to stimulate innovation, accountability/transparency, potential for transnational impacts, risk of greenwashing, durability/adaptability, and expressive content.[4]

This Article examines in-depth the parallel adoption by public and private actors of a market approach (a carbon tax or fee) and a hybrid market approach (carbon emissions trading) to address climate change.[5] While there is a great deal of legal scholarship

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1. Sarah E. Light & Eric Orts, *Parallels in Public and Private Environmental Governance*, (forthcoming 2015) (manuscript at 3) (on file with authors) (offering a new analytical approach to issues of "instrument choice" in environmental law). In *Parallels*, we argue that each of what we deem the primary categories of public environmental law, namely prescriptive rules, the creation of property rights, the use or creation of markets, and informational governance, as well as hybrid approaches, are methods that both public and private actors employ to set and enforce environmental standards. *Id.* at 3, 19-43. *See also* Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129, 133 (2013) (arguing that private environmental governance should be recognized as a form of law).

2. Light & Orts, *supra* note 1, at 19-43.

3. *Id.*

4. *Id.* at 45-55 (discussing these normative criteria in-depth).

5. A "market approach," either (i) intends to affect market behavior by using prices, incentives, and other market signals or (ii) creates new markets. *Id.* at 33. Market approaches include, for example, public and private (1) taxes, charges, and fees; and (2) subsidies and payments. *Id.* A great deal of legal scholarship considers emissions trading schemes a "market approach," alongside carbon taxes. However, Eric Orts and I argue that emissions trading is better understood as a hybrid form of governance that incorporates the creation of *property* rights in the new allowance, a *prescriptive* cap, and the creation of a new *market* for trading. *Id.* at 31-32; *cf.* James Salzman, *Teaching Policy Instrument Choice in Environmental Law: The Five P's*, 23 DUKE ENVTL. L. & POL'Y F. 363, 369-70 (2013) (arguing that public tradable permit schemes are a hybrid form of property and

debating the relative merits of market approaches, such as carbon taxes and cap-and-trade systems over other instruments, such as prescriptive regulation, there has been no discussion in the legal literature about the use of private market and hybrid approaches by firms to combat climate change. This Article therefore focuses attention on this underexplored parallel use of private environmental market and hybrid instruments. After addressing the theoretical literature on carbon taxes and emissions trading, I analyze British Petroleum's (BP's) use of a private carbon emissions trading scheme and Microsoft's use of a private carbon fee to illuminate some of the common challenges that public and private decision makers face in designing these systems. This new "insider trading" has the potential to reap significant benefits to combat climate change. At the same time, it is essential to be thoughtful about both the normative implications of private environmental governance, and how to integrate private environmental governance and traditional public law.[6]

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prescriptive rules); JAMES SALZMAN & BARTON THOMPSON, ENVIRONMENTAL LAW & POLICY 47-53 (4th ed. 2013) (arguing the same). For ease of reference, here I refer to carbon taxes and cap-and-trade schemes as market approaches, or as market and hybrid approaches, respectively.

6. Although the BP and Microsoft programs are conducted within each firm (rather than imposed by another party in the firm's value chain through contract, or enforced by a third-party certifier), I consider them as a form of private environmental governance rather than simply internal corporate management for several reasons. First, a complete account of private environmental governance must acknowledge that the phenomenon exists in many different forms, each with particular strengths and weaknesses. The intra-firm nature of the programs I discuss here may affect how to evaluate them along certain normative dimensions as compared to other forms of private environmental governance (such as accountability, transparency, durability, or potential for greenwashing). Other forms of private governance—such as those involving third-party certification and auditing, or environmental standards imposed through supply chain contracts—may be more durable, involve a greater degree of accountability and less risk of greenwashing, though they may be less transparent if embodied in a private contract. This descriptive account is not the same as advocating the option in all circumstances. Second, the source of the environmental standards is purely private. *See* Light & Orts, *supra* note 1, at 3. Third, each actor was, at least to some degree, influenced to adopt these measures by private stakeholder pressure, including from the public or investors. Microsoft, for example, reported its significant emissions reductions to the CDP, a third-party NGO that provides a forum for investors to press firms to report (and ultimately reduce) their greenhouse gas emissions. BP's reputation was significantly enhanced when it adopted its emissions trading system. *See infra*, Part III.A-B. Thus, even for those who define "governance" to require a coercive element should find at least some coercive pressure here. Fourth, while a full discussion of this point is outside the scope of this paper, each firm is a large, multinational corporation with multiple business units in different countries. The particular corporate form of these interconnected enterprises should not affect whether these methods fall on one side or the other of the line of what constitutes private

There is a rich scholarly literature debating how best to combat climate change. Many legal scholars have examined the relative merits of different public regulatory options, including prescription, market approaches such as carbon taxes, hybrid market approaches such as cap-and-trade systems, and the use of information disclosure.[7] Some advocate government subsidies for green technology development, the creation of a governmental "green bank" to support emerging renewable energy technologies,[8] or government-funded technology-inducement prizes.[9] Elsewhere, I have argued that the United States military's "green" procurement and investment in research and development can stimulate technological innovation to promote the development of renewable energy sources, and should be included in this matrix of options for global environmental

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environmental "governance" as opposed to mere corporate environmental social responsibility. Finally, here I focus on issues relating to the design of private (and public) systems that account for carbon; such design issues are likely to be present in other private environmental governance schemes that involve third-party certification or contracts within the value chain.

7. *See, e.g.*, Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1347-51 (1985) (advocating market solutions to address air and water pollution); Reuven S. Avi-Yonah & David M. Uhlmann, *Combating Global Climate Change: Why a Carbon Tax is a Better Response to Global Warming Than Cap and Trade*, 28 STAN. ENVTL. L.J. 3, 6-9 (2009) (advocating a carbon tax); Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 TUL. L. REV. 511, 513 (2013) (advocating information disclosure with quasi-tax effects to address climate change and summarizing literature); Gilbert E. Metcalf & David Weisbach, *The Design of a Carbon Tax*, 33 HARV. ENVTL. L. REV. 499, 502 & n.11 (2009) (advocating a carbon tax); Robert N. Stavins, *A Meaningful Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 344-53 (2008) (advocating an upstream carbon cap-and-trade system). *But see* Nathaniel O. Keohane, Richard L. Revesz & Robert N. Stavins, *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 313-14 (1998) (explaining through a public choice model why prescriptive environmental regulation has generally been preferred both by firms and government actors over market solutions); Thomas Merrill, *Explaining Market Mechanisms*, 2000 U. ILL. L. REV. 275, 290-96 (2000) (discussing why, if market mechanisms are more "efficient" than prescriptive regulation, they have not been widely adopted); *cf.* David Weisbach, *Instrument Choice is Instrument Design*, *in* U.S. ENERGY TAX POLICY 113 (Gilbert E. Metcalf ed., 2011) (arguing that distinctions between a carbon tax and cap-and-trade system can be eliminated through careful design).

8. Allison S. Clements & Douglass D. Sims, *A Clean Energy Deployment Administration: The Right Policy for Emerging Renewable Technologies*, 31 ENERGY L.J. 397, 398 (2010) (arguing that government intervention is necessary to "create a level playing field" for emerging clean technologies in light of subsidies for fossil fuel extraction, processing, and infrastructure).

9. Jonathan H. Adler, *Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization*, 35 HARV. ENVTL. L. REV. 1, 1 (2011) (favoring technology inducement prizes to "accelerate the rate of technological innovation in the energy sector").

governance.[10] Others have argued that insurance can drive behavioral changes to mitigate and adapt to climate change risks.[11] Still others favor the use of litigation, relying on nuisance law or the public trust doctrine to convince courts to force action to combat climate change.[12] Finally, recent literature on "choice architecture" shows that the setting of default rules has emerged as a public and private option to drive behavior in the climate change context.[13]

Some legal scholars advocate a multi-faceted approach since it is unlikely that a single, global approach to combat climate change will materialize, at least, not anytime soon.[14] In 2014, the Obama Administration took a step in this pluralist direction when it proposed the *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units* (the "Clean Power Plan") under Section 111(d) of the Clean Air Act.[15] The Clean

10. Sarah E. Light, *The Military-Environmental Complex*, 55 B.C. L. Rev. 879, 884 (2014); Light & Orts, *supra* note 1, at 25-27 (arguing that procurement, as a form of both public and private governance, should be included more explicitly in taxonomies of environmental governance).

11. Howard C. Kunreuther & Erwann O. Michel-Kerjan, *Climate Change, Insurance of Large-Scale Disasters, and the Emerging Liability Challenge*, 155 U. PA. L. REV. 1795, 1839-40 (2007) (addressing the role of public and private insurance in driving individual behavior in the climate change context).

12. The Supreme Court has rejected the use of nuisance law to obtain damages in a climate-change suit. Am. Elec. Power Co. v. Connecticut, 131 U.S. 2527, 2532 (2011) (holding that the Clean Air Act displaces federal common law claims seeking to abate greenhouse gas emissions from power plants). For a discussion of the public trust doctrine in the climate change context, see Julia B. Wyman, *In States We Trust: The Importance of the Preservation of the Public Trust Doctrine in the Wake of Climate Change*, 35 VT. L. REV. 507, 508 (2010).

13. *See* Cass R. Sunstein & Lucia A. Reisch, *Automatically Green: Behavioral Economics and Environmental Protection*, 38 HARV. ENVTL. L. REV. 127, 131 (2014); *cf.* Ryan Bubb & Richard H. Pildes, *How Behavioral Economics Trims Its Sails and Why*, 127 HARV. L. REV. 1593, 1599 (2014). *See generally* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS (2008).

14. *See, e.g.*, Eric Orts, *Climate Contracts*, 29 U. VA. ENVTL. L. REV. 197, 198-99, 205 & n.22 (2011) (arguing that "a plurality of lower-level 'climate contracts'" and decentralized approaches including "national and regional regulations, public-private partnerships brokered by non-governmental organizations, various organizational alliances, and everyday transactions for goods and services" are "likely to provide effective and efficient responses to climate change in the long run."). The Lima Accord, reached at the 20th United Nations Climate Change Conference of the Parties (COP20) in Lima, Peru, in December 2014, is a positive step, but does not contain enforceable, binding emissions limitations. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, REPORT OF THE AD HOC WORKING GROUP ON THE DURBAN PLATFORM FOR ENHANCED ACTION (2014) *available at* http://tinyurl.com/oru4gr6.

15. Carbon Pollution Emission Guidelines for Existing Stationary Sources:

Power Plan proposes limits on carbon emissions from existing stationary sources (coal-fired power plants) for each state. The proposed rule offers a menu of options for each state to achieve its reduction target.[16]

Recently, legal scholars have come to recognize the important role that *private environmental governance* can play in combating climate change, among other environmental issues.[17] Private environmental governance should be understood as the traditionally "governmental" functions of environmental standard setting and enforcement that private actors are employing to address environmental problems.[18] Private environmental governance can take many forms and often mirrors public environmental law options quite explicitly.[19] By focusing on the parallel use of environmental market approaches, this Article aims to achieve three goals. My aim is first to highlight how, despite very different goals and scopes of public and private governance, public and private actors face similar design issues and strategic choices based on political and economic realities. Second, I argue that these private market and hybrid approaches within firms, what I call the "new insider trading," have a potentially important role to play in combating climate change. Finally, I acknowledge some limitations of private environmental markets along different normative dimensions.

The implications of this argument are significant. In the absence of a single, global regime requiring the reduction of greenhouse gas emissions, private environmental governance, especially by certain multinational business firms with large carbon

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Electric Utility Generating Units, 79 Fed. Reg. 34,830 (proposed Jun. 18, 2014) (to be codified at 40 C.F.R. pt. 60) [hereinafter Clean Power Plan]. For simplicity, I refer to all greenhouse gas emissions as "carbon emissions" or simply "emissions" in this Article.

16. *Id.*

17. Vandenbergh, *supra* note 1, at 139 ("Understanding private environmental governance can lead to new options for tackling climate change."); Michael P. Vandenbergh, *Climate Change: The China Problem*, 81 S. CAL. L. REV. 905, 907 (2008) (arguing that supply chain contracting initiatives can address climate change); Light & Orts, *supra* note 1, at 9 (arguing that private environmental governance must be considered as part of a single multi-tiered regime of global environmental governance); *cf.* Marc Allen Eisner, *Private Environmental Governance in Hard Times: Markets for Virtue and the Dynamics of Regulatory Change*, 12 THEORETICAL INQUIRIES L. 489, 489 (2011) (examining the viability of private environmental governance in light of the global financial crisis).

18. Vandenbergh, *supra* note 1, at 133 (defining private environmental governance activities as "play[ing] the standard-setting, implementation, monitoring, enforcement, and adjudication roles traditionally played by public regulatory regimes").

19. Light & Orts, *supra* note 1, at 3, 19-43.

footprints, has the potential to reduce global greenhouse gas emissions substantially. In some cases, private environmental governance has the potential for even greater impact than action by certain state governments or regional systems. For example, Wal-Mart, ranked first in the Fortune 500, reported combined direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions of 20.8 million metric tons of CO_2 equivalent ($MMTCO_2e$) for the year 2011.[20] Comparing that figure to publicly available information on the emissions from fossil fuel combustion from the "commercial, industrial, residential, transportation, electric power sectors" within different states demonstrates that emissions under Wal-Mart's control are higher than the 2011 emissions (in $MMTCO_2e$) within the jurisdiction of each of the following eight states: Hawaii, Maine, New Hampshire, Idaho, South Dakota, Delaware, Rhode Island, and Vermont, as well as the District of Columbia.[21] Notably, this figure for Wal-Mart does not include any emissions data from its supply chain (Scope 3), which, if included, would vastly increase the level of emissions. In fact, Wal-Mart has estimated that approximately 90% of its emissions come from its supply chain.[22]

BP, whose operations are directly related to the production, extraction, and ultimately, consumption, of fossil fuels, likewise has

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20. WAL-MART 2013 GLOBAL RESPONSIBILITY REPORT 56-57 (2013), *available at* http://tinyurl.com/p5dmkqn. The 2011 figures are the most recent figures currently available. Scope 1 emissions are direct emissions from sources owned or controlled by the entity. Scope 2 emissions are indirect emissions associated with the purchase of heat, cooling, steam, or electricity consumed by the entity. Scope 3 emissions are indirect emissions such as upstream emissions from the supply chain or downstream emissions from foreseeable activities by third parties. *See generally* WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. & WORLD RES. INST., THE GREENHOUSE GAS PROTOCOL: A CORPORATE ACCOUNTING AND REPORTING STANDARD 25 (2004), *available at* http://tinyurl.com/pgknmvt. For a complete list of Fortune 500 firms, see FORTUNE 500 2014, http://tinyurl.com/p5kofbe (last visited Jan. 23, 2015).

21. The EPA provides data on fossil fuel combustion from the commercial, industrial, residential, transportation, and electric power sectors in $MMTCO_2e$ within each state. *See* CO_2 Emissions from Fossil Fuel Combustion (2014), *available at* http://tinyurl.com/k9e5pzb. There is overlap between the emissions reported in the state data and emissions of private firms like Wal-Mart (if generated in the particular state at issue). *See also* U.S. Energy Information Administration, *State-Level Energy-Related Carbon Dioxide Emissions, 2000-2011* 1, 6 (Aug. 2014), *available at* http://tinyurl.com/p39v6m6 (noting that state-level carbon dioxide emissions data reflects emissions "based on the location where the primary energy is consumed as a fuel. To the extent that fuels are used in one state to generate electricity that is consumed in another state, emissions are attributed to the former rather than the latter."). *Id.*

22. *See Wal-Mart Pledges to Cut Supply Chain Emissions 20M Tons by 2015*, ENVTL. LEADER (Feb. 26, 2010), http://tinyurl.com/pbtpdyu.

a carbon footprint that is comparatively larger than that of several states. In 2013, BP reported combined direct (Scope 1) and indirect (Scope 2) emissions of 55.8 $MMTCO_2e$.[23] That total was greater than the reported 2012 fossil fuel emissions (the last year for which state data are available) within each of the following sixteen states: Alaska, Connecticut, Delaware, Hawaii, Idaho, Maine, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oregon, Rhode Island, South Dakota, and Vermont, as well as the District of Columbia.[24] And those figures are just from two private firms.[25] Indeed, according to data reported by firms to the CDP (formerly known as the Carbon Disclosure Project), the top fifty reporting business firms accounted for approximately three-quarters of all emissions in 2013.[26] After reviewing historical emissions data from 1854-2010, one author concluded that for the highest emitting entities based on cumulative emissions (fossil fuel producers and cement manufacturers) "emissions of 315 GTCO2e have been traced to investor-owned entities," as compared to state-owned or nation-state entities.[27] Half of these emissions have occurred since 1986.[28]

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23. BP SUSTAINABILITY REVIEW 2013 8 (2013), *available at* http://tinyurl.com/odm87p3. BP also reported 422 $MMTCO_2e$ downstream Scope 3 emissions from consumption of its products. *See id.* The 2013 figures are significantly lower than figures for 2012, which were 59.8 (Scope 1), 8.4 (Scope 2), and 517 (Scope 3 consumer emissions) all in $MMTCO_2e$. *Id.*

24. *See* CO_2 Emissions from Fossil Fuel Combustion, *supra* note 21. Using the same baseline year of 2012 for BP (68.2 $MMTCO_2e$ Scope 1 and 2 only), BP's emissions would exceed that within each of the states listed above, as well as Arkansas, Kansas, Maryland, Massachusetts, Mississippi, Utah, and Wyoming.

25. In May 2012, Microsoft, the other firm of focus in this Article, announced its commitment to becoming carbon neutral, and thus currently offsets all of its greenhouse gas emissions. *Our Footprint*, MICROSOFT, http://tinyurl.com/cgjpc4f (last visited Jan. 23, 2015); *see also infra*, Part 0. However, Microsoft voluntarily reported to the CDP that in 2013, its direct Scope 1 emissions were 48,516 $MTCO_2e$ and indirect Scope 2 emissions were 1,207,419 $MTCO_2e$. *See* CDP, INVESTMENT, TRANSFORMATION, AND LEADERSHIP: CDP S&P 500 CLIMATE CHANGE REPORT 2013 88 (2013), *available at* http://tinyurl.com/k2opzmn. Microsoft reported its emissions to CDP in $MTCO_2e$ rather than $MMTCO_2e$.

26. CDP GLOBAL 500 CLIMATE CHANGE REPORT 2013 8, 56 (2013), *available at* http://tinyurl.com/kry9j4m. Sixteen American firms make the list of top fifty emitters of greenhouse gases (in alphabetical order): Air Products & Chemicals, American Electric Power, Apache, AT&T, Chevron, ConocoPhillips, Devon Energy, Dow Chemical, Duke Energy, E.I. du Pont de Nemours, Exelon, ExxonMobil, FedEx, Occidental Petroleum, Praxair, and Wal-Mart.

27. Richard Heede, *Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854-2010*, 122 CLIMATIC CHANGE 229, 229, 238 (2014), *available at* http://tinyurl.com/ncn6dfo (concluding that "nearly two-thirds of historic carbon

Thus, though private environmental governance is hardly a panacea, it has the potential for significant impact in the climate change context, and more importantly, significant *global* impact.[29]

This Article is structured as follows: Part II situates the discussion within the legal literature discussing public carbon emissions trading systems and carbon taxes. The Article identifies key features of design that are common to public and private market and hybrid approaches. The Article then considers the advantages and disadvantages of these methods as compared to other instruments—a debate that has salience in the private environmental governance context as well. In the heart of the Article, Part III delves into how two business firms have created private analogues to these public cap-and-trade and carbon tax systems, BP's private emissions trading program and Microsoft's private carbon fee, respectively. Part IV synthesizes the normative implications of environmental market approaches along various dimensions, and argues that scholars and policymakers should think more deeply about how public policy will interact with private environmental governance. Public and private actors should likewise recognize that design choices in one sphere may shed light on design choices in the other. I then offer a brief conclusion.

II. PUBLIC MARKETS AND HYBRIDS IN THEORY AND PRACTICE

Many legal scholars, as well as economists, have advocated the use of market approaches, specifically public cap-and-trade systems and carbon taxes, to combat climate change.[30] This Part addresses

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dioxide and methane emissions can be attributed to 90 entities").

28. *Id.* at 229.

29. At the same time, it is essential to address normative concerns about both "greenwashing" and the durability of these private approaches. *See infra*, Parts III.A.5, III.B.4, and IV. "Greenwashing" is "the intersection of two firm behaviors: poor environmental performance and positive communication about environmental performance." Magali A. Delmas & Vanessa C. Burbano, *The Drivers of Greenwashing*, 54 CAL. MGMT REV. 64, 68 (2011). For a discussion of concerns about the durability of private action, see Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey from Command to Self-Control*, 22 HARV. ENVTL. L. REV. 103, 175-80 (1998).

30. *See* sources cited *supra* note 7 (advocating carbon taxes or cap-and-trade to combat climate change). British economist Arthur Pigou is credited with the idea of using a tax or subsidy to internalize the negative externalities associated with market failures, called a "Pigouvian" or "Pigovian" tax or subsidy. *See* Keohane et al., *supra* note 7, at 313 & n.2 (citing ARTHUR PIGOU, ECONOMICS OF WELFARE (1920)) Law and economics scholar Ronald Coase laid the intellectual groundwork for cap-and-trade programs in his work regarding the effect of initial entitlements on how parties bargain in the absence of

the theoretical debate over the advantages and disadvantages of these instruments. In addition, I highlight several key issues that public regulators face in designing these instruments that are reflected in the context of private environmental governance.[31]

Public market approaches aim to remedy the market's failure to capture the social costs associated with carbon emissions.[32] Put more bluntly, the government can impose taxes or fees on "bad" (polluting) behavior to create incentives to stop or reduce the behavior.[33] Markets thus force polluters to internalize the negative externalities associated with carbon emissions by requiring them to pay for the emissions that, in the absence of regulation, would be free. Such market approaches, which include taxes, subsidies, and

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transaction costs. Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 6-8 (1960). While much of the legal scholarship refers to both taxes and trading systems as "market" approaches, I emphasize that Coasean trading schemes are more accurately described as having hybrid features of market approaches, the creation of property rights or entitlements, and prescriptive rules. *See* Light & Orts, *supra* note 1, at 31-33. To the extent that I refer to both types as "market" instruments here, that is merely shorthand for the hybrid market nature of cap-and-trade regimes.

31. At the outset, I note that this literature is vast. I do not claim to address all of the theoretical scholarship on public market approaches, but rather focus on those aspects of public markets that have salience for the parallel forms of private environmental governance. I also do not wish to suggest that public and private actors face *identical* challenges here. To be sure, the scope and scale of public market mechanisms is far broader than many (though not all) intra-firm private governance approaches would be. Incorporating multiple industries within a single program introduces a degree of complexity that may not be present in many forms of private environmental governance. In addition, mechanisms for public enforcement and penalties are different from mechanisms for private enforcement, particularly within a single firm, though there may be greater similarities for third-party audited programs. The key point is that parallel does not mean identical.

32. Light & Orts, *supra* note 1, at 32-38 (discussing market approaches in the context of a larger analytical framework of global environmental governance). On the social cost of carbon, see INTERAGENCY WORKING GROUP ON SOCIAL COST OF CARBON, TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 (2013), *available at* http://tiyurl.com/kmjdae2. The social cost of carbon ("SCC") provides an "estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services" in dollars per metric ton of CO_2. *Id.* at 2. In 2013, the Working Group provided four estimates ($12, $43, $64, and $128) (in 2007 dollars) of monetized damages associated with one ton of CO_2 released in 2020; these estimates grow over time and are associated with different discount rates. *Id.* at 2-3. These 2013 figures updated (and increased) the Working Group's original 2020 estimates ($7, $26, $42, $81) (in 2007 dollars) based on updates to the models on which the government estimates were based. *Id.*

33. Light & Orts, *supra* note 1, at 32-35.

fees, can provide certainty as to the price of emissions.[34] Hybrid market instruments, such as emissions trading, provide certainty as to the quantity of emissions within a jurisdiction.[35] The cap determines the price of each emissions allowance, which then affects the market decisions of polluters to reduce emissions.

A. *Relative merits of market and hybrid approaches*

Advocates of market approaches have touted their advantages over prescriptive regulation. First, advocates contend that markets are economically efficient, because they can achieve environmental results at the lowest overall cost.[36] This efficiency is achieved by focusing on the order in which different sources of pollution are eliminated or reduced, with reductions coming first from those emissions that can be eliminated most cheaply. In addition to reducing abatement costs for firms, who have more autonomy to select their own methods of achieving pollution reduction, proponents argue that market approaches reduce administrative burdens and costs for regulators.[37] The greatest advantage, they contend, lies in the reduced burden that the federal government, in particular, the Environmental Protection Agency (EPA), would bear upfront and over time to accumulate and process information to set prescriptive standards.[38] To set a prescriptive environmental standard, the regulator needs a great deal of information about what constitutes the best technology for a technology-based standard, or information about firm processes and capabilities to set an appropriate performance-based standard. These administrative system design costs can be substantial.[39] This is even more salient in light of informational asymmetries—when firms have better information than the government regulator. In contrast, tradable permits and carbon taxes place the burden on market participants to gather and process information about how

34. *Id.*

35. Stavins, *supra* note 7, at 293 (advocating an upstream CO_2 cap-and-trade system with gradual emissions reductions over time); Avi-Yonah & Uhlmann, *supra* note 7, at 8, 36 (distinguishing "cost" certainty from "benefit" certainty). *See also* Amy C. Christian, *Designing a Carbon Tax: The Introduction of the Carbon-Burned Tax (CBT)*, 10 UCLA J. ENVTL. L. & POL'Y 221, 232 (1992); Roberta Mann, *Waiting to Exhale?: Global Warming and Tax Policy*, 51 AM. U. L. REV. 1135, 1220-21 (2002).

36. Ackerman & Stewart, *supra* note 7, at 1341-42.

37. Stavins, *supra* note 7, at 347.

38. Ackerman & Stewart, *supra* note 7, at 1336-37.

39. *Id.* at 1342-43.

best to reduce pollution.[40] Thus, advocates contend, market approaches reduce administrative burdens on the regulator.[41]

Second, market approaches can create incentives for innovation to combat pollution. Unlike technology-based prescriptive standards, they do not require polluters to use the same technology to abate pollution.[42] Third (and related to the first two advantages), market approaches can reduce the amount of litigation over prescriptive standards, because markets afford business firms who must pay the taxes or trade emissions permits greater flexibility at a lower cost.[43] Fourth, market approaches can remove burdens imposed by prescriptive standards (particularly technology standards) on new entrants to industry.[44] Finally, both the sale of emissions allowances (permits) and the payment by firms of carbon taxes can generate revenue for the government.[45]

But market approaches also have drawbacks. It is important to ask whether the overall costs and administrative burdens associated with market approaches are actually lower than those associated with prescriptive approaches.[46] Even if certain upfront administrative costs to set up a market are lower, there may be higher enforcement costs. For the regulator to enforce compliance with a prescriptive, technology-based standard, the regulator simply needs to verify that each firm is using the mandated technology. When the environmental standard is not technology-

40. *Id.* at 1343.

41. *Id.* at 1342-43 (noting that "federal and state officials [would not] be required to spend vast amounts of time and energy" determining the best available technology since tradable permit systems would "put the information-processing burden precisely where it belongs: upon business managers and engineers who are in the best position to figure out how to cut back on their plants' pollution costs").

42. *Id.*

43. *Id.* at 1343-46.

44. *Id.* at 1336.

45. *Id.* at 1343 (noting that if, in a cap-and-trade system, the initial permits last only for a limited time period, the purchase of new permits can raise money for the government on an ongoing basis).

46. *Cf.* Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 33-35 (1991) (arguing that in comparing regulatory strategies, one must examine the overall system costs as well as the distribution of those costs). Some have argued that setting up an emissions trading system, with the creation of new emissions allocations, a new market, and rules on how to trade allocations, particularly among multiple industries, is an incredibly complex and costly endeavor upfront. *See* Avi-Yonah & Uhlmann, *supra* note 7, at 36-38 (discussing the comparative simplicity of setting up a tax, compared to cap-and-trade, and noting that emissions trading proposals in the U.S. have run into the hundreds of pages, while one proposal for a carbon tax was seventeen pages long).

based, enforcement of compliance is more complex. The regulator must have good baseline data, as well as the ability to track performance on an ongoing basis.[47] Thus, even if upfront design costs are lower for market approaches, or costs of compliance by the regulated firms are lower, enforcement costs may be higher using a market approach.[48] In addition, efficiency can only be achieved if regulators set the correct "price." A failure to set the price correctly in the first instance and the need to change the price in the future can lead to additional administrative and political costs that the regulator may not be willing to incur.

Market approaches also raise normative concerns. First, some scholars criticize the use of markets for the expressive message that they send.[49] Because these market approaches either put a price on pollution or create a new property "right" or entitlement to pollute, this arguably sends the message that a polluter can simply pay to pollute. As Carol Rose has argued, the use of tradable permits or taxes loses the "moral thrust" of prescriptive approaches "by surrounding pollution with rights-talk, by using a rhetoric of entitlement to pollute."[50] Depending upon one's normative goals, expressive content may matter as much as economic efficiency and environmental effectiveness.

A second normative critique of market approaches is based on notions of distributive and environmental justice.[51] Advocates of environmental justice are concerned with the distributional effects that different forms of governance may impose on different groups

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47. *But cf.* Steinzor, *supra* note 29, at 175-80 (arguing that EPA lacks perfect information about health effects of different kinds of environmental harms).

48. It may of course be possible to offset some of those enforcement costs with stiff penalties for non-compliance.

49. Rose, *supra* note 46, at 33-35 (discussing the expressive content of various management controls for common pool resources). *See also* Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2045 (1996).

50. Rose, *supra* note 46, at 34. Jedediah Purdy has described how the sponsors of the Clean Water Act defeated a proposed amendment to add a tax approach to the Act on the grounds that the law should not incorporate a "right to pollute." Jedediah Purdy, *The Politics of Nature: Climate Change, Environmental Law, and Democracy*, 119 YALE L.J. 1122, 1187-88 (2010).

51. *See* Exec. Order No. 12898, 59 Fed. Reg. 94,3685 (Feb. 16, 1994); Richard J. Lazarus, *Pursuing "Environmental Justice": The Distributional Effects of Environmental Protection*, 87 NW. U. L. REV. 787, 787-88 (1993); Rae Zimmerman, *Issues of Classification in Environmental Equity: How We Manage Is How We Measure*, 21 FORDHAM URB. L.J. 633, 634 (1994); Rae Zimmerman, *Social Equity and Environmental Risk*, 13 RISK ANALYSIS 649, 649 (1993).

of citizens.[52] Burdens include not only the distribution of environmental impacts, but also of costs.[53] With respect to distribution of environmental impacts, in the traditional air pollution context, if a market instrument allows entities to trade emissions allowances, such as for sulfur dioxide, freely, there is a risk that firms in certain regions will purchase allowances rather than reduce emissions, thus creating "hot spots" of pollution for local populations.[54] The same critique is arguably applicable in the case of a pollution tax, in that firms in particular regions can choose to continue polluting and pay the tax. In contrast, a prescriptive approach would require *all* polluters to reduce emissions, thus reducing the potential for hotspots or an unfair distribution of the resulting pollution. In the climate change context, however, this argument has less force, since greenhouse gas emissions mix in the atmosphere, rendering the location of emissions generation arguably irrelevant.[55] Some scholars, however, have pointed out the potential for markets to create hot spots of "co-pollutants," which are traditional air pollutants that tend to be emitted alongside greenhouse gases.[56]

Finally, there may be distributive concerns regarding whether firms or government regulators (and thus, taxpayers) must pay the costs associated with each form of governance. While market mechanisms may reduce emissions at the lowest overall cost,[57] it is important to disaggregate and consider the distribution of those costs. Thus, if a regulator faces more of what Rose has called "administrative" costs in one system, even if business firms face reduced "user" costs, or the entire system costs less, it is important to take the distribution of costs into account in evaluating the

52. Lazarus, *supra* note 51, at 787.

53. Rose, *supra* note 46, at 12. Rose argues that the overall costs of imposing a management strategy on common pool resources should be minimized, but divides the costs into three categories: "administrative or system costs" (costs of devising, running and enforcing the management strategy); "user costs" (costs of new technologies users must adopt); and "overuse or failure costs" (cost of failure to achieve efficient resource use).

54. Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, 38 ENVTL. L. REP. NEWS & ANALYSIS 10287, 10299 (2008).

55. Erwin Chemerinsky et al., *California, Climate Change, and the Constitution*, 25 ENVTL. FORUM 50, 51 (2008) (noting that the "threat of climate change does not hinge on where GHG emissions occur. On the contrary, because these gases quickly assimilate into the global atmosphere, emissions in Florence, Italy, have the same global impact as those releases in Florence, California.").

56. Kaswan, *supra* note 54, at 10299.

57. Stavins, *supra* note 7, at 298.

system.[58]

The next two sections of this Part address some of the leading issues of design that regulators face in setting up a cap-and-trade system or a carbon tax. Again, I focus attention here on those design features with the greatest salience for private actors designing similar systems.

B. *Cap-and-trade systems in theory and practice*

A cap-and-trade system sets a cap on overall emissions within the jurisdiction by creating a limited number of emissions allowances.[59] Each allowance permits the holder to emit, without penalty, a certain volume of carbon emissions, for example, one ton. Each entity within the jurisdiction must thus hold the requisite number of allowances to cover its emissions; otherwise, it must reduce those emissions. Emitters face financial incentives to reduce emissions when the price of reducing one marginal unit of emissions is less than the cost of an allowance and to purchase allowances from others when the price is less than their marginal cost of reducing emissions. In this way, the allowances minimize the overall social cost of reducing emissions, because a cap-and-trade regime "creates a market in which allowances migrate toward their highest-valued use, protecting those emissions that are the most costly to reduce."[60]

1. *Design issues*

With this theory in mind, designers must confront several issues. The first design issue is *at what level to set the cap* and thus, how many allowances to create.[61] A higher cap would permit more emissions and be less protective of the environment, but perhaps more politically feasible. A lower cap would be more politically difficult to enact but would lead to more emissions reductions. Proponents of cap-and-trade regimes often suggest that the cap should decrease over time, and that the system should incorporate a long time horizon to encourage investment in long-term

58. Rose, *supra* note 46, at 12.

59. Ackerman & Stewart, *supra* note 7, at 1333; Metcalf & Weisbach, *supra* note 7, at 502 n.11.

60. Stavins, *supra* note 7, at 298.

61. *Id.*; Ackerman & Stewart, *supra* note 7, at 1347.

emissions reduction strategies.[62] Of course, in order to set the cap, the regulator must first have a basic administrative system in place to measure baseline emissions.

A second, related issue that system designers must address is *what baseline year* to use in setting the cap. An earlier baseline year may reward (or at least, not penalize) "early movers" who have already reduced their emissions to some extent, while a later year tends to reward those who have delayed implementing emissions reduction programs.[63] Thus, different constituencies—firms that have been earlier or later movers—may advocate for competing baseline years to protect their interests.

A third key design issue is determining *the scope* of the cap-and-trade regime, in other words, which industries or firms will be required to purchase allowances for their emissions. A cap-and-trade system could cover all emitters of greenhouse gases within the jurisdiction (including individual consumers), upstream producers/refiners/extractors of fossil fuels, a single industrial sector (such as coal-fired power generation), or some middle approach.[64] Different choices create different administrative burdens. Robert Stavins, for example, has advocated an "upstream, economy-wide CO_2 cap-and-trade system that implements a gradual trajectory of emissions reductions over time."[65] The upstream producers/refiners/extractors who would be required to pay for allowances could then pass the additional costs downstream through the market to ultimate end-users of their products. Stavins argues that this approach would reduce administrative and enforcement costs by limiting the number of

62. Stavins, *supra* note 7, at 298-99 (noting that a long-term cap-and-trade system can send signals to firms to invest in emissions reductions processes and technologies).

63. *Id.* at 364 (noting that selection of baseline year affects measurement of effectiveness).

64. While at first glance, this issue might appear to lack a private environmental governance parallel, given that trading would occur within a single firm, Part III explains that private firms must likewise determine which emissions to cover: all business units, or some sub-set of the firm's emissions. This is especially relevant in global, multinational firms with business units abroad. In addition, the firm must decide whether to include only Scope 1 and 2 emissions (direct and indirect purchased electricity), or supply chain and downstream Scope 3 emissions as well, such as from employee business travel. *See infra* Part III.

65. Stavins, *supra* note 7, at 293. By "upstream," Stavins means that "allowances are surrendered based on the carbon content of fuels at the point of fossil fuel extraction, import, processing, or distribution." *Id.* at 309. This limited number of upstream entities can then pass costs through the supply chain to customers and ultimately, consumers. *Id.* at 310.

firms participating in the trading, while covering the widest possible swath of emissions to increase effectiveness.[66]

A fourth key design issue is *how to distribute* the allowances. The regulator can either freely distribute or sell the allowances to participants in the cap-and-trade regime. One clear advantage of freely distributing allowances is that this approach is likely to be more politically feasible. Firms will already have to expend resources to reduce emissions (compliance costs), so they may resist being forced, in addition, to purchase allowances in the first instance. Free distribution raises additional questions, however. For example, if allowances are given away for free, the question arises as to what principle to use to distribute allowances among firms. One widely used option has been "grandfathering"—namely, to base the distribution on past performance.[67] Critics, however, argue that this approach rewards the worst polluters with the highest number of allowances.[68] An alternative distribution approach could include simply giving an equal number of allowances to firms, who could then trade among themselves.[69] In contrast, selling allowances avoids the question of what allocation principle to use. In addition, selling allowances can raise revenue for the state—revenue that can be used to generate new renewable sources of energy or can be used for redistributive purposes.[70] It is also possible to use a combination of these approaches.

Once the allowance allocation issues are resolved, polluting firms can then trade allowances in a market. This requires the regulator to consider several *administrative* issues, including the creation of a platform for trading, whether allowances can be "banked" or "borrowed" and how to enforce compliance with trading rules.[71] Possible enforcement options in public environmental markets include criminal penalties, civil financial

66. *Id.* at 312.

67. Merrill, *supra* note 7, at 284 (noting that grandfathering has been adopted in eight cap-and-trade regimes to date).

68. *Id.* at 289.

69. In the absence of transaction costs, the Coase Theorem suggests that the initial allocation of entitlements would be irrelevant to a socially optimal outcome. Coase, *supra* note 30, at 6-8. However, in this scenario there would certainly be transaction costs for firms. *See* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1096 (1972) (discussing different initial allocations in the presence of transaction costs).

70. Ackerman & Stewart, *supra* note 7, at 1343.

71. *Id.* at 1347; Avi-Yonah & Uhlmann, *supra* note 7, at 39.

penalties for violations enforced by the government, citizen suit enforcement, or debarment from the market.

Thus, to summarize, the key design issues that public regulators face—and, I demonstrate below that designers of private emissions trading regimes face as well—are at what level to set the cap; what baseline year to select; how to distribute allowances; the scope of the program; and issues of administration, including creating rules for trading and enforcement of compliance.

2. *Public cap-and-trade systems in operation and their limits*

Cap-and-trade programs exist in different jurisdictions around the world. Although the United States has not chosen to employ a national cap-and-trade program for greenhouse gas emissions,[72] the EPA has recently proposed the Clean Power Plan to reduce emissions from existing Electricity Generating Units (EGUs) within the states.[73] The Clean Power Plan explicitly permits states to rely on existing regional and state cap-and-trade programs, such as the Regional Greenhouse Gas Initiative (RGGI),[74] and state programs such as California's Global Warming Solutions Act (Assembly Bill 32),[75] to achieve their emissions reductions targets.[76] Outside of the United States, other national and regional government organizations have adopted cap-and-trade systems. For example, in 2003, the European Union adopted a directive on emissions trading that created the European Union Emissions Trading System (EU-ETS), which applies to approximately 11,000 heavy industrial sources of greenhouse gas emissions, as well as flights to and from the EU, and operates in thirty-one countries.[77] Finally, the United States has employed cap-and-trade regimes in

72. Although the American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009)—a proposed national cap-and-trade program—passed in the House of Representatives, it failed to pass in the Senate.

73. Clean Power Plan, 79 Fed. Reg. at 34,830.

74. *CO_2 Auctions, Tracking & Offsets*, REGIONAL GREENHOUSE GAS INITIATIVE, http://www.rggi.org/market/ (last visited Jan. 23, 2015).

75. *Assembly Bill 32 Overview*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY AIR RESOURCES BOARD, http://tinyurl.com/yeoddcs (last visited Jan. 23, 2015).

76. Clean Power Plan, 79 Fed. Reg. at 34,834.

77. *The EU Emissions Trading System*, EUROPEAN COMMISSION CLIMATE ACTION, http://tinyurl.com/2u2mswh (last visited Jan. 23, 2015) (noting operation in twenty-eight EU countries plus Iceland, Liechtenstein, and Norway); *The EU Emissions Trading System*, EUROPEAN UNION 5 (2013), http://tinyurl.com/kx7h8zx.

other contexts in the past. For example, the United States used a cap-and-trade system to reduce use of chlorofluorocarbons and other chemicals under the Montreal Protocol to minimize or reverse stratospheric ozone depletion.[78] Under the Clean Air Act Amendments of 1990, the United States created a cap-and-trade program which significantly reduced sulfur dioxide emissions.[79]

a. *EPA's proposed clean power plan, RGGI and California AB 32*

While not expressly creating a new emissions trading scheme, the EPA's recent proposed Clean Power Plan suggests that states may rely on existing markets to meet emissions reduction targets. In proposing the Plan, the EPA relied on its authority under Clean Air Act Section 111(d) to seek a proposed thirty percent reduction in carbon emissions from the power sector by 2030 (as compared to 2005 levels).[80] The proposed rule sets a reduction goal[81] for each state, but then affords each state flexibility as to how to meet the goal.[82] Each state may adopt any combination of four "building blocks" to achieve the "Best System of Emission Reduction."[83] These building blocks include: efficiency improvements at coal-fired EGUs; reduced emissions from switching to natural gas generation; reduced emissions from

78. Merrill, *supra* note 7, at 283.

79. Stavins, *supra* note 7, at 300-01 (citing Clean Air Act, tit. IV, 42 U.S.C. §§ 7401-7671 (1994)). Merrill cites other examples of public trading schemes, including California's Regional Clean Air Incentives Market (RECLAIM) program to reduce smog as well as three water pollution initiatives. Merrill, *supra* note 7, at 283 (citing John P. Dwyer, *The Use of Market Incentives in Controlling Air Pollution: California's Marketable Permits Program*, 20 ECOLOGY L.Q. 103, 104 (1993)).

80. Clean Power Plan, 79 Fed. Reg. at 34,832. Section 111(d)(1) of the Clean Air Act requires each state to "establish[] standards of performance for any existing source" of air pollutants. 42 U.S.C. § 7411(d) (1994). Under section 111(a)(1), a "standard of performance" is "a standard for emissions . . . which reflects the degree of emission limitation achievable through the application of the best system of emission reduction [BSER] . . . adequately demonstrated." 42 U.S.C. § 7411(a).

81. "The proposed goals are expressed in the form of state-specific, adjusted output-weighted-average CO_2 emission rates for affected EGUs. However, states are authorized to translate the form of the goal to a mass-based form, as long as the translated goal achieves the same degree of emission limitation." Clean Power Plan, 79 Fed. Reg. at 34,892.

82. *Id.* at 34,833 ("Under CAA section 111(d), state plans must establish standards of performance that reflect the degree of emission limitation achievable through the application of the 'best system of emission reduction' that, taking into account the cost of achieving such reduction and any non-air quality health and environmental impacts and energy requirements, the Administrator determines has been adequately demonstrated (BSER).").

83. *Id.* at 34,834-35.

switching to renewables, nuclear generation, or other "low—or zero—carbon generation"; and emissions reductions from demand-side reductions.[84]

Importantly for this discussion, the EPA indicates that states may "identify technologies or strategies that are not explicitly mentioned in any of the four building blocks and may use those technologies or strategies as part of their overall plans (e.g., *market-based trading programs* . . .)."[85] In addition, the EPA's approach permits the adoption of multi-state compliance strategies.[86] For example, the EPA notes that RGGI established a market-based trading program in 2009, in which nine states currently participate.[87] While the RGGI incorporates an overall emissions cap, each state has a separate emissions budget and issues allowances to EGUs in its state.[88] Those allowances are distributed quarterly at regional CO_2 allowance auctions.[89] EGUs may also buy allowances on the secondary trading market.[90]

There are three-year "control periods" within RGGI. By the first business day in March following the end of each control period, each EGU must own a sufficient number of allowances to cover its emissions during the preceding three-year control

84. *Id.* at 34,836. The EPA contends, "[t]he combination of all four blocks best represents the BSER because it achieves greater emission reductions at a lower cost, takes better advantage of the wide range of measures that states, cities, towns and utilities are already using to reduce CO_2 from EGUs and reflects the integrated nature of the electricity system and the diversity of electricity generation technology." *Id.*

85. *Id.* at 34,837 (emphasis added). The EPA noted that in discussions with key stakeholders, "states highlighted the importance of the EPA recognizing existing state and regional programs that address carbon pollution, *including market-based programs*, and allowing credit for prior accomplishments in reducing CO_2 emissions." *Id.* (emphasis added).

86. *Id.*

87. Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont are current participants in RGGI. *See generally* REGIONAL GREENHOUSE GAS INITIATIVE, www.rggi.org (last visited Jan. 23, 2015). Although New Jersey originally participated in RGGI, it withdrew on January 1, 2012. Letter from Bob Martin, Commissioner, State of N.J. Dep't. of Envtl. Prot., to Signatory States, Reg'l Greenhouse Gas Initiative (Nov. 29, 2011), *available at* http://tinyurl.com/lw67ocw.

88. *Allowance Allocation*, REGIONAL GREENHOUSE GAS INITIATIVE, http://tinyurl.com/lkptpnn (last visited Jan. 23, 2015).

89. *CO_2 Auctions*, REGIONAL GREENHOUSE GAS INITIATIVE, http://tinyurl.com/mxjhv76 (last visited Jan. 23, 2015).

90. POTOMAC ECONOMICS, ANNUAL REPORT ON THE MARKET FOR RGGI CO2 ALLOWANCES: 2013, REGIONAL GREENHOUSE GAS INITIATIVE 7 (May 2014), http://tinyurl.com/lnn96kx.

period.[91] The allowances it used during that period are deducted from its Compliance Accounts, and the EGU may carry over allowances it did not use to the next period.[92]

RGGI permits EGUs to trade both with "regulated and non-regulated parties, creating a market for emission allowances."[93] From 2005-2012, "power sector CO_2 emissions in the RGGI participating states fell by more than forty percent."[94] The EPA notes that "RGGI was not the primary driver for these reductions but the reductions led RGGI-participating states to later adjust the CO_2 emission limits downward."[95] In 2014, RGGI set an overall cap that was more than fifty percent below 2008 emissions levels.[96] By using an auction to distribute ninety percent of RGGI's emission allowances, RGGI has generated significant funds (more than $700 million) to invest in programs that "lower costs for energy consumers and reduce CO_2 emissions."[97]

The Clean Power Plan also cites with approval California's emissions trading program under AB-32, which sets an overall goal of reducing emissions to 1990 levels by 2020.[98] California's trading regime includes EGUs, but is not limited to the power-generation sector.[99] EPA notes that in addition to using these existing cap-and-

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91. CO_2 BUDGET SOURCE COMPLIANCE PROCESS CHECKLIST: 8 STEPS, REGIONAL GREENHOUSE GAS INITIATIVE 2 (May 25, 2012), *available at* http://tinyurl.com/ptkkrtg. The first period was January 2009 to December 2011. *Id.* at 1. The current control period is January 2012 to December 2014. REGIONAL GREENHOUSE GAS INITIATIVE, http://tinyurl.com/owm3lck (last visited Jan. 23, 2015).

92. REGIONAL GREENHOUSE GAS INITIATIVE, FACT SHEET: CO_2 BUDGET SOURCE (RGGI) COMPLIANCE 2 (2012), *available at* http://tinyurl.com/n8gy4c6.

93. Clean Power Plan, 79 Fed. Reg. at 34,848.

94. *Id.* (citing REGIONAL GREENHOUSE GAS INITIATIVE, REPORT ON EMISSION REDUCTION EFFORTS OF THE STATES PARTICIPATING IN THE REGIONAL GREENHOUSE GAS INITIATIVE AND RECOMMENDATIONS FOR GUIDELINES UNDER SECTION 111(D) OF THE CLEAN AIR ACT 2 (2013)).

95. *Id.*

96. *Id.* (citing Press Release, RGGI Inc., RGGI States Make Major Cuts to Greenhouse Gas Emissions from Power Plants (Jan. 13, 2014), http://tinyurl.com/mwhywgs).

97. *Id.* (citing *2013 Allowance Allocation*, REGIONAL GREENHOUSE GAS INITIATIVE, http://tinyurl.com/ktyjyxw (last visited Jan. 23, 2015)); REGIONAL INVESTMENTS OF RGGI CO_2 ALLOWANCE PROCEEDS, 2012, REGIONAL GREENHOUSE GAS INITIATIVE (Feb. 2014), *available at* http://tinyurl.com/lwv3ccn.

98. Clean Power Plan, 79 Fed. Reg. at 34,848 (citing State of California Global Warming Solutions Act of 2006, Assemb. B. 32, ch. 488 (Cal. 2006), *available at* http://tinyurl.com/yvo7l8).

99. *Id.* The proposed Clean Power Plan also approvingly cites other cap-and-trade programs previously put in place to reduce conventional air pollutants such as SO_2 and NOx. *Id.* at 34,880.

trade systems or creating its own new cap-and-trade program, that states could impose a "cost on carbon emissions." [100]

The EPA is silent, however, about whether any private firms currently use internal cap-and-trade systems or carbon fees to reduce their carbon emissions, and whether private environmental governance might be a way to reduce emissions.[101] Nor does the Clean Power Plan suggest that states may or should encourage private firms to create internal markets in order to reduce emissions.

Although in theory cap-and-trade systems have much to recommend them, in practice, the record has been somewhat mixed. Critics have argued that the oversupply of allowances is a common problem, and has led to ineffectively low allowance prices, including in the EU-ETS.[102] Another concern is that any system that creates new financial instruments is open to fraud. In fact, there was a widely reported fraud in the EU-ETS regime that required the shutting down of trading after a cyber-attack on the trading system.[103] Grandfathering of existing pollution levels through the free distribution of allowances can undercut the goals

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100. *Id.* at 34,882.

101. *Id.* at 34,886. This is as a result of the Clean Air Act's structure of cooperative federalism in which the federal government sets limits that states must determine how to meet. *See* Margaret H. Lemos, *State Enforcement of Federal Law*, 86 N.Y.U. L. REV. 698, 716 (2011). The EPA does note that the EGUs themselves can consider options to reduce carbon emissions, and acknowledges that "[m]any companies . . . already factor a carbon cost adder into their long-term planning decisions." Clean Power Plan, 79 Fed. Reg. at 34,886. The use of an internal carbon price for strategic planning purposes is different from BP's use of an internal emissions trading system or Microsoft's use of a carbon fee to abate current emissions. *See generally* CDP, GLOBAL CORPORATE USE OF CARBON PRICING: DISCLOSURES TO INVESTORS (2014), *available at* http://tinyurl.com/o6fazsy (noting that globally, 150 firms use some form of carbon pricing to drive investment decision making, and that sixty-nine of those firms are U.S.-based); CDP, USE OF INTERNAL CARBON PRICE BY COMPANIES AS INCENTIVE AND STRATEGIC PLANNING TOOL (2013), *available at* http://tinyurl.com/mwovh44.

102. *See* Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving Toward Stringency*, 34 COLUM. J. ENVTL. L. 395, 411-12 (2009) (arguing that the EU-ETS cap was set too high and thus that the allowance price was too low, citing empirical studies). Arguably, this is not a critique of cap-and-trade *per se*, but rather a critique of the cap selected in particular systems. The same criticism could be leveled at other instruments. For example, one could argue in the case of technology-based prescriptive rules that the technology selected was insufficiently aggressive at achieving the desired results.

103. Terry Macalister & Tim Webb, *Carbon Fraud May Force Longer Closure of EU Emissions Trading*, THE GUARDIAN, Jan. 23, 2011, *available at* http://tinyurl.com/lhb7zgc (noting that the European Commission shut down "spot" trading after a "£28m cyber attack on the Czech, Austrian and other national markets" within the EU-ETS system).

of a cap-and-trade system.[104] Thus, the actual implementation of public systems of emissions trading has not been without flaws, often due to the political unpopularity of reducing emissions by any means.

C. *Carbon taxes in theory and practice*

Carbon taxes are a second market approach to address climate change. Often referred to as "Pigouvian taxes," carbon taxes can remedy a market failure by putting a price on "bad" behavior—the negative externalities caused by pollution.[105] While taxes can have many purposes, including to raise revenue or to redistribute wealth, a Pigouvian tax primarily serves regulatory ends.[106] Such taxes build on the assumption that "rational" economic actors are profit-maximizers, and will change their behavior when that behavior becomes more costly.[107]

1. *Design issues*

To design a carbon tax in an ideal world, the regulator should set the marginal tax rate equal to the marginal social cost of each additional unit of carbon emissions, which should also equal the marginal benefit of abatement.[108] Thus, the first major challenge is *setting the right "price"* or level of the tax.[109] Often, advocates suggest

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104. *See generally* Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677 (2007). *See also* Merrill, *supra* note 7, at 286 (noting that grandfathering of pollution permits has been common in cap-and-trade systems).

105. Avi-Yonah has argued that taxation has three goals: to raise revenue, redistribute wealth, and regulate behavior "by incentivizing (subsidizing) activities [governments] wish to promote and by disincentivizing (penalizing) activities they wish to discourage." Reuven S. Avi-Yonah, *Carbon Tax, Health Care Tax, Bank Tax and Other Regulatory Taxes*, *in* UNIVERSITY OF MICHIGAN PUBLIC LAW & LEGAL THEORY RESEARCH PAPER SERIES No. 281, 2 (July 9, 2012), *available at* http://tinyurl.com/q8x4esm. *See also* Reuven Avi-Yonah, *The Three Goals of Taxation*, 60 TAX L. REV. 1, 22-25 (2007).

106. Avi-Yonah, *Carbon Tax, Health Care Tax, Bank Tax and Other Regulatory Taxes*, *supra* note 105, at 2.

107. *See, e.g.*, RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 3 (6th ed. 2003). Whether or not this assumption is true is beyond the scope of this paper.

108. Metcalf & Weisbach, *supra* note 7, at 511.

109. Avi-Yonah & Uhlmann, *supra* note 7, at 6-9. The consulting firm McKinsey & Co. has compiled a report on the marginal costs of different greenhouse gas emissions abatement strategies, ranging from negative costs (cost savings) through projects such as energy-efficient lighting and insulation retrofits, to positive marginal costs for construction of new infrastructure to transmit solar or wind power, in addition to carbon capture and storage. MCKINSEY & CO., REDUCING U.S. GREENHOUSE GAS EMISSIONS: HOW MUCH AND

that the government be authorized to reset the price in light of new information or changed circumstances. Unlike the case of cap-and-trade systems, there is no issue as to what baseline year to select or how to distribute emissions allowances. All emitters within the scope of the program must pay the tax.

This, of course, raises a second issue—determining the *scope* of the tax, including who within the relevant jurisdiction should pay for emissions. Options include upstream producers, refiners and extractors of fossil fuels, end-users, or some combination of these. Several law and economics scholars have argued that the most efficient carbon tax is an upstream tax, which can be relatively easily administered because it need only be imposed on a small number (around 2,000) of oil, gas, and coal producers.[110] Those upstream entities would then pass the burden of the tax, in the form of increased prices, downstream, eventually onto consumers.

A third set of key design issues relates to *administration*: namely, whether to use an existing tax structure, or to create an entirely new administrative structure to collect the tax. This also raises the question of *who should administer the system*: whether the jurisdiction's taxing authority should be responsible for collecting (and setting) the tax rate, or an environmental authority should do so, or whether the two should work in concert in this regard.[111] A final administrative issue relates to *enforcement*: how to penalize violations and enforce compliance with the rules.[112] As in the case of a public cap-and-trade scheme, possible options for public carbon taxes include criminal penalties, civil financial penalties for violations enforced by the government, citizen suit enforcement, or debarment from the market.

AT WHAT COST? xiii (2007), http://tinyurl.com/csb44aa.

110. Avi-Yonah argues that the regulatory function of taxation is best served by a corporate tax, because there are relatively few corporations as compared to individuals "so that it is possible to achieve regulatory goals with minimal administrative efforts." *Carbon Tax, Health Care Tax, Bank Tax and Other Regulatory Taxes*, *supra* note 105, at 3. He notes specifically that an upstream carbon tax would be levied on only "2000 oil, gas and coal producers and importers . . . [which] will pass the tax burden downstream where it will ultimately influence consumer behavior, but the regulatory structure that is needed to police the tax is much simpler than it would be if the government attempted to monitor consumers directly." *Id.* at 6.

111. Avi-Yonah & Uhlmann, *supra* note 7, at 33 (arguing that a carbon tax could easily be administered through the Internal Revenue Code and existing programs of the Department of Energy).

112. *Id.* at 31-33, 39-40 (discussing enforcement of carbon tax, both on its own, and as compared to cap and trade).

Thus, to summarize, the key design issues that public regulators face include: setting the price; the scope of emissions covered in the regime; and issues of administration, including who should collect the fee, whether to use an existing tax collection regime, and how to enforce compliance.

2. *Public carbon taxes in operation and their limits*

The United States has not employed a carbon tax to date, though other nations, including the Scandinavian countries, the United Kingdom, and Australia, have with notably mixed results.[113] Carbon taxes, like other climate policies, have been politically unpopular. For example, in Australia, the Clean Energy Act, which came into force in 2012, imposed a carbon emissions fee on the largest emitters in the nation.[114] However, in July, 2014, the legislature voted to repeal the tax.[115] In Norway, a carbon tax has been in effect since 1991; however some scholars have argued that its impact on emissions has been limited, in light of "extensive tax exemptions and relatively inelastic demand in the sectors in which the tax is actually implemented."[116] Despite these critiques, which largely result from a lack of political will or ability to design the "theoretically ideal" carbon tax regime, carbon taxes have reduced emissions to some extent, and have the potential to reduce them in greater amounts.[117] Though the concept of "political will" might appear at first blush to apply only to the design of public regulatory regimes, we will see that a private equivalent has

113. Metcalf & Weisbach, *supra* note 7, at 508-10 (describing carbon tax systems in Scandinavia and the United Kingdom). The idea of a carbon tax has never gained political traction in the United States. *See* Walter Wang, *Looking Back to Move Forward: Revisiting the BTU in Evaluating Current Policy Alternatives*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 181 (2010) (discussing history of failed effort to enact a broad-based energy tax (the "BTU tax") in the first Clinton Administration).

114. *See generally Clean Energy Act 2011* (Cth) (Austl.), *repealed by Clean Energy Legislation (Carbon Tax Repeal) Act 2014* (Cth) (Austl.); Bruno Zeller & Michael Longo, *Australia's Clean Energy Act: A New Measure in the Global Common Market*, 10 LOY. U. CHI. INT'L. L. REV. 179 (2013) (discussing Australia's Clean Energy Act of 2011, which came into force in 2012).

115. *Australia Votes to Repeal Carbon Tax*, BBC NEWS (July 17, 2014), http://tinyurl.com/leugx9g (noting that under the carbon tax, the 248 largest emitters paid US $22.60 per metric ton emitted). *See also* Julia Baird, *Why Australia Killed Its Carbon Tax*, N.Y. TIMES, July 25, 2014, at A23.

116. Annegrete Bruvoll & Bodil Merethe Larsen, *Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work?*, 32 ENERGY POL'Y 493, 498 (2004).

117. Metcalf & Weisbach, *supra* note 7, at 499 (arguing that a "well-designed carbon tax can capture about 80% of U.S. emissions by taxing only a few thousand taxpayers, and almost 90% with a modest additional cost").

affected the design, implementation, and durability of private markets as well.

D. *Carbon taxes versus cap-and-trade*

Despite economists' more common preference for carbon taxes over emissions trading, David Weisbach has argued that, with proper design, any differences between a carbon tax and a cap-and-trade regime can be "substantially eliminated."[118] There are, however, a few systemic differences in the public regulatory context that are worth addressing because they likewise arise in the context of private environmental markets.

Advocates of a carbon tax note certain administrative advantages over a cap-and-trade regime. First, in a jurisdiction with an existing system to collect taxes, the creation of a carbon tax adds fewer administrative burdens than the creation of an entirely new instrument (the emissions allowance) as well as trading system in a cap-and-trade regime. The jurisdiction can use its existing tax regime to collect the tax.

Second, Reuven Avi-Yonah has made a compelling argument that cap-and-trade systems raise "collateral" tax issues that carbon taxes do not.[119] Most notably, Avi-Yonah contends that there may be tax consequences arising out of the receipt, sale, trading, borrowing, and banking of permits, which would not arise in the carbon tax context.[120] As a result, he and other scholars prefer a carbon tax over a cap-and-trade regime. A similar issue arises in the private environmental market context, as we will see below. On the other hand, a cap-and-trade regime may be more politically palatable than a carbon tax, at least in the United States.[121]

Finally, in light of informational asymmetries between the regulator and private firms about firms' marginal cost of abatement, a cap-and-trade regime may have a lower administrative burden, as the regulator need not know firms'

118. Weisbach, *supra* note 7, at 113. *But see* Keohane et al., *supra* note 7, at 316 n.17 (noting that the relative efficiency of taxes and cap-and-trade systems differs depending on shape of the curve of marginal abatement costs); Avi-Yonah & Uhlmann, *supra* note 7, at 37-39 (noting greater administrative complexity of setting up cap-and-trade compared to carbon tax).

119. Avi-Yonah, *Carbon Tax, Health Care Tax, Bank Tax and Other Regulatory Taxes*, *supra* note 105, at 4-6.

120. *Id.*; Avi-Yonah & Uhlmann, *supra* note 7, at 37-39.

121. *See* Wang, *supra* note 113, at 183-88 (discussing failed BTU tax proposal in the United States).

marginal cost of abatement in advance to set the cap. Under a cap-and-trade regime, trading generates information that becomes simultaneously available to all market participants about the participants' marginal costs of abatement.

The legal scholarship on market approaches, however, has completely ignored how these design issues and the relative merits of carbon taxes and cap-and-trade systems might apply in the context of private cap-and-trade systems or carbon fees. It has also failed to address the potential for interaction between public and private markets. It is to these forms of private environmental governance that this Article now turns.

III. PRIVATE MARKET AND HYBRID APPROACHES

This Part focuses on two case studies of the use of internal emissions trading and emissions fees by business firms. The first, BP's internal emissions trading system, resembles public cap-and-trade systems. The second, Microsoft's adoption of an internal carbon fee, shares many characteristics with a carbon tax.[122] In establishing these private markets and hybrid approaches, business firms have faced (and in the future are likely to face) similar design issues as public regulators for both instruments.[123] These include setting the right "cap" or "price", determining the scope of coverage, issues of administration including trading/collection, and enforcement. In addition, BP's cap-and-trade system raised the issue of how to allocate allowances.[124]

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122. It is worth noting that other firms have adopted private environmental market and hybrid instruments of these types. For example, Royal Dutch/Shell Group ran an internal emissions trading system called "STEPS" from 2000-2002. Marc Gunther, *Disney, Microsoft and Shell Opt for Self-Imposed Emissions Schemes*, THE GUARDIAN, Mar. 26, 2013, http://tinyurl.com/lb7s7l7. In addition, the Disney Corporation has, like Microsoft, adopted an internal carbon emissions fee to abate emissions. *Id.* To provide a sufficiently detailed analysis, I focus only on the two case studies.

123. *Cf.* Jacob Horisch, *Combating Climate Change Through Organisational Innovation: An Empirical Analysis of Internal Emission Trading Schemes*, 13 CORP. GOVERNANCE 569, 570 (2013) (discussing design issues in private emissions trading schemes). For a practitioner-oriented compendium of different sustainability instruments that business firms are using, including a brief discussion of emissions trading, see SCHALTEGGER ET AL., SUSTAINABILITY MANAGEMENT IN BUSINESS ENTERPRISES: CONCEPTS AND INSTRUMENTS FOR SUSTAINABLE ORGANISATION DEVELOPMENT 55-56 (2002), *available at* http://tinyurl.com/myhzx66 (describing design issues involved in creating internal emissions trading system for a firm). Schaltegger et al. assert that internal trading can be more efficient than centralized "technical rules," and can also better integrate environmental issues into the "commercial" side of a firm. *Id.* at 56.

124. Horisch, *supra* note 123, at 570 (identifying issues that a firm must address in

A. *BP's internal emissions trading scheme*

In the mid-to-late 1990s, most firms in the energy industry, most notably ExxonMobil, publicly opposed governmental regulation of greenhouse gas emissions and contributed to misinformation campaigns that sought to undermine scientific consensus about the anthropogenic nature of climate change.[125] In a 1997 speech at Stanford University, BP's then-CEO John Browne publicly announced the firm's split from industry-wide opposition to governmental limitations on greenhouse gas emissions.[126] At that time, Brown estimated that BP's direct and indirect activities resulted in approximately ninety-five million metric tons of carbon emissions annually (equivalent to 349 million metric tons of CO_2-equivalent), with approximately ten percent of those emissions arising out of BP's exploration, production, refining, and chemical production processes, and the remaining ninety percent arising out of consumption by end-users.[127] Browne subsequently announced publicly in 1998 that BP would reduce its emissions by ten percent (as compared to a 1990 baseline) by 2010.[128] To reach this target, BP decided to adopt an internal emissions trading system.[129]

In 1999, BP began by launching a pilot internal emissions trading system that it expanded to all business units of the firm in

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designing an internal cap-and-trade scheme, including setting the cap, distributing permits, setting up a system for trading, and developing a method of carbon accounting); SCHALTEGGER ET AL., *supra* note 123, at 55 (identifying the same design issues). Horisch contends that emissions trading can only be successful in "large" firms in which there are multiple business units with different marginal costs of abatement. *See* Horisch, *supra* note 123, at 570. The same is not necessarily true of an internal emissions fee.

125. Ingvild Andreassen Sæverud & Jon Birger Skjærseth, *Oil Companies and Climate Change: Inconsistencies Between Strategy Formulation and Implementation?*, 7 GLOBAL ENVTL. POL. 42, 43 (2007).

126. David G. Victor & Joshua C. House, *BP's Emissions Trading System*, 34 ENERGY POL'Y 2100, 2101 (2006) (citing John Browne, Climate Change: The New Agenda, Address at the Stanford University Graduate School of Business (May 19, 1997)); s*ee also* Sæverud & Skjærseth, *supra* note 125, at 49 (stating that BP withdrew from the Global Climate Coalition, an anti-climate change lobbying organization, in 1996).

127. Forest Reinhardt, *Global Climate Change and BP Amoco*, HARV. BUS. SCH., case no. 9-700-106, at 1, 9, & n.16 (Feb. 28, 2001).

128. *Id.* at 10. This reduction applied only to BP's direct emissions (i.e., emissions from production, extraction, refining, or BP's own vehicles) but not to downstream emissions by consumers of BP's products, such as consumers of BP gasoline. *Id.*

129. Victor & House, *supra* note 126, at 2111 (arguing that BP's emissions trading system was a "tool for adjusting the attention of decentralized mid-level managers, not forcing strategic change").

the following year.[130] By 2002, when BP terminated the program, it had exceeded its target to reduce emissions by ten percent below 1990 levels—many years ahead of schedule.[131] Actual emissions reductions came largely from a "highly publicized foray into solar energy," combined with a reduction of venting and flaring, as well as other actions to increase efficiency and reduce energy use.[132]

In 2002, after terminating the internal trading program, BP set a new target not to increase its net emissions beyond 2001 levels by 2012, notwithstanding any growth in its business.[133] BP reported that it declined to continue its internal trading scheme in light of the introduction of applicable public trading schemes in the UK and the European Union.[134]

BP was motivated to adopt an internal emissions trading program for several reasons. First, it allowed BP to develop expertise in trading in anticipation of potential public regulation.[135] Second, it increased BP's credibility when seeking to

130. *Id.* Victor and House conducted in-depth interviews with managers at BP who were central to the creation and implementation of the emissions trading system. They challenge prior accounts of the internal cap-and-trade scheme as an "unqualified success story," including an account written by employees of BP. *Id.* at 2100. The BP employee article provides an inside view of BP's emissions trading program and describes it as an "important step" in reducing emissions that created "the right incentives to innovation and investment." Mark Akhurst, Jeff Morgheim & Rachel Lewis, *Greenhouse Gas Emissions Trading in BP*, 31 ENERGY POL'Y 657, 663 (2003). Two business school cases also address emissions trading at BP. Reinhardt, *supra* note 127; Michelle Rogan et al., *The Transformation of BP*, LONDON BUS. SCH., case no. 302-033-1 (2002). In addition, other sources discuss BP's internal ETS. *See, e.g.*, John Carey & Sarah R. Shapiro, *Global Warming*, BUSINESS WEEK, Aug. 15, 2004, at 60; *Welcome to Kyoto-land*, THE ECONOMIST, Oct. 7, 2004; *see also* Thomas H. Malone, *Bringing the Market Inside*, HARV. BUS. REV. 107, 107-10 (2004) (discussing BP internal emissions trading as part of a broader trend of the increasing use of internal markets within firms to aggregate information accurately and efficiently); Sæverud & Skjærseth, *supra* note 125 (examining consistency between the climate change strategies of multinational oil companies such as ExxonMobil, Shell, and BP and their implementation from 1998-2005).

131. Victor & House, *supra* note 126, at 2100.

132. Reinhardt, *supra* note 127, at 11; *see also id.* at 14 (discussing flaring); Sæverud & Skjærseth, *supra* note 125, at 51 (discussing BP's reduction of venting and flaring, as well as increased investment in carbon capture and storage (CCS) technology, divestment from coal mining investments, and increased investment in solar and wind power); Victor & House, *supra* note 126, at 2109.

133. Sæverud & Skjærseth, *supra* note 125, at 49.

134. Horisch, *supra* note 123, at 571. Horisch contends that while external trading schemes can be more efficient and effective than private trading, private trading remains important because many nations lack public regulations limiting emissions, and many public regulations that do exist do not actually apply to all firms within the jurisdiction. *Id.*

135. Victor & House, *supra* note 126, at 2101. *See also* Reinhardt, *supra* note 127, at 10-11, 13 (noting that Browne wanted to "help BP acquire the managerial skills it would

influence public policy instrument choice by government officials.[136] Specifically, BP preferred a cap-and-trade system over what its leadership viewed as "more costly policy responses such as an emissions tax."[137] Third, the internal trading scheme allowed BP to reduce its emissions at no net cost to the firm.[138] BP claims that much of the cost saving required very little investment,[139] as most reductions did not require capital allocation.[140] BP reports that the effort created $650 million in value.[141]

Fourth, the emissions trading scheme fit with BP's structure as a firm: the ETS was a "decentralized mechanism that would encourage business units to find the most advantageous cuts in emissions," given BP's decentralized, organizationally diverse business units with "varying marginal costs of emissions."[142]

Finally, BP achieved certain reputational benefits. These included extremely favorable press reports after Browne's announcement in such media outlets as the *Wall Street Journal* (calling BP a "maverick" within the oil industry), the *Financial Times* ("the most positive response by an oil company yet" to address climate change), and the *Los Angeles Times* ("a break as stunning as that which shook the tobacco industry").[143] Reactions among employees were mixed; some were positive, while others were skeptical and thought BP's initiative was "'insincere' because it was driven by 'business advantage rather than environmental

need in a world where Kyoto had the force of law" and that "BP Amoco executives were confident that their first-hand experience with trading would allow them to have a strong voice in discussions about the structure and rules of any governmentally instigated trading system.").

136. Victor & House, *supra* note 126, at 2101, 2109.

137. *Id.* at 2101.

138. Press Release, BP, BP Makes First Emissions Trades (Apr. 9, 2002), *available at* http://tinyurl.com/nlqwk48 ("[BP] was the first company to introduce an internal emissions trading scheme, which helped BP to meet its commitment to achieve a 10% reduction in greenhouse gas emissions below 1990 levels eight years early, and at no net cost."); Victor & House, *supra* note 126, at 2100 ("[W]ith its public commitment of a 10% reduction achieved nine years ahead of schedule and at no cost, BP could declare the program a resounding success.").

139. Tony Hayward, BP Chief Executive, Delivery Technologies via Carbon Markets, Address at the GLOBE Berlin Legislators Forum (Jun. 3, 2007), *available at* http://tinyurl.com/kandtw7.

140. Victor & House, *supra* note 126, at 2101.

141. John Browne, BP Chief Executive, Energy and the Environment: 10 Years On, Address at Stanford University (Apr. 26, 2007), *available at* http://tinyurl.com/n3yk9th.

142. Victor & House, *supra* note 126, at 2101.

143. Reinhardt, *supra* note 127, at 9.

concern.'"[144] On the negative side, in 2000, Greenpeace argued that BP's internal cap-and-trade system was a "cover" so that it could continue to explore increased oil drilling in Alaska.[145]

BP confronted many of the same issues that public policymakers confront in designing public cap-and-trade regimes at the state, regional, federal, or international level.

1. *Setting the cap, selecting the baseline year, and scope of the program*

In designing its internal cap-and-trade system, BP's managers had to determine an appropriate cap. In order to do this, BP first had to confront several administrative challenges, including how to create (a) a system to collect and report emissions data; (b) a standardized emissions reporting protocol; and (c) an inventory of emissions data for the baseline year that its managers selected.[146] It is worth noting that BP worked with the Environmental Defense Fund (EDF) to develop its trading system. EDF has been a strong proponent of market-based approaches to emissions reduction, including emissions trading.[147]

After setting up this administrative infrastructure, BP had to decide at what level to set the emissions reduction "cap."[148] After asking the leaders of BP's business units to estimate emissions targets that "would be achievable without incurring net present costs," CEO Browne selected the ten percent figure, which was slightly higher than his managers' estimates.[149] Ultimately, BP selected 1998 as its baseline year, in light of it being the most recent year for which reliable data were available.[150] Finally, BP determined that the program would apply to emissions from all of its business units globally, creating a relatively large "scope" for its program.

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144. *Id.*

145. *Id.* at 13 (citing *Stop Northstar*, GREENPEACE, www.greenpeace.org (last visited Oct. 19, 1999)).

146. Victor & House, *supra* note 126, at 2102.

147. *Id.* at 2101-02; Reinhardt, *supra* note 127, at 10 (citing EDF's support for SO_2 emissions trading in the 1990 Clean Air Act Amendments). EDF offered "workshops on trading" to BP managers to aid in implementation. Victor & House, *supra* note 126, at 2102.

148. Victor & House, *supra* note 126, at 2102.

149. *Id.* The decision not to incur net present costs demonstrates some of the limitations of internal environmental markets and hybrids in the absence of government regulation and thereby underscores the importance of private-public interaction.

150. Akhurst et al., *supra* note 130, at 661.

2. *Distributing emissions allowances*

As noted above, one of the more politically complex issues of design for a public cap-and-trade system is how to allocate the initial emissions allowances. BP confronted the same issue. The firm ultimately chose to rely on "grandfathering" to distribute emissions freely, based on historical data of business units' emissions.[151] While BP considered adjusting the initial allocation based on so-called "early action"—to reward business units that had reduced emissions before the internal cap-and-trade scheme was created—the task force rejected this approach as "too complicated."[152]

3. *Administration and enforcement*

BP confronted several administrative issues including how to administer the system, who would run the program, and how to enforce compliance. To administer the system, BP created a centralized database for storing permits, which could be electronically allocated among business units when internal trading occurred.[153]

Second, BP had to decide who would run the trading program and, within individual business units, who would actually conduct trades. Browne created several centralized structures within the firm to enable and manage trading. The Climate Steering Group was an "executive-level body responsible for climate policy within BP."[154] Browne created a "central emissions trading task force" to report to the Steering Group and to design the cap-and-trade system by determining how to allocate permits and create rules on trading and compliance.[155] Experienced oil and gas traders created the actual "trading platform" on BP's internal network.[156]

The decision about who would trade on behalf of each business unit, however, was made at a decentralized level—by each business unit itself. Most of the business units designated traders with a "commercial" background, rather than an "environmental,

151. *Id.* (noting that BP adopted a "grandfathered approach" based on data from 1998 emissions); Victor & House, *supra* note 126, at 2103.

152. Victor & House, *supra* note 126, at 2103.

153. *Id.* at 2102.

154. *Id.*

155. *Id.*

156. *Id.*

health, and safety background."[157] As trading actually occurred, it became apparent that these two cohorts traded differently: those with an "environmental, health, and safety" background "viewed greenhouse gas trading as a compliance issue rather than a potential profit center, and tended to trade in large batches rather than make many smaller transactions."[158]

Third, BP decided to decentralize enforcement of compliance. BP's internal cap-and-trade scheme relied on individual business managers to enforce the emissions caps for their business units. According to Victor and House, "Compliance with the emissions caps became part of each [business unit] manager's performance contract, just as managers were assessed in regard to numerous other health, safety, and environmental indicators."[159]

4. *Collateral issues*

BP's internal emissions trading program raised several of what Avi-Yonah has referred to as "collateral issues," including tax consequences. Consistent with Avi-Yonah's concern about the tax consequences of allowance allocation in a public cap-and-trade regime, BP decided that business units would not actually exchange money when trading permits to avoid creating any unwanted tax consequences from its internal cap-and-trade system.[160] However, business units "did report trading-related 'income' and 'expenses' alongside their other accounts, which allowed for an evaluation of [business units] according to traditional financial criteria such as return on capital employed."[161]

Finally, just as BP did not wish to incur external tax consequences from internal trades, BP likewise did not wish for the internal ETS system to "distort the deployment of capital."[162]

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157. *Id.*

158. *Id.* at 2104 (citing Interview with Bill Gerwing, Dir., W. Hemisphere, Health, Safety, Sec., and Env't Grp., BP, May 7, 2004).

159. *Id.* at 2103. One notable alternative for enforcement and compliance would have been to use a third-party organization to monitor and certify compliance. This arguably would have increased both the effectiveness and accountability of the program.

160. *Id.* at 2102.

161. *Id.* Akhurst et al. clarify that because "allowances were not yet externally recognised, assets, costs and revenues from trades were tracked and used to assess trading performance relative to investments in GHG reductions, but were not part of 'above the line' performance." Akhurst et al., *supra* note 130, at 661.

162. Victor & House, *supra* note 126, at 2103. This issue is arguably a concern in any

Thus, BP created a special $50 million capital fund for business unit leaders to use for emissions-reduction investments, separate from other capital funds.[163] The idea was to enable business unit leaders to invest in emissions-reduction projects with an insufficiently favorable return on investment for a "normal capital allocation."[164] As it became clear that many projects could be launched at "negative cost," BP reduced the size of the capital fund to $25 million.[165]

5. *Lessons from BP's experience*

Other private actors and public regulators designing cap-and-trade systems can benefit from examining BP's internal trading program. Victor and House concluded that "executive leadership and the first-mover effect" had an important impact on BP's success in achieving its emissions reduction target early through the use of an internal trading program.[166] BP's CEO's public statements created credible commitments for the firm to meet.[167] BP's decision to partner with the environmental NGO Environmental Defense Fund arguably lent "credibility" to the cap-and-trade system.[168]

One interesting note is that BP's Task Force "tolerated non-compliance" when the price for emissions allowances rose more sharply than anticipated.[169] This is not entirely different from a

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economic-incentive-based program—public or private.

163. *Id.* at 2103.

164. *Id.*

165. *Id.*; *see* MCKINSEY & CO., *supra* note 109 (discussing McKinsey marginal abatement cost curves).

166. Victor & House, *supra* note 126, at 2109 (arguing, in contrast, that it is not clear that internal financial incentives had a large impact: "Our impression from numerous interviews is that no manager inside BP ever felt any financial or career pain, nor any great gains for that matter, as a result of excessively bad or good behavior in the emissions trading system.").

167. *Id.*

168. *Id.*

169. *Id.* at 2110. At several times, permit prices rose substantially, possibly due to speculation by traders within BP. *Id.* ("Prices in the BP ETS were being set by traders playing the supply and demand game and were not representative of the true cost of avoiding carbon emissions."). BP's experience was not unique. For example, Andrew Hoffman's review of four internal emissions trading programs within firms was likewise mixed. Hoffman reported: "Shell, for example, discovered that its STEPS program (Shell Tradable Emissions Permit System) suffered from problems including a lack of participants, lack of liquidity and difficulties with permit apportionment. The system was further weakened by the fact that it was voluntary and business units often requested, and

public regulator deciding to increase the number of allowances or exempt certain emissions from the scope of a public cap-and-trade system. To some extent, BP was responding to a concern that internal speculation was distorting prices and that if "managers [used] the prices from the internal trading system as a planning mechanism, [this] would have caused uneconomic investment in abatement projects, which would have destroyed shareholder value and harmed BP's business."[170] This demonstrates that internal "political will" is as much an issue for private firms as it is for public regulators. Ultimately, BP chose not to continue its internal emissions trading program after meeting its initial target.[171] Similarly, in the RGGI, when the State of New Jersey determined it was not in the Governor's interest to continue participating in the system, New Jersey pulled out.[172]

This story of speculative trading, price spikes, and toleration of non-compliance illustrates some limitations of the new insider trading. But according to Victor and House, BP's internal trading scheme nonetheless had an impact, because it "had an effect in reallocating and focusing the resource that was most needed to realize low-cost emission reductions: management time and attention to detail."[173] Even if the design was not perfect by the standards of economic theory, the use of internal emissions trading allowed BP to reduce emissions significantly. As Daniel Esty and Andrew Winston argued, BP (among other private adopters of internal emissions trading) "recognize[s] the limits of the intracompany carbon game. They don't worry about whether they've got the carbon price exactly right. The management teams understand that internal trading is simply a tool to draw attention

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received, more permits. Finally, and most seriously, there were legal issues: internal emissions permits with a monetary value could not be traded across international boundaries without significant tax consequences in host countries." ANDREW J. HOFFMAN, CARBON STRATEGIES: HOW LEADING COMPANIES ARE REDUCING THEIR CLIMATE CHANGE FOOTPRINT 35 (2007). On the other hand, Shell reaped certain advantages from employing an internal emissions trading system, most importantly that it "buil[t] awareness" among employees, "created a structured mechanism for factoring GHG considerations into the operations of individual business units," allowed the firm to "develop in-house expertise" in trading, and gave the firm "credibility" when it gave input on what ultimately became the EU ETS. *Id.*

170. Victor & House, *supra* note 126, at 2110. In one such example, "Prudhoe Bay—one of the larger emitters inside BP—decided not to comply with its cap when prices rose too high; a handful of business units appear never to have even considered trading." *Id.*

171. *Id.* at 2105.

172. *See* Letter from Bob Martin, *supra* note 87 and accompanying text.

173. Victor & House, *supra* note 126, at 2111.

to emissions and highlight opportunities to reduce them."[174]

In addition to driving these firms to reduce their emissions, the information-forcing features of a cap-and-trade system are valuable to private firms. Thomas Malone has argued that BP's internal emissions trading is part of a larger trend of firms relying on internal markets to do more efficiently what firms used centralized direction to accomplish in the past.[175] He emphasizes how internal private markets make information transparent to all relevant actors within the firm:

> But no one really sees the whole picture. Even the CEO, who—in theory—is responsible for the whole picture, can't peer deeply enough into the organization to make out all the details. With an internal market, all prices for all products in all future time periods are visible to everyone.[176]

In addition, internal markets can provide flexibility when new information arises.[177] There are risks with internal markets, just as there are with public markets. For example, if two parties lack a shared interest in the transaction, it will not occur.[178] However, Malone points out that central firm managers can adjust incentives to ensure that the internal market supports "corporate goals."[179]

On the other hand, it is also important to recognize the potential for greenwashing in the use of any method of achieving environmental goals, including internal emissions trading.[180]

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174. DANIEL C. ESTY & ANDREW S. WINSTON, GREEN TO GOLD: HOW SMART COMPANIES USE ENVIRONMENTAL STRATEGY TO INNOVATE, CREATE VALUE, AND BUILD COMPETITIVE ADVANTAGE 215 (2006). This, of course, raises the question of whether this is the most efficient way to focus management's attention on reducing emissions, or whether there are ways to do so that are less administratively cumbersome. A comparative survey of all methods of environmental management to reduce emissions is beyond the scope of this Article. For present purposes, it is sufficient to point out that this is one way that has demonstrably achieved reduction targets.

175. Malone, *supra* note 130, at 107.

176. *Id.*

177. *Id.* at 112-13 ("An internal market is faster and more flexible. Salespeople, planners, and plant managers can immediately start trading based on new information. In fact, everyone has an incentive to trade as soon as possible to gain an advantage.").

178. *Id.* at 113.

179. *Id.*

180. *See supra* text accompanying note 29. By highlighting the potential for greenwashing in internal emissions trading programs, I do not wish to downplay the potential for greenwashing in the context of other instruments, both public and private. For example, a private-governance technology-based standard could promote greenwashing if a private firm touted its adoption of a particular technology as "green,"

Again, BP provides an example of this concern. On April 20, 2010, the Deepwater Horizon drilling rig, which BP had leased to explore an oil field in the Gulf of Mexico, exploded killing eleven people and spilling millions of barrels of oil into the Gulf.[181] While BP touted its achievements in fighting climate change, this disastrous oil spill followed closely on the heels of BP's green initiatives. Earlier, in 2005, an NGO report entitled "Don't Be Fooled 2005" found BP's "Beyond Petroleum" advertising campaign to be second among the "top ten" firms engaged in greenwashing.[182] Thus, while BP's emissions reduction achievements should be recognized, they must also be examined in the larger context of the firm's overall environmental record. Stakeholders should not be misled by private measures touted as achieving green benefits when the actual record does not bear this out.

While BP's experiment with internal emissions trading did not last, it remains important to consider private emissions trading as a tool within the environmental governance toolkit. As I address more fully below in Part IV, private markets can serve to educate firms about how public markets will work. Private markets have the potential to create stakeholders who support wider private markets

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when in fact the technology has a negligible effect on environmental performance. Greenwashing can likewise occur in the context of public environmental law. For example, the government could impose a new technology-based prescriptive rule and make "green" claims about it, but the same concerns about negligible impact could apply. Similarly, the government could adopt a carbon tax or cap-and-trade system, but set the cap so high or the price so low that environmental performance would not change dramatically, all while touting the "success" of its "green" policies.

181. *Compare* Miriam A. Cherry & Judd F. Sneirson, *Beyond Profit: Rethinking Corporate Social Responsibility and Greenwashing After the BP Oil Spill Disaster*, 85 TUL. L. REV. 983, 988-90 (2011) (discussing the Deepwater Horizon oil spill disaster and other environmental health and safety lapses at BP), *with id.* at 999-1008 (discussing BP's "Beyond Petroleum" initiative). In a decision entered on September 4, 2014, a federal district court held that the discharge of oil in the Deepwater Horizon disaster was due to the "gross negligence" of BP Exploration and Production (the primary leaseholder), and found BP liable for sixty-seven percent of the damage. *In re* Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, Nos. 10-2771, 10-4536, 2014 WL 4375933, at *60, *64, *67 (E.D. La. Sept. 4, 2014).

182. ESTY & WINSTON, *supra* note 174, at 136. Esty and Winston also note that others deemed BP's advertising campaign "'Beyond Preposterous'—as well as Beyond Pompous, Beyond Pretension, Beyond Posturing, Beyond Presumptuous, and Beyond Propaganda." *Id.* They conclude, "BP has achieved admirable reductions in its own greenhouse gas emissions. It's one of the world's largest providers of renewable energy products such as solar panels. But with solar sales of $247 million in 2007, more than ninety-nine percent of the company's annual revenues still come from oil and gas. Bottom line: BP hasn't moved beyond petroleum just yet." *Id.*

or even public markets to reduce the cost of emissions allowances, achieve economies of scale, and ensure a "level playing field" within industry. Private markets, especially when adopted by multinational firms, can have greater transnational impacts than domestic public law or regulation. And private markets have expressive content—when adopted, they send the message that firms have an obligation to reduce their emissions even in the absence of law.

B. *Microsoft's internal carbon fee*

A second example of a private market approach to address climate change is Microsoft's imposition of an internal fee on carbon emissions.[183] Similar to a public carbon tax, Microsoft's internal carbon fee is a way for the firm to create incentives to reduce emissions, to force emitting business units or divisions to acknowledge the "true cost" of using energy, and to raise money for its emissions-reduction efforts.[184]

The following analysis suggests that similar issues arise in designing public and private carbon taxes or fees. These issues include (1) setting the right "price" for each marginal unit of

183. TAMARA "TJ" DICAPRIO, MICROSOFT CORP., BECOMING CARBON NEUTRAL: HOW MICROSOFT IS STRIVING TO BECOME LEANER, GREENER, AND MORE ACCOUNTABLE (2012), *available at* http://tinyurl.com/n26rxcx [hereinafter BECOMING CARBON NEUTRAL]; TAMARA "TJ" DICAPRIO, MICROSOFT CORP., THE CARBON FEE: THEORY AND PRACTICE (2013), *available at* http://tinyurl.com/lotams6 [hereinafter MS CARBON FEE].

184. BECOMING CARBON NEUTRAL, *supra* note 183, at 11 (noting that the price for carbon reflects "true cost accounting"). For example, "the internal cost for electricity use includes not only the price we pay the utility for electricity, but also the price we pay to offset the carbon emissions associated with our electricity use." *Id.* at 11-12. Microsoft is not attempting to capture the full social cost of carbon—its vision of "true cost accounting" is slightly more limited. I note that the Disney Corporation has also employed an internal carbon fee to abate emissions. *See* 2010 CORPORATE CITIZENSHIP REPORT, THE WALT DISNEY COMPANY, http://tinyurl.com/lvqtp6c (last visited Jan. 23, 2015) ("[The]costs of [Disney's] carbon offset projects are charged back to individual business units at a rate proportional to their contribution to the Company's overall direct emissions footprint. Thus, our businesses are now exposed to an internal carbon price. The 'Climate Solutions Fund' is the name given to the Company's internal carbon pricing program."); Gloria Gonzalez, *Disney to Up the Ante on Carbon Offsets*, GREENBIZ.COM (Sept. 19, 2013, 5:03 AM), http://tinyurl.com/ljc44v9 (noting that that Disney was charging business units $11-$14/ton of CO_2e); Marc Gunther, *Disney, Microsoft and Shell Opt for Self-Imposed Carbon Emissions Taxes*, THE GUARDIAN (Mar. 26, 2013, 1:18 PM), http://tinyurl.com/lb7s7l7 (describing internal carbon limitations of Microsoft, Shell and Disney); William McLennan, *Disney Caught Up in Carbon Offsetting Controversy*, THEECOLOGIST.ORG (Apr. 7, 2011), http://tinyurl.com/427ugu9 (noting criticism of Disney's use of carbon offsets rather than emissions reductions).

emissions; (2) determining the scope of covered emissions; and (3) administration of the system, including creating the necessary infrastructure to collect the fee, managing the system, and enforcement of compliance. I address each of these in turn.

It is important to note that I distinguish here between Microsoft's imposition of a carbon fee on its organizational divisions to abate emissions and the practice that an increasing number of private firms have adopted of employing an internal carbon price for planning purposes (*i.e.*, to plan future capital expenditures).[185] Firms use the latter type of carbon planning price based on the assumption that in the future, a government regulator is likely to impose some form of public regulation that makes carbon emissions more expensive.[186] I focus here only on the internal carbon fee in a program like Microsoft's, in which the firm imposes a carbon fee to abate current emissions, as this is more analogous to a public carbon tax.

In July, 2012, Microsoft announced its goal to become carbon neutral or "net zero" in its data centers, software development labs, offices, and employee business air travel.[187] Microsoft's Chief Environmental Strategist Robert Bernard explained that the rationale for employing an internal carbon fee to achieve Microsoft's net zero goal was twofold: first, to "distribute accountability across the firm" while maintaining incentives for innovation and flexibility; and second, to keep the mechanics simple, so as to avoid taking time and effort away from employees' creation of value for the company.[188] Bernard explains that the

185. *See* sources cited *supra* note 101 (describing firms' use of internal carbon price for planning, but not abatement, purposes).

186. *See e.g.*, *Building a Sustainable Energy Future*, SHELL.COM, http://tinyurl.com/mpdaeoq (last visited Jan. 23, 2015); Mathew Carr, *Shell May Boost Internal Carbon Price as Emission Rules Tighten*, BLOOMBERG.COM (May 30, 2014, 3:19 AM), http://tinyurl.com/l8qmldn; Joe Romm, *Shell Oil Self-Imposes Carbon Pollution Tax High Enough to Crash Coal, Erase Natural Gas's Value-Added*, THINKPROGRESS.ORG (Nov. 21, 2013, 5:36 PM), http://tinyurl.com/kk8odfg.

187. MS CARBON FEE, *supra* note 183, at 3, 6; *see also* BECOMING CARBON NEUTRAL, *supra* note 183, at 3. "Carbon neutral" means that Microsoft would contribute no emissions to the atmosphere, or that any emissions would be offset by verifiable offset programs for carbon sinks (such as planting trees, among other projects). MS CARBON FEE, *supra* note 183, at 19 ("Microsoft has established a corporate carbon neutral policy, meaning that we reduce our net emissions by 100 percent through investments in internal efficiency, green power, and carbon offset projects. Our subsidiaries are also establishing individual reduction targets.").

188. Telephone Interview with Robert Bernard, Chief Environmental Strategist, Microsoft Corp. (Jun. 4, 2014).

second goal came "directly" from the firm's Chief Financial Officer (CFO).[189]

1. *Setting the price*

In designing its carbon fee, Microsoft faced the same issue as public regulators of how to set the right level of "tax" (the carbon fee).[190] Rather than attempting to calculate the social cost of carbon, however, Microsoft adopted a much simpler system design.[191] Having first determined the overall goals for its emissions reductions projects—essentially, what it wanted to do with the money it would collect—Microsoft's sustainability team then determined the price based on how much money it would need to raise to reach that target.[192]

Microsoft wanted to set the fee in a way that was simple, and would not "shock the system," but that would maintain flexibility to increase the fee over time.[193] The fee charged to the firm's organizational divisions forces division leaders to think more deeply about the cost of emissions by raising the price of energy consumption, while simultaneously allowing Microsoft to raise funds for sustainability projects such as energy offsets and the purchase of Renewable Energy Certificates (RECs).[194] The total

189. *Id.*

190. If an internal market approach were nested within public regulation (such as a cap-and-trade system or a carbon tax), this concern would likely disappear, as the firm would be obligated to use the price set by the government (or the price resulting from the cap set by the government). A private firm could use a higher price if it wanted to establish itself as "greener" to exceed government requirements.

191. *See* INTERAGENCY WORKING GROUP ON SOCIAL COST OF CARBON, *supra* note 32 (explaining social cost of carbon).

192. MS CARBON FEE, *supra* note 183, at 4 ("[T]he price on carbon is determined by the total cost of the carbon fee fund investment strategy, which is set to meet the organizational carbon reduction policy objectives."). In essence, Microsoft follows three steps in an iterative process: first, devise a firm-wide strategy for carbon reduction; second, set the internal price on carbon to raise the funds necessary to achieve that goal; and third, develop a strategy for investing the funds generated by the fee. *Id.*

193. *Id.* at 23.

194. "Renewable Energy Certificates" (RECs) are "the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source." *Green Power Market: Renewable Energy Certificates*, EPA.GOV, http://tinyurl.com/cch3arx (last visited Jan. 23, 2015). According to the EPA's Green Power Partnership website, "[i]n early 2012, Microsoft purchased renewable energy credits (RECs) for the first time, totaling more than 1 billion kilowatt-hours (kWh) of green power. In 2013, Microsoft upped its use of renewable energy nearly 73 percent to 1,935,637,485 kWh annually. . . . In total, the

amount collected offsets the entire amount of Microsoft's emissions reductions projects.[195]

Simplicity has been key to the design: "[t]he ideal level at which to allocate the fee is a balance between ensuring that the groups responsible for the carbon emissions feel the financial impact of the fee (thereby making climate change a consideration in business decisions) and keeping the administrative burden manageable."[196] For different types of emissions, Microsoft allocates the fee by individual or by organizational division.[197] Unlike BP's internal emissions trading program, Microsoft's carbon fee incorporates no "grandfathering" of existing emissions.[198]

Microsoft has stated that it reconsiders the amount of the fee annually; however, after the first year of implementation, it did not change the fee.[199] For Fiscal Year 2015, however, Microsoft intends to increase the fee.[200] While Bernard declined to disclose the exact fee Microsoft charges, the CDP has reported it to be in the range of six to seven dollars per ton.[201] Bernard explained that Microsoft sets the fee by examining the price for carbon offsets.[202] After consulting with various NGOs, including CERES and the Natural Resources Defense Council, among others, Microsoft was able to identify what Bernard referred to as the "best of breed certification" for RECs and carbon offsets.[203] Those carbon offsets

company is purchasing U.S. green power equivalent to 80 percent of its U.S. electricity needs." *Green Power Leadership Awards: 2013 Award Winners*, EPA.GOV, http://tinyurl.com/kj7qyev (last visited Jan. 23, 2015). Microsoft is the number two purchaser of green power in the United States, behind the Intel Corporation. MS CARBON FEE, *supra* note 183, at 34; *Green Power Leadership Awards: 2013 Award Winners*, EPA.GOV, http://tinyurl.com/kj7qyev (last visited Jan. 23, 2015).

195. Telephone Interview with Robert Bernard, *supra* note 188.

196. MS CARBON FEE, *supra* note 183, at 24.

197. *Id.* at 26.

198. *Id.* at 5.

199. *Id.* at 6, 33 (noting that Microsoft retained the fee level but altered its investment strategy).

200. Telephone Interview with Robert Bernard, *supra* note 188.

201. CDP, GLOBAL CORPORATE USE OF CARBON PRICING: DISCLOSURES TO INVESTORS, *supra* note 101, at 13; Valerie Volcovici, *Major Companies Plan for U.S. Carbon Emissions Fee, Report Says*, REUTERS.COM (Dec. 5, 2013, 11:44 AM), http://tinyurl.com/kek3823 (discussing pricing of carbon by firms). Notably, the six to seven dollars per ton figure is considerably lower than the price used by U.S. firms that use an internal carbon price for planning purposes only in anticipation of future regulation. See *id.* at 10 (citing figures ranging from six dollars per ton to eighty dollars per ton).

202. Telephone Interview with Robert Bernard, *supra* note 188.

203. *Id.*

tend to range from four to eleven dollars per ton of carbon.[204] In addition to the price of carbon offsets or RECs, the total fee must pay for administrative costs of running the program. Finally, the fee supports a new "grant" program at Microsoft called the Plowback Fund, which allows Microsoft to support energy efficiency and carbon reduction programs and improvements that do not otherwise meet Microsoft's internal return on investment criteria.[205]

2. *Scope of the program*

As with public carbon taxes, private firms must determine which emissions fall within the scope of the program.[206] Because Microsoft is a global firm, the fee obligation crosses national borders. Thus, the fee is different from a traditional public carbon tax, and in fact, potentially has a broader transnational scope that can reach more emissions. In Fiscal Year 2013, for example, Microsoft assessed the fee in more than 100 countries, on fourteen different divisions within the firm.[207] It is important to note, however, that Microsoft's fee does not apply to all of its emissions, but is limited to its data centers, software development labs, offices, and employee business air travel.[208]

3. *Administration and enforcement*

Just as public regulators must decide which agency (for example, a taxing authority or an environmental protection agency) should administer a carbon tax, private firms face the same choice. Microsoft determined that its Environmental Sustainability team, in partnership with the Corporate Finance department, would administer the fee.[209] Microsoft highlighted the importance of involving the corporate finance department to avoid siloing the program as a "sustainability" measure, rather than a strategic financing and accounting measure.[210]

In terms of how to collect and administer the fee, Microsoft

204. *Id.*
205. *Id.*
206. *See supra*, Part II.C.2.
207. MS CARBON FEE, *supra* note 183, at 7.
208. *Id.* at 3, 6. *See also* BECOMING CARBON NEUTRAL, *supra* note 183, at 3.
209. MS CARBON FEE, *supra* note 183, at 7.
210. Telephone Interview with Robert Bernard, *supra* note 188.

faced a similar choice as public regulators: whether to use an existing administrative system or to create a new one to collect the fee. Just as government regulators could rely on an existing tax system to collect a carbon tax, Microsoft uses its existing "chargeback" system to allocate and collect the fee.[211] This reduces administrative costs related to running the system.[212]

In addition, designers of a carbon tax must determine how frequently to charge the fee: annually, less often (such as in the RGGI's three-year "truing up" period), or more often (for example, quarterly); and whether the charge should be based on actual (past) or predicted (estimated future) emissions. Charging the fee more frequently has the advantage of forcing decision makers to take the cost of emissions into account more actively in routine decision making. However, a quarterly charge may require the use of predicted emissions, if data on actual usage is not available. Assuming that actual emissions may differ from predicted emissions, charging the fee quarterly (or based on predicted emissions) would require "truing up" later and making corrections to amounts assessed. Charging the fee less frequently imposes fewer administrative burdens and does not raise the same estimation problem.

Microsoft ultimately determined that it would assess the fee quarterly.[213] Each quarter, the organizational divisions obligated under the program are charged a fee reflecting "projected emissions based on historical performance and projected growth rates from the primary consumers," and the divisions then "pay their allotted fee from their own budgets through an internal transfer into the Carbon Neutral Fee fund, which is used to invest in green initiatives."[214]

Compliance for Microsoft's internal carbon fee program incorporates information disclosure, increasing the transparency of the program. In addition to internal reporting, Microsoft uses public reporting to external stakeholders.[215] This includes publishing data internally and externally about the firm's emissions, such as with the CDP.[216] Such stakeholder accountability

211. MS CARBON FEE, *supra* note 183, at 24.
212. *Id.*
213. *Id.* at 29.
214. *Id.*
215. *Id.* at 27-28.
216. *Id.* at 31-32.

can improve performance and program durability.

4. *Lessons from Microsoft's carbon fee*

In the first year of the program (June 2012-June 2013), Microsoft achieved significant environmental results.[217] By June 2013, Microsoft had met its pledge to become carbon neutral in its data centers, software development labs, offices, and in employee business air travel.[218] Most of that progress resulted from purchases of renewable energy.[219] By June 2013, Microsoft reduced its emissions by nearly a million metric tons.[220] This represented an eighty-two percent reduction in net emissions as compared to 2011.[221]

According to Bernard, Microsoft's carbon fee has been successful because "it is not command-and-control, but empowerment."[222] The fee drives not only accountability, but also perception and behavior change.[223] The distribution of the fee enables awareness and innovation, which Microsoft expects will have a greater impact than a centralized or siloed approach.[224] Just as public environmental market solutions like carbon taxes and cap-and-trade are valued for their ability to stimulate innovation within the business community, the internal carbon fee empowers individual managers and organizational divisions to be creative and innovative to reduce emissions. Quantifying emissions and the associated price can also "align" business decisions with the firms' "code of ethics," and permit environmental impacts to play a role in driving business decisions.[225]

Microsoft has noted that its internal emissions fee can aid in most efficiently meeting any applicable public environmental law standards to reduce emissions in different countries in which

217. AMY CUTTER ET AL., NATURAL RES. DEF. COUNCIL, FULFILLING THE RIO+20 PROMISES 32 (2013), *available at* http://tinyurl.com/l27frwu.

218. *Id.* (citing Microsoft representatives' self-assessment).

219. *Id.* at 32 (discussing MS's investment in renewable energy projects and increasing efficiency of operations); MS CARBON FEE, *supra* note 183, at 31-32.

220. CUTTER ET AL., *supra* note 217, at 32 (noting MS's reduction of emissions by almost one million metric tons).

221. *Id.* at 32.

222. Telephone Interview with Robert Bernard, *supra* note 188.

223. *Id.*

224. *Id.*

225. MS CARBON FEE, *supra* note 183, at 9.

Microsoft operates as a global firm.[226] The internal emissions fee also helps Microsoft to enhance its reputation among stakeholders, including investors who follow sustainability indexes and the CDP's reports, among others.[227]

Microsoft's advocacy of an internal market sounds very different from BP's in one key arena. BP used an internal cap-and-trade system to reduce its own emissions, and also to prepare for the possibility that it would be subject to an external cap-and-trade system in the future. As the following discussion indicates, clear strategic benefits exist for Microsoft arising out of its use and promotion of an emissions fee approach. Indeed, Microsoft's public literature expressly advocates that other firms consider adopting this approach and provides a blueprint for those firms to do so. Many of Microsoft's suggestions for how to administer the fee and to reduce emissions in response to the fee would create new customers for Microsoft's core business of software and technology.

For example, Microsoft advocates that other firms use Microsoft teleconferencing software to reduce their business travel-related emissions.[228] To monitor and report energy use and consumption, firms are advised to use a suite of Microsoft software products.[229] If a firm wishes to purchase RECs, carbon credits, or other sustainable investments, Microsoft hosts a platform for such transactions on its cloud.[230] Finally, Microsoft advises firms seeking to reduce their emissions to switch to cloud computing (a service that Microsoft provides).[231]

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226. *Id.* at 9-10 (citing the EU-ETS and California's AB-32, among others).

227. *Id.* at 10.

228. MS, BECOMING CARBON NEUTRAL, *supra* note 183, at 9 (noting increased use of MS Lync to reduce air travel).

229. MS CARBON FEE, *supra* note 183, at 16. The report states: "In early 2012, Microsoft selected a cloud-based emissions inventory solution [by Envizi], based on Microsoft platform technology, to manage our emissions data. This data management solution holds emissions data from more than 600 facilities across more than 100 countries and provides distributed visibility into our emissions inventory." *Id.* at 16, 36.

230. *Id.* at 36. Microsoft explains: "An organization taking advantage of the cloud is the Carbon Trade Exchange (CTX). The CTX Trading Platform, hosted on the Microsoft cloud, provides real-time trading and instantaneous clearing and settlement mechanisms for environmental units—such as carbon credits, renewable energy certificates (RECs), and water allocation rights—making it easier for businesses of all sizes to invest in sustainable, clean-tech, and energy-efficient projects around the world in support of a more efficient and low-carbon economy." *Id.*

231. *Id.* ("When organizations move business applications to the cloud, their energy use and carbon footprint per user reduce by at least 30 percent.") (citing ACCENTURE &

Microsoft's advocacy that other firms switch to cloud computing to reduce emissions is particularly noteworthy, because Microsoft contends that this switch can result in a thirty percent overall drop in emissions.[232] Arguably, switching to cloud computing could just lead to "leakage" in that the same emissions would simply shift to Microsoft's books from the original firm's books. But according to Bernard, because of economies of scale, certain overall energy savings arise when other firms switch to cloud computing. He explains that on average when a small business using 100 units of energy switches to cloud computing through Microsoft, Microsoft's emissions increase by ten to seventy units. A larger business enterprise using 100 units of energy that switches to cloud computing likewise increases Microsoft's emissions by up to seventy units.[233] However, Bernard points out that because Microsoft has committed to being net zero in its data centers, Microsoft offsets all of these emissions.[234] Thus, even if there were some emissions "leakage," there is a net reduction in overall emissions.[235]

This synergy between Microsoft's core business strategy of software development and cloud computing, and its continued use of the carbon fee may not always be an option for private business firms. For example, the business advantage to BP from adopting its internal emissions trading scheme is less clear. But Microsoft's synergy highlights how thinking beyond short-term carbon emissions reduction targets is worthwhile. It also demonstrates that a carbon fee whose price does not "shock the system" may be more "politically" palatable over a longer term, especially when that fee is expressly designed to raise money for energy efficiency programs from which all constituencies benefit. Finally, Microsoft's continuing use of the carbon fee sends the "expressive" message that private firms have responsibility to the environment, even in

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WSP, CLOUD COMPUTING AND SUSTAINABILITY: THE ENVIRONMENTAL BENEFITS OF MOVING TO THE CLOUD 5 (2010), *available at* http://tinyurl.com/oe878ds).

232. MS Carbon Fee, *supra* note 183, at 36.

233. Bernard's assertions are based on a study prepared by Accenture and WSP Environment and Energy of Microsoft's Cloud. *See* ACCENTURE & WSP, *supra* note 231; *see also* CDP, CLOUD COMPUTING: THE IT SOLUTION FOR THE 21ST CENTURY 13 (2011), *available at* http://tinyurl.com/klu4v4o (concluding that the likely increase in cloud computing over the next decade could save 85.7 million tons of carbon emissions by 2020 due to the increased efficiency of large scale data centers).

234. Telephone Interview with Robert Bernard, *supra* note 188.

235. *Id.*

the absence of a mandatory carbon tax.[236]

IV. NORMATIVE IMPLICATIONS

This close examination of the public and private use of markets and hybrid market approaches to reduce greenhouse gas emissions highlights several important lessons about what methods are best for setting environmental standards and who should be setting those standards. It also raises questions about how public and private actors should think about the interaction effects between public law and private environmental governance.

First, the above case studies demonstrate that public regulators and private firms face common design issues in establishing carbon fees and emissions trading schemes. In a world in which there are few extant examples of either public or private market approaches to address climate change, a dialogue between public and private actors may lead to improved design. While there is a great deal of scholarship arguing that public regulators should seek to encourage private actors to protect the environment, it is equally important for public regulators to recognize lessons from the private sector for the design of public regulations.

For example, both BP and Microsoft determined that setting up these programs as a feature of core business strategy, rather than solely an issue of health, safety, and environmental compliance, was essential to the integration of these programs into firm decision making. In order to achieve that end, both firms made sure that those managing the system were integrated within the firm's core business functions, such as individuals from the finance department, rather than solely environmental, health, and safety professionals. There is a lesson for public regulators here. Perhaps, instead of EPA being the sole administrator of public market environmental regulations, EPA should share jurisdiction with another agency that has authority over (and credibility with) the financial side of business firms, such as the Securities and Exchange Commission, the Commodity Futures Trading Commission, or the Internal Revenue Service.[237] That step may be

236. To be sure, as a multi-national corporation, Microsoft may be subject to carbon emissions regulatory regimes outside of the United States; however, in the United States no such federal-level carbon emissions limitations exist for technology firms.

237. *Cf.* Leo Mensah, Note, *Missed Opportunity: Excluding Carbon Emissions Markets From Comprehensive Oversight*, 38 WM. & MARY ENVTL. L. & POL'Y REV. 795, 799-800 (2014) (arguing that the United States CFTC should have regulatory power over the carbon

both practical and expressive. It is practical because it puts agencies with financial expertise and credibility in charge of market solutions (jointly with the EPA). It is expressive because such an approach would send the message that emissions reduction is a business function and obligation, not "merely" an environmental aspiration.

Second, the above analysis demonstrates that recognizing these private markets as part of a wider global environmental governance regime can reveal new avenues to address environmental problems.[238] Just as private firms expressly seek to gain experience with how future public regulatory regimes might work, or to influence public policy based on their experience with private markets, public regulators should take note of the significant impact that private markets can have in this arena—especially when adopted by multinational firms where the private market mechanisms can have a global impact. For example, the current proposed Clean Power Plan suggests that states may rely on existing *state* and *regional* (public) market mechanisms to reach their carbon emissions reduction targets.[239] Given the potential significance of private markets in this arena, the final Plan should expressly permit states to encourage *private* environmental governance solutions to achieve those targets as well. In order to encourage firms to adopt such voluntary programs, government regulators may want (or need) to commit credibly that these firms would not be penalized by subsequent regulatory actions (such as choosing a later baseline year or using a cap-and-trade system that distributes allowances based on grandfathering) for being "early movers." Government regulators should also think carefully about using technology-based prescriptive standards to achieve their goals. Government selection of prescriptive rules is likely to discourage the use of private governance solutions employing

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emissions market to ensure efficient pricing, and to prevent fraud and manipulation, but not raising the issue of promoting environmental action as a core business strategy); Benjamin J. Richardson, *Enlisting Institutional Investors in Environmental Regulation: Some Comparative and Theoretical Perspectives*, 28 N.C. J. INT'L L. & COM. REG. 247, 317 (2002) (arguing that regulators of financial institutions should integrate environmental policy into financial services regulation in order to incentivize environmentally sensitive investment); BENJAMIN J. RICHARDSON, ENVIRONMENTAL REGULATION THROUGH FINANCIAL ORGANISATIONS: COMPARATIVE PERSPECTIVES ON THE INDUSTRIALIZED NATIONS (2002) (arguing the same point as above).

238. Light & Orts, *supra* note 1, at 9 (discussing multiple forms of public and private environmental governance as a single global environmental governance regime).

239. *See supra* Section II.B.2.a.

market approaches within firms, while other types of government regulation, including prescriptive performance-based standards, property rights, public market approaches, and informational governance may encourage (or at least permit) firms to adopt private market solutions. If individual firms covered under the Plan used private markets to achieve greater energy efficiency (the first "building block" under the Clean Power Plan), or if a private NGO set up an inter-firm carbon trading regime among covered entities, they could likewise have a significant impact in reducing emissions and meeting the targets set forth in the Plan.

Third, beyond environmental impacts and effectiveness, private environmental governance sends an expressive message.[240] It signals that private firms have a role to play in combating climate change—not merely because the law requires it, but because it is part of the firm's core business strategy or simply because it is the right thing to do. It thus can create an environmental ethic within firms that business managers have a public responsibility as well as a private role to play with respect to the environment. In addition, private markets within the firm can create stakeholders for wider markets—both public and private (such as inter-firm or industry-wide). For example, if a firm using an internal cap-and-trade system has plucked all of the so-called "low-hanging fruit" within the firm to reduce its emissions, and the internal price of allowances is rising, firm managers may realize that there would be efficiency gains from trading with other firms who may have different, higher, marginal costs of abatement. In addition, while there are undoubtedly reputational benefits for firms that adopt internal market approaches, firm managers may prefer a level playing field among all firms in their industry with respect to the added costs imposed by internalizing the externalities of emissions.

With this in mind, Victor and House's insight that BP's internal cap-and-trade scheme was most successful in focusing firm managers' attention on emissions reduction becomes all the more important. The allocation of time and attention of business firm managers matters—whether that attention is focused because of public regulation or private environmental governance. It sends the message to the business unit managers who are actually in a position to reduce emissions that they must incorporate emissions reductions—a business goal—into their decision making. This

240. *See generally* sources cited *supra* note 49 (discussing expressive content of the law).

communicates that protecting the environment is valued within the firm. And, it is valued not only because the law requires it, but for broader reasons.

Perhaps an analogy is appropriate. When the National Environmental Policy Act (NEPA) was enacted, there was a well-founded perception that federal agencies were not taking into account the environmental impacts of their actions.[241] Agencies were ignoring environmental impacts in order to implement their primary statutory mandates. NEPA helped to create what Eric Biber has called "multiple-goal agencies."[242] Agencies were, for the first time, required to consider whether actions taken pursuant to their primary mandates—such as dredging canals, building levees, financing the construction of roads, or permitting the siting of power lines—would have a significant impact on the environment.[243] NEPA was "action-forcing" in that it legally required agency decision makers to focus their time and attention on environmental impacts. Private environmental governance can have a similar impact by creating "multiple goal managers."

This positive story is, of course, not the only story to tell. An alternative, more negative view of private markets exists. Under that view, private markets (like any other instrument) are merely "greenwashing" designed to create a public perception of environmental performance. When push comes to shove, however, the firm can stop the program at any time.[244] In contrast, because a public law is mandatory, it does not rely on the good will of managers to appreciate the strategic advantages of using an internal carbon market. Indeed, BP's example is both a success story (in that BP achieved its carbon emissions reduction goal years ahead of schedule) and a cautionary tale (in that BP ended the program). This more pessimistic view sees private environmental governance—including private markets—as inadequate when firm managers are driven by a profit motive.[245] BP's decision to

241. *See generally* Light, *NEPA's Footprint*, *supra* note 7, at Part I.

242. Eric Biber, *Too Many Things to Do: How to Deal with the Dysfunctions of Multiple-Goal Agencies*, 33 HARV. ENVTL. L. REV. 1, 3 (2009).

243. Light, *NEPA's Footprint*, *supra* note 7, at 513-14.

244. *Cf.* Steinzor, *supra* note 29, at 175-80 (raising concerns about the durability and accountability of market-based government regulation).

245. Light & Orts, *supra* note 1, at 52 (citing Milton Friedman, *The Social Responsibility of Firms is to Increase Profits*, N.Y. TIMES MAGAZINE, Sep. 13, 1970, at 32); Steinzor, *supra* note 29, at 175-180 (arguing that prescriptive regulation is necessary because firm managers have incentives that are not aligned with environmental protection).

halt its internal cap-and-trade program thus played directly into the hands of critics of private markets and private environmental governance more broadly. Yet these business realities are not so different from the political realities that led New Jersey to withdraw from RGGI, and Australia to abandon its public carbon tax. As in public regulatory regimes, there are feedback mechanisms that come into play in private environmental governance. Stakeholders can punish firms that fail to live up to their commitments. For example, after the BP Oil Spill in the Gulf of Mexico, consumers boycotted BP gas stations choosing to purchase their gas elsewhere.[246]

V. CONCLUSION

So where does this leave us? First, it is essential to recognize that there are many forms of private environmental governance, and that those forms can be evaluated along different normative dimensions. Some forms—involving contractual obligations in supply-chain contracts, or third-party certifications—may be more durable, achieve greater accountability, or possibly transparency than intra-firm markets and hybrid approaches. However, if these contract-based approaches incorporate "prescriptive" standards, they may reduce incentives for innovation, or be less efficient than other approaches. From the perspective of environmental effectiveness, efficiency, and one view of taking expressive considerations into account, the private environmental market and hybrid market approaches I have addressed here may have an important role to play. In addition, as the Article demonstrates, these private environmental market and hybrid market approaches have the potential for global, transnational impact—especially if employed by major multinational firms.

Ultimately, there may be no single "best" solution to the challenges of climate change, taking all normative considerations into account. In fact, it is likely the case that a combination of approaches is valuable. Using public and private environmental governance in concert can be synergistic and may provide the best hope to reduce the impact and severity of climate change. Furthermore, such action will send the message that everyone—

246. Sarah Wheaton, *Protesters Gather at BP Gas Stations*, N.Y. TIMES, Jun. 2, 2010, *available at* http://tinyurl.com/33ok4mc ("Protests at BP gas stations have sprouted around the world, with events scheduled at franchises from Berlin to Concord, Calif. And almost 300,000 people have joined a 'Boycott BP' group on Facebook.").

including business firms—has a responsibility to act.