GOALS, INSTRUMENTS, AND ENVIRONMENTAL POLICY CHOICE

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I. INTRODUCTION

In 1995, the Office of Technology Assessment (OTA) observed, "[C]hoosing the means or policy instruments to meet environment goals . . . can be a surprisingly complex task for decision-makers . . . ."[1] Kenneth Richards' article, *Framing Environmental Policy Instrument Choice*,[2] offers a powerful way to address this complexity. His multi-factored analytical framework for deciding which instrument has the best chance of minimizing PC + IC + TX (the "constrained optimization formula")[3] is new to the literature. Moreover, his situation-specific analysis provides useful new insights, including:

- the greater attractiveness of incentive-based instruments where the range of technology options is greatest or applications are varied;[4]
- the tendency of measurement costs (a subset of implementation costs) to rise as the realm of private party discretion in instrument choice increases;[5]

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1. OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, REP. NO. OTA-ENV-634, ENVIRONMENTAL POLICY TOOLS—A USER'S GUIDE 1 (1995) <http:www.wws.princeton.edu/~ota/> [hereinafter OTA REPORT].

2. Kenneth R. Richards, *Framing Environmental Policy Instrument Choice*, 10 DUKE ENVTL. L. & POL'Y F. 221 (2000).

3. Richards defines PC as "production costs" (which include capital, training, operation, maintenance, and management costs of producing emissions abatement), IC as "implementation costs" (which include measurement and "governance" costs), and TX as "public finance impacts." *See* Richards, *supra* note 2, at 228-29.

4. *See id*. at 256, 265.

5. *See id*. at 258.

- the desirability of paying interest on saved allowances;[6] and
- the characterization of "voluntary" regulation as an example of the "Calabresian role" for government (*i.e.*, assignment of property rights and liability rules),[7] which reveals that this instrument is subject to the same pitfalls as relying on the market, private bargaining, or private litigation to reduce pollution.

Although we find much to like in Professor Richards' taxonomy and analysis, we also have some questions, hesitations, and disagreements. We would add, however, that the fact that the article stimulated these responses indicates its value in focusing the debate over policy instruments. Our comments focus on four aspects of Professor Richards' framework.

First, the framework establishes a method of analyzing which policy instrument might be the best (defined as lowest cost) option to carry out a specific regulatory goal. The choice of an environmental *goal* is not the subject of the analysis. The article, however, has a few things to say about regulatory goals in establishing the basis for the taxonomy to which we object. More importantly, the analysis itself hides a common confusion in the literature between regulatory goals and policy instruments, which requires clarification.

Second, Professor Richards professes to be agnostic on the preferability of various policy instruments, indicating that the lowest-cost option may vest "production" decisions in the government rather than in private parties.[8] His commitment to carefully analyzing the relative "costs" of instruments distinguishes him from many of his fellow economists who are quick to assume that incentive-based instruments are preferable. His analysis, however, is not always consistent with this commitment, as we will indicate.

Third, the calculation of which instrument will create the lowest costs is subject to pollution goals and existing legal and political constraints. We believe that the legal constraints are less confining than Richards appears to suggest, and that the political constraints are more confining than he acknowledges.

Finally, the framework is based on institutional economics, which focuses on the transaction costs arising out of, among other factors, the bounded rationality of decision-makers. While this analysis leads

6. *See id*. at 249.
7. *See id*. at 236, 251.
8. *See id*. at 225-26, 265.

Professor Richards to important new insights, it also poses a challenge for his cost-minimization framework that cannot be ignored. Based on realistic limitations on time, information, and understanding, it will be difficult to make accurate comparisons among available policy instruments of the sum of (PC + IC + TX) for implementation purposes.

II. POLICY GOALS AND POLICY INSTRUMENTS

The formulation of environmental policy requires that policy-makers address two "central questions: (1) what is the desired level of environmental protection; and (2) what policy instruments should be used to achieve this level of protection?"[9] The goals established in response to the first question are typically expressed in terms of either numerical[10] or narrative[11] descriptions. Those goals may be arrived at through a variety of approaches. Using what is often referred to as a media quality-based approach,[12] the policy-maker may set the goal by determining how clean a particular environmental medium needs to be to provide an acceptable level of protection to the relevant exposed population or resource base. Alternatively, the policy-maker may establish the goal by determining what existing technology or anticipated future technology is capable of achieving. A third approach is to set the goal based on a determination of the point at which the cost of the next marginal level of pollution control is equal to the environmental benefit derived from achieving that incremental level of control, on the theory that any additional control requirement would cost more than it is worth. The essential task of policy-makers addressing the second question involves, in Professor Richards' termi-

9. Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 313 (1998).

10. The national ambient air quality standards established under the Clean Air Act (CAA), for example, are expressed in terms of the maximum permissible concentrations of pollutants in the ambient air. *See* Clean Air Act (CAA) §§ 101-618, 109(b), 42 U.S.C. §§ 7401-7671q, 7409(b) (1994).

11. The Clean Water Act (CWA), for example, prohibits the discharge of oil into navigable waters "in such quantities as may be harmful" to the public health or welfare or the environment, as determined by the President or an agency to which he delegates his authority. *See* CWA §§ 101-607, 311(b)(3), 33 U.S.C. §§ 1251-1387, 1321(b)(3) (1994). The U.S. Environmental Protection Agency (EPA) issued regulations defining as "harmful" any discharge that causes a film or sheen upon the surface of the water. *See* 40 C.F.R. § 110.3 (1997). *See also* 33 U.S.C. § 1251(a)(2) (1994) (enunciating the goal of achieving fishable/swimmable waters by July 1, 1983).

12. *See e.g.*, JOHN E. BONINE & THOMAS O. MCGARITY, THE LAW OF ENVIRONMENTAL PROTECTION: CASES –LEGISLATION –POLICIES 215 (2d ed. 1992).

nology, "the selection of abatement practices."[13] At this step of the process, environmental policy-makers have a broad range of instruments from which to choose, as the summary of instrument categories in Table A2 of Richards' article vividly illustrates.[14]

The literature on environmental policy does not always carefully distinguish between the issues raised by the question of how to set the desired level of environmental protection and the question of how to choose among the available instruments for achieving the goal that has been established. This blurring of the conceptually distinct questions of how to set the goal and how to achieve it has prompted criticisms of existing environmental regulatory programs that may not be justified. It has made defensible choices of environmental policy-makers appear to be irrational. In particular, the blurring of the two questions tends to mask the possibility that an environmental policy goal might be set using criteria other than economic efficiency, but that, once the goal has been established, regulators may select the policy instrument likely to achieve that goal at the least cost.

Professor Richards' article focuses on the second question—the choice of policy "instruments that the government uses when it directly intervenes in environmental protection decisions"[15]—but it does not entirely avoid contributing to the confusion that stems from the failure to separate the two steps in the policy formulation process. The article's failure to delineate sharply between goals and instruments has several potential consequences that the author does not intend. First, it may contribute to a mischaracterization of the rationale for federal environmental regulation. That mischaracterization, in turn, may distort the rationale for combining a non-efficiency-based environmental goal with an efficiency-based instrument for achieving it. Second, it may induce policy-makers to avoid one category of policy instruments—performance standards—that have the potential to minimize the sum of production costs, implementation costs, and public finance impacts.

Professor Richards describes a series of "dimensions" for differentiating environmental policy instruments.[16] The first dimension relates to "the role of government in determining the degree of environmental protection."[17] The government may simply define property

13. Richards, *supra* note 2, at 237.
14. *See id*. at 284.
15. *Id*. at 237.
16. *Id*. at 249, Table 1.
17. *Id*. at 235.

rights and tort rules, and rely on "Coasean bargaining among individuals to determine the efficient level of environmental protection."[18] Alternatively, it may intervene when transaction costs, coordination costs, and free-riding would prevent individuals from negotiating to efficient outcomes despite the presence of well-defined property rights.

The difficulty with Richards' description of this choice as the "first dimension" in selecting environmental policy *instruments* is that the determination of the appropriate degree of environmental protection is a determination that relates to the establishment of a policy goal rather than to the selection of a policy instrument to achieve it. Further, the article's description of when government intervention is appropriate reflects the traditional economic justification for such intervention. It does not accurately reflect, however, the rationale actually advanced by environmental policy-makers, particularly in the federal legislature, for foregoing exclusive reliance on common law property and tort rules backed by private litigation to enforce them.

The economic justification for government regulation of activities with potential adverse effects on the environment is the need to correct market failure. Accordingly, the goal of regulation is to replicate the result that private bargaining between the producers of environmental externalities ("producers") and those adversely affected by them ("receptors") would have produced in the free market in the absence of such failure. That goal can be accomplished by adopting a cost-benefit methodology for setting environmental quality goals, such that the regulatory scheme requires a reduction in pollution up to the point at which the marginal costs and benefits of the last unit of pollution reduction are equivalent. This result replicates the process of private bargaining in a well-functioning market because, in the absence of regulation, the producer would be willing to reduce its pollution output only up to the point at which the cost of any further reduction would exceed the amount receptors are willing to pay to avoid the adverse consequences of that output. The receptors would be willing to pay the producer only up to the point at which any higher payment would exceed the value to them of being free of further pollution. Professor Richards also assumes a cost-benefit justification in describing a grandfathered permit scheme as one in which

18. *Id*. at 236.

"the government grants each firm allowances equal to that firm's efficient level of emissions."[19]

Environmental regulation in this country, however, has rarely been based exclusively, or even primarily, on this utilitarian justification. Statutes that employ a media quality-based approach start from the premise that it is appropriate to adopt whatever pollution controls are necessary to achieve a chosen level of environmental quality, regardless of its cost.[20] This approach may be based on the notion that citizens have a right to a certain level of environmental quality. Alternatively, it might make sense on more pragmatic grounds in circumstances in which the policy-making entity has relatively good information about the relationship between various levels of exposure and resulting harm to health or the environment (*i.e.*, a well-defined dose-response curve), but not much information about the costs of employing alternative technological fixes. While it may be appropriate for policy-makers to consider cost in the selection of the appropriate regulatory instrument, or even to allocate permissible emissions based on a cost-benefit test, the goal itself is not based on a cost-benefit test. Even statutes requiring goals be set on the basis of technological feasibility do not reflect a cost-benefit justification. Senator Edmund Muskie, the principal sponsor of the CWA, justified the statute's regulatory approach as follows: "Can we afford clean water? Can we afford rivers and lakes and streams and life itself? Those questions were never asked as we destroyed the waters of our Nation, and they deserve no answers as we finally move to restore and renew them. These questions answer themselves."[21] Indeed, of the many federal statutes adopted to protect the environment, only a few

19. *Id.* at 239. The term "grandfathering" typically describes a situation in which a regulatory scheme exempts or provides preferential treatment for activities that predate the adoption of the scheme. In this context, a system of grandfathered marketable allowances presumably refers to one in which allowable emissions are assigned based on preexisting levels of pollution by regulated firms. *See, e.g.,* Keohane et al., *supra* note 9, at 316. It is not clear whether Professor Richards is using the term "grandfathered" in this fashion. The analysis of his framework for the selection of environmental policy instruments would benefit from a more extensive description of what a system of grandfathered marketable allowances entails, and how it differs from an auctioned marketable allowance system.

20. *See* Lead Indus. Ass'n. v. EPA, 647 F.2d 1130, 1148 (D.C. Cir. 1980) (concluding that Congress intended that "economic considerations play no part in the promulgation of" the national ambient air quality standards). *See also* American Trucking Ass'ns, Inc. v. EPA, 175 F.3d 1027, 1040 (D.C. Cir. 1999), *modified on rehearing*, 195 F.3d 4 (D.C. Cir. 1999) (holding that the CAA precludes EPA from considering costs of implementation in setting the standards), *cert. granted sub nom.*, American Trucking Ass'ns, Inc. v. Browner, 120 S. Ct. 2193 (2000).

21. 1 Legislative History of the Water Pollution Control Act Amendments of 1972, S. Rep. No. 93-1, at 164 (1973).

authorize implementing agencies to set goals by reference to a cost-benefit rubric.[22] Most of the federal environmental statutes are based on alternative justifications, such as a commitment to do whatever is necessary to provide adequate public health and environmental protection, provided it is not infeasible.[23] Recent efforts to shift to an economic justification by requiring that environmental regulation satisfy a cost-benefit test have met with fierce opposition by public interest groups. Thus far, Congress, for the most part, has not abandoned its historical commitment to the use of alternative means of setting regulatory goals.[24]

The fact that Congress has eschewed reliance on a cost-benefit test for the establishment of environmental policy goals does not necessarily mean that it has chosen to completely ignore costs, or even the relationship between costs and benefits. One of the disadvantages of blurring the distinction between policy goals and instruments is that it hides an important insight that flows from Professor Richards' framework for selecting environmental policy instruments: it may make sense to select cost-minimizing or cost-efficient instruments even if the goals have been selected on the basis of some other yardstick. There is no reason why, for example, a regulatory system where a goal is set without reference to cost—such as a media quality-based regulatory scheme—could not be coupled with incentive-based policy instruments, such as marketable permits or pollution taxes, that are traditionally favored by economists committed to the market replication theory of government intervention.

Indeed, such "non-traditional" policy instruments have become a well-established part of the CAA's national ambient air quality standards regulatory scheme, the archetypal environmental program

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22. Those that do reflect a goal-setting process consistent with the traditional economic rationale for government regulation include the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) §§ 2-32, 2(bb), 3(c)(5)(C)-(D), 7 U.S.C. §§ 136(bb), 136a(c)(5)(C)-(D) (1994); the Accountable Pipeline Safety and Partnership Act of 1996, 49 U.S.C. § 60,102(b)(2)(C)-(E) (Supp. III 1997); and perhaps the Toxic Substances Control Act (TSCA) §§ 2-412, 6(a), (c)(1), 15 U.S.C. §§ 2601-2692, 2605(a), (c)(1) (1994).

23. *See* Thomas O. McGarity, *The Expanded Debate Over the Future of the Regulatory State*, 63 U. CHI. L. REV. 1463, 1493-94 (1996) ("The purpose of pollution reduction standards is to ensure that sources do the best they can to protect health and the environment, even if a detailed cost-benefit analysis would suggest that less pollution reduction would be more efficient.").

24. *But cf.* 42 U.S.C. § 300g-1(b)(6) (Supp. III 1997) (allowing EPA to establish maximum contaminant levels for drinking water contaminants in public water systems at a level other than the most feasible level if the benefits of a maximum contaminant level would not justify the costs of achieving it).

whose goals are set using a media quality-based approach. EPA issued an Emission Trading Policy Statement in 1986[25] to endorse various forms of both intra-firm and inter-firm trading.[26] Its 1994 Economic Incentive Program[27] was designed to encourage economically efficient reduction of pollutants in areas of the country that have not yet achieved the national standards by allowing sources that have relatively high control costs to purchase allowances from sources with lower control costs and that are therefore capable of "over-controlling" to generate excess, saleable allowances. The Program even authorized trades between stationary and mobile sources.[28] State environmental agencies have provided further opportunities for the use of incentive-based instruments as a means of achieving the levels of emissions reductions necessary to comply with the national ambient air quality standards.[29] Marketable permits and related incentive-based instruments also promise to play a larger role in the future under the CWA, a statute that relies on a technology-based scheme to set goals for categories of point sources. EPA has considered authorizing trades between point and nonpoint sources as a means of generating efficiencies in discharge reductions and reaching sources that, to date, have not been regulated to any meaningful degree.

One of the important contributions that Richards' article makes is the guidance it provides to environmental policy-makers for comparing a variety of available policy instruments and choosing the most efficient among them. This selection process may proceed regardless of the nature of the mechanism chosen to set the policy goal. Even the opponents of cost-benefit justifications for environmental regulation would find it hard to dispute the notion that it makes no sense to ignore the most cost-effective means of achieving a media quality-based or technology-based goal.

III. DIFFERENTIATING COMMAND-AND-CONTROL INSTRUMENTS

Once the confusion over goals and instruments is clarified, Pro-

25. *See* Emissions Trading Policy Statement, 51 Fed. Reg. 43,814 (1986).

26. The "bubble concept" endorsed in the famous (or infamous) case of Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837 (1984), is an example of intra-firm trading.

27. *See* Economic Incentive Program Rules, 59 Fed. Reg. 16,690 (1994).

28. *See id.* at 16,696.

29. For further discussion of the use of incentive-based policy instruments under the CAA, see FREDERICK R. ANDERSON ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 487-96 (3d ed. 1999).

fessor Richards' article supports the important conclusion that policy-makers can pair non-utilitarian environmental goals with regulatory instruments that rely on economic incentives to reduce risks to humans and the environment. This clarification is important because it indicates that the interest of economists in replacing command-and-control regulatory instruments with ones that rely on economic incentives does not require Congress to change existing regulatory goals.

Richards discusses the choice between command-and-control and market incentive instruments in his second dimension, which focuses on the "locus of discretion" for determining what abatement tools will be used to meet environmental goals.[30] Here Richards distinguishes between instances in which the government takes a hierarchical approach to decision-making by retaining control over instrument selection and those in which regulated entities themselves "identify the best way[ ] to meet pollution abatement requirements."[31] Richards includes "command-and-control" regulations under the rubric of the hierarchical approach and incentive-based instruments as examples of the private party control model.

The difficulty with the dichotomy drawn by Professor Richards is that command-and-control regulation, as that term is typically employed, is not unidimensional. It includes both design standards and performance standards. Both types of standards typically specify a goal that the agency defines by ascertaining the level of pollution abatement that is technologically and economically possible for regulated entities to achieve. The difference is that under a design standard the agency defines the method by which regulated entities are required to achieve the goal—such as by installing and operating a particular kind of pollution control technology or work practice—whereas under a performance standard, regulated entities are free to achieve the goal any way they want. They can use the model technology or work practice identified by the agency as the one that makes compliance possible, or they can devise alternative means of meeting the goal. In theory at least, regulated entities subject to a performance standard have an incentive to develop such alternative means if they provide a more efficient means of achieving the regulatory goal.[32]

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30. Richards, *supra* note 2, at 237.

31. *Id.*

32. Some critics of command-and-control regulation, however, have asserted that controls based on best available technology do not provide strong incentives to develop new, environmentally superior technologies, and may even discourage their development. *See, e.g.*, Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1334-36 (1985).

Thus, while design standards qualify as "hierarchical arrangements," in Professor Richards' terminology, performance standards are closer in this regard to the category of "private party control instruments" in which Richards places incentive-based environmental policy instruments. In describing Figure 3, in which he models various combinations of dimensions two and three of his framework for instrument selection, Richards notes that government production and command-and-control regulation "in their purest form" maximize government control over instrument selection.[33] Perhaps he means by that qualification to confine the entry for "command-and-control regulation" in the figure to design standards. Indeed, later in his description of dimension three, Richards describes performance standards as regulations that provide "more discretion to the polluting firm regarding how to abate pollution."[34] Similarly, at the end of Part IV.B.3, Richards concedes in his discussion of "intermediate instruments" that *"[i]n some applications*, performance-based standards provide private firms with more discretion (lower production costs) than technology-based command-and-control standards."[35] The article nevertheless presents the misleading impression that design standards are the norm in federal pollution control regulatory programs and that performance standards represent the exception. In fact, the opposite is true. The CWA, for example, requires that point sources comply with a series of technology-based effluent limitations (numerical goals),[36] but allows those sources complete discretion to choose the means of compliance. The nationally uniform, technology-based emission standards under the CAA by and large follow the same pattern.[37] On occasion, the statutes explicitly bar EPA from

33. *See* Richards, *supra* note 2, at 238.

34. *Id*. at 239.

35. *Id*. at 268 (emphasis added).

36. *See* 33 U.S.C. §§ 1311(b)(1)-(2) (effluent limitations for existing point sources), 1316(a)(1), (e) (effluent limitations for new point sources), 1317(b)(1), (d) (1994) (pretreatment standards for indirect point sources).

37. *See* 42 U.S.C. §§ 7411(a)(1), (e) (national emission standards for new stationary sources), 7412(d) (1994) (national emission standards for hazardous air pollutants). Indeed, the statute was amended in 1990 to eliminate provisions that effectively limited the discretion of certain coal-burning sources to choose between scrubber installation and switching to fuels with lower sulfur concentrations as means of compliance with the new source standards. *Compare* the earlier 42 U.S.C. § 7411(a)(1) (1988) with the revised 42 U.S.C. § 7411(a)(1) (1994). The Act authorizes EPA to promulgate design or work practice standards for new stationary sources, but only if it is not feasible to prescribe or enforce a performance standard. *See* 42 U.S.C. § 7411(h) (1994). This authority has rarely been invoked.

specifying the means of compliance.[38] Even where they do not do so, however, it is clear that, as a general proposition, "the Administrator is not to prescribe the technology which must be used, but is rather to set discharge levels which can be met if indicated technology is used. The choice of technology at each plant is left to the operator."[39]

In short, Richards' attempt to distinguish among environmental policy instruments according to, among other things, the degree to which they vest control over production decisions in the government or in private parties is a useful device. It should assist policy-makers in the selection of those instruments that minimize the sum of production costs, implementation costs, and public finance impacts, particularly when coupled with insights such as the relatively greater attractiveness of incentive-based instruments in situations where the range of technology options is greatest.[40] Richards' use of a government versus private party control dichotomy should also help analysts to identify those cases in which government regulators have not made an optimal choice. Both policy-makers and analysts could be led astray, however, if they fail to recognize that a performance standard is closer to the left side of Richards' Figure 3 than it is to the right in that it vests considerable, if not complete, discretion in the regulated entity to select the means of regulatory compliance. To that extent, it should afford some of the same production-cost-minimization advantages that other incentive-based standards do, if, as Richards posits, non-hierarchical instruments "will virtually always lead to lower production costs than the hierarchical instruments."[41] Thus, lumping design and performance standards together under the general rubric of "command-and-control regulation" threatens to eliminate performance standards from consideration in circumstances in which they might perform as well as "purer" incentive-based instruments in terms of production cost-minimization, and better than those instruments from the vantage point of either implementation costs or public

38. *See, e.g.*, 42 U.S.C. § 7423(c) (1994) ("In no event may [EPA] prohibit any increase in any stack height or restrict in any manner the stack height of any source").

39. CPC Int'l Inc. v. Train, 515 F.2d 1032, 1045 n.25 (8th Cir. 1975) (citing S. Rep. No. 92-414, at 1477 (1971); S. Rep. No. 92-1236, at 311, *in* A Legislative History of the Water Pollution Control Act Amendments of 1972)). This is such a fundamental point that one would expect it to be highlighted in academic and judicial treatments of the federal pollution control laws. In fact, it sometimes escapes recognition altogether. *But cf.* ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 155 (2d ed. 1996) (performance standards "routinely devolve into de facto design standards").

40. *See* Richards, *supra* note 2, at 256.

41. *Id.*

finance impacts. Performance standards rely on particular technologies to formulate pollution reduction goals, but do not dictate that those same technologies be used as policy instruments to achieve those goals.

By way of digression, we would offer one final suggestion in relation to Figure 3. The lower, right-hand corner of the figure is meant to represent situations in which the government controls the selection of abatement practices but imposes both abatement and residual pollution costs on private parties. Professor Richards suggests that, although this combination of his second and third dimensions must exist "in theory,"[42] there is currently no term for such an instrument. Accordingly, Richards leaves a question mark in that corner of the figure "for now."[43] In fact, although it may not have the benefit of an impressive moniker, a product or chemical ban fits the description, if only because a prohibition results in the elimination of residual pollution costs. Although such bans are rare under the federal environmental laws, they do surface on occasion.[44] Nevertheless, we agree with Professor Richards' implicit conclusion that this "arrangement" deserves relatively less emphasis than those represented in the other five entries in Figure 3.[45]

IV. THE PRESUMPTION IN FAVOR OF INCENTIVE-BASED INSTRUMENTS

A strength of Professor Richards' analysis, as we noted in the introduction, is that it purports to be, and for the most part is, agnostic on the preferability of various policy instruments. He prefers the policy instrument that will in a given case minimize the sum of (PC + IC + TX). Further, he notes that "[i]n some settings, instruments such

42. *See id*. at 243. One is reminded of the genesis of the famous "rule four" for resolving private nuisance disputes generated more or less contemporaneously in Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1116 (1972), and in Spur Indus., Inc. v. Del E. Webb Dev. Co., 108 Ariz. 178, 494 P.2d 700 (1972). *See also* ANDERSON, ET AL., *supra* note 29, at 1135-36; JESSE DUKEMINIER & JAMES E. KRIER, PROPERTY 774-75 (4th ed. 1998).

43. *See* Richards, *supra* note 2, at 243.

44. *See e.g.*, 42 U.S.C. §§ 7671c(a)-(b), 7671d(a)-(b) (1994) (phasing out the production and consumption of chemicals with the potential to harm the stratospheric ozone layer); 15 U.S.C. § 2605(e) (1994) (phasing out the manufacture, processing, and use of polychlorinated biphenyls). Both sets of prohibitions, of course, are subject to the usual panoply of exemptions and exceptions. To the extent these exceptions and exemptions exist, they may well generate residual pollution costs that will not be borne by the private parties. To the extent this is so, the regulatory provision will move up along the vertical axis (Distribution of Costs) of Richards' Figure 3.

45. *See* Richards, *supra* note 2, at 243.

as command-and-control regulation and government production may provide greater overall economic efficiency than their incentive-based counterparts."[46] This insight is a useful caution to the general preference expressed by many policy analysts for incentive-based instruments. Cass Sunstein, for example, would have the government adopt a "presumption" in favor of "flexible, market-based incentives."[47] The relative desirability of market incentive instruments, however, is an empirical question, because, as Professor Richards recognizes, the "optimal choice of policy instrument to implement a particular pollution abatement goal depends upon the nature of the pollutant, the kind of harm the pollutant causes, the available control technologies, the number and type of polluting entities, and the type of market failure."[48] Sunstein and other supporters of market-incentive approaches apparently assume that these conditions will favor market-based instruments more times than not, but we do not know of any empirical evidence that would support such a general assumption.

Despite Professor Richards' professed agnosticism, he slips on occasion and exhibits a preference for market-incentive instruments that is unsupported by his analysis. More importantly, the entire approach that Professor Richards uses—choosing an instrument based on the concept of cost-minimization—is itself an unwarranted preference in favor of market-based incentives because it fails to account for other environmental policy objectives that should be considered along with cost in choosing an environmental instrument.

A. *Unsupported Preferences*

Although Professor Richards' cost-minimization approach does not designate any instrument as preferred, he does observe, "[t]he fact that taxes and marketable allowances tend to minimize both PC and TX would seem to make them the instruments of choice for environmental protection."[49] This statement is consistent with Sunstein's recommendation that there be a "presumption" in favor of such instruments. Richards goes on to observe, "[h]owever, these advantages might be overridden in *some* cases where the implementation

46. *Id*. at 226.

47. CASS R. SUNSTEIN, FREE MARKETS AND SOCIAL JUSTICE 354 (1997).

48. Richards, *supra* note 2, at 226.

49. *Id*. at 279. Richards also observes, "[g]enerally command-and-control regulation should be preferred to the enterprise mode instruments on the basis of public finance considerations." *Id*. at 281. We are uncertain how to reconcile this statement with the one in the text above.

costs associated with incentive-based instruments are sufficiently high due to information requirements, specialized assets, and uncertainty. Thus, no instrument dominates the others in all cases."[50] We have the same problem with this statement as we do with Sunstein's assumption. Neither Richards (as far as we can tell from his article) nor we know in *how many* cases the implementation costs associated with incentive-based instruments are sufficiently high that a non-incentive approach is optimal.

If analysts are to engage in assumptions about the outcome of the cost-minimization formula, we might engage in the opposite assumption—that implementation costs generally weigh in favor of avoiding market-based instruments because they are more difficult to implement. Consider the following difficulties with implementing a pollution tax, which one of the authors identifies in an earlier article:

> [The proponents of pollution taxes] assume[ ] that risks from toxic substances could easily be reduced by simply assessing high taxes on, for examples, toxic waste disposal and automobile emissions. These optimistic assessments may underestimate the difficulties inherent in estimating risks and benefits. In addition, the incentive-based approach adds new uncertainties to the prediction of the number of permits and level of taxes necessary to achieve a given level of risk reduction, on top of the already existing uncertainties about how various levels of exposure to toxic substances affect humans and the environment. Unless agencies are prepared to tolerate potentially high exposures and/or devastating short-term economic consequences during the time it takes for the system to reach "steady state," proceedings examining the level of tax or the issuable number of permits are likely to be highly contentious. Moreover, because industry will likely resist any change to the status quo, especially if it requires immediate outlays, implementation of any market-based program is likely to be slow.[51]

Moreover, although Richards is quick to discuss the possibility of opportunistic behavior on the part of the government, he does not give equal time, or actually any time, to the possibility of opportunistic behavior on the part of regulated entities. Consider his discussion of the pitfalls of opportunistic behavior, where he indicates that fear of opportunistic behavior by the government may impede allowance trading.[52] But there may be other reasons why trading does not work well, including opportunistic behavior by regulated entities, such as

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50. *Id*. at 279 (emphasis added).

51. Sidney A. Shapiro & Thomas O. McGarity, *Not So Paradoxical: The Rationale for Technology-Based Regulation*, 1991 DUKE L. J. 729, 745.

52. *See* Richards, *supra* note 2, at 262-63.

overestimating compliance costs before the regulatory scheme goes into effect.[53] In essence, there are two competing explanations for why a trading program may fail, in the sense that few, if any, trades take place. One explanation, offered by Professor Richards, is that regulated entities are reluctant to trade because of their concern that trades would reveal new cost information to the government and would therefore cause the government to engage in stricter regulation.[54] Another explanation, not considered by Professor Richards, is that few trades occur because most regulated entities can meet pollution limits without engaging in high cost abatement. According to this explanation, regulated entities lobby the government to adopt a less stringent pollution limit because they argue that stricter emission limitations would cost too much. After the government accedes to this argument, the entities are then able to meet the weaker pollution goals at costs that are less (and sometimes much less) than the estimates that they gave to the government. The lower cost of the pollution abatement reduces the number of trades because there are few firms with high abatement costs that wish to make trades with firms that have lower abatement costs.

We do not know which of these stories is correct, although there is some empirical support for the second theory that trades do not occur because abatement costs are low.[55] Our point is simply that opportunistic behavior exists on both sides—regulators and regulated entities—and further study is needed concerning why certain instruments do or do not work.

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53. *See, e.g.*, Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Justice: Los Angeles' Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL'Y F. 231, 251-68 (1999) (providing a host of reasons why pollution trading may fail, including opportunistic behavior by firms in overestimating both compliance costs and pollution reductions).

54. *See* Richards, *supra* note 2, at 262-63.

55. *See* Adam M. Finkel, *A Return to Alchemy*, ENVTL. F., Sept.-Oct. 1996, at 15, 18 (finding that costs of installing emission control equipment on stationary sources of nitrogen oxides to reduce acid deposition turned out to be between 20 and 50 percent of the amounts initially predicted). *Cf.* Margaret Kriz, *Heavy Breathing*, NAT'L J., Jan. 4, 1997, at 8, 11 (discovering that although electrical utility officials predicted during congressional debate on the 1990 Clean Air Act Amendments that curbing sulfur dioxide emissions would cost $10,000 per ton, reductions were subsequently made for as little as $100 per ton); Dallas Burtraw & Byron Swift, *A New Standard of Performance: An Analysis of the Clean Air Act's Acid Rain Program*, 26 ENVTL. L. REP. 10,411, 10,423 (1996) (finding that aggregate annual compliance costs with acid rain control provisions were $1.2-2.5 billion, not the $4 billion predicted); Curtis Moore, *The Impracticality and Immorality of Cost-Benefit Analysis in Setting Health-Related Standards*, 11 TUL. ENVTL. L. J. 187, 199 n.55 (1998) (noting that projections by utilities of rate increases that would result from the adoption of proposed 1982 sulfur dioxide emissions requirements were far too high).

Still, we do not mean to dismiss Professor Richards' useful insight that "credible commitments" by the government against opportunistic behavior may be necessary to make trading work, and that these commitments can be costly and infeasible.[56] Indeed, the difficulties encountered by the Interior Department in implementing its "no surprises" policy under the Endangered Species Act seem to support this warning. Under this policy, the Fish and Wildlife Service promised that landowners who agreed to abide by habitat conservation plans to protect listed species would not be subject to additional land use restrictions or monetary sanctions, even if unforeseen circumstances made the plan agreed upon earlier ineffective.[57] The "no surprises" policy was obviously meant to "provide economic incentives for businesses and landowners to participate in proactive species conservation and thereby help avoid the larger economic dislocation associated with species listings."[58] But the policy generated stiff political opposition, particularly from environmental public interest groups, who complained that it affords unwarranted benefits to regulated entities.[59] More specifically, critics have charged that the policy "trade[s] species protection for landowner certainty," conflicts with congressional intent by placing the risks of scientific uncertainty on the government and the public, undermines the utility of the statute's prohibition on the taking of species, and ignores agency statutory duties to use all available means to conserve listed species.[60]

B. *Inherent Preference*

Our more fundamental objection to Professor Richards' cost-minimization approach is that it ignores important aspects of choosing an environmental instrument and that it may therefore bias the analysis in favor of market-incentive instruments. This defect is illustrated by comparing Richards' approach with one set of factors identified in the 1995 OTA Report mentioned above. The OTA study proposed

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56. *See* Richards, *supra* note 2, at 264.

57. *See* Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8,859 (1998); ANDERSON ET AL. *supra* note 29, at 187; Robert L. Glicksman, *Wildlife Habitat and Protection*, *in* ENVIRONMENTAL LAW PRACTICE GUIDE: STATE AND FEDERAL LAW § 24.06[3] (1998).

58. J.B. Ruhl, *While the Cat's Asleep: The Making of the "New" ESA*, NAT. RESOURCES & ENV'T, Winter 1998, 187, 225.

59. *See id.*

60. Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heels of the Endangered Species Act*, 6 N.Y.U. ENVTL. L. J. 279, 283-84 (1998). *See also* John H. Cushman, Jr., *The Endangered Species Act Gets A Makeover*, N.Y. TIMES, June 2, 1998, at D2.

that instruments be evaluated according to "environmental results," which includes evaluating the "assurance" that an instrument will meet environmental goals, and that environmental equity and justice will be attained in those results.[61]

The idea of "assurance" recognizes that instruments vary in terms of how well stakeholders will be assured that environmental goals will be met. OTA justifies "assurance" as a criterion for evaluation because it is a "bottom line criteria for many stakeholders, especially when [an] environmental problem poses serious risks to human health."[62] When OTA compares instruments, it finds that what Richards describes as "command-and-control" instruments are "the most effective at assuring stakeholders that environmental goals will be met."[63] By comparison, OTA rated tradable emissions as less reliable according to this criterion because of the "potential difficulty with monitoring."[64] Similarly, "pollution charges . . . have the potential to move things in the right direction," but the "action-forcing component is weakened since sources are given an option to pay rather than to reduce their discharges."[65] OTA admitted, however, that "more experience in the future with instruments such as tradeable emissions . . . and pollution charges may increase the confidence that stakeholders have that they can ensure results."[66] Richards, by comparison, compares the relative costs of each instrument subject to a "pollution abatement requirement."[67] Thus, he apparently assumes that each instrument will meet the abatement requirement and that he can therefore merely compare the instruments on the basis of cost.

The OTA Report also considers how instruments may differ in terms of the "equality of environmental outcomes, full participation by affected communities in decision-making, and freedom from bias in policy implementation."[68] Consider, for example, environmental justice, which recognizes that "environmental policies have discriminated against racial minorities and low-income communities in both direct and indirect ways."[69] OTA warns that market-based incentives, particularly tradable emissions and pollution charges, "may create se-

61. *See* OTA REPORT, *supra* note 1, at 144-45.
62. *Id*. at 146.
63. *Id*. at 147.
64. *See id*.
65. *Id*.
66. *Id*. at 147-48.
67. *See* Richards, *supra* note 2, at 228.
68. OTA REPORT, *supra* note 1, at 145.
69. *Id*. at 160 (citation omitted).

rious problems if equity is a major concern."[70] Tradable emissions, for example, may be a problem because firms or industries have a "choice which facilities will make improvements in performance and in which order improvements will be made."[71] As a result, "individuals in one area or region could be comparatively worse off even though others are much better off" and "even though the overall environmental performance for the industries or firms involved is improved."[72] Pollution charges can cause the same problem because firms in an area or region may decide to pay the charges rather than reduce pollution, while firms in another area or region may reduce pollution.[73]

The failure to consider factors such as effectiveness and equity may bias the Richards framework in favor of market-based incentives. According to the OTA analysis, market-based incentives may be less attractive in terms of their effectiveness and equity considerations, yet neither consideration apparently is taken into account by Richards. To be fair, Richards may not intend that his analysis be the end point in terms of the choice of instruments. He may simply offer his framework to identify the least cost instrument, and policy-makers then can take into account other factors, such as effectiveness and environmental equity. If so, it would be helpful for Professor Richards to acknowledge the limitations of the analysis.

V. THE ROLE OF LEGAL AND POLITICAL CONSTRAINTS

Professor Richards states that his cost-minimization formula for the selection of environmental policy instruments is "subject to" three sets of potentially limiting factors, including legal and political constraints.[74] Richards states that most previous studies of these instruments have ignored the effect that legal constraints may have in narrowing the range of available instruments.[75] Rather than analyze the

70. *Id.* For more on the environmental justice implications of emissions trading, see Drury et al., *supra* note 53.

71. OTA REPORT, *supra* note 1, at 162. On some of the choices made by firms in Los Angeles under the RECLAIM program, see Drury et al., *supra* note 53, at 260.

72. OTA REPORT, *supra* note 1, at 147. One possible means of mitigating the resultant undesirable concentrations of pollution, often referred to as "hot spots," would be to weight tradable emissions such that the selling entity receives more credit for selling excess emissions to a nearby source than it would by selling to a source located further away.

73. *See id*. at 164.

74. *See* Richards, *supra* note 2, at 228. The third constraining factor identified by Richards is "pollution abatement requirements." *See* discussion *supra* Part IV.

75. *See* Richards, *supra* note 2, at 224.

role of legal constraints exhaustively, Richards highlights the potential for legal constraints to limit the government's access to potentially efficient instruments "as an important consideration in instrument choice analysis."[76] Richards does not devote a separate section of his article to the role of political constraints. We agree that both legal and political factors may limit the range of available environmental policy instruments. We would add that government policy-makers are likely to devote more attention, in most situations, to the political constraints than to some of the legal constraints raised by Richards as potential limiting factors, such as the constitutional limitations emanating from the takings clause.

A. *Legal Constraints*

Richards posits that constraints imposed by the takings clause of the Fifth and Fourteenth Amendments may preclude the government from employing the regulatory option as opposed to the government production option when it seeks to retain control over production decisions.[77] As he points out, the Supreme Court has been more willing in recent years than in past decades to find that the application of regulatory schemes to property owners amounts to a compensable taking.[78] Among other things, the Court has cast doubt on the status of the "harm-benefit" test,[79] which, according to Richards, provided a rule of thumb for resolving takings disputes for the better part of a century.[80] The uncertainty created by the Court's shift in approach and the sense that a more encompassing model of regulatory takings has become entrenched among the courts may indeed have induced government policy-makers in certain instances to resort to the government production instrument instead of the hierarchical regulatory

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76. *Id*. at 273.

77. *See id*.

78. *See id*. at 273-75; *see, e.g.*, Dolan v. City of Tigard, 512 U.S. 374 (1994); Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992); Nollan v. California Coastal Comm'n, 483 U.S. 825 (1987). *See also* First English Evangelical Lutheran Church v. Los Angeles, 482 U.S. 304 (1987) (recognizing the availability of an inverse condemnation damage remedy for temporary takings). The courts may have begun to limit, if not roll back, the reach of these expansive takings precedents, however. *See, e.g.*, City of Monterey v. Del Monte Dunes, 526 U.S. 687, 702 (1999) (holding that the *Dolan* rough proportionality test does not apply to denial of permission to develop property); Bonnie Briar Syndicate, Inc. v. Town of Mamaroneck, 94 N.Y.2d 96, 721 N.E.2d 971, 699 N.Y.S.2d 721 (1999) (holding that the *Nollan* essential nexus test does not apply outside the exactions context).

79. *See* Lucas, 505 U.S. at 1023-28.

80. *See, e.g.*, Robert L. Glicksman, *Making A Nuisance of Takings Law*, 3 WASH. U. J. L. & POL'Y 149 (October 2000).

model.[81] Still, takings considerations are likely to play a relatively minor role in environmental policy instrument selection except in cases in which the regulatory scheme involves direct regulation of land use. Because land use regulation remains primarily the province of state and local regulation, as Professor Richards points out, takings concerns will probably surface more frequently at those levels than in the formulation of environmental policy by federal agencies.

The recent expansion of the protection afforded by the takings clause to private property has not infringed significantly, if at all, on the application of traditional command-and-control regulation by agencies such as EPA. It has long been clear that a regulation does not amount to a taking just because it precludes a business from operating as profitably as is would have in the absence of regulation.[82] As Justice Scalia, of all people, recently confirmed, "business in the sense of the activity of doing business, or the activity of making a profit is not property in the ordinary sense."[83] Accordingly, "[a]s heavy as the economic effects of [the federal pollution control] requirements have been, they have not resulted in a wave of successful takings claims for compensation."[84]

The takings challenges that have raised the most serious questions have been those directed at regulatory schemes that directly restrict the use of land by barring or severely restricting development. Thus, claims that the application of the CWA's technology-based effluent limitations, as implemented through the National Pollutant

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81. *See* Nollan, 483 U.S. at 866 (Stevens, J., dissenting) (noting "the unprecedented chilling effect" that the majority's conclusion that land use regulation worked a taking "will obviously have on public officials charged with the responsibility for drafting and implementing regulations designed to protect the environment and the public welfare").

82. *See* Concrete Pipe and Prod. of Calif., Inc. v. Construction Laborers Pension Trust, 508 U.S. 602, 645 (1993) ("mere diminution in the value of property, however serious, is insufficient to demonstrate a taking"); Penn Central Transp. Co. v. City of New York, 438 U.S. 104 (1978) (although the economic impact of regulation is a relevant consideration, mere diminution in value of regulated property is not enough to work a taking).

83. Florida Prepaid Postsecondary Ed. Expense Bd. v. College Savings Bank, 119 S. Ct. 2199, 2225 (1999).

84. Oliver Houck, *Why Do We Protect Endangered Species, and What Does that Say about Whether Restrictions on Private Property to Protect Them Constitute Takings?*, 80 IOWA L. REV. 297, 326 (1995). Houck's research "disclosed *no* cases in which pollution control requirements were found to constitute a 'taking' for which just compensation was required and few cases that even raised the issue." *Id.* at 326 n.164 (emphasis added). He cites illustrative cases rejecting takings claims. By contrast, a state Supreme Court recently held that an effort to *immunize* by statute certain agricultural activities from liability for externality-generating activities amounted to a taking of neighboring property owners' land. *See* Bormann v. Board of Supervisors, 584 N.W.2d 309 (Iowa 1998).

Discharge Elimination System (NPDES) permit program, to point sources of pollution has worked a taking have not proliferated. Yet, cases alleging that the denial of permits under the same statute's dredge and fill permit program[85] has resulted in a taking are myriad. In some cases, the Court of Federal Claims and the Court of Appeals for the Federal Circuit have found that the property of unsuccessful permit applicants denied permission to develop in protected wetlands has been taken.[86]

The Endangered Species Act (ESA) is another statute that promises to generate a series of Fifth Amendment takings claims by property owners precluded from developing or otherwise using their land by the statute's prohibition on the taking (which includes habitat modification) of protected species.[87] In a recent decision, however, the Federal Circuit rejected the assertion that the Act effected a taking despite depriving the owner of all economic value by requiring that his property be maintained in its natural state and by specifying onerous alternative development options that would avoid jeopardizing listed species found on the land.[88] The property owner was unable to demonstrate reasonable, investment-backed expectations of development, even though he bought the property before enactment of the ESA. The "regulatory climate" that existed at the time of purchase, including the existence of the CWA's dredge and fill permit program, deprived the owner of any reasonable expectation of being able to develop.[89]

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85. *See* 33 U.S.C. § 1344 (1994).

86. *See, e.g.*, Palm Beach Isles Assoc. v. United States, 208 F.3d 1374 (Fed. Cir. 2000); Loveladies Harbor, Inc. v. United States, 28 F.3d 1171 (Fed. Cir. 1994); Florida Rock Indus., Inc. v. United States, 45 Fed. Cl. 21 (1999). Takings challenges to dredge and fill permit denials do not always succeed. *See, e.g.*, Good v. United States, 189 F.3d 1355 (Fed. Cir. 1999), *cert. denied*, 120 S. Ct. 1554 (2000); Tabb Lakes, Ltd. v. United States, 10 F.3d 796 (Fed. Cir. 1993).

87. *See* Endangered Species Act (ESA) §§ 2-18, 9(a)(1)(B), 16 U.S.C. §§ 1537-1544, 1538(a)(1)(B) (1994). *But cf.* Blaine I. Green, *The Endangered Species Act and Fifth Amendment Takings: Constitutional Limits of Species Protection*, 15 YALE J. ON REG. 329 (1998) (asserting that the Fish and Wildlife Service has become "increasingly constrained" in its application of the Endangered Species Act to avoid raising takings questions). Professor Houck has predicted that constitutional takings claims will arise under the Endangered Species Act. But he has argued that they should not succeed. According to Houck, restrictions on development to protect endangered species are analogous to pollution controls, which have generally not been vulnerable to takings challenges because they replicate limitations on the use of private property that inhere in common law private nuisance doctrine. *See* Houck, *supra* note 84, at 321-31.

88. *See* Good v. United States, 189 F.3d 1355 (Fed. Cir. 1999), *cert. denied*, 120 S. Ct. 1554 (2000).

89. *See id.* at 1362-63.

State and local regulators, of course, frequently engage in direct land use regulation as a means of protecting the environment. When they do so, they risk running afoul of the takings clause, although they may be protected to the extent that regulatory restrictions restate limitations that inhere in the title of regulated property owners under state property law doctrines such as nuisance law.[90] If the takings clause is going to have a meaningful constraining effect on environmental policy instrument selection, therefore, it is most likely to be in the context of state and local land use regulation.

Although Professor Richards does not explore them, the group of federalism doctrines that the Supreme Court has recently invoked to strike down a series of federal statutes (some with direct environmental applications) may have a more significant impact on instrument selection than the takings clause. The Supreme Court has in the last few years relied on the commerce clause,[91] the Tenth Amendment,[92] and the Eleventh Amendment[93] to invalidate statutes as beyond the scope of federal legislative power.[94] To date, these decisions have not resulted in a radical restructuring in the scope of the power of federal environmental agencies.[95]

Regulated entities have relied on the Court's 1995 decision in *Lopez* to attack a variety of federal regulatory programs as beyond the scope of the commerce power. For the most part, these attacks have failed. One appellate court, for example, held that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is a legitimate exercise of the commerce power, even as the statute applies to hazardous waste contamination located entirely in one state.[96] Sometimes, however, the question has been close. The

90. *See* Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1029 (1992).

91. *See* United States v. Morrison, 120 S. Ct. 1740 (2000); United States v. Lopez, 514 U.S. 549 (1995).

92. *See* New York v. United States, 505 U.S. 144 (1992).

93. *See* Kimel v. Florida Bd. of Regents, 528 U.S. 62 (2000); Alden v. Maine, 527 U.S. 706 (1999); Seminole Tribe v. Florida, 517 U.S. 44 (1996). *See generally* Stephen R. McAllister & Robert L. Glicksman, *Federal Environmental Law in the "New" Federalism Era*, 30 ENVTL. L. REP. 11122 (2000); Stephen R. McAllister & Robert L. Glicksman, *State Liability for Environmental Violations: The U.S. Supreme Court's "New" Federalism*, 29 ENVTL. L. REP. 10665 (1999) [hereinafter McAllister & Glicksman, *State Liability*].

94. The *Lopez* case represented the first time the Court struck down a statute as beyond the scope of the commerce power since the New Deal.

95. However, in New York v. United States, 505 U.S. 144 (1992), the Court did bar the federal government from forcing the states to take title to low-level radioactive waste not properly disposed of within the time periods specified by statute.

96. *See* United States v. Olin, 107 F.3d 1506 (11th Cir. 1997).

Court of Appeals for the District of Columbia Circuit held in a split decision, and with a notable lack of consensus as to rationale, that the ESA is supported by the commerce power, even as it applies to efforts to protect a species located entirely in one state.[97] The Court of Appeals for the Fourth Circuit did overturn a felony conviction under a provision of the CWA's dredge and fill permit program regulations applicable to intrastate, isolated wetlands.[98] The holding did not rest directly on constitutional grounds, however. Rather, the court held that the regulation was beyond the agency's statutory authority as a means of avoiding the constitutional question that would have arisen had the regulation been authorized by statute. Furthermore, the Seventh Circuit subsequently upheld the constitutionality of the application of the dredge and fill permit program to isolated wetlands that actually provide habitat to migratory birds based on the substantial effects on interstate commerce that would result from the class of activities involving the destruction of migratory bird habitat.[99] The court deferred to EPA's position that Congress intended to regulate those wetlands and distinguished the Fourth Circuit's decision as a case involving potential as opposed to actual use of wetlands by migratory birds.[100]

The Court's Eleventh Amendment jurisprudence will bar suits by private entities against states for alleged violations of the federal environmental statutes, but the authority of the United States to pursue such violations has not been affected, and a plethora of other avenues of forcing states to comply with federal regulatory obligations remains.[101] The Eleventh Amendment cases, of course, will have no

97. *See* National Ass'n of Home Builders v. Babbitt, 130 F.3d 1041 (D.C. Cir. 1997), *cert. denied*, 524 U.S. 936 (1998). *See also* Gibbs v. Babbitt, 214 F.3d 483 (4th Cir. 2000) (holding, in another split decision, that regulatory restrictions on the taking of red wolves on private land did not violate the Commerce Clause). *See generally* John C. Nagle, *The Commerce Clause Meets the Delhi Sands Flower-Loving Fly*, 97 MICH. L. REV. 174 (1998). Post-*Lopez* commerce clause attacks on other federal species protection legislation have all come to naught. *See, e.g.*, United States v. Bramble, 103 F.3d 1475 (9th Cir. 1996) (challenging the Eagle Protection Act); United States v. Lundquist, 932 F. Supp. 1237, 1244-45 (D. Or. 1996) (challenging the Bald and Golden Eagle Protection Act); United States v. Romano, 929 F. Supp. 502 (D. Mass. 1996) (challenging the Lacey Act).

98. *See* United States v. Wilson, 133 F.3d 251 (4th Cir. 1997).

99. *See* Solid Waste Agency of N. Cook County v. U.S. Army Corps of Engineers, 191 F.3d 845, 850-51 (7th Cir. 1999), *rev'd on other grounds*, 2001 WL 15333 (U.S. Jan. 9, 2001).

100. *See id*. at 851-52. *See also* United States v. Hallmark Constr. Co., 14 F.Supp.2d 1069, 1074-75 (N.D. Ill. 1998) (upholding the same congressional objective of preventing actual wetland habitat destruction).

101. *See generally* McAllister & Glicksman, *State Liability*, *supra* note 93.

effect on the selection of instruments to ensure compliance with environmental laws by private parties.

It may be that the Supreme Court's efforts to erect barriers to the exercise of federal legislative power have not yet reached fruition and that future developments will strike further at the core of federal authority to regulate activities with potential adverse environmental impacts. As things now stand, though, the federalism limitations stemming from the recent commerce clause, Tenth Amendment, and Eleventh Amendment cases should constrain environmental policy instrument selection by federal agencies only at the margins.

B. *Political Constraints*

The political constraints mentioned by Professor Richards are likely to play a more vital role than the legal constraints in eliminating some policy instruments from serious consideration and relegating agencies to the selection of others. Recognizing that political considerations historically have continued to play a major role in every aspect of the formulation and implementation of environmental policy and that they will undoubtedly continue to do so is to state the obvious. Political factors have shaped the scope of federal regulatory programs. The CWA's failure to regulate nonpoint sources of surface water pollution has nothing to do with either science or economics and everything to do with politics.[102] The impact of a certain amount of water pollution on a given receiving body of water is the same regardless of its source. The identity of the origin of the pollution therefore provides no basis for deciding to regulate point sources to the hilt but to ignore nonpoint source pollution. As EPA has proceeded to implement the various iterations of the CWA's technology-based effluent limitations for point sources, the marginal costs of controlling those sources have increased. In many cases, therefore, it would likely be more efficient to generate further effluent reductions from nonpoint sources than to slap yet another level of more stringent controls on point sources. The reason Congress has not authorized EPA to do so is largely political—regulation of nonpoint sources tends to look like land use control, and land use control traditionally

102. This probably overstates the point. The government's oversight costs may be higher under a system of nonpoint source control than under a system of point source control due to the large number of nonpoint sources, their dispersed nature, and the general unavailability of best available technology-based mechanisms for controlling runoff from activities like agriculture, silviculture, and construction. Thus, even if production costs of nonpoint source controls may be no higher (and, as indicated below, may well be lower) than for point source controls, implementation costs may be higher.

has been the jealously guarded prerogative of state and local governments.[103] Any effort by Congress or EPA to regulate nonpoint sources would appear to some to represent a dangerous intrusion into local matters and would provoke a hue and cry that might redound to the detriment of the entire regulatory program by casting aspersions on the validity of federal regulation writ large. In similar fashion, political considerations were largely responsible for Congress' decision to allocate authority under the CWA to establish and implement ambient water quality standards to the states rather than to EPA.[104]

Political factors also may dictate instrument selection, regardless of the economic efficiency of the resulting choices. It may have made more sense from an economic perspective to allow new coal-burning stationary sources of air pollution to meet national standards of performance under the CAA by choosing the least-cost compliance methodology, whether that turned out to be fuel-switching or scrubber installation. Allowing regulated entities that degree of discretion, however, was likely to lead to an increase in the use of low-sulfur coal located in western states and a decrease in the use of high-sulfur coal found in Appalachia and the Mid-west. That result was unacceptable to politicians from high-sulfur coal-bearing states. The upshot, until it was eliminated in 1990,[105] was a provision requiring fossil fuel-fired stationary sources subject to new source standards of performance to achieve a percentage reduction in the emissions that would result from burning untreated coal, regardless of its sulfur content.[106]

Political factors may also provide a partial explanation for the paucity of emissions fees and taxes in federal pollution control programs, despite their theoretical superiority to command-and-control regulation on efficiency grounds. Emission taxes might be set by comparing the value of differences in the marginal cost of increasing and decreasing pollution with the marginal benefits in resource protection resulting from such changes in pollution levels.[107] There is no guarantee that polluters would respond to the tax to a degree that produces the desired level of environmental quality. If the tax gener-

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103. *See* ANDERSON ET AL., *supra* note 29, at 613-14.

104. *See* Mississippi Comm'n on Natural Resources v. Costle, 625 F.2d 1269, 1272 (5th Cir. 1980) (citing H. R. Rep. No. 89-215, *reprinted in* 1965 U.S.C.C.A.N. 3313, 3320-23).

105. *See supra* note 37 & accompanying text.

106. *See* 42 U.S.C. § 7411 (1988). For an explanation of the political backdrop as well as criticism of the percentage reduction requirement, see BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR (1981). For a defense of the requirement, see Eugene M. Trisko, *Universal Scrubbing: Cleaning the Air*, 84 W. VA. L. REV. 983 (1982).

107. *See* ANDERSON ET AL., *supra* note 29, at 495.

ates less than the amount of pollution reduction necessary to reach the environmental quality protection goal, it will be necessary to either modify the goal or increase the amount of the tax. Policy-makers intent on reaching a predetermined level of environmental quality may fear that hiking up a pollution tax once it is set will be politically impossible.[108] They may therefore opt for a "hierarchical" instead of an incentive-based approach due to a conviction that adjustments to a regulatory scheme may be more politically palatable than tax increases if initial predictions of the pollution reductions to be generated by each turn out to be too optimistic.

Environmental policy, then, is churned out in a highly political arena. Policy-makers take these factors into account in opting for one goal rather than another and in selecting one instrument for achieving the selected goal in lieu of available alternatives. Indeed, those affected by environmental policy may decide to trade off goals for policies or vice versa to minimize the impacts of these political constraints. Some environmental public interest groups, for example, may be willing to accept a program that authorizes effluent trading between point and nonpoint sources, despite skepticism over the degree to which regulators can police such trades, because they perceive it as a way to pull nonpoint sources into the CWA regulatory net in a way that otherwise would be politically impossible.

VI. COST-MINIMIZATION IN A WORLD OF BOUNDED RATIONALITY

In Part II, we objected to the idea that cost-minimization is the only criterion that should guide the choice of environmental policy instruments. We recognize, however, the importance of taking costs into account in this choice, and we find Professor Richards' cost-minimization framework to be an important and useful recommendation concerning how to account for costs. The actual benefit of the framework, however, is a function of how readily decision-makers are able to compile the relative cost information that the framework requires. If the framework is to become a useful decision-making tool, Professor Richards will need to consider how easily it can be adopted in a world where decision-makers lack complete information at the time they are required to act.

Professor Richards underpins his analysis of implementation costs with "lessons" from the New Institutional Economics.[109] This

108. *See* Shapiro & McGarity, *supra* note 51, at 748.

109. *See* Richards, *supra* note 2, at 256.

literature recognizes that economic actors will choose the business arrangement that yields for them the greatest economic benefit at the lowest cost. The choice of such arrangements, however, is subject to collective action problems, including "bounded rationality," or limits concerning the actors' knowledge and understanding. Thus, one of the challenges to choosing the "best" business arrangement is that structural choices must be made under conditions of uncertainty.[110] The idea of "bounded rationality" was originated by Herbert Simon and James March, who posited that institutional decision-making is a function of "bounded rationality" because of limitations concerning knowledge and understanding.[111] Simon's essential insight was that organizations were unable to choose the "optimal" solution to a problem because of organizational time and cost constraints.[112] The impossibility of choosing the "optimal" solution forced organizations to engage in "satisficing" or to find a "course of action that is satisfactory or good enough."[113]

Professor Richards' framework would have us choose the "optimal" instrument—the instrument that minimizes the costs that he identifies. But the New Institutional Economics, with its focus on factors like bounded rationality, reminds us that optimization is not always possible under real world conditions. Based on realistic limitations on time, information, and understanding, it will be difficult for decision-makers to make accurate comparisons of the sum of (PC + IC + TX) for implementation purposes. Just as economic actors have to adjust business arrangements in light of uncertainty, government decision-makers have to make instrument choices in light of uncertainty. Having identified a framework for choosing the optimal solution, we hope that Professor Richards will suggest in future publications how his framework can be adapted to the real world conditions in which decision-makers operate.

VII. CONCLUSION

There has been an important debate in the environmental policy literature over the choice of policy instruments.[114] Professor Richards'

110. *See id*. at 261-62.

111. *See generally* JAMES MARCH & HERBERT SIMON, ORGANIZATIONS (1958).

112. *See generally* HERBERT SIMON, ADMINISTRATIVE BEHAVIOR: A STUDY OF DECISION-MAKING PRACTICES IN ADMINISTRATIVE ORGANIZATIONS 65-68, 122, 174-75 (1st ed. 1948).

113. *See id.,* 3rd ed. 1976, at xxiv.

114. For excellent recent articles, see Keohane et al., *supra* note 9; Daniel H. Cole & Peter Z. Grossman, *When Is Command and Control "Efficient": Institutions, Technology, and the*

proposed framework adds considerable clarity and insight to these deliberations. We expect that others will find the framework as useful as we did and that it will play a central role in the debate over regulatory instruments in environmental policy.

In an effort to improve the usefulness of Professor Richards' decision-making framework, we have discussed four aspects of the framework that we believe require clarification, qualification, or elaboration. None of our points disputes the importance of Richards' contribution to the literature, although each suggests that additional fine-tuning of the analysis may be necessary.

First, Richards does not clearly indicate that policy-makers can pair non-utilitarian environmental goals with regulatory instruments that rely on economic incentives to reduce risks to humans and the environment. Thus, choosing instruments that rely on market incentives does not require Congress to change existing regulatory goals.

Second, Richards also fails to clearly explain that command-and-control instruments vary in terms of the extent to which they give governmental officials the power to specify the means by which regulated entities must protect the public and the environment. When Richards discusses command-and-control standards, he does not clearly distinguish "design" and "performance" standards, which are different in terms of the extent to which they permit regulated entities to choose the method of compliance. Failure to draw that distinction may lead environmental policy-makers to ignore performance standards even in situations in which they represent the least cost instrument, as measured by Richards' formula, available for achieving a particular policy goal.

Third, Richards' framework may contain a hidden presumption in favor of incentive-based instruments. Richards does not acknowledge that policy instruments differ in terms of their capacity to reduce pollution or address other environmental problems. Likewise, instruments may have different impacts in terms of environmental justice. Richards may not intend to preclude these considerations, but he should clarify how they would interact with his cost-minimization formula.

Finally, Richards may understate some of the difficulties in adopting his framework for actual environmental decision-making. He notes there are legal and political limitations, but his analysis ap-

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Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection, 1999 WIS. L. REV. 887 (1999).

pears to underestimate how politics skews instrument choice. He also does not discuss the impact of bounded rationality on the use of his own framework. Agencies cannot easily obtain the information necessary to determine which instrument minimizes implementation costs. These objections do not detract from the fundamental value of Richards' framework, but they do suggest that it will not necessarily be easy to adopt it.