PUTTING A PRICE ON CARBON: THE METAPHOR

BY
DAVID M. DRIESEN*

This Article analyzes the characterization of pollution taxes and so-called cap-and-trade programs addressing greenhouse gas emissions as policies that "put a price on carbon," a characterization that has come to dominate both policy discussion and much modern scholarship on environmental instrument choice. It explains that the rationale for characterizing cap and trade as putting a price on carbon suggests that analysts should likewise treat traditional regulation as a mechanism putting a price on carbon.

Treating "market-based mechanisms" as uniquely putting a price on carbon reflects and perpetuates a tendency to see markets and government as antonyms—with markets operating through price, and governments operating through coercion—even though markets and governments are intimately intertwined and use a variety of tools. This Article shows that an informed third generation debate about instrument design and choice should focus on understanding price's limits as a coordinating tool, including the appreciation of potential conflicts among the values price is thought to serve.

* University Professor, Syracuse University. J.D. Yale Law School, 1989. The author wishes to thank Joe Frateschi and Nicholas Cortese for research assistance. He thanks Timo Goeschl, the other participants in the 2014 meeting of the Society for Environmental Law and Economics and the attendees of the Syracuse University College of Law workshop for helpful comments. Any errors, however, belong to the author.

I. INTRODUCTION

In recent years, policy analysts have emphasized the need to "put a price on carbon."[1] And contrary to what analysts usually said years ago, they made clear that not only a carbon tax, but also an emissions trading program, puts a price on carbon.[2] Newspapers picked up on the analysts' rhetoric and began characterizing emissions trading as putting a price on carbon in published stories, helping make this way of characterizing emissions trading quite common by the time the House of Representatives passed the Waxman–Markey bill, which proposed an environmental benefit trading program—conventionally characterized as a cap-and-trade program—to regulate greenhouse gas emissions.[3]

---

1 *See, e.g.*, Paul Krugman, *Who Cooked the Planet?*, N.Y. TIMES, July 26, 2010, at A23 (linking the failure to "put a price on carbon" by passing a cap-and-trade bill to conservatives' insistence that the economy would collapse if we did so).

2 *See* ANDREW E. DESSLER & EDWARD A. PARSON, THE SCIENCE AND POLITICS OF GLOBAL CLIMATE CHANGE: A GUIDE TO THE DEBATE 108 (2006) (describing both emission fees and cap and trade as putting a price on each ton of greenhouse gases emitted); H.J. Cummins, *Price of Pollution: Scholars at this Year's Nobel Conference Were Emphatic Global Warming is Real, and a Solution is Needed—Now*, MINNEAPOLIS STAR TRIB., Oct. 5, 2007, at 1D, *available at* 2007 WLNR 19713085 (quoting Massachusetts Institute of Technology economist Paul Joskow's characterization of emissions trading as putting a price on carbon); Dirk Forrister & Paul Bledsoe, *Pollution Economics*, N.Y. TIMES, Aug. 10, 2013, at A19 (describing a trading bill that the House approved in 2009 as "put[ting] a price on fossil-fuel emissions"); Jeffrey D. Sachs, *Pay for it Now or Pay for it Later*, TORONTO GLOBE & MAIL, June 19, 2006, at A13 (characterizing "cap and trade" as putting a price on carbon).

Although I use the term "emissions trading" for the sake of concreteness, the points made herein apply to any program that trades environmental benefits, not only to programs trading emissions of air pollutants. *See* David M. Driesen, *Free Lunch or Cheap Fix? The Emissions Trading Idea and the Climate Change Convention*, 26 B.C. ENVTL. AFF. L. REV. 1, 33 (1998) (noting that the Kyoto Protocol went beyond "emissions trading" to create more amorphous "environmental benefit trading" programs by allowing carbon sequestration credits).

3 *See, e.g.*, Matt Viser & Beth Daley, *Climate Consensus Collapses in Senate: Kerry's Bill on Hold After GOP Ally Bolts*, BOSTON GLOBE, Apr. 25, 2010, at 1, *available at* 2010 WLNR 8541467 (describing John Kerry's Senate bill, based on cap and trade, as one that "would put a price on carbon emissions"); *National Mission*, Editorial, N.Y. TIMES, June 21, 2010, at A28 (Andrew Rosenthal ed.) (arguing that President Obama should strongly advocate a "cap-and-trade system" in order to "put a price on carbon emissions"). A Westlaw search reveals that more than 50% of U.S. news stories used a pricing characterization when describing cap-and-trade bills in 2009–2010 and the search term "price w/2 carbon" appeared more commonly than "cap w/2 carbon" or any other search term used.

I refer to the Waxman–Markey bill as a so-called cap-and-trade bill, because it did not propose to cap all sources of credits that could be used to fulfill capped sources' pollution control obligations. Thus, it was not a pure cap-and-trade program, like the acid rain program, but rather, a hybrid that combined some features of cap and trade with earlier offset programs. *See* DAVID M. DRIESEN, ROBERT W. ADLER, & KIRSTEN H. ENGEL, ENVIRONMENTAL LAW: A CONCEPTUAL AND PRAGMATIC APPROACH 310–13 (2d ed. 2011) (explaining that trading programs addressing climate disruption conform to a hybrid, rather than a cap-and-trade, model).

Amongst economists, equating emissions trading and taxation amounts to praise of emissions trading.[4] Economists view pricing negative "externalities" as an efficient means of correcting "market failure."[5] But few Americans share economists' enthusiasm for taxation of any kind.[6] Political opponents of greenhouse gas abatement seized on the pricing rhetoric and began castigating emissions trading as a tax.[7] This characterization brought carbon abatement through emissions trading within the crosshairs of anti-government and anti-taxation sentiment in the United States, thereby contributing to Waxman–Markey's defeat in the Senate (probably to the chagrin of most analysts, many of whom have come to recognize climate disruption as a serious problem requiring a remedy, with emissions trading high on their list of preferred approaches).[8]

This Article examines the meaning of "putting a price on carbon." Some of the older environmental policy literature on instrument choice distinguishes between a pricing mechanism, like a pollution tax, and a quantitative mechanism, like an emissions trading program.[9] This distinction suggests a question: Is the characterization of emissions trading as a mechanism for pricing carbon a technical error? On the other hand, if the pricing characterization properly applies to emissions trading, might it also

---

4 *See* Martin L. Weitzman, *Prices v. Quantities*, 41 REV. ECON. STUD. 477, 477 (1974) (noting that economists generally have "a vague preference toward indirect control by prices").

5 *See, e.g.*, Todd Strauss & John A. Urquhart, *Energy Prices and Environmental Costs*, *in* THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY 217, 220–21 (Marian R. Chertow & Daniel C. Esty eds., 1997) (pointing out that the "failure to price" energy use's "environmental effects" compromises market efficiency, and characterizing pollution taxes as "the simplest . . . way" to fix this).

6 *See* BURTON RICHTER, BEYOND SMOKE AND MIRRORS: CLIMATE CHANGE AND ENERGY IN THE 21ST CENTURY 196 (2010) (advocating calling a carbon tax a fee because calling it a tax hurts it politically).

7 *See* Jeffrey Simpson, *Case of the Conservatives' Carbon Amnesia*, TORONTO GLOBE & MAIL, Sept. 21, 2012, *available at* http://www.theglobeandmail.com/globe-debate/case-of-the-conservatives-carbon-amnesia/article4557581/ (discussing Canada's Conservative Party's "attack machine" denouncing a cap-and-trade approach as a "carbon tax"); Matt Viser, *Energy Measure Would Cut Deficit by $19b, Report Says*, BOS. GLOBE, July 8, 2010, at 8, *available* at 2010 WLNR 13651134 (noting that opponents of a cap-and-trade system have attacked it as a "tax").

8 *See* WILLIAM NORDHAUS, A QUESTION OF BALANCE: WEIGHING THE OPTIONS FOR GLOBAL WARMING POLICIES 2–3 (2008) (arguing that climate disruption is a serious issue); Edward A. Parson & Eric L. Kravitz, *Market Instruments for the Sustainability Transition*, 38 ANN. REV. ENV'T & RESOURCES 415, 425 (2013) (mentioning Waxman–Markey's failure in the Senate); *see, e.g.*, Wayne Slater, *Where Perry Fits on Climate Proposal*, DALL. MORNING NEWS, June 6, 2010, at A03, *available at* 2010 WLNR 11571963 (explaining Texas Governor Rick Perry's claim that "cap-and-trade" legislation "would put a price on carbon . . . kill jobs and raise energy costs").

9 *See* WILLIAM A. PIZER, PRICES VS. QUANTITIES REVISITED: THE CASE OF CLIMATE CHANGE (1997), *available at* www.rff.org/documents/RFF-DP-98-02.pdf (applying the distinction between price and quantity measures to climate policy instruments); Robert N. Stavins, *Correlated Uncertainty and Policy Instrument Choice*, 30 J. ENVTL. ECON. & MGMT. 218, 219–20 (1996) (describing discussions of the comparative advantage of price and quantity instruments as part of a "standard analysis" found in the economics literature); Weitzman, *supra* note 4, at 477 (drawing a general distinction between price and quantity mechanisms); Jonathan Baert Wiener, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 704–05 (1999) (distinguishing price, quantity, and conduct instruments).

apply to traditional regulation—often called command-and-control regulation—which, like trading, restricts the quantity of pollution emitted? Analysis of these questions reveals that the pricing language serves as more of a metaphor than a technical description, and uncovers some of the questions at stake in conceptualizing some cost-imposing mechanisms but not others as "pricing carbon."

This Article shows that the pricing rubric supports a conception of markets and government as antonyms, rather than as overlapping institutions. It also bolsters a discourse that glorifies price—and therefore markets—as uniquely capable of spurring innovation, effectively addressing environmental problems, and supporting private autonomy. I argue that this market essentialism tends to undermine governmental institutions that must function well if we are to have a good society—including effective markets—and tends to obscure questions that we must address in order to effectively choose and design environmental protection instruments.

In making this argument, I do not mean to suggest that economists involved in this debate consciously intend to glorify markets at the expense of government. Indeed, many of them understand that governments play an important role in market-based mechanisms and in markets more generally. Nevertheless, the conventional ways of characterizing emissions trading, especially in materials likely to come to the attention of policy makers—such as introductions to literature reviews on the subject—have the tendencies I identify.

This Article calls for a subtle third generation debate on instrument choice and design that goes beyond glorifying or demonizing markets by asking questions about price's capabilities and limitations that can illuminate environmental policy and law.[10] To some extent, that debate has already begun, but a sharp awareness of the limits of price would help move it forward.[11]

Part I begins with a review of the basics of pollution taxes, environmental benefit trading, and traditional regulation. It discusses the

---

10 The environmental literature usually treats the first generation of environmental law as beginning with the adoption of major federal statutes in the 1970s. *See, e.g.*, THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY 1, 4 (Marian R. Chertow & Daniel C. Esty eds., 1997) (contrasting the "next generation" with the environmental policies of the 1970s and 1980s). By the 1990s, environmental law entered a second generation, which featured increasing use of economic tools, including emissions trading. *See id.* at 11 (lauding the acid rain trading program as an exemplar of second generation policy); BEYOND ENVIRONMENTAL LAW: POLICY PROPOSALS FOR A BETTER ENVIRONMENT xix (Alyson Flournoy & David M. Driesen eds., 2010) (characterizing the first generation as being based on complex statutes and the second as being marked by reforms ostensibly aimed at enhancing economic efficiency). I use the term "third generation" both because two previous twenty-year periods have elapsed since the early 1970s and because the new questions I suggest involve a response to one of the major economic reforms that had become well entrenched by the 1990s. *See id.* (noting in 2010 that we were reaching the end of the second generation of environmental law).

11 *See, e.g.*, Timo Goeschl & Grischa Perino, *Instrument Choice and Motivation: Evidence from a Climate Change Experiment*, 52 ENV'T & RESOURCE ECON. 195 (2011) (offering experimental evidence that pricing policies crowd out intrinsic motivation to reduce greenhouse gas emissions).

evolution away from a quantity–price distinction in the literature, toward a pricing characterization of environmental benefit trading.

The stage thus set, Part II critically analyzes the price-on-carbon characterization. It shows that the custom of characterizing trading as involving price relies on an inconsistent analysis of taxing and trading, thus suggesting that something more subtle than technical analysis explains the evolution from a quantity–price distinction to a literature emphasizing pricing characteristics. It also shows that the features of trading that support characterizing emissions trading as a pricing mechanism also support characterizing traditional regulation as a pricing mechanism.

This recognition that the pricing rhetoric does not perform a merely technical function suggests that selective use of the pricing characterization performs a quasi-ideological function of supporting market essentialism, which treats markets as independent of government, rather than dependent upon it, and glorifies markets as having unique virtues unrelated to how government performs. Part III discusses this quasi-ideology and shows that recognizing that price's virtues must have some limits opens up questions that could lead to a fruitful third generation debate on instrument choice and design.

II. INSTRUMENT CHOICE AND PRICE'S ROLE IN THE LITERATURE

This section lays the groundwork for analysis of the price-on-carbon characterization by describing the environmental instruments of pollution taxes, emissions trading, and traditional regulation. It then discusses the treatment of these instruments' relationship to price in the instrument choice literature.

A. Taxes, Trading, and Traditional Regulation

Taxation serves as many economists' preferred environmental protection instrument.[12] The idea of taxation follows directly from economists' conception of environmental problems as "market failures."[13] They view environmental harm as a "cost" of production and consumption.[14] Unfortunately, conventional markets do not internalize this cost; for example, power plant owners do not take into account the harms pollution causes in deciding how much electricity they produce or how to produce it.[15] Pollution constitutes the quintessential example of an external cost—

12 *See, e.g.*, Frank S. Arnold, *The Economist's Perspective: Why There Are No Pollution Taxes*, ENVTL. F., Mar.–Apr. 1998, at 14 (explaining that economists "hold pollution taxes in near reverential regard").

13 *See id.*

14 *See* JOHN M. GOWDY, MICROECONOMIC THEORY OLD AND NEW: A STUDENT'S GUIDE 80–81 (2010) (describing damages from pollution as part of production's true social cost).

15 *Cf.* E. Kareda et al., *Internalizing of External Cost in Electricity Generation*, 24 OIL SHALE 175, 176–77 (2007) (discussing how external costs can be internalized).

meaning a cost external to the market.[16] Taxing pollution provides the most straightforward solution from an economic perspective because it forces producers and consumers to internalize the costs associated with its harms.[17] In theory, an optimal tax equals the dollar value of the environmental harms the pollution causes, although in practice, analysts cannot reliably calculate such an optimum because of scientific uncertainty about pollution's effects and weaknesses in monetization techniques.[18]

With or without optimization, a pollution tax cost-effectively reduces emissions. The costs of pollution control often vary among facilities.[19] Because of this variation, producers will reduce pollution efficiently if the pollution control efforts focus primarily on those with the cheapest pollution abatement options. A tax provides an incentive that encourages those with the cheapest abatement options to lower their emissions.[20] To see this, imagine that the government levies a $100 per ton tax on owners of two polluting facilities, which we will call Cheap and Expensive. At Expensive, the marginal cost of pollution control equals $120 per ton of the taxed pollutant.[21] At Cheap, the marginal cost of pollution control equals $80 per ton of pollution. Presumably, the owner of Expensive would choose to pay the $100 tax and not reduce emissions at $120 per ton, but the owner of Cheap would choose instead to make emission reductions at $80 per ton in order to escape the obligation to pay a $100 per ton tax. The taxation of

16 *See* GOWDY, *supra* note 14. (using pollution damages to illustrate the externality concept).

17 *See* Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea*, 18 ECOLOGY L.Q. 1, 7 (1991) (describing pollution charges as forcing firms to internalize pollution costs).

18 *See* Natalia Andronova et al., *The Concept of Climate Sensitivity: History and Development*, *in* HUMAN-INDUCED CLIMATE CHANGE: AN INTERDISCIPLINARY ASSESSMENT 5, 15 (Michael E. Schlesinger et al. eds., 2007) (discussing various types of uncertainty in climate models); Gary W. Yohe, *Lessons for Mitigation from the Foundations of Monetary Policy in the United States*, *in* HUMAN-INDUCED CLIMATE CHANGE: AN INTERDISCIPLINARY ASSESSMENT, *supra* at 294 (suggesting that uncertainty justifies avoiding intolerable impacts even though it defeats reliable cost–benefit calculation); Robert S. Pindyck, *Climate Change Policy: What Do the Models Tell Us?*, 51 J. ECON. LITERATURE 860, 861 (2013) (finding integrated assessment models at the base of climate disruption cost–benefit analysis "close to useless as" policy analysis tools); Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255, 2257, 2283 (2002) (noting that the "exceedingly wide range" of plausible numbers of lives saved through EPA's arsenic regulation does little to discipline policy judgment). *See generally* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004) (discussing the limits of monetization techniques); FRANK ACKERMAN & ELIZABETH A. STANTON, CLIMATE ECONOMICS: THE STATE OF THE ART 129 (2013) (discussing key ecological uncertainties limiting cost–benefit analysis of greenhouse gas abatement).

19 *See* Robert N. Stavins, *Market-Based Environmental Policies*, *in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 31, 32 (Paul R. Portney & Robert N. Stavins eds., 2d ed. 2000) (noting that control costs "may vary greatly among firms"). *See generally* Wiener, *supra* note 9, at 697 (discussing the variation of abatement costs for sources of greenhouse gas emissions).

20 *See* Wiener, *supra* note 9, at 715 (explaining that pollution taxes encourage high-cost abaters to pay more taxes and low-cost abaters to produce more emission reductions).

21 I have deliberately provided a simplified abatement cost example in order to facilitate the exposition. More commonly, each pollution source has an array of possible abatement options with varying marginal control costs associated with them.

pollution produces a cost-effective allocation of reductions by encouraging polluters with relatively low-cost abatement options to reduce pollution, while encouraging those with relatively high-cost abatement options to forego pollution reductions.[22] The government chooses the tax rate—and a higher rate will generally produce more reductions than a lower one—but the polluters themselves determine the amount of reductions in response to the incentives the tax provides.[23]

An emissions trading approach likewise provides for cost-effective emission reductions. Under this approach, the regulator does not establish a price on carbon emissions, as in a carbon tax. Instead, the regulator limits the quantity of emissions permitted in the aggregate.[24] The regulator must then allocate the aggregate emission reduction obligation among regulated sources.[25] Regulators can either allocate these obligations—often called allowances—through some legislative or administrative process; or they can auction off the allowances to the highest bidders.[26] After allocation of the aggregate reductions, polluters can trade their reduction obligations to produce cost-effective pollution abatement. To see why trading produces cost-effective abatement, imagine that the owners of both Cheap and Expensive must reduce emissions by 100 tons. At Expensive, the technological change necessary to produce a 100 ton reduction costs $150 per ton. At Cheap, these reductions cost $50 per ton. Presumably, Expensive's owners will pay Cheap's owners to make reductions in their stead. Cheap will then make 200 tons of reductions: 100 tons to satisfy its own obligation, and an extra 100 tons to generate a surplus to sell to Expensive. Expensive's owners make no reductions at their own facility, purchasing the 100 ton surplus from Cheap instead. Because the emission reductions take place at the facility with the cheapest pollution abatement opportunities, the cost of making these reductions has fallen below what would have occurred if each party had met its obligation independently without trading. Hence, emissions trading, like pollution taxes, produces cost-effective abatement.[27]

Traditional regulation basically follows the same pattern as emissions trading, but without the trading; that is, the regulator decides what aggregate quantity of reductions to demand and allocates the reductions among

22 *See* Stavins, *supra* note 19, at 34 (noting that under a pollution tax firms with high cost abatement options will reduce emissions more than firms with low cost abatement options).

23 *See* Parson & Kravitz, *supra* note 8, at 427 (noting that higher tax rates produce greater behavioral changes).

24 *See* Wiener, *supra* note 9, at 715 (explaining that under trading government limits the allowances permitting emissions).

25 *See* Tom H. Tietenberg, *Economic Instruments for Environmental Regulation*, *in* ECONOMICS OF THE ENVIRONMENT: SELECTED READINGS 279, 286 (Robert N. Stavins ed., 5th ed. 2005) (noting that once the regulator has chosen how much pollution to allow, it must allocate the permits among the sources).

26 *See* David M. Driesen, *Capping Carbon*, 40 ENVTL. L. 1, 13–20 (2010) (distinguishing governmental allocation of a cap from auctioning of allowances).

27 *See* Stavins, *supra* note 19, at 33–34 (noting that properly defined "market-based instruments" produce cost-effective abatement and defining market-based instruments to include pollution charges and tradable permits).

facilities.[28] The regulator then requires each polluter to make reductions independently.[29] Because regulators usually lack the information necessary to make the least cost allocation of these reduction obligations, they may impose a uniform standard, leaving too many reduction obligations on those with expensive abatement options and too few on those with inexpensive options, from an efficiency standpoint.[30] This approach can make monitoring and enforcement simpler than in a trading approach, but it produces more expensive pollution abatement.[31]

The climate disruption problem came of age at about the same time as the United States government launched the acid rain emissions trading program, which proved quite successful at making a significant cut in sulfur dioxide emissions at a low price.[32] Accordingly, the United States, with some support from the environmental community, became an advocate of emissions trading as a mechanism for reducing greenhouse gas emissions.[33] This advocacy produced international law encouraging the use of a trading approach and the enactment of emissions trading regimes outside of the United States and within some states.[34] The evolution toward price in the discourse took place in that context.

B. The Evolution Toward Price

As mentioned at the outset, the older regulatory choice literature frequently distinguished between a pricing mechanism and a quantity

---

28 *See, e.g.*, Clean Air Act, 42 U.S.C. § 7521(a)(6) (2006) (authorizing command-and-control regulation for automobiles).

29 *Id.*

30 *See* Stavins, *supra* note 19, at 32–33 (noting that uniform standards "exact relatively high costs," but that regulators lack the information necessary to produce cost-effective abatement through nonuniform standards).

31 *See* David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 333 (1998) (explaining why trading increases monitoring and enforcement challenges); *see also* Tom Tietenberg, *Tradable Permits in Principle and Practice*, *in* MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 63, 71 (Jody Freeman & Charles D. Kolstad eds., 2007) [hereinafter MOVING TO MARKETS] (noting that trading can increase incentives for noncompliance).

32 U.S. ENVTL. PROT. AGENCY, *Cap and Trade: Acid Rain Program Results*, *available at* http://www.epa.gov/capandtrade/documents/ctresults.pdf.

33 *See* PETER NEWELL & MATTHEW PATTERSON, CLIMATE CAPITALISM: GLOBAL WARMING AND THE TRANSFORMATION OF THE GLOBAL ECONOMY 27 (2010) (attributing the adoption of emissions trading in the Kyoto negotiations to the "USA's single-minded determination").

34 *See* Driesen, *supra* note 2, at 27–35 (discussing U.S. advocacy of trading and the provisions in the Kyoto Protocol authorizing it); Bruce R. Huber, *How Did RGGI Do It? Political Economy and Emissions Auctions*, 40 ECOLOGY L.Q. 59, 62 (2013) (discussing a trading program regulating electric utility carbon dioxide emissions in the northeastern United States); CAL. CODE REGS. Tit. 17, § 9580 (2014) (establishing a trading program for greenhouse gas emissions from large stationary sources in California); Council Directive (EC) No. 2003/87, 2003 O.J. (L 275) 32 (establishing a trading scheme regulating large stationary sources of greenhouse gas emissions in the European Union).

mechanism.[35] Under this taxonomy, any approach that requires a political body to establish a price as a means of meeting an environmental goal constitutes a pricing mechanism.[36] By contrast, any approach that requires the regulator to establish the quantity of pollution reductions demanded constitutes a quantity mechanism.[37] Thus, the regulator's task, not the response of the market, served as the organizing principle for the taxonomy.

Scholars employing this taxonomy classify pollution taxes, along with subsidies and sometimes liability mechanisms, as examples of pricing instruments.[38] Conversely, they classify traditional regulation in the form of performance standards (as described above) and emissions trading as quantitative mechanisms.[39] Accordingly, the seminal law review article on environmental instrument choice, penned by Richard Stewart and Bruce Ackerman shortly before the enactment of the famed acid rain trading program, treated emissions trading as a modest tweaking of the traditional performance standard.[40]

At the same time, economists' descriptions of emissions trading in the 1990s, mostly arising from study of the landmark acid rain program, frequently noted that emissions trading produces a market price for emission reductions.[41] In time, they began to characterize trading as a policy that relies on a price signal.[42] This led to an erosion of the quantity–price

35 *See supra* note 9 and accompanying text; *see also* PIZER, *supra* note 9, at ii (distinguishing price and quantity controls); Weitzman, *supra* note 4, at 477 (comparing prices and quantities as planning instruments).

36 *See* William A. Pizer, *Combining Price and Quantity Controls to Mitigate Global Climate Change*, 85 J. PUB. ECON. 409, 410 (2002) (describing a tax fixing the cost of abatement as a price instrument); Weitzman, *supra* note 4, at 477 (describing price instruments as maximizing profits at "given parametric prices").

37 *See* Pizer, *supra* note 36, at 410, 412 (describing a permit system limiting emissions as an example of a quantity instrument); Weitzman, *supra* note 4, at 477 (describing a quantity mechanism as "operating rules" taking the "form of quotas, targets, or commands").

38 *See* Kenneth R. Richards, *The Instrument Choice Game: When Do Environmental Taxes Win?*, *in* 1 CRITICAL ISSUES IN ENVIRONMENTAL TAXATION: INTERNATIONAL AND COMPARATIVE PERSPECTIVES, 61, 66 (Janet Milne et al. eds., 2003) (describing taxes and subsidies as price-based instruments); Kathleen Segerson, *An Assessment of Legal Liability as a Market-Based Instrument*, *in* MOVING TO MARKETS, *supra* note 31, at 250, 266 (characterizing strict liability for environmental damages as "a pricing approach to environmental protection").

39 *See, e.g.*, Wiener, *supra* note 9, at 709–10 (characterizing both "a fixed performance standard" and tradable allowances as quantity instruments).

40 *See* Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVTL. L. 171, 178–79 (1988) (characterizing the authors' emissions trading proposal as building upon, not abandoning, the "basic permit system" underlying traditional regulation).

41 *See, e.g.*, Jeremy B. Hockenstein et al., *Crafting the Next Generation of Market-Based Environmental Tools*, ENV'T: SCI. & POL'Y FOR SUSTAINABLE DEV., May 1997, at 14 (describing "market-based policy instruments," including trading, as "devices that shape behavior through price signals rather than explicit instructions on pollution control levels").

42 *See* OFFICE OF POLICY, ECONOMICS, AND INNOVATION, EPA, THE UNITED STATES EXPERIENCE WITH ECONOMIC INCENTIVES FOR PROTECTING THE ENVIRONMENT ii (2001), *available at* http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0216B-13.pdf/$file/EE-0216B-13.pdf (describing economic incentive programs, including trading, as employing "financial means" to motivate

distinction featured in the earlier literature.[43] In advocating emissions trading, they emphasized that a price provides an incentive to go beyond compliance that is not found in the other leading quantitative mechanism, traditional regulations.[44] During the last decade, the pricing metaphor took over the growing discourse on climate disruption policy in fairly dramatic fashion. Frequently, economists writing about this issue would proclaim that the objective of climate policy should be to "put a price on carbon."[45] The earlier discourse had treated putting a price on carbon, i.e., taxing pollution, as a possible instrument choice, albeit a very desirable one. In other words, the older literature treated pricing as a means of environmental protection, not as its end.[46] The newer literature portrays putting a price on carbon not just as a means to the goal of reducing emissions, but also as an end in and of itself.

At the same time, the budding instrument choice literature began to erase the old quantity–price distinction. It emphasized that emissions trading, like pollution taxes, "puts a price on carbon."[47] It distinguished "market-based" mechanisms like emissions trading and pollution taxes, which put a price on carbon from "command-and-control" regulation, which

cleanup); Segerson, *supra* note 38, at 252 (describing taxes and marketable permits as policies that rely "on the pricing of environmental services").

43 *See* Winston Harrington & Richard D. Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, *in* MOVING TO MARKETS, *supra* note 31, at 95 (claiming that in a trading system the government controls aggregate emissions, but not the emissions from each firm, so that "each firm has discretion over its pollution discharge, but at a cost"); Robert Stavins, *Market-Based Environmental Policies: What Can We Learn from U.S. Experience (and Related Research)?*, *in* MOVING TO MARKETS, *supra* note 31, at 19 (characterizing a trading system as "harnessing market forces" because it relies on "market signals [presumably prices] rather than . . . explicit directives regarding pollution control levels"). *Cf.* Jason Scott Johnston, *Tradable Pollution Permits and the Regulatory Game*, *in* MOVING TO MARKETS, *supra* note 31, at 353, 353 (pointing out that trading regimes require regulators to "allocate [the] . . . aggregate cap among individual sources"); W. David Montgomery & Anne E. Smith, *Price, Quantity, and Technology Strategies for Climate Change Policy*, *in* HUMAN-INDUCED CLIMATE CHANGE: AN INTERDISCIPLINARY ASSESSMENT, *supra* note 18, at 328 ("Cost-effective market approaches to environmental management all entail the use of some form of price signal"); Driesen, *supra* note 31, at 290 (noting that both emissions trading and traditional regulation rely on economic incentives and monetary penalties to secure compliance with government-mandated emission limits).

44 *See, e.g.*, Adam B. Jaffe et al., *Environmental Policy and Technological Change*, 22 ENVTL. & RESOURCE ECON. 41, 51 (2002) (stating that economic incentives pay firms to clean up "a bit more").

45 *See* William D. Nordhaus, Sterling Professor of Economics, Yale Univ., Economic Issues in a [sic] Designing a Global Agreement on Global Warming, Keynote Address at Climate Change: Global Risks, Challenges, and Decisions (Mar. 10–12, 2009) *available at* http://www.econ.yale.edu/~nordhaus/homepage/documents/Copenhagen_052909.pdf (describing the lesson that all people must "face a market price for the use of carbon" as the economists' "bottom line for policy").

46 *See* Hahn & Stavins, *supra* note 17, at 28–30 (noting that then-recent calls for policy change supported using "incentive-based policies" as a means to achieve political goals).

47 *See, e.g.*, Christian Azar & Bjorn A. Sanden, *The Elusive Quest for Technology-Neutral Policies*, 1 ENVTL. INNOVATION & SOCIETAL TRANSITIONS 135, 136 (2011) (pointing out that a "price on carbon" can be achieved through a carbon tax or through a "cap-and-trade" system).

presumably did not.[48] Furthermore, it emphasized that putting a price on carbon produced incentives for producers and consumers to reduce activities producing carbon emissions, thereby contributing to amelioration of climate disruption.[49] Although focused on carbon, these statements represent a change in thinking about instrument choice more generally.

III. WHICH MECHANISMS PUT A PRICE ON CARBON?

Although at the outset I suggested the possibility that associating emissions trading with pricing constitutes a mere "technical error," that conclusion proves dubious. The classification of emissions trading as a quantitative mechanism itself reflects a choice to emphasize one particular feature of the trading mechanism—the government role. I show below that something more subtle and important is going on. First, the characterization of both trading and taxation as pricing instruments is not so much wrong as inconsistent. Second, consistent application of the reasoning showing that trading can be rationally characterized as a pricing mechanism would lead to the conclusion that traditional regulation of greenhouse gas emissions also puts a price on carbon.

A. Taxonomic Inconsistency

Although it is an error to classify the government role under trading as establishing a price for carbon, as the government establishes only a quantitative limit, one can justify the description of trading as a pricing mechanism by making the market output, rather than the government input, the controlling feature in a taxonomy. An emissions trading market will establish a price on carbon in response to the government's establishment of a quantitative limit.[50] The quantitative limit creates demand for cuts in emissions. The amount of the price will depend upon the stringency of the limit and the market price of various abatement technologies.[51] Thus, one can justify the pricing characterization by making the market's product, rather than the government's role, the controlling feature, as this figure illustrates:

---

48 *See, e.g.*, Stavins, *supra* note 43, at 19–20 (contrasting market-based instruments that rely on "market signals" to encourage behavior, with "conventional approaches . . . frequently characterized as command-and-control approaches").

49 *See, e.g.*, Joseph E. Aldy & Robert N. Stavins, *The Promise and Problems of Pricing Carbon: Theory and Experience*, 21 J. ENV'T & DEV. 152, 153 (2012) (describing "carbon pricing" as a way to encourage "private firms and individuals" to reduce emissions).

50 *See id.* at 157 (explaining trading as beginning with a government-set cap, but that trading among polluters produces a price); Tietenberg, *supra* note 25, at 285 (noting that the market, not the government, establishes price in an emissions trading program).

51 Amy Sinden, *The Tragedy of the Commons and the Myth of a Private Property Solution*, 78 U. COLO. L. REV. 533, 572 (2007) (noting the dependence of the supply curve on the stringency of the cap, and the cost of abatement technologies).

Emissions Trading: Government and Market Roles

Government Role	Establish Quantity
Market Role	Establish Price

Yet, an asymmetry exists that suggests something subtler than mere technocratic analysis is at play. Expanding the matrix to include pollution taxes reveals that applying the same taxonomic approach to taxes—under which the market's role governs our characterization of the mechanism—would produce a flipped description; we should then call taxes a quantitative mechanism[52]:

Pollution Trading and Taxes: Government and Market Roles

	Emissons Trading	**Pollution Tax**
Government Role	Establish Quantity	Establish Price
Market Role	Establish Price	Establish Quantity

That is, taxes produce a market response establishing a quantity of emission reductions, just as emissions trading produces a market response in the form of a price.[53]

One can refine this framework by noting that the emissions trading market does not *only* establish a price; it also provides an incentive for polluters to reallocate required emission reductions among their facilities. Although the government determines both the aggregate quantity of reduction among facilities and the initial allocation (at least under an administrative or legislative allocation regime), facility owners determine the ultimate allocation of these reductions through deals among themselves. This private reallocation function, however, suggests that even on the market side, one might consider trading a quantitative mechanism.

In an emissions trading scheme, the price established for carbon abatement performs a distinctive function that it does not perform in a non-trading market established in response to a traditional regulation. The

52 *Cf. id.* at 555 (characterizing a pollution tax as a quantitative mechanism on the different ground that in practice, governments will use taxes to achieve quantitative environmental goals).

53 *See* Parson & Kravitz, *supra* note 8, at 419 (noting that under a tax, the "market response determines the pollution level"); PIZER, *supra* note 9, at 1 (noting that a carbon tax produces "abatement levels and emission outcomes"). In practice, a government adopting a carbon tax might well have a quantitative target in mind. *See, e.g.*, Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENVTL. L. 153, 159 (1988) (stating that a government will choose the price likely to achieve its environmental goals). But the market response to any given price may deviate from the quantitative goal justifying the government-set price, since the government will not have perfect information about the abatement costs of producers. As a formal matter, and in practice under imperfect information, a taxing government establishes a price and the market responds by producing a quantity of pollution reductions.

market price in a trading market provides information to polluters about how much they can expect to earn if they produce "extra" emission reductions to sell to other polluters. The literature puts some emphasis on this feature,[54] suggesting that it might explain why so many authors claim that trading relies on price. But this feature only suggests a distinctive function for the price the market produces in response to a quantitative demand in a trading regime, and does not defeat the existence of the asymmetry identified above.

Similarly, one might say that a carbon tax not only leads to markets establishing the quantity of reductions; it also provides an incentive for producers to change their costs. Although polluters under a carbon tax will pay the government-determined tax on any pollution they continue to emit, they will determine their own actual costs through their choices about how much abatement to carry out.[55] To the extent that polluters find and implement abatement options costing less than the government-set price, they may lower their own compliance costs. These points, however, refine, rather than fundamentally challenge, the matrix presented above. They do not refute the point that referring to both taxes and trading as putting a price on carbon reflects an inconsistent taxonomic approach.

Thus, one can characterize either emissions trading or environmental taxation as "putting a price on carbon," or as quantitatively reducing carbon emissions. It depends on what features one wants to emphasize. But the contemporary approach of calling both pricing mechanisms lacks consistency in its taxonomic approach. It uses the market response as the taxonomic feature defining trading, and the government role as the feature defining taxes. Any consistent taxonomic approach would treat trading and taxing differently from each other, rather than characterize both as either a quantitative or a pricing mechanism.

B. Does Traditional Regulation Put a Price on Carbon?

So far, I have left traditional regulation out of the analysis, but its inclusion proves particularly revealing. It turns out that traditional regulation also can be fairly characterized as putting a price on carbon, just as trading can, if one accepts the market's role as a generator of a proper characterization.[56] To show this, we must further unpack the rationale for considering trading a pricing mechanism.

---

54 *See* Adam B. Jaffee & Robert N. Stavins, *Dynamic Incentives of Environmental Regulations: The Effects of Alternative Instruments on Technology Diffusion*, 29 J. ENVTL. ECON. & MGMT. S-43, S-44 (1995) (describing the belief that trading provides "continuous dynamic incentives . . . to clean up more" because one can always profit by selling more permits).

55 Stewart, *supra* note 53, at 158–60.

56 *See, e.g.*, PATRICK LUCKOW ET AL., 2013 CARBON DIOXIDE PRICE FORECAST 6 (2013), *available at* http://www.synapse-energy.com/Downloads/SynapseReport.2013-11.0.2013-Carbon-Forecast.13-098.pdf (explaining that traditional regulatory measures impose an "effective price" on carbon); Cameron Hepburn & Nicholas Stern, *The Global Deal on Climate Change*, *in* THE ECONOMICS AND POLITICS OF CLIMATE CHANGE 36, 49 (Dieter Helm & Cameron Hepburn eds., 2009) (stating that "regulations and standards" put an implicit price on carbon).

Commentators' recent propensity to describe trading as a pricing mechanism is justifiable because demanding a quantity of reductions does produce a market price for carbon abatement.[57] And analysts are not crazy to identify that price as providing an incentive for both producers and consumers to change their behavior in environmentally desirable ways. Because trading programs usually regulate producers, not consumers, elaboration of the rationale for seeing trading programs as having an effect on consumers will aid our analysis of traditional regulation.[58] Put simply, the demand for emission reductions created by capping emissions will force polluters to either abate pollution at their own facilities, or pay somebody else to do so.[59] Although trading reduces abatement cost, relative to a traditional regulation of identical scope and stringency, it does not eliminate it. Polluters will incur some abatement cost in a well-designed trading program of reasonable ambition. If at all possible, polluters will then raise the prices of carbon-intensive goods and services that they provide in order to help them pay for these costs.[60] Any successful effort to increase the prices of carbon-intensive goods and services (in order to preserve profits in the face of a pollution control obligation) may influence consumers.[61] An ambitious carbon abatement trading program, for example, might well raise the price of energy, producing incentives for consumers to purchase more efficient vehicles, insulate their homes, or even turn down the thermostat. To the extent that rising prices decrease demand for energy, a trading program may reduce energy consumption and the associated carbon emissions.[62] Hence, emissions trading tends to establish a price on carbon for consumers, as well.

---

57 *See, e.g.*, Tietenberg, *supra* note 24, at 285 (claiming that, in theory, trading equalizes marginal control costs).

58 *See* Jason F. Shogren & Michael A. Toman, *Climate Change Policy*, *in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 125, 148 (Paul R. Portney & Robert N. Stavins eds., 2d ed. 2000) (explaining that applying a trading system to consumers would be an "administrative nightmare").

59 *See* Driesen, *supra* note 31, at 290 (defining trading as a program allowing a polluter to avoid making reductions at its own facility if it provides an emission reduction elsewhere).

60 *See* Lawrence H. Goulder & Ian W.H. Parry, *Instrument Choice in Environmental Policy*, 2 REV. ENVT. ECON. & POL'Y 152 (2008) (stating that abatement costs and emission prices show up in higher consumer prices). The price elasticity of demand determines whether efforts to pass costs on to consumers will prove successful. Price elasticity measures the degree to which a change in price produces a change in demand and therefore consumption. *See* PAUL A. SAMUELSON, ECONOMICS 376–84 (8th ed. 1970) (explaining demand elasticity). For some goods, demand is elastic, meaning that a price rise will produce a fall in demand. If the fall is too great, then the producer cannot pass the price on to consumers without creating a decrease in net revenue. *See id.* at 376–77 (explaining the link between elasticity and producer revenue). If the producer can pass on a price increase to consumers without a large decrease in demand, then demand is inelastic, and the producer will likely pass the price increase on to consumers.

61 *See* Shogren & Toman, *supra* note 58, at 148 (describing various ways that consumers of fossil fuels respond to carbon prices).

62 *See, e.g.*, Paul Krugman, *Green Economics: How We Can Afford to Tackle Climate Change*, N.Y. TIMES, Apr. 11, 2010, at SM34 (suggesting that putting a price on carbon will encourage consumers to consider whether to buy fruit shipped from long distances, and to consider energy efficiency measures to reduce cooling and heating costs).

This analysis should have already caused the reader to recognize that a traditional regulation also establishes a price on carbon for consumers. A traditional regulation requiring a given quantity of reductions from each polluter will cause the polluter to incur pollution abatement costs, which the polluter will then attempt to pass on to consumers. Thus, traditional regulation establishes a price on carbon for consumers. Indeed, a traditional regulation will produce a more robust incentive for environmentally desirable consumer behavior than an emissions trading program of identical stringency, because it will raise prices by a greater amount.

Perhaps less obviously, a traditional regulation of greenhouse gases also establishes a price on carbon for *producers*.[63] A quantitative reduction obligation requires polluters to spend money on some form of pollution abatement. The market in pollution control techniques (including, in the climate context, fuel costs) together with the stringency of the regulation, will determine the amount of that price, so that traditional regulation generates a market price influenced by regulation, just as a trading program does. Furthermore, the pollution control requirement in effect creates or expands the market by stimulating demand.[64] The cost of making the changes necessary to meet the traditional performance standard, in effect, puts a price on carbon for the producer. Indeed, it is this price that the polluter will try to pass on to the consumer. Furthermore, if the producer cannot pass the price on to the consumer—i.e., if demand falls—the producer may produce less of the goods generating carbon emissions. Thus, the price traditional regulation puts on carbon changes producer behavior. In short, it is perfectly sensible to treat traditional regulation as "putting a price on carbon."

That is probably why the literature tends to imply, rather than explicitly state, that traditional regulation does not put a price on carbon. Most economists discuss trading and taxation as putting a price on carbon and then mention traditional regulation by way of contrast, thus creating the impression that traditional regulation does not do so.[65] The handful of commentators that have addressed the question directly, however, have noted that traditional regulation does put a price on carbon.[66]

Thus we can expand our matrix as follows:

---

63 *See* LUCKOW ET AL., *supra* note 56, at 6 (discussing producers' abatement costs associated with pollution regulation).

64 *See* DAVID M. DRIESEN, THE ECONOMIC DYNAMICS OF ENVIRONMENTAL LAW 103, 112, 177 (2003) (conceptualizing government as the source of demand for environmental protection on behalf of citizens, since the market does not generally produce demand for public goods).

65 *See, e.g.*, Stavins, *supra* note 43, at 19 (describing trading as relying on market signals and then beginning his treatment of traditional regulation with the phrase "[b]y way of contrast"); Robert Stavins & Bradley Whitehead, *Market-Based Environmental Policies*, *in* THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY 105, 105–07 (Marian R. Chertow & Daniel C. Esty eds., 1997) (contrasting "putting a price on pollution" through "market-based mechanisms" with "so-called command-and-control regulations").

66 *See* Hepburn & Stern, *supra* note 56, at 49 (noting that "regulations and standards" put an implicit price on carbon).

Instruments: Government and Market Roles

	Carbon Tax	**Emissons Trading**	**Traditional Regulation**
Government Role	Establish Price	Establish Quantity	Establish Quantity
Market Role	Establish Quantity	Establish Price	Establish Price

This analysis suggests that exclusion of traditional regulation from the list of instruments "putting a price on carbon" might constitute a technical error in the following sense: We can logically exclude traditional regulation from the list of instruments that put a price on carbon by insisting on the taxonomic procedure that uses the government role to identify the type of instrument. But doing that requires that we likewise exclude emissions trading. No readily apparent rationale justifies treating emissions trading as establishing a carbon price and traditional regulation as not accomplishing the same outcome.

My effort to justify the recent evolution of the putting-a-price-on-carbon characterization in purely technical terms has met with little success.[67] This should lead one to inquire whether this characterization reflects ideological influences.

IV. PRICING CARBON AS QUASI-IDEOLOGY: TOWARD A THIRD GENERATION INSTRUMENT CHOICE DEBATE

The literature does not suggest prevalent extreme anti-government ideology among economists (or anybody else) studying environmental instrument choice. The whole literature presupposes the need for some government regulation, coupled with a desire to make this regulation as efficient as possible. Yet, a distinctive worldview (one might say quasi-ideology) seems to underlie the selective use of pricing rhetoric and related rhetorical choices in the instrument choice literature.[68]

This section will first explain how the selective pricing rhetoric tends to present a very simple and somewhat misleading picture of government and markets. It will then argue that some attention to price's limits as a regulatory tool would provide a basis for a third generation instrument choice literature that would greatly enhance our understanding of environmental law.

---

67 *See generally* Kenneth R. Richards, *Framing Environmental Policy Instrument Choice*, 10 DUKE ENVTL. L. & POL'Y F. 221, 231 (2000) (describing instrument choice studies as "ad hoc" because they do not explain the "differences and relationships among instruments").

68 *See* Hahn & Stavins, *supra* note 17, at 41–42 (describing economists as "lobbyists for efficiency," but chiding them for exaggerating the value of the proposals they have packaged and sold).

A. Selective Use of Price as Quasi-Ideology

The use of price to describe market-based mechanisms, but not traditional regulation, suggests that we should view government regulation and markets as antonyms: Markets use prices; governments use commands. Although there certainly is some truth to this, it amounts to an essentialist view that denies a lot of reality. Markets do not only consist of a set of prices. They rely on contracts (including some that amount to complex, privately imposed regulations), advertising, hardball negotiations, and lawsuits seeking to enlist government's coercive power.[69] And governments do not use only commands; they use nudges, taxation, and spending.[70]

Even on the most fundamental level, markets use commands. A breached contract can lead to a lawsuit producing an order for specific performance or to pay damages.[71] Market actors form contracts precisely because prices fluctuate and absent a contract a deal they want locked in might fall part, so they want commands to enter into the market after changes in price make performance inefficient.[72] Furthermore, absent government enforcement of the command, "thou shalt not steal" through coercion, prices might accomplish nothing even when they remain stable; people could simply take what they want.[73]

Conversely, prices back up most coercive government orders. In the environmental realm, the law establishes civil penalties—a price—that a polluter must pay if she violates a pollution control requirement.[74] And the policies behind the penalties have generally insisted that the penalties be large enough to provide a powerful incentive not to violate the law.[75]

---

69 *See generally* MARGARET JANE RADIN, BOILERPLATE: THE FINE PRINT, VANISHING RIGHTS, AND THE RULE OF LAW (2013) (discussing the use of boilerplate to regulate consumers without their consent); Parson & Kravitz, *supra* note 8, at 417 (noting that markets depend on "state authority" to enforce contracts and settle disputes).

70 *See* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS (2008) (discussing the use of nudges like information, default rules, and other behavioral cues to influence conduct); Gillian E. Metzger, *To Tax, to Spend, to Regulate*, 126 HARV. L. REV. 83, 90, 109–10 (2012) (discussing the role of taxing and spending as regulatory tools); Lauren E. Willis, *When Nudges Fail: Slippery Default Rules*, 80 U. CHI. L. REV. 1155, 1157 (2013) (discussing some of the ways firms can manipulate nudges to harm consumers).

71 *See* David M. Driesen, *Contract Law's Inefficiency*, 6 VA. L. & BUS. REV. 301, 302 (2012) (pointing out that contract law coercively forces payment of damages or performance when a contract is violated).

72 *See id.* at 312 (explaining that enforcement of contracts that have become inefficient because of price changes encourages businessmen to contract even in the face of uncertainty about future prices).

73 Abraham Bell & Gideon Parchomovsky, *A Theory of Property*, 90 CORNELL L. REV. 531, 597–98 (2005) (explaining that the right to exclude others from one's property is essential to being able to determine a price for using one's property).

74 *See* Sinden, *supra* note 51, at 549 (noting that civil penalties provide an economic incentive to comply with traditional regulations).

75 *See* Friends of the Earth, Inc. v. Laidlaw Envtl. Servs., Inc., 890 F. Supp. 470, 481 (D.S.C. 1995), *vacated on other grounds*, 149 F.3d 303 (4th Cir. 1998), *rev'd*, 528 U.S. 167 (2000) (quoting an EPA manual setting out EPA's policy of removing economic incentives for noncompliance through civil penalties).

This quasi-ideology involves seeing markets not only as uniquely relying on price, but also on seeing price as leading inevitably to a unique set of virtues. These virtues include not just efficiency, but also a propensity toward innovation,[76] promotion of private autonomy,[77] and effectiveness at achieving desirable ends.[78] This essentialist view of markets leads to bizarre statements in the economics literature about emissions trading markets "automatically" leading to emission reductions,[79] thereby ignoring the importance of establishing a cap on emissions, allocating allowances to polluters, and then enforcing the obligations thus created in a more indeterminate and geographically wide context than the context in which traditional regulation typically operates.[80] I do not mean to suggest that the literature as a whole completely ignores these issues, but that the

76 *See* Hahn & Stavins, *supra* note 17, at 13 (characterizing "market-oriented policies" as providing "powerful incentives" to innovate).

77 *See* Robert W. Hahn & Robert N. Stavins, *Trading in Greenhouse Permits: A Critical Examination of Design and Implementation Issues*, *in* SHAPING NATIONAL RESPONSES TO CLIMATE CHANGE: A POST-RIO GUIDE 177, 181 (Henry Lee ed., 1995) (characterizing "incentive-based regulations" as embracing "freedom of choice"); Peter S. Menell, *An Economic Assessment of Market-Based Approaches to Regulating the Municipal Solid Waste Stream*, *in* MOVING TO MARKETS, *supra* note 31, at 271, 311 (describing fees on garbage disposal as an example of "noncoercive" government intervention*;* Stavins, *supra* note 43, at 19 (contrasting trading and taxes' reliance on market signals with the lack of flexibility implied by conventional approaches, thus emphasizing the market's flexibility); Hahn & Stavins, *supra* note 17, at 3, 8–9 (criticizing "command and control approaches" for giving firms "little flexibility" and then praising trading for allowing firms to decide where and how to reduce emissions); Jodi L. Short, *The Paranoid Style in Regulatory Reform*, 63 HASTINGS L.J. 633, 674 (2011–2012) (finding "respect for individual autonomy" the most commonly used argument for alternatives to traditional regulation).

78 *See* A. Denny Ellerman, *Are Cap-and-Trade Programs More Environmentally Effective than Conventional Regulation?*, *in* MOVING TO MARKETS, *supra* note 31, at 48 (arguing that "cap and trade" is more effective than traditional regulation); OFFICE OF POLICY, ECONOMICS, AND INNOVATION, *supra* note 42, at ii–iii (claiming that economic incentives can achieve better environmental results than traditional regulation). *Cf.* CHOOSING ENVIRONMENTAL POLICY: COMPARING INSTRUMENTS AND OUTCOMES IN THE UNITED STATES AND EUROPE 254 (Richard D. Morgenstern and Thomas Sterner eds., 2004) (finding, on the basis of case studies, that "regulatory policies achieved their objectives faster and with greater certainty than incentive policies").

79 *See* David M. Driesen, *Sustainable Development and Market Liberalism's Shotgun Wedding: Emissions Trading Under the Kyoto Protocol*, 83 IND. L.J. 21, 61 (2008) (noting trading advocates' assertions of automatic reductions); Ruth Greenspan Bell & Clifford Russell, *Ill-Considered Experiments: The Environmental Consensus and the Developing World,* HARV. INT'L REV., Winter 2003, at 20, 24 (describing proponents of "market-based instruments" as claiming "almost" automatic achievement of desired environmental quality levels).

80 *See* Joseph Kruger, *Companies and Regulators in Emissions Trading Programs*, *in* EMISSIONS TRADING: INSTITUTIONAL DESIGN, DECISION MAKING AND CORPORATE STRATEGY 3, 4, 11 (Ralph Antes et al. eds., 2008) (characterizing trading programs as "starkly different from traditional regulatory programs" and the government role in a trading program as that of "a banker or accountant"); Driesen, *supra* note 31, at 303–04 (explaining that traditional regulation features "spatial specificity" and that lack of such specificity multiplies the number of claims and transactions an agency must monitor). *Cf.* Lesley K. McAllister, *Beyond Playing "Banker": The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 272 (2007) (criticizing the conception of the regulator administering a trading program as merely a banker).

paradigmatic descriptions in the literature read as if they did not exist and the literature as a whole gives them less attention than they deserve.

Although the literature is not always explicit, much of the rhetoric about automatic reductions, innovation, superior performance, and autonomy seems tied in with the claim that price in a trading market provides an incentive to go beyond compliance.[81] Although it is true that trading does provide an incentive for polluters with low-cost abatement options to go beyond compliance, it does so because those facing high-cost abatement options will presumably purchase these allowances in lieu of achieving on-site compliance.[82] Price tells polluters facing high-cost on-site abatement options how much they can save by foregoing local abatement and purchasing allowances instead.[83]

Thus, price in a trading market provides incentives for about half the sources to go beyond compliance and another half to stop short of compliance.[84] The economist, David Malueg, highlighted the radical incompleteness of the beyond compliance model many years ago, but much of the literature prominently features the beyond compliance incentive, while not mentioning the short-of-compliance incentive, except through the occasional oblique footnote.[85]

This emphasis on going beyond compliance would give the unwary reader the impression that a well-functioning emissions trading market produces more reductions than the regulator demands through the cap, lending support to the claims of automatic emission reductions. Indeed, if the market produced performance going beyond compliance without limit, the level of the cap would not matter. An inference that trading provides more net reductions than the regulator demands, however, would constitute an error. In a well-functioning trading market, the incentive to go beyond the reductions required of a single polluter would be provided by the willingness of another polluter to pay for the extra reductions.[86] That willingness to pay would arise only to the extent that the paying polluter made *fewer*

---

81 *See, e.g.*, Tietenberg, *supra* note 25, at 294 (suggesting that trading provides superior innovation incentives, because innovations producing extra reductions "create saleable . . . credits").

82 *See* Driesen, *supra* note 30, at 334 (explaining that trading creates incentives for polluters to stop short of compliance and purchase credits from those generating credits by going beyond compliance).

83 *Cf.* Jaffe & Stavins, *supra* note 54, at S-45 to S-46 (stating, incorrectly, that "*any* reductions in emissions generate revenues" from permit sales or reduced costs) (emphasis added).

84 *See* Driesen, *supra* note 31, at 334 (explaining that in a smoothly functioning emissions trading market, the incentives for some to stop short of compliance at their own plants, and for others to go beyond compliance at their own plants, "cancel each other out").

85 *See* David A. Malueg, *Emissions Credit Trading and the Incentive to Adopt New Pollution Abatement Technology*, 16 J. ENVTL. ECON. & MGMT. 52, 56 (1989); Jaffe & Stavins, *supra* note 54, at S-45 n.3 (citing Malueg and others as providing "theoretical research" coming to "less definitive conclusions" about market instruments' dynamic incentives).

86 *See* Driesen, *supra* note 31, at 334 (pointing out that a polluter has an incentive to decrease emissions to the extent that the polluter plans to sell the resulting credits to other polluters with high abatement costs).

reductions than otherwise required at his own facility, which he would be obliged to make up with purchased surplus reductions.[87] In other words, foregone emission reductions at one facility generate the incentive to go beyond compliance at another facility. A well-functioning trading market will not produce net reductions beyond those the regulator demands through the cap.[88]

Thus, the price metaphor creates a misleading picture of a wholly autonomous market not dependent on government decisionmaking. And this picture, rather than careful analysis, supports all sorts of claims about trading's superiority that go far beyond the efficiency advantages trading actually offers.

B. Toward a Third Generation Instrument Choice Debate

By contrast, a less essentialist view of instrument choice holds much more promise for advancement in our understanding of instrument choice and design. For example, the essentialist view of trading holds that since trading relies on price, it must—like markets themselves, presumably—provide superior incentives for innovation.[89] Scholars questioning the essentialist view have noted that lowering the price of making routine reductions might reduce incentives for initially expensive technological advancements, a prediction supported by the induced innovation hypothesis in economics.[90] This has led to some empirical work comparing emissions trading to actual traditional regulations, instead of just characterizing every good thing that happens under a trading program as an innovation and just assuming that there must be more of it under trading than under a rigid

87 *See* Russell Korobkin, *The Local Politics of Acid Rain: Public Versus Private Decisionmaking and the Dormant Commerce Clause in a New Era of Environmental Law*, 75 B.U. L. REV. 689, 695 (1995) (pointing out that utilities with high abatement costs may purchase allowances from utilities using fewer allowances than allocated under the acid rain program).

88 Robert N. Stavins, *Addressing Climate Change with a Comprehensive US Cap-and-Trade System*, *in* THE ECONOMICS AND POLITICS OF CLIMATE CHANGE, *supra* note 56, at 198 (noting that through trading, emissions are brought down to the level of the cap).

89 *See, e.g.*, OFFICE OF POLICY, ECONOMICS, AND INNOVATION, *supra* note 42, at iii (arguing that "economic incentives can stimulate . . . innovations . . . where traditional regulatory mechanisms may not").

90 *See* David M. Driesen, *Design, Trading and Innovation*, *in* MOVING TO MARKETS, *supra* note 31, at 436, 436–37 & n.4 (analyzing the theory, data, and literature on trading and innovation); Montgomery & Smith, *supra* note 43, at 329 (stating that experience, modeling, and theory do not show that the cap-and-trade approach is effective at stimulating future technological development); Tietenberg, *supra* note 25, at 294 (noting that when cheaper routine ways of making reductions are available, fewer innovations will arise under a trading program); MARIUS LEY ET AL., THE IMPACT OF ENERGY PRICES ON GREEN INNOVATION 6 (2013), *available at* http://www.ssrn.com/abstract=2306534 (finding an econometric link between higher energy prices and green innovation); Richard G. Newell et al., *The Induced Innovation Hypothesis and Energy-Saving Technological Change*, 114 Q. J. ECON. 941, 942 (1999). *See generally* HANS P. BINSWANGER & VERNON W. RUTTAN, INDUCED INNOVATION: TECHNOLOGY, INSTITUTIONS, AND DEVELOPMENT (1978) (discussing the essentialist view and the induced innovation hypothesis).

command-and-control system.[91] It also has led to some more imaginative work on new instruments that might prove superior at sparking innovation, in part because they are not preoccupied with optimizing incremental changes from a status quo baseline.[92]

The analysis above points to some new questions that the literature has failed to see, much less explore. Does trading, by reducing the prices producers must pay to lower emissions, reduce dynamic incentives for consumers? If so, how important are those incentives?

The essentialist view has, until recently, led to a failure to study cap setting.[93] If market-based mechanisms are seen as functioning automatically and as fundamentally different from reliance on government-imposed obligations, then cap setting seems like a secondary issue. But a failure to set an adequate cap has impaired the effectiveness of many emissions trading programs.[94]

The essentialist view treats flexibility as an unalloyed good.[95] But a key problem in trading design involves seeing to it that market's much admired flexibility does not turn into chicanery undermining environmental

91 *See, e.g.*, David Popp, *Pollution Control Innovations and the Clean Air Act of 1990*, 22 J. POL'Y ANALYSIS & MGMT. 641, 641–42 (2003) (finding more innovation under command and control than under the acid rain trading program, but that the trading program favored innovations enhancing control efficiency, as opposed to innovations reducing cost); Margaret R. Taylor, *Innovation Under Cap-and-Trade Programs*, 109 PROC. NAT'L ACAD. SCI. U.S. 4804 (2012) (showing that for both sulfur dioxide and nitrogen oxides, trading diminished innovation to levels lower than those that prevailed under traditional regulatory programs); Margaret R. Taylor et al., *Regulation as the Mother of Innovation: The Case of SO_2 Control*, 27 L. & POL'Y 348, 368–70 (2005) (showing that more innovation in control of sulfur dioxide occurred under traditional regulation than under emissions trading).

92 *See, e.g.*, HOWARD A. LATIN, CLIMATE CHANGE POLICY FAILURES: WHY CONVENTIONAL MITIGATION APPROACHES CANNOT SUCCEED 162–70 (2012) (proposing a "clean technology" commission to evaluate and fund zero-carbon technologies); David M. Driesen, *An Environmental Competition Statute*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 199, 200 (2010) (proposing a scheme where polluters reducing emissions could collect their costs plus a profit margin from any competitor with higher emissions); *see also* CHOOSING ENVIRONMENTAL POLICY, *supra* note 78, at 254 (finding innovation under both traditional regulation and economic incentive policies in a set of case studies).

93 *See* Driesen, *supra* note 26, at 11 (noting that the literature has paid much more attention to the advantages of trading than to the problems in setting caps). *Cf.* Harro van Asselt, *Book Review*, 1 CARBON & CLIMATE L. REV. 124 (2009) (reviewing three books on European Union emissions trading that include treatment of cap setting).

94 *See* Michael Grubb, *Preface to National Allocation Plans in the EU Emissions Trading Scheme: Lessons and Implications for Phase II*, 6 CLIMATE POL'Y 349 (Michael Grubb et al., 2006) (discussing the overallocation of allowances in phase one of the EU Emissions Trading Scheme); Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving Toward Stringency*, 34 COLUM. J. ENVTL. L. 395, 410–23 (2009) (discussing examples of the overallocation of allowances); Parson & Kravitz, *supra* note 8, at 425, 428 (describing overallocation of permits as a problem for the EU Emissions Trading Scheme and the Regional Greenhouse Gas Initiative).

95 *Cf.* Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential,* 55 UCLA L. REV. 1759, 1795–99 (2008) (discussing "additionality problems" that can interfere with achieving a cap).

performance.[96] While "flexibility" is an attractive-sounding word, it can mean the freedom to cheat or the freedom to reduce pollution efficiently, and trading programs vary in terms of which type of flexibility dominates.[97] Treating flexibility as an unalloyed good tends to cut off questions about what good instrument design looks like.

The effectiveness claim obscures fundamental truths and questions about the limits of price as an inducement to environmental advancement. A fundamental truth stems from the difference between artificial markets and markets in more conventional goods and services. Buyers of blue jeans care about their quality, so blue jean makers have to make them well or risk losing customers.[98] Buyers of pollution reduction credits have no intrinsic reason to care about the quality of the credits they purchase, so polluters have incentives to exaggerate a credit's value by claiming more emission reductions than actually will occur.[99] Buyers and sellers will only care about the quality of credits if sufficient government oversight exists to make them

96 *See* NEWELL & PATTERSON, *supra* note 33, at 133–37 (delineating some of these issues for the Clean Development Mechanism); Tietenberg, *supra* note 25, at 298 (discussing the loss of emission reductions through credits for existing discrepancies between actual and allowable emissions).

97 *See* Driesen, *supra* note 31, at 314 n.121 (quoting California Air Resources Board & U.S. EPA, PHASE THREE RULE EFFECTIVENESS STUDY OF THE AEROSPACE COATING INDUSTRY 4 (1990)) (finding that almost all aerospace facilities using bubbles that authorize trades among emitting units are not complying with regulatory limits); David Driesen, *Economic Instruments for Sustainable Development*, *in* ENVIRONMENTAL LAW FOR SUSTAINABILITY: A READER 277, 297–98 (Benjamin J. Richardson & Stepan Wood eds., 2006) (contrasting the environmentally successful acid rain program with the environmentally ineffective bubble programs); Robert N. Stavins, *Implications of the US Experience with Market-Based Environment Strategies for Future Climate Policy*, *in* EMISSIONS TRADING FOR CLIMATE POLICIES: U.S. AND EUROPEAN PERSPECTIVES 63, 67 (Bernd Hansjürgens ed., 2005) (noting that "deficient" monitoring and enforcement has produced "ineffective" market-based policies); David D. Doniger, *The Dark Side of the Bubble*, 4 ENVTL. F., July 1985, at 32, 34–35 (discussing ways industry uses the "bubble" concept to game regulators); David Driesen, *Markets Are Not Magic*, 20 ENVTL. F., Nov.–Dec. 2003, at 18, 22 (discussing a failed New Jersey trading program as an example of magical thinking about markets); Sam Headon, *Offsets in the International Emissions Market: Do Buyers Get What They Pay For?*, 4 CARBON & CLIMATE L. REV. 406, 415 (2008) (discussing problems with the carbon offset market); LAMBERT SCHNEIDER, INST. FOR APPLIED ECOLOGY, IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT 14 (2007), *available at* http://www.oeko.de/oekodoc/622/2007-162-en.pdf; Michael Wara, *Is the Global Carbon Market Working?*, 445 NATURE 595 (2007); RICHARD A. LIROFF, REFORMING AIR POLLUTION REGULATION: THE TOIL AND TROUBLE OF EPA'S BUBBLE 62–67, 80–91 (1986) (providing examples of bubbles where trading was used to avoid compliance with pollution reduction requirements); Parson & Kravitz, *supra* note 8, at 422, 428 (noting that the lead trading program produced "widespread gaming and a few cases of fraud," that numerous sources failed to comply with California's RECLAIM program, and that as many as 75% of credits in the Clean Development Mechanism may not have represented legitimate reductions). *Cf.* Tietenberg, *supra* note 24, at 282 (stating that the "level of compliance . . . has increased," without specifying the baseline for this improvement or citing any evidence).

98 *See* Driesen, *supra* note 26, at 66.

99 *Id.*; *see also* Sinden, *supra* note 51, at 571 (noting that the demand for permits, unlike the demand for potato chips, has no relationship to the purchaser's preference).

care. Rhetoric about "automatic" emission reductions in "market-based programs" obscures this truth.

The blanket assertion that price makes pollution reduction effective, not merely cost-effective, tends to cut off vital inquiry about price's limits. With respect to climate disruption, experts in the field foresee the need to abandon the use of fossil fuels.[100] This implies that, in the long run, effectively addressing climate disruption requires vast changes in infrastructure. The effective creation and deployment of new infrastructure frequently poses coordination challenges so great that markets alone cannot address them effectively.[101] A long history of government support for railroads, highways, the Internet, and municipal waste treatment, to mention just a few examples, reflects a well-founded recognition that markets alone cannot accomplish some tasks of great scale and scope.[102] Furthermore,

100 *See* MYLES ALLEN ET AL., *THE EXIT STRATEGY*, NATURE REP. CLIMATE CHANGE 56 (2009), *available at* www.nature.com/climate/2009/0905/pdf/climate.2009.38.pdf (calling for phasing out net carbon dioxide emissions altogether and leaving substantial fossil fuel resources in the ground); James Hansen et al., *Target Atmospheric CO_2: Where Should Humanity Aim?*, 2 THE OPEN ATMOSPHERIC SCI. J. 217, 228 (2008) (concluding that "remaining fossil fuel reserves should not be exploited without a plan for retrieval and disposal of resulting atmospheric CO_2"); Michael Le Page, *IPCC Digested: Just Leave the Fossil Fuels Underground*, NEW SCIENTIST, Oct. 1, 2013, http://www.newscientist.com/article/dn24299-ipcc-digested-just-leave-the-fossil-fuels-underground.html#.Utmzh_Qo4nK (last visited July 26, 2014) (interpreting the latest Intergovernmental Panel on Climate Change draft report as a call to leave recoverable fossil fuels in the ground); Alex Morales, *Fossil Fuels Need to Stay Unburned to Meet Climate Target*, BLOOMBERG, Sept. 27, 2013, http://www.bloomberg.com/news/2013-09-27/fossil-fuels-need-to-stay-unburned-to-meet-climate-target.html (last visited July 26, 2014) (stating that "most known reserves of fossil fuels will need to stay unburned to stop temperatures rising beyond United Nations target"); Veerabhadran Ramanathan & Yangyang Xu, *The Copenhagen Accord for Limiting Global Warming: Criteria, Constraints, and Available Avenues*, 107 PROC. NAT'L ACAD. SCI. U.S. 8055, 8057 (2010) (including the replacement of fossil fuels with renewables as things we must do in order to halve emissions by 2050, while also calling for an 80% reduction by 2100); *see also* Henry Shue, *Climate Hope: Implementing the Exit Strategy*, 13 CHI. J. INT'L L. 381, 388–89 (2013) (pointing out that most of the studies cited above may understate the need for aggressive action because they focus only on carbon dioxide, ignoring other greenhouse gases).

101 *See* Hepburn & Stern, *supra* note 57, at 49 (arguing that putting a price on carbon is necessary, but not sufficient, to affect behavioral change, because of the need to finance research and development, adaptation, and programs to reduce deforestation, and the need for other domestic measures); Krugman, *supra* note 63, at SM54 (noting that market mechanisms do not work well with things that cannot be monitored effectively, and recommending a combination of direct controls and price incentives); Stavins, *supra* note 89, at 199 (acknowledging that mechanisms beyond cap and trade are needed to encourage sufficient research and development).

102 *See* Robert D. Cooter & Neil S. Siegel, *Collective Action Federalism: A General Theory of Article I, Section 8*, 63 STAN. L. REV. 115, 148 (2010) (discussing the federal government's support for the Internet and the railroads as examples of efforts to grow an industry that initially was not economically viable); Gregory W. Bowman, *The Domestic and International Policy Implications of "Deep" Versus "Broad" Preferential Trade Agreements*, 19 IND. INT'L & COMP. L. REV. 497, 520 (2009) (arguing that government support for road improvements, the Internet, and railroads are needed because of high startup and research costs); Richard Briffault, *The Local Government Boundary Problem in Metropolitan Areas*, 48 STAN. L. REV. 1115, 1144 (1996) (mentioning highway projects and wastewater treatment facilities as examples of public works).

massive investments in energy efficiency are needed to reduce the scale of the fossil fuel substitution project. Some economists have claimed that energy efficiency investment has proven "relatively insensitive" to energy prices, a claim enjoying a great deal of empirical support, suggesting that pricing alone may not lead to adequate exploitation of opportunities for increased energy efficiency, usually the cheapest option available.[103] Too much love of markets can cut off much needed debate about the right mix of government and markets needed to achieve climate goals.

If one looks around the world at great achievements in the climate realm more than a decade after global adoption of market-based programs as the instruments of choice, emissions trading and environmental taxation often do not figure as important causal factors.[104] One country in Europe has far less fossil fuel emissions in the electric utility sector than just about any economically comparable place in the world. That country is France.[105] France achieved this miracle primarily by building state-licensed nuclear power plants, made publicly acceptable through rigid state control of both power plant design and worker training.[106] Germany has made enormous strides in advancing solar power—an energy source with the technical potential to replace a lot of fossil fuel in the long run—and other renewables through an economic incentive measure that does not put a price on carbon: a type of government subsidy called a feed-in tariff.[107] Brazil has a

103 *See* Hepburn & Stern, *supra* note 56, at 49 (stating that because of energy efficiency investment's insensitivity to price, "carbon pricing" will do little to increase deployment of energy efficiency). *Cf.* Stavins, *supra* note 88, at 198 (stating flatly that polluters will undertake "all reductions" that are less costly than the allowance price in a well-designed cap-and-trade system).

104 *See, e.g.*, David Jacobs, *The German Energiewende—History, Targets, Policies and Challenges*, 4 RENEWABLE ENERGY L. & POL'Y REV. 223, 229 (2012) (discussing the failure of the EU Emissions Trading Scheme to induce a switch from coal to natural gas in Germany); *see also* Michael Shellenberger & Ted Nordhaus, *Subsidies for Innovation*, N.Y. TIMES, Nov. 15, 2012, at A34 (noting that the lower natural gas prices currently dropping U.S. emissions stem from innovation supported by more than $10 billion in government subsidies).

105 *See* The Shift Project, *Breakdown of GHG Emissions By Sector*, http://www.tsp-data-portal.org/Breakdown-of-GHG-Emissions-by-Sector#tspQvChart (last visited July 26, 2014) (showing that France's electricity sector emitted 757 $MtCO_2eq$ as compared to more than 4,000 $MtCO_2eq$ for Germany and 2,500 $MtCO_2eq$ for the UK).

106 *See* Dieter Helm, *Nuclear Power, Climate Change, and Energy Policy*, *in* THE ECONOMICS AND POLITICS OF CLIMATE CHANGE, *supra* note 56, 247, 249 (discussing the French government's ownership of the entire technology chain for nuclear energy and state training of the nuclear workforce); NUCLEAR ENERGY DATA 2013, NUCLEAR ENERGY AGENCY ORG. FOR ECON. CO-OPERATION AND DEV., NUCLEAR ENERGY DATA 11 (2013), *available at* http://www.oecd-nea.org/ndd/pubs/2013/7162-bb-2013.pdf (showing that France gets 77.8% of its power production from nuclear energy).

107 *See* Samantha Booth, *Community Solar: Reviving California's Commitment to a Bright Energy Future*, 43 ENVTL. L. REP. 10,585, 10,590–91 (2013) (noting that Germany has become the first country to exceed 30 gigawatts of solar capacity because of its feed-in tariff); Craig A. Hart & Dominic Marcellino, *Subsidies or Free Markets to Promote Renewables?*, 3 RENEWABLE ENERGY L. & POL'Y REV. 196, 202–03 (2012) (showing a 20,000 fold increase in solar energy and 20.3% market share for renewables in 2011); Marc Ringel, *Fostering the Use of Renewable Energies in the European Union: The Race Between Feed-in Tariffs and Green Certificates*, 31

transportation sector with much lower emissions than one typically finds in advanced countries.[108] It achieved this through a very complicated mix of measures encouraging biofuels production, not by simply putting a price on carbon.[109] Most of Europe has far lower per capita carbon emissions in the transportation sector than the United States.[110] Some of this is because of Europe's smaller geographic scale.[111] But it also reflects substantial government investment in mass transit and urban design decisions that limit sprawl, rather than putting a price on carbon.[112]

Putting a price on carbon would constitute a constructive step forward in reducing carbon emissions, whether done through traditional regulation, taxation, or emissions trading. Thankfully though, policy makers around the world have not put all of their eggs in that basket. Little doubt exists that some of the design improvements recently adopted in trading programs aimed at greenhouse gas abatement will make them accomplish more in the future than they have in the past,[113] so economists' advocacy is not so much

RENEWABLE ENERGY 1, 6 (2006) (explaining that a feed-in tariff pays renewable energy producers fixed above-market prices for the electricity they produce).

108 *See* Paulina Calfucoy, *The Brazilian Experience in Building a Sustainable and Competitive Biofuel Industry,* 30 WIS. INT'L L.J. 558, 574 (2012) (stating the ethanol accounts for some 40% of Brazil's transportation fuel).

109 *See generally* Juscelino F. Colares, *A Brief History of Brazilian Biofuels Legislation*, 35 SYRACUSE J. INT'L L. & COM. 293 (2008) (summarizing the history of Brazil's biofuels program and translating some of the relevant laws).

110 INT'L ENERGY AGENCY, CO_2 EMISSIONS FROM FOSSIL FUEL COMBUSTION: HIGHLIGHTS 69–71 (2012), *available at* https://www.iea.org/co2highlights/co2highlights.pdf (showing that the United States has higher transport emissions than any country in Europe).

111 *See generally* CHRISTOPHER D. PORTER ET AL., U.S. DEP'T OF ENERGY, EFFECTS OF THE BUILT ENVIRONMENT ON TRANSPORTATION: ENERGY USE, GREENHOUSE GAS EMISSIONS, AND OTHER FACTORS 12 (2013) (discussing the relationship between population density and carbon dioxide emissions); David Dodman, *Blaming Cities for Climate Change? An Analysis of Urban Greenhouse Gas Emissions Inventories*, 21 ENV'T & URBANIZATION 185, 193 (2009) (describing "urban density" as "one of the most important factors" influencing energy used in transportation and hence greenhouse gas emissions); Christopher Kennedy et al., *Greenhouse Gas Emissions from Global Cities*, 43 ENVTL. SCI. & TECH. 7297, 7299 (2009) (noting a correlation between urban density and greenhouse gas emissions from fossil fuels in the transportation sector).

112 *See, e.g.*, Charles Knutson, *Europe on the Move: Public Transportation Lessons for the U.S.*, THE GERMAN MARSHALL FUND OF THE UNITED STATES BLOG, July 5, 2013, http://blog.gmfus.org/2013/07/05/europe-on-the-move-what-the-us-can-learn-from-europes-investment-in-a-21st-century-transportation-system (last visited July 26, 2014) (discussing efforts in Brussels to reduce car traffic by promoting bicycle and transit use); Elisabeth Rosenthal, *Across Europe, Irking Drivers is Urban Policy*, N.Y. TIMES, June 27, 2011, at A1 (discussing European policies to discourage driving in urban centers and the paucity of such policies in the U.S.). *Cf.* Dodman, *supra* note 111, at 190 (noting that New York City, because of its extensive public transportation system, has much lower car ownership levels than other North American cities, which helps keep its emissions low); *see also* PORTER ET AL., *supra* note 111, at 45–50 (discussing land use policies that led to sprawl, contrasting them with smart growth policies encouraging urban density lowering greenhouse gas emissions); Kennedy et al., *supra* note 111, at 7299 (suggesting that smart growth policies would reduce greenhouse gas emissions by increasing population density and decreasing vehicle miles traveled).

113 *See, e.g.*, Aldy & Stavins, *supra* note 49, at 164 (noting that phase III of the EU Emissions Trading Scheme makes the cap more stringent, subjects more allowances to auctioning, and tightens limits on offset use); REGIONAL GREENHOUSE GAS INITIATIVE, INC., RGGI STATES PROPOSE

wrong, as it is evasive of fundamentally important questions that should not be decided by blind allegiance to either markets or government. Market essentialism tends to cut off realistic debate about the conditions necessary to make prices accomplish something valuable, and about the limits of price as a coordinating mechanism for some needed changes.

Some of the more perceptive economic writing recognizes that the values bundled together in the price-on-carbon metaphor can conflict. For example, maximizing efficiency suggests the need to adopt the broadest possible trading market.[114] Making programs effective counsels constrained markets where only well-monitored reductions from actors subject to caps can be traded.[115] Similarly, maximizing autonomy might suggest flexibility in measurement programs, an invitation to inefficient gaming of reduction credits.

The questions the pricing metaphor masks could provide a predicate for a desperately needed third generation debate on the design and use of environmental instruments. A perceptive European commentator has noted the "promotional . . . nature" of much of the writing about emissions trading.[116] More than two decades after the acid rain program launched, an era where trading approaches played a huge role in environmental law, many emissions trading advocates use metaphors and figures of speech suggestive of an ideological effort to advocate mechanisms that have yet to gain a foothold. By now, we should be past this.[117] Almost nobody doubts that a "well-designed" emissions trading program can achieve environmental goals cost effectively.[118] Scholars need to move beyond this basic observation and grapple with the tougher issues suggested above. What

LOWER CO_2 EMISSIONS CAP 45%, IMPLEMENTING A MORE FLEXIBLE COST-CONTROL MECHANISM 1 (2013), *available at* http://www.rggi.org/docs/PressReleases/PR130207_ModelRule.pdf (proposing a 45% reduction in the cap for the Regional Greenhouse Gas Initiative in the northeastern United States).

114 *See* Tietenberg, *supra* note 25, at 290 (noting that a larger trading area implies greater cost-effectiveness); Wiener, *supra* note 9, at 716–17 (discussing studies suggesting potentially large cost savings from the global trading of greenhouse gas emissions).

115 *See* BLAS LUIS PÉREZ HENRÍQUEZ, ENVIRONMENTAL COMMODITIES MARKETS AND EMISSIONS TRADING: TOWARDS A LOW-CARBON FUTURE 218 (2013) (suggesting that a trading program should only include sources whose emissions can be accurately monitored).

116 *See* Sanja Bogojevi, *Ending the Honeymoon: Deconstructing Emissions Trading Discourses*, 21 J. ENVTL. L. 443, 447 (2009) (describing the emissions trading literature as having a "promotional," rather than analytical, nature); *see also* Richards, *supra* note 69, at 242 (describing the instrument choice literature as focused on "championing . . . taxes and marketable allowances"); Robert W. Hahn & Robert N. Stavins, *Economic Incentives for Environmental Protection: Integrating Theory and Practice*, 82 ECON. ENV'T 464, 464 (1992) (describing economists as "extolling the virtues of market-based . . . approaches to environmental protection").

117 *See, e.g.*, James Krier, *The Tragedy of the Commons: Part Two*, 15 HARV. J.L. & PUB. POL'Y 325, 325–26 (1992) (characterizing the idea of relying on market-based incentives as "old hat" and describing emissions trading as the "alternative of choice" in the United States).

118 *See, e.g.*, Robert N. Stavins, *What Can We Learn from the Grand Policy Experiment? Lessons from SO_2 Allowance Trading*, *in* ECONOMICS OF THE ENVIRONMENT: SELECTED READINGS 334, 334 (Robert N. Stavins ed., 5th ed. 2005) (noting that a "well-designed . . . tradeable permit system will minimize the aggregate cost of achieving" a given pollution reduction goal).

distinguishes a well-designed from a poorly designed program? What sorts of coordination tasks require us to go beyond the by now traditional approaches of tradable or non-tradable quantitative limits or of environmental taxation? How does one address the tensions between static and dynamic efficiency?[119] Policy analysts can see the relevant questions and begin to tackle them effectively only if they get beyond the tendency to glorify or demonize markets.

Finally, we come full circle to the political use of the pricing talk we started with. The political use of the pricing feature produces a paradox. On the one hand, talking about emissions trading as a price on carbon may serve a political purpose in making environmental progress palatable to those who revere markets and distrust government.[120] The widespread use of this metaphor, not just by scholars, but by politicians and editorial writers supporting comprehensive climate legislation,[121] suggests that emphasizing the price feature looked like an effective political strategy to some savvy players. Nor should one infer from the Congressional failure to pass climate change legislation that this was an obviously wrong strategy, as political changes and even some serendipity can convert any sensible strategy into a failure.[122]

On the other hand, recent history should have taught us that glorifying markets and demonizing government is dangerous in the long run, because we need both to function well in order to have a good society. I have argued elsewhere that neoclassical law and economics contributed to the financial crisis by providing an ideological underpinning for radical deregulation of financial markets.[123] A Nobel Prize-winning economist has made similar arguments about neoclassical economics itself.[124] Market glorification is not easily contained. Those who hijacked the economists' metaphor to demonize

119 *See* Montgomery & Smith, *supra* note 43, at 329–30 (questioning cap and trade's capacity to induce adequate innovation to address climate disruption properly).

120 *See* Aaron M. McCright & Riley E. Dunlap, *Defeating Kyoto: The Conservative Movement's Impact on U.S. Climate Change* Policy, 50 SOC. PROBLEMS 348, 353 (2003) (noting that conservatives tend not to have pro-environmental attitudes because environmental protection "involves government action that is seen as threatening to economic libertarianism").

121 *See supra* notes 1–9 and accompanying text.

122 *See* Patricia Murphy, *Immigration Decision Endangers Climate Change Bill*, POLITICS DAILY, Apr. 24, 2010, http://www.politicsdaily.com/2010/04/24/immigration-decision-endangers-climate-change-bill (last visited July 26, 2014) (showing that Senator Reid's decision to give an immigration bill priority undermined the bipartisan effort to pass Waxman–Markey); M.S., *Lindsey Graham Takes Ball, Goes Home*, ECONOMIST, Apr. 27, 2010, http://www.economist.com /node/21006290 (last visited July 26, 2014) (reporting Senator Graham's claim that Senator Reid gave an immigration reform bill priority, in order to shore up Reid's support from Hispanic voters in an upcoming election). *Cf.* Evan Lehman, *Reid, in Fistfight, Could Take More Punches from Climate Bill*, N.Y. TIMES, May 26, 2010, (noting that Senator Reid faced a Tea Party challenger in the upcoming election who might benefit from Reid's championing of climate disruption legislation).

123 *See* DAVID M. DRIESEN, THE ECONOMIC DYNAMICS OF LAW 28–32, 36–49 (2012) (arguing that neoclassical law and economics supported deregulation at the heart of the financial crisis).

124 *See* JOSEPH E. STIGLITZ, FREEFALL: AMERICA, FREE MARKETS, AND THE SINKING OF THE WORLD ECONOMY xi–xvii (2010) (blaming the economic crisis, in part, on free market fundamentalism supported by flawed economic theories).

cap and trade as a disguised tax, tapped into a deep anti-government sensibility in this country, which makes raising taxes anathema.[125] Economics' tendency to treat markets as efficient because firms act rationally and possess nearly perfect information has contributed to this market glorification. The exaggeration of pricing's virtues constitutes another manifestation of this market glorification problem, and perhaps not its most important one. Still, more nuanced portrayal of instrument choice might help ameliorate the tendency of economists' admiration for the institutions they study to contribute—perhaps contrary to their intentions—to deification of markets and demonization of government. Any sound approach to climate disruption will require effective government as well as responsive markets.

V. CONCLUSION

Traditional regulation, emissions trading, and pollution taxes all put a price on carbon. While that is a good thing, progress in addressing climate disruption will require a shift in the ideological environment that has for too long demonized government and idealized markets. And it will require a third generation instrument choice literature that focuses as heavily on price's limits as on its virtues.

125 *See, e.g.*, Aldy & Stavins, *supra* note 49, at 174 (describing Waxman–Markey's failure in the Senate as "collateral damage in a much larger political war").