

Marketable Permits in New Contexts: Have We Learned the Right Lessons from History

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CSAS Working Paper 18-05

Permits, Licenses, and the Administrative State

October 24, 2018

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Introduction

Every year, a wide variety of regulated industries—from electric utilities to construction to broadcasting—trade or purchase billions of dollars’ worth of U.S. government licenses in the form of marketable permits.² Marketable permits are regulatory tools designed to allocate privileges or obligations more efficiently by harnessing the market’s decision-making powers. Both regulators and regulated industries have come to rely on marketable permits as a way to lower compliance costs, ease administrative burdens, and incentivize innovation more than traditional regulatory approaches, all while—in theory—achieving policy goals with greater certainty. Since their advent in U.S. policymaking in the 1970s, marketable permit programs have been used most prominently to advance environmental policies like reducing air and water pollution, though they have other diverse applications, from transportation policy (addressing aerospace congestion and allocating taxi medallions) to communication policy (allocating electromagnetic spectrum).

Through most of their five decades of proliferation through the American regulatory landscape, marketable permits have enjoyed fairly substantial support from regulated industries, as well as a degree of bipartisan political support, thanks to their cost-saving potential. So far, that support has most typically only eroded when industry gambles that it can avoid regulation altogether by opposing a market-based approach, as seen in 2010 with the collapse of negotiations over a federal cap-and-trade program for greenhouse gases. Though certainly not without their vocal detractors,³ several marketable permit programs, like the widely regarded market for acid rain pollution, have been hailed by countless corporations, trade associations, public interest groups, politicians, and academics alike as tremendous successes that effectively solve policy problems while minimizing industry costs.⁴

Some cautious observers of marketable permits programs, however, have wondered whether the success of past efforts is attributed to picking the low-hanging fruit first: perhaps there are few remaining policy areas still ripe for markets that can replicate the success of an acid rain pollution market or an electromagnetic spectrum auction.⁵ The Department of Energy’s recently launched exploration into adding market-based approaches to a brand new regulatory context therefore creates a fresh opportunity to observe how a different cast of stakeholders will respond.

Before 2017, the U.S. Department of Energy had not experimented with incorporating marketable permits into its regulatory programs⁶ (besides a very small market of tradable credits operating under a somewhat obscure regulatory requirement for state-owned fleets to include a certain share of alternative fuel vehicles).⁷ In November 2017, however, the agency cracked open the door to

² E.g., <https://www.rggi.org/Auctions/Auction-Results/Prices-Volumes> (showing nearly \$200 million in total proceeds from 2017 auctions). http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=97 (showing \$41 billion in net bids for FCC’s advanced wireless services auction 97, which took place in 341 rounds over 2014-2015). Ecosystem Marketplace, *State of Biodiversity Markets* (2011) (through 2011, wetland, stream, and habitat conservation banking programs, which facilitate construction in wetlands and endangered species habitats, had processed \$2-\$3.4 billion in transactions).

³ E.g., David Driesen, *Trading and Its Limits*, Penn St. Envtl. L. Rev.

⁴ E.g., <https://www.edf.org/approach/markets/acid-rain> (“historic success”).

⁵ James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 Stanford L. Rev. 607 (2000) (wondering whether all the “low-hanging fruit” were picked early (e.g., acid rain, lead in gas), and there might be few areas left ripe for markets).

⁶ That said, the agency has, pursuant to Executive Order 12,866, routinely considered whether non-regulatory alternatives, including financial incentives like consumer rebates and corporate tax credits, could be viable options for implementing energy efficiency requirements for appliances and equipment. See, e.g., Dept. of Energy, *Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Walk-In Coolers and Walk-In Freezers at 17-2 to 17-16* (2016) (analyzing non-regulatory options including no action, consumer rebates, consumer tax credits, manufacturer tax credits, voluntary targets, and bulk government purchases, and finding all these non-regulatory approaches inferior to the proposed regulatory actions). But this article defines market-based *regulatory* approaches like averaging, banking, trading, and feebates as distinct from these *non-regulatory* alternatives.

⁷ Dept. of Energy-EERE, *Fleet Compliance Results for MY2014/FY2015* (The market for credits is small, with only 13 transactions totaling 383 credits traded for model year 2014 (out of about 20,000 credits)).

marketable permits by publishing a Request for Information to evaluate the advantages and disadvantages of adding compliance flexibilities—such as credit trading, averaging, “feebates,” or other market-based approaches—to its Appliance and Equipment Energy Conservation Standards (ECS) program.

The ECS program is regarded as a tremendous success by industry⁸ and public interest groups⁹ alike. The Department of Energy is charged by the Energy Policy and Conservation Act (EPCA) to set energy efficiency standards for a range of residential appliances and commercial equipment “to achieve the maximum improvement in energy efficiency . . . [that] is technologically feasible and economically justified.”¹⁰ The ECS program has set efficiency standards for more than 60 product categories, from major home appliances like dishwashers, to industrial air compressors, to lightbulbs.¹¹ The agency reports that the ECS program covers the products responsible for 90% of home energy use, 60% of commercial building energy use, and 30% of industrial energy use.¹² Collectively, the efficiency standards that were on the books in 2016 will, by the year 2030, save a cumulative 141 quadrillion British thermal units of energy (which is “more energy than the entire nation consumes in one year”), thereby saving consumers more than \$2 trillion on their cumulative utility bills.¹³ The reduced energy consumptions has also already helped the United States avoid 2.6 billion tons of carbon dioxide emissions cumulatively since 1975¹⁴—to put that in context, the entire U.S. electric power sector would have to be taken completely offline for a year and a half to avoid that many carbon dioxide emissions.¹⁵

Yet despite its general support for the ECS program, industry often pushes back against new or upgraded efficiency standards as too expensive in terms of allegedly growing compliance costs and supposed limits on consumers’ willingness-to-pay for increased energy efficiency.¹⁶ Given the scope of the ECS program, the theoretical potential for market-based approaches like credit trading to reduce compliance costs, and the historical support among many regulated industries for market-based approaches in general, the appliance industry might be expected to support the Department of Energy’s proposed shift to greater compliance flexibility.¹⁷ Yet industry’s initial reaction completely subverts that expectation. Instead, a clear majority of industry commenters have harshly panned the idea, with only a small minority offering even lukewarm support. This article explores that somewhat surprising opposition in light of the lessons that the appliance industry might have drawn from the history of successes and failures of marketable permit programs in other regulatory contexts.

This article starts with an overview of the theoretical reasons industry may or may not be likely to support marketable permits and related compliance flexibilities. The article then recounts the history of industry reactions to the development of market-based flexibilities in various regulatory contexts. With this history in mind, the article next examines the somewhat surprising reaction to the Department of Energy’s proposed introduction of market-based flexibilities to efficiency standards for appliances and equipment. The article details each objection to the addition of market-based flexibilities that industry

⁸ Joint Industry Comments (“The Appliance Standards Program has been successful over its more than 30 year existence—efficiency gains have been significant.”).

⁹ NRDC Comments (“By all measures, the program is a success: it generates trillions of dollars in savings for consumers, provides manufacturers with regulatory predictability, and sets up a level playing field for industry regardless of where products are manufactured.”).

¹⁰ 42 U.S.C. § 6295(o)(2)(A). Also to set water efficiency standards for plumbing products.

¹¹ <https://www.energy.gov/eere/buildings/standards-and-test-procedures>

¹² https://www.energy.gov/sites/prod/files/2017/01/f34/Appliance%20and%20Equipment%20Standards%20Fact%20Sheet-011917_0.pdf

¹³ *Id.*

¹⁴ <https://www.energy.gov/eere/buildings/about-appliance-and-equipment-standards-program> (through 2015).

¹⁵ https://www.epa.gov/sites/production/files/2018-01/documents/2018_executive_summary.pdf (2016 carbon dioxide emissions for the electric power sector were 1,809.3 MMT).

¹⁶ See, e.g., Zero Zone litigation over commercial refrigeration standards.

¹⁷ In fact, the Northwestern Power and Conservation Council’s comments, EERE-2017-BT-STD-0059-0017, speculated that a market-based approach might increase in support of industry.

raised in their public statements, and uses historical comparisons to see if the objections are grounded in the five decades of experience with marketable permits in other context. After concluding that the history of marketable permits in other context does not support most—or any—of industry’s stated objections, and finding instead that history offers potential solutions that both industry and the Department of Energy seem to have overlooked, this article ends by theorizing about industry’s potential unstated objections to the idea of adding market-based flexibilities to the Energy Conservation Standards for appliances and equipment.

“A Beautiful Idea”: Historical Support for Market-Based Flexibilities

What are marketable permits and related market-based compliance flexibilities? Why would policymakers propose them? How might industry react to them, and how has industry in fact reacted to them over the last several decades as they have been introduced into various regulatory contexts? This section explores when and why industry has viewed market-based flexibilities as a complex “novelty,”¹⁸ or with “hostility and indifference,”¹⁹ or as “a beautiful idea.”²⁰

Defining Marketable Permits versus Traditional Regulatory Approaches

Marketable permits are, first and foremost, *permits*: they are government-created licenses or obligations for a specific level of a particular activity. Often they ration use of common public resources like clean air, fisheries, or electromagnetic spectrum,²¹ but in addition to such marketable privileges, marketable obligations also exist, like tradable requirements to produce renewable energy.²²

What distinguishes *marketable* permits is that they can be bought or sold independently of any real property or other interest. Independent alienability is a crucial distinction, since many permits can be transferred together with the sale of a business or underlying assets. For example, if a factory previously secured a traditional, prescriptive air pollution permit to authorize its emissions, when the factory is sold the permit may transfer, too, and the permit has its own value that contributes to the overall sale price.²³ What makes marketable permits special is that they can be exchanged by themselves on markets.

Marketable permits depart from the prescriptive, inflexible, or highly particularized approaches often seen in traditional regulation. Traditional environmental regulation, for example, may require each individual polluter to comply with a specific standard and may even prescribe exactly which technological or operational changes sources must make to comply. Such an approach might, for instance, require each individual power plant to limit greenhouse emissions to the same numerical maximum of pollution per unit of electricity generated—regardless of whether compliance may be vastly more expensive for some plants while other plants could cheaply reduce emissions even further beyond the numerical limit. As an example in a different context, traditional licensing of access to the

¹⁸ Welch (1983) (citing Liroff 1980).

¹⁹ Meidinger (1985) (citing Kelman; but Kelman was about taxes, not trading).

²⁰ The American Electric Power Company, once a principal opponent of the Acid Rain Market, eventually grew to love marketable permits, which their CEO Mike Morris reported had “turned out to be a beautiful idea.” Michael Kranish, A Clean Water Revival, BOSTON GLOBE, Oct. 17, 2010, http://www.boston.com/yourtown/malden/articles/2010/10/17/washing_away_of_acid_rain_offer_s_lesson/

²¹ Tom Tietenberg, *Tradable Permits in Principle and Practice*, in *Moving to Markets in Environmental Regulation: Lessons from Twenty Years of Experience* (Jody Freeman & Charles Kolstad eds., 2006).

²² Kirsten Engel, *Dormant Commerce Clause Threat to Market-Based Environmental Regulation: The Case of Electricity Deregulation*, 26 *Eco. L. Q.* 243 (1999).

²³ Jonathan Remy Nash, *Framing Effects and Regulatory Choice*, 82 *Notre Dame L. Rev.* 313 (2006). A few fish quota share programs typically grouped with individually transferrable quota programs may, in fact, only allow transfer of the fish catch share along with the fishing license. See Katrina Wyman, *Why Regulators Turn to Tradable Permits: A Canadian Case Study*, 52 *U. Toronto L.J.* 419 (2002); see also Nat’l Marine Fisheries Serv., Catch Share Spotlights (the Bering Sea Groundfish Cooperative allows transfer of quota with vessel). Such programs, even if often called marketable permit programs, would not be included under this report’s definition.

electromagnetic spectrum was similarly particularized and inflexible: individual applicants had to navigate long, complex administrative hearings, and once spectrum was assigned it may have been somewhat difficult to reassign.

By contrast, marketable permits rely on the market to identify the most cost-efficient way to allocate regulatory privileges or obligations. For example, under a marketable permit system for greenhouse gases called “cap-and-trade,” a regulator would first set an overall maximum budget of permitted emissions per time period. The regulator would then initially allocate those emission allowances to the regulated sources, and may further authorize unregulated sources to generate additional “credits” or “offsets” for sale by voluntarily undertaking verified emissions reductions not otherwise required by law. Because the allowances and credits can be traded between sources, the marketable permit system empowers individual regulated sources to decide for themselves, based on their own abatement costs, what emissions reductions to make and how: they can choose to emit as many tons as they can afford to buy additional permits for, or they can reduce emissions and sell any unused permits for profit, all without (in theory) losing any regulatory benefits. Similarly, instead of forcing regulators to divine how to allocate electromagnetic spectrum to the highest value uses, by auctioning off spectrum licenses and allowing subsequent re-sales and leases, regulators entrust the market to identify the most valuable use of the resource.²⁴

A Taxonomy of Market-Based Compliance Flexibilities

There is, unfortunately, no well-defined and standardized set of terms to categorizes market-based compliance flexibilities. Even this article uses both “market-based compliance flexibilities” and “marketable permits” somewhat interchangeable. This section attempts to provide basic definitions and groupings of key terms.

Some kinds of market-based flexibilities essentially allow a single regulated entity to swap permits or credits within itself. “Averaging” (sometimes called “bubbling”²⁵ or “netting”) gives a single regulated entity some flexibility to choose which of its sources or products will bear responsibilities for an overall compliance target. If a regulated entity has two sources subject to regulation but can comply more cheaply at one source, it can essentially over-comply for that source, under-comply for the other, and average the two to meet a combined target. If the sources or products being averaged are of sufficiently different type, averaging may instead be referred to as “transferring” credits between product lines, or as internally trading credits.

“Banking” and “borrowing” also give a single regulated entity some internal compliance flexibility, but instead of the flexibility across space or type that averaging affords, these market-based tools give temporal flexibility. With banking (sometimes called a carry-forward), a regulated entity can over-comply, compared to a minimum baseline standard, in one year to earn credits that will allow it to under-comply in a future year; borrowing (sometimes called a carry-back) is the exact opposite, allowing a regulated entity to under-comply now with the promise that it will make up for the shortfall in the future. Borrowing is somewhat rarer than banking.

When separate regulated entities can buy and sell compliance credits between them, it is called trading. If a regulated entity receives its permit initially from a government agency but then can resell it, that is sometimes called secondary trading. If the total number of available permits is capped by the government, the program may be called “cap-and-trade.” Though the term “cap-and-trade” is most

²⁴ See Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 3 (1981) (explaining market-based regulation helps ensure that firms with highest-value use of the resource will obtain the permit).

²⁵ To further complicate matters, some bubbles under EPA’s emissions trading program reportedly involved averaging among external sources, though such external bubbles were rare. Hahn (1989).

often associated in political debates with pollution reduction measures, the cap-and-trade framework applies to a range of marketable permit schemes, including the allocation of a capped number of tradable licenses in electromagnetic spectrum or aerospace. In cap-and-trade programs, regulators set an “absolute baseline” by capping the budget of emissions allowances or allowable fish catch or number of airport landing slots. Other trading programs may instead set a “relative baseline.” For example, in the lead phase-out trading program, refineries were subject to a standard that limited the grams of lead in gasoline per gallon produced; for every gallon of gasoline that a refinery produced that contained less lead than the baseline standard required, the refinery generated a credit that could be banked or traded. Because there was no limit on the total gallons of gasoline that could be produced, there was no absolute limit on the number of lead-reduction credits that could be generated.

Another type of trading program involves trading with otherwise unregulated entities. This type of program is often called an “offset” program. For example, water quality regulations typically focus on so-called “point sources”: stationary plants that discharge effluent into a waterbody from a relatively fixed location, like a pipe. The effluent from point sources is easily measured, and so point sources are more easily regulated. By contrast, “non-point sources,” such as large farms, may generate hard-to-measure runoff into various waterbodies from multiple and irregular pathways. Because non-point emissions are harder to measure, they are less often targeted with regulation. But if an unregulated non-point source can reduce its effluent in a measurable, verifiable way, it can earn a credit that it can sell to a point source to offset the point source’s emissions reduction obligations.

In any trading program, how the permits are allocated is a key design element. Two of the most common allocation structures are “auctioning” and “grandfathering.” Under an auction, credits generated by the regulatory agency, by a third-party offset generator, or by the regulated entities themselves are sold openly to the highest bidder. Under grandfathering, existing regulated entities are freely given allocations based on their historical use of the regulated resource, and they may either continue to use those allocated credits or may trade any unneeded permits for a profit to new or expanding entities. Other allocation schemes include lottery (where permits are distributed randomly either for free or at a fixed price per permit awarded) and “output-based allocations” (such as the lead phase-out program described above, where the number of credits earned depended on the amount of reduced-lead gasoline produced).

A related market-based regulatory approach is a tax (sometimes called a “Pigovian tax,” “charge,” or “regulatory fee”): for instance, a tax either on all emissions or on all emissions above a certain level. A hybrid approach, somewhere between a tax and an offset-auction program, is the “feebate.” Under a feebate system, entities that fall short of a regulatory standard, or “pivot-point,” will pay the government a fee, while entities that exceed the standard earn a payment from the government.

Various market-based compliance flexibilities can be combined in a single regulatory program. For example, the Department of Transportation’s corporate average fuel economy standards for motor vehicles allows intra-manufacturer averaging, banking, and borrowing for their separate passenger car and light-duty truck fleets; some intra-manufacturer cross-fleet transfers; inter-manufacturer trading of credits; offset credits generated by installing technology in unregulated segments of the vehicle (like lighting efficiency) that improve on-road fuel economy; and a non-compliance penalty that, in some ways, operates like a tax.

Importantly, many market-based compliance flexibility options are just that: compliance *options*. In some cases, they use of a market-based compliance approach may instead be essentially mandatory, in the sense that it may be difficult or impossible for a regulatory entity to continue operating without using the program. For example, under the Clean Air Act, new stationary sources of air pollution that want to develop in areas that fall below minimum air quality standards may be required to purchase

credits from existing sources in that area to fully offset (or even to more-than-offset) all the additional pollution that the new source plans to emit. Unless the new source purchases the offset credits or else reduces its emissions down below any threshold for regulation, that source may not be allowed to develop in that area. However, in many other (if not most other) context, market-based compliance flexibilities are just one optional way to comply. For example, under the corporate average fuel economy standards, manufacturers could simply produce vehicle models that all meet the minimum standards for fuel economy. Whether a manufacturer uses the averaging, banking, borrowing, trading, and offset programs made available to it is entirely up to that manufacturer to decide. Market-based regulation empowers the market actors to decide which compliance option is best for them.

The Theoretical Economic Efficiency of Market-Based Compliance Options

The classic economic case for market-based regulation is to lower compliance costs, incentivize innovation, and ease administrative burdens compared to traditional regulatory approaches, all while—in theory—achieving policy goals with greater certainty. This section explores the reasons why regulatory agencies and society-at-large might prefer market-based compliance approaches over traditional regulation. These reasons will inform the following section on why regulated industry may—or may not—favor various market-based approaches.

Lowering Compliance Costs and Raising Value

The major theoretical advantage of marketable permits over traditional regulation is that market-based tools efficiently allocate privileges and obligations, lowering costs and raising value.²⁶ Specifically, marketable permits programs equalize marginal compliance costs across regulated sources, by allowing the market to identify and prioritize the lowest-cost abatement opportunities. Similarly, instead of forcing regulators to divine how to allocate regulatory privileges to the highest value use of scarce resources, the market identifies the most valuable use of the permits.²⁷

For example, when compliance costs vary greatly across regulated sources, uniformly prescriptive environmental standards can be counterproductively expensive.²⁸ If one source can reduce its greenhouse emissions at \$1 per ton while another faces \$1000 per ton abatement costs, requiring the same performance from both is inefficient: the same environmental gains could be achieved at lower overall cost (i.e., \$2 instead of \$1001 for the first two tons) by allowing the second source to pay the first to make extra reductions cheaply, at least until reaching a point when abating one more ton would cost each source the same. The flexibility of markets either lowers the total cost of achieving any given regulatory target or else, for any given total cost, achieves a more ambitious regulatory target.²⁹ One economic study estimated that, to achieve a 5% reduction in overall U.S. greenhouse emissions, the marginal welfare costs of a prescriptive regulatory scheme would be 1159% higher than the marginal welfare costs of a market-based regulatory scheme designed to achieve the same overall emissions reductions.³⁰

²⁶ Widely agreed upon by legal and economic experts. Even David Driesen, a prominent skeptic of marketable permits, admits that overly uniform prescriptive standards may use private sector resources inefficiently, though he argues that prescriptive standards are more efficient for administrative resources and may also have equitable advantages. David Driesen, *Is Emission Trading an Economic Incentive Program?*.

²⁷ See Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 3 (1981) (explaining market-based regulation helps ensure that firms with highest-value use of the resource will obtain the permit).

²⁸ Robert Stavins, *Market-Based Environmental Policies* 2 (RFF Disc. 98-26, 1998, republished in Paul Portney & Robert Stavins eds., *Public Policies for Environmental Protection* (2000)).

²⁹ See U.S. Office of Mgmt. & Budget, *Regulatory Impact Analysis: A Primer* 6 (2011).

³⁰ Pizer, Burtraw et al., *supra* note [Error! Bookmark not defined.](#), at tbl.3 (\$277/ton versus \$22/ton). The additional marginal welfare costs of performance standards over market-based regulation rise as the reduction target increases in stringency. See *id.* fig. 1.

The variation of abatement opportunities drives the market's efficiency.³¹ Therefore, a regulatory market's size can enhance its efficiencies, as bigger markets maximize the number of opportunities for low-cost abatement. For example, even if a particular industry emits a relatively small volume of greenhouse gases, if it offers very low-cost abatement opportunities, it could be efficient to include that industry in a broader cap-and-trade program for greenhouse gases.³² For this reason, allowing uncovered sources to generate offset credits may provide especially low-cost abatement opportunities. In modeling the possibility of economy-wide greenhouse gas cap-and-trade legislation in 2009, EPA found that offsets would have "a strong impact on cost-containment," and that without international offsets, allowance prices would have increased 89%.³³

The theory behind a marketable permit program's superior efficiency begins to break down if the standard is set so stringently as to require every source to control as much as possible. At that point, there will be few if any additional trades to make, and any efficiency advantage between marketable permits and prescriptive regulations will be small.³⁴

Better Incentivizing Innovation

Besides lowering compliance costs, the second key theoretical advantage of marketable permits over traditional regulation is that market-based tools create a price signal that dynamically incentivizes innovation and the diffusion of knowledge.³⁵ For example, because an air pollution cap-and-trade market puts a price on emissions but does not otherwise constrain compliance strategies, sources are free to experiment continually and develop new, unanticipated methods of low-cost abatement. And because unused permits can be sold for profit, sources can benefit the more reductions they make. By contrast, prescriptive environmental regulations give sources little incentive to innovatively reduce emissions so much as a single ton below their required limit. Similarly, prescriptive standards frequently—yet inefficiently—pick "winners" from among existing technologies: for example, regulating vehicle emissions by mandating use of certain biofuel technologies reduces the incentive to explore other, potentially better reduction opportunities, like new mass transit options.³⁶ A special additional advantage of credit trading programs is the potential stimulation of activity and innovation in otherwise unregulated sectors.

David Driesen, a prominent critic of marketable permit programs, has attacked this theory of innovation incentives. Driesen argues that innovation is encouraged more by a regulation's stringency and enforcement than by its form. Performance standards with predictable increases in stringency over time would, according to Driesen, produce the same drive for continuous innovation.³⁷ In contrast, if marketable permit programs are weaker on enforcement than traditional regulation (because it is harder to continuously monitor emissions and permit transactions than to simply check whether a source installed an approved technology), marketable permits could produce less innovation than traditional regulation.³⁸ However, Driesen's argument depends on the willingness of regulators either to repeatedly issue new rules to increase stringency or else to initially make predictions far into the future

³¹ Nathaniel O. Keohane, *Cap and Trade, Rehabilitated: Using Tradable Permits to Control U.S. Greenhouse Gases*, 8 Rev. Envtl. & Econ. Pol'y 42, 49 (2009).

³² Metcalf & Weisback, *supra* note Error! Bookmark not defined., at 8.

³³ EPA, Analysis of H.R. 2454, at 3 (June 2009).

³⁴ Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 Colum. J. Envtl. L. 171 (1987).

³⁵ *Marketable Rights*, at 2-3; Gabriel Chan, Robert Stavins, et al., *The SO2 Allowance Trading System & the Clean Air Act Amendments of 1990: Reflections on Twenty Years of Policy Innovation* 23 (2012).

³⁶ Jack Lienke & Jason Schwartz, *Shifting Gears: A New Approach to Reducing Greenhouse Gas Emissions from the Transportation Sector* 5 (Policy Integrity Brief, 2014).

³⁷ David Driesen, *Is Emission Trading an Economic Incentive Program?*.

³⁸ *Id.*

about what levels of stringency will someday be appropriate.³⁹ Marketable permit programs, on the other hand, incentivize innovation simply by tapping into the firms' profit motives, without needing to repeatedly increase the stringency of the cap.

Driesen also challenges the assumption that marketable permits uniquely encourage sources to go beyond their minimum compliance obligations: most polluters go at least slightly below their performance standards to guarantee consistent compliance (though admittedly, once regulated sources achieve an adequate compliance cushion, they have little incentive for additional reductions under traditional regulatory approaches).⁴⁰ Driesen also reminds that while any incentive to continually innovate and reduce emissions under a cap-and-trade program could reduce overall compliance costs, it will not actually decrease total emissions, since any reduction by one innovative source will allow another source to increase its emissions, back up to the level of the cap.⁴¹

Finally, Driesen worries that marketable permits programs will actually chill innovation. Trading incentivizes reductions first at sources with the cheapest abatement opportunities, but this low-hanging fruit may not require much technological innovation. Rather, according to Driesen, it is the reductions at the higher-cost sources that require true innovation.⁴² However, as other scholars have pointed out, an exclusive focus on the very lowest hanging fruit requiring no innovation is only likely if the program's overall stringency is too lenient.⁴³ An appropriately calibrated cap will encourage firms to look for any innovative opportunity to reduce costs.

That said, even proponents of the theory of marketable permits' innovation incentives recognize some limitations. For example, the dynamics of competition in regulated sources' underlying product markets can interfere with the incentive to innovate. Imagine several rival refineries all under the same cap-and-trade program. Innovation decreases marginal compliance costs, which decreases permit prices, which helps permit buyers but not permit sellers.⁴⁴ Because lowering permit prices will benefit any rivals who are permit buyers by lowering their production costs, some firms may strategically choose not to innovate. In such cases, traditional regulation may provide better innovation incentives: innovation under traditional regulation only lowers your own compliance costs, while innovation in a market may decrease costs for your rivals.⁴⁵ Strategic behavior can also negatively affect innovation under marketable permit programs in other ways: for example, firms may innovate out of a desire to reduce their need for permits in order to hoard permits and exercise market power.⁴⁶

Saving Administrative Resources

Crucial administrative tasks for either marketable permits or prescriptive regulation include designing the rules, responding to new information and changing circumstances, resolving disputes with regulated entities and stakeholders, and monitoring and enforcing the standards. Marketable permits have some theoretical advantages over prescriptive regulation for these tasks and will require a very different allocation of administrative resources.

First, once the cap or baseline has been set and the rules for allocation and trading have been finalized, in theory the market in a cap-and-trade or credit program then relieves the regulators of some decision-

³⁹ Note that, in the ECS program, for example, while the Department of Energy is supposed to review each standard at least every six years, the agency has a long history of missing those deadlines for reviewing and upgrading standards.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ Jennifer Yelin-Kefer, *Warming Up to an International Greenhouse Gas Market: Lessons from the U.S. Acid Rain Experience*, 20 *Stanford Envtl. L. J.* 221 (2001).

⁴⁴ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 43 (2006, 2d ed).

⁴⁵ *Id.* at 151.

⁴⁶ *Id.*

making responsibilities. Rather than forcing regulatory agencies to decide which industries, regions, or sources will bear the abatement costs or have access to valuable public resources, the market decides for itself. While marketable permits impose some new regulatory tasks on regulators, like running auctions and registries, arguably they eliminate one of “the greatest roadblock[s] to administrative efficiency, namely that technical and economic decisions will now be made by plants” instead of by bureaucrats who inevitably have less information on the costs and benefits facing individual regulated entities.⁴⁷ Historically, many federal and state agencies have been overwhelmed by the heavy information burdens of determining the best technologies for each individual industry and writing individual prescriptive permits.⁴⁸ In other words, marketable permit programs may create some new upfront administrative tasks, but may lower administrative costs over time. Besides saving administrative costs, market-based approaches may also advance rational decision-making, since the market efficiently assimilates existing information and bypasses the potential for agency bureaucrats injecting bias into permitting decisions.⁴⁹

Critics like David Driesen challenge whether it is really more efficient to set a cap, design an allocation scheme, and create rules for trading than to simply set a uniform prescriptive standard.⁵⁰ Other scholars argue that effectively running a complex market-based scheme with few administrative resources is a myth. Markets will not function properly with only a passive regulator keeping a tally of permits. Rather, active regulators are needed to analyze and disseminate market information, and in some cases to create the platforms for trading; to coordinate with firms as a technical consultant and assist small entities and other sources in designing compliance plans; and to formulate a contingency plan in case the market fails to achieve the regulatory objective.⁵¹ Ultimately, running a marketable permit program may be just as or more demanding for agencies than traditional regulation.⁵²

Second, market systems may respond better to changing economic circumstance, like new technologies or new substitute goods, without necessarily prompting new regulatory proceedings. For example, prescriptive emissions regulation specific to each use of ozone-depleting substances would have to be repeatedly updated each time a new use for chlorofluorocarbons was discovered; a cap-and-trade market for chlorofluorocarbon emissions just lets new users buy in to the existing cap. In particular, markets can automatically adjust to accommodate economic growth and the new levels of regulated activities that accompany growth; prescriptive regulation requires constant new efforts to accommodate growth without pollution increases.⁵³ Even Driesen admits that mass-based caps (though not rate-based marketable permits) can automatically accommodate economic growth, as the cap will incentivize additional reductions to offset any new demand for permits.⁵⁴ Additionally, by setting a clear price on the regulated activity, markets give agencies ready and accurate information on regulatory costs—information that agencies can incorporate to improve future regulatory decisions.⁵⁵

Third, many legal and economic experts on market-based regulation predict that such approaches should ease disputes between agencies and regulated entities. Because trading lowers compliance costs, it lowers the incentive for firms to lobby or litigate for delay or to entertain noncompliance strategies: it simply may be cheaper to comply than to dispute.⁵⁶ Disappointed permit seekers may argue the cap was

⁴⁷ Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case*.

⁴⁸ *Id.*

⁴⁹ Michael Abramowicz, *The Law-and-Markets Movement*.

⁵⁰ David Driesen, *Is Emission Trading an Economic Incentive Program?*.

⁵¹ Lesley McAllister, *Beyond Playing “Banker”*, 59 Admin. L. Rev. 269 (2007).

⁵² *Id.*

⁵³ Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case*.

⁵⁴ David Driesen, *Is Emission Trading an Economic Incentive Program?*.

⁵⁵ *Marketable Rights*, at 5-7.

⁵⁶ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 176 (2006, 2d ed).

too stringent, but they cannot accuse the agency of individual bias or litigate each individual permitting decision as they can with prescriptive regulation.⁵⁷ Though some skeptical scholars argue that complexity, uncertainty, and delay are just as likely to plague marketable permits programs as traditional regulations,⁵⁸ overall, market-based regulatory tools are thought to remove some of the friction between regulators and the regulated.⁵⁹

Fourth, markets could incentivize more accurate and cheaper monitoring and could be easier to enforce. Historically, agencies spent relatively little on monitoring compliance with prescriptive environmental regulations, relied heavily on industry-reported data, and enforcement was often weak.⁶⁰ By contrast, the market can give both agencies and regulated entities an incentive to support thorough monitoring.⁶¹ Agencies could be especially motivated in an repeated auction system, because better compliance results in higher permit demand, higher permit prices, and greater revenue for the government.⁶² Regulated entities will support monitoring and enforcement because noncompliance by other parties lowers the value of the permits they hold. The cost savings afforded by a market-based system may make it easier for agencies to transfer the responsibility and expense of monitoring to regulated entities. Additional advantages may arise in particular contexts: for example, because conservation banks consolidate mitigation efforts, it is easier for agencies to monitor a small number of large sites than a large number of small, disperse sites.⁶³ Driesen disagrees once again with this theory of administrative resource savings, arguing that marketable permit programs in fact double the cost and challenge of monitoring, because the regulator needs to monitor both buyers and sellers of allowances and credits, instead of just the regulated source itself.⁶⁴

On enforcement, historically prescriptive environmental permits often featured vague standards and resulted in ineffective enforcement, and penalties for violation of prescriptive regulation were similarly inconsistent and weak.⁶⁵ Enforcement by agencies and courts may be easier under market-based systems in part because of the compliance cost savings: agencies and courts are less reluctant to simply require the purchase of additional credits as a penalty, as opposed to installing expensive retrofits.

Regardless of aggregate administrative costs, marketable permits will require a different allocation of agency resources. Agencies will have to retrain staff in the theory and operation of markets.⁶⁶ Agencies may also need to hire different staff: instead of engineers who identify control strategies and negotiate permit terms, under a marketable permit program, agencies might need more people who can monitor and enforce.⁶⁷ However, setting the cap or baseline and verifying that credits are additional may require much of the same expertise and administrative work as under prescriptive regulations.⁶⁸

⁵⁷ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 5-6 (1981)

⁵⁸ David Driesen, *Is Emission Trading an Economic Incentive Program?* (predicting inevitable disputes for market-based approaches over baselines, creditable reductions, and market restrictions).

⁵⁹ Lesley McAllister, *Beyond Playing "Banker"*, 59 Admin. L. Rev. 269 (2007).

⁶⁰ Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case* (agencies spend on air monitoring 0.02% of the total estimated cost of air pollution controls)

⁶¹ *Id.*

⁶² Note that, unless given specific authority to keep revenue, individual federal agencies would have to deposit any revenue beyond covering their own expenses into the general U.S. treasury. State laws may allow individual state agencies to retain revenue.

⁶³ NMFS West Coast Region, *Conservation Banking Guidance* (2015).

⁶⁴ David Driesen, *Is Emission Trading an Economic Incentive Program?*

⁶⁵ Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case*.

⁶⁶ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 41 (2006, 2d ed).

⁶⁷ Tom Tietenberg, *Tradable Permits in Principle and Practice*.

⁶⁸ *Id.*

Capturing Windfalls and Reducing Barriers to Entry

In trading programs, regulators have several options for the initial allocation of privileges or obligations: by open auction; by lottery, either for free or with a fixed price per allocation awarded; or by criteria-based rules, such as historical use of the resource, again either free or with a fixed charge.⁶⁹ The two dominant choices⁷⁰ for existing and proposed trading programs are auctions and free allocations based at least partly on historical use of the resource. The free allocation approach is a form of “grandfathering,” which, broadly defined, means giving special regulatory treatment to existing actors compared to new actors.

In theory, the method for initial allocation should not affect the ultimate efficiency of the market, so long as the allocation does not create a monopoly.⁷¹ For example, consider a greenhouse gas cap-and-trade market. As soon as an emissions cap is put in place, the cost of electricity and energy-intensive goods will rise, creating a price signal across the economy to save energy and move to cleaner technologies like wind and solar. This effect will take place regardless of how permits are distributed, because utility companies will account for the market value of the permits, not the purchase price. The following analogy paints a clear picture: “A ticket scalper is going to charge the same amount—the going black-market price—whether he’s selling a ticket that he found on the ground or a ticket that he bought. He’s just going to turn more of a profit if he found it on the ground.”⁷²

Regulators often choose grandfathering to avoid disruptions to the status quo, to protect returns on past investments, and to ease tensions with the regulated industry.⁷³ In regional programs that allocate fishing vessels with tradable shares of the total allowable catch, for example, grandfathering based on fishers’ catch history has been preferred in order to protect traditional fishing communities, increase fishers’ returns on investment, and provide incentives for existing communities to act collectively to enhance the long-term value of the fish stock.⁷⁴ Despite specific statutory authority to auction,⁷⁵ no U.S. fish catch share program has used auctions. The fishing industry has a loud voice on regional fishery councils, and therefore such councils are unlikely to vote for an auction.⁷⁶

However, grandfathering can be inequitable, as it awards the regulated industry a windfall enrichment and creates barriers to new entry. Returning to the ticket scalper analogy, whether the ticket was initially purchased or found for free on the ground does not change the opportunity cost or the black market price; it only affects the scalper’s profits. Likewise, freely allocating or auctioning greenhouse gas permits will not affect the choices firms make about their individual levels of pollution or the costs

⁶⁹ But setting the right fee is very difficult, it is better to auction. FTC, Comments of the Staff of the Bureau of Economics on Protection of Stratospheric Ozone (1988).

⁷⁰ Other structures are possible. For example, the acid rain market allocated almost all allowances freely, but also required sources to auction a small percentage of their allowances at a zero-revenue auction, for purposes of price discovery and to allow a vehicle for new entrants into the market.

⁷¹ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 12 (1981). However, that theory may be overstated. In reality, freely allocating valuable permits to existing actors based on their historical use of the resource increases the risk of monopoly power in the permit market and incentivizes perverse strategic behavior, like a firm artificially inflating its use of the resource in the baseline year to increase its allocation share. T.H. Tietenberg, *Emissions Trading: Principles and Practice* 138-139 (2006, 2d ed). The Federal Trade Commission has also found that, compared to auctions, grandfathering may reduce the incentive to innovate. FTC, Comments of the Staff of the Bureau of Economics on Protection of Stratospheric Ozone (1988).

⁷² Inimai Chettiar & Jason Schwartz, *The Road Ahead: EPA’s Obligations and Options for Regulating Greenhouse Gases* (2009) (citing Rob Inglis, *The Power Industry’s Prisoner’s Dilemma*, THE NEW REPUBLIC: THE VINE, Mar. 23, 2009, available at <http://blogs.tnr.com/tnr/blogs/environmentandenergy/archive/2009/03/23/the-power-industry-prisoner-s-dilemma.aspx>).

⁷³ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 13 (1981)

⁷⁴ Terry Anderson et al., *Efficiency Advantage of Grandfathering*, NBER No. w161519 (2010).

⁷⁵ 16 U.S.C. § 1853a(d)-(e).

⁷⁶ The National Marine Fisheries Service directly controls the catch share program for highly migratory Bluefin tuna, but the agency specifically declined to auction quotas in order to protect past investments and minimize uncertainty that an auction would create. 79 Fed. Reg. 71,509 (2014).

passed on to customers; it only affects the firms' profits. By contrast, with a revenue-raising auction run by the government, only the taxpayer gets a windfall enrichment.⁷⁷

Auctions also reduce barriers to entry compared to grandfathering.⁷⁸ Grandfathering is a common feature of traditional prescriptive regulation, and new entrants face disproportionately stringent standards while existing entities are protected out of political concerns.⁷⁹ Open permit auctions and offset credit programs may create fewer anticompetitive barriers to new entrants to industry than prescriptive regulation.⁸⁰ For example, the cost, delay, uncertainty, and contentiousness of FCC licensing proceedings discouraged new competitors from seeking access to electromagnetic spectrum; with license auctions, they can just buy in.⁸¹ Similarly, in offset credit markets where offsets are generated by unregulated third party entities, new regulated entrants face no special constraints to buying the number of offsets they need to enter the market.

By contrast, when allowances are freely allocated, new entrants must rely on the secondary market for the necessary permits to operate. Existing entities that hold the permits have an incentive not to facilitate purchases from potential new competitors. For example, there have been accusations of collusion against new entrants in the airport landing slot market.⁸² Airlines in possession of valuable landing slots, which they got for free, have an incentive to retain the slots for possible future ridership expansion, even if it means flying empty in the meantime.⁸³ Some regulators try to address such new entry barriers by creating a reserve pool or set-aside of allowances for new entrants. To that end, in 2011, FAA approved a trade of airport landing slots between Delta and U.S. Airways, but the agency conditioned its approval on a portion of the paired slots being auctioned to carriers who had less than 5% of the existing slots at those airports.⁸⁴ Overall, special set-asides for new entrants remain rare in marketable permit programs.⁸⁵

Auctions are typically considered to be politically more difficult to implement, because the benefits of auctioning are diffusely spread across all taxpayers, while the interests in favor of grandfathering are highly concentrated and often politically connected.⁸⁶ However, free initial allocations may create a constituency of concentrated interests that will politically oppose any future changes to the programs' stringency or allocations. In the long-run, auctions may make programmatic adjustments politically easier.

Finally, auctions generate revenue, which the government can then distribute to taxpayers or dividend back more specifically to consumers of the regulated products.⁸⁷

⁷⁷ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 12 (1981).

⁷⁸ Breger, Stewart, Elliott, & Hawkins, *Providing Economic Incentive in Environmental Regulation*, *supra* note **Error! Bookmark not defined.**

⁷⁹ See Jonathan Nash & Richard Revesz, *Grandfathering and Environmental Regulation: the Law and Economics of New Source Review*, 101 *Northwestern U. L. Rev.* 1677 (2007). Also, prescriptive regulations like BAT place disproportionate burdens on new industries (i.e., more stringent because no fear of shutdown) and on more productive industries (i.e., more stringent because they can afford it); trading eliminates those disproportionate burdens. Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case*, *supra* note **Error! Bookmark not defined.**

⁸⁰ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* at 4.

⁸¹ *Id.* at 5.

⁸² The accusations led FAA to propose reforms in 2015 to increase transparency and public participation, 80 *Fed. Reg.* 1273; however, the proposed rule was withdrawn in 2016.

⁸³ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 42 (1981).

⁸⁴ FAA Briefing, *Auction Opens for Slots at New York and Washington Airports*, Nov. 14, 2011, <https://www.transportation.gov/briefing-room/auction-opens-slots-new-york-and-washington-airports>.

⁸⁵ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁸⁶ Interview with Don Elliott.

⁸⁷ Direct dividend mechanisms typically will not be available to federal agencies implementing auctions. Unless specifically authorized otherwise by statute, the law requires all proceeds collected by federal agencies to be deposited into the general treasury of the United States, *see* Miscellaneous Receipts Act, 31 U.S.C. § 3302 (2008), except perhaps enough to cover administrative expenses, IOAA, 31 U.S.C. § 9701(a) ("It is

Lowering compliance costs, incentivizing innovation, saving administrative expenses, and—depending on the type of market-based program adopted—potentially lowering barriers to competition and generating government revenue, are all reasons why regulatory agencies might favor market-based regulatory approaches. Those reasons, however, will not always guarantee that regulated industry will also support the market-based approaches. The following sections explore why regulated industry may, or may not, support market-based flexibilities, starting with theories from the literature before turning to evidence from history.

Theories of Industry Preferences on Market-Based Compliance Flexibilities

The literature posits several theories on why various segments of regulated industry may or may not prefer different market-based compliance flexibilities.

Most theories assume that regulated firms' attitudes toward regulation are largely driven by their profit motive, and so firms will either oppose, support, or outright demand different forms of regulation to help them generate the most profits or, minimally, to protect them the most from losses.⁸⁸ Compared to other types of regulation, or even at times compared to the absence of regulation, a regulatory scheme with marketable permits or other compliance flexibilities may help firms lower aggregate costs, capture rents, erect barriers to entry, or gain an advantage on existing competitors.⁸⁹ On the other hand, in different contexts, firms may have profit-driven reasons to oppose marketable permits and other compliance flexibilities,⁹⁰ if the regulatory flexibility forces firms to internalize costs, lowers barriers to entry, or eliminates an advantage against existing competitors.

For example, in the case of pollution control, theory would predict “virtually unanimous opposition by private industry to pollution taxes”⁹¹ because it makes industry internalize the costs of every emission: either the firm must pay for pollution controls to reduce its emissions, or it pays the tax on the remaining emissions. Because a permit auction operates in much the same way as a tax, it will likely face similar opposition.⁹² By comparison, if marketable permits are freely allocated to existing firms based on their historical usage, then existing firms not only bear no costs for their historical emissions levels, but by acquiring for free the scarce and valuable pollution allowances, they may profit by selling excess permits or by hoarding permits to block new entrants. Existing firms, therefore, may under the right conditions prefer grandfathered marketable permits to non-flexible traditional regulatory approaches,⁹³ because grandfathered marketable permits not only preserve the advantage of existing firms over new entrants, but creates new, flexible mechanisms for monetizing that advantage through the permit market.⁹⁴ Under the right conditions, firms may even “prefer marketable rights to no pollution control

the sense of Congress that each service or thing of value provided by an agency (except a mixed-ownership Government corporation) to a person (except a person on official business of the United States Government) is to be self-sustaining to the extent possible.”).

⁸⁸ Revesz, Stavins, Keohane (citing Stigler, Posner, Peltzman, and Becker).

⁸⁹ Revesz, Stavins, Keohane

⁹⁰ Hahn & Stavins (1991) (to gain industry's support, industry “must be persuaded that profits will generally be higher than under alternative approaches”).

⁹¹ Revesz, Stavins, Keohane.

⁹² But see Dewees (1983) (explaining that “if capital is perfectly malleable,” and given various other conditions, “then shareholders will be indifferent to standards, charges, and pollution rights sold to the existing industry,” though “if capital is immobile and non-malleable, shareholders should resist effluent standards, and resist effluent charges and the sale of rights more vigorously.”).

⁹³ Revesz, Stavins, Keohane (explaining that from the perspective of rent-seeking and entry restrictions, neither grandfathered permits nor command-and-control has a clear advantage over the other). Dewees (1983) (“if capital is immobile and non-malleable . . . effluent rights distributed free to the existing industry will be preferred to rights that are sold or to charges, and might be preferred to an effluent standard.”). Dewees suggests, for example, that existing firms may prefer a grandfathered marketable permit structure over traditional regulation that does not contain grandfathering for existing sources.

⁹⁴ Meidinger (1985) (“Not only would existing firms be able to keep their advantage under the new system, but they would also have the profit maximizing choice of keeping or selling it.”).

policy at all.”⁹⁵ For example, large existing firms that can efficiently take advantage of marketable permits’ cost-minimizing potentials may support such a structure, while smaller firms that lack the economies of scale may oppose.⁹⁶ Would-be new entrants, meanwhile, may at times have cause to prefer an auction system, which creates fewer barriers to entry, though small firms may also worry that auctions could become “dominated by larger players.”⁹⁷

Similar splits between larger and smaller regulated entities may emerge on proposals for averaging, banking, and offsets. Some firms within an industry may be better able to take advantage of such flexibilities than others. Specifically, firms with more diverse operations will have more opportunities to take advantage of the flexibility to average internally across different sources or products with different compliance costs. Banking and borrowing could similarly be more attractive to firms with more temporally diverse operations. Existing firms with “ambitious expansion plans” may be able to use the flexibilities of averaging, banking, and borrowing to gain an advantage over existing or new competitors.⁹⁸ Offsets, by comparison, may most benefit those firms with the least internal flexibility, as those firms will value the ability to voluntarily outsource some of their compliance obligations.

In general, smaller entities may face special challenges in a marketable permit program. They may lack the resources for the kind of long-term planning necessary to manage risk in the market.⁹⁹ Because of economies of scale, they may have a harder time than larger sources offsetting the new monitoring costs of trading programs with the cost savings of trading.¹⁰⁰ They may face higher transaction costs on secondary markets and may not have the relationships with larger entities necessary to find buyers and sellers if permits are not traded on established, standardized markets. That said, smaller and newer firms may have reason to favor an auction- or offset-based regulatory scheme, which may lower entries to barrier compared to either flexible trading programs that rely on grandfathered allocations or even compared to some forms of traditional regulation that control new actors more stringently than existing entities.

Overall, industry may be expected to be more eager about averaging and banking than about trading. Trading permits with competitors and other external actors creates transaction costs and uncertainty, whereas averaging and banking may be seen as internal tools for managing costs and risks.¹⁰¹ Banking especially may be attractive to industry as a tool to manage long-term risk, and firms may seek the addition of banking provisions on top of other marketable permit approaches, to help them minimize price volatility in the permit markets.¹⁰²

There are some reasons to think that market-based regulatory approaches may become more supported by industry over time. For example, Robert Hahn and Robert Stavins predicted in 1991 that market-based regulatory approaches would become more common as evidence of how actual instruments work in practice came in, and as confidence in their success grew.¹⁰³ Gary Becker’s classic work would also suggest that, with competition among different industry groups for influence over regulatory policy, the more efficient solutions to regulatory problems should be favored over time,¹⁰⁴

⁹⁵ Dewees (1983).

⁹⁶ Revesz, Stavins, Keohane (giving large versus small lead refiners as an example).

⁹⁷ Revesz, Stavins, Keohane.

⁹⁸ Revesz, Stavins, Keohane.

⁹⁹ Lesley McAllister, *Beyond Playing “Banker”*, 59 Admin. L. Rev. 269 (2007).

¹⁰⁰ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 182 (2006, 2d ed).

¹⁰¹ Hahn & Hester, *Where Did All the Markets Go?*

¹⁰² Jan-Peter Voß (2007).

¹⁰³ Also with other factors, such as increasing stringency of controls and associated compliance costs.

¹⁰⁴ Gary Becker, *A Theory of Competition among Pressure Groups for Political Influence*, 98 Q. J. Econ. 357, 384, 386 (May 1983).

which would point in the direction of market-based regulatory approaches. Yet various other factors may disrupt industry support for efficient compliance flexibilities.

First, industry disfavors uncertainty. If market-based regulatory approaches create more uncertainty, industry will oppose them. Some of the literature speculates that, compared to traditional forms of regulation, market-based approaches may be subject to more legal uncertainty and may carry a greater potential for unpredictable rulemaking revisions over time. Meanwhile, industry may be uncertain whether the cost savings promised by market-based approaches will actually materialize. As a result, some firms' compliance managers "would rather install identifiable controls than deal with the uncertainty of the market and the uncertainty generated by the new regulatory program. These managers find it easier to minimize control costs in the political arena than in the market," by using delay tactics or negotiating exemptions.¹⁰⁵ In short, industry often "learn[s] to live" with the "shortcomings" of inflexible, traditional regulation.¹⁰⁶

Second, some firms' agents may have idiosyncratic reasons for opposing marketable permit programs and other compliance flexibilities. Lobbyists, regulatory compliance officers, and others may simply not understand the complexities of the new regulatory proposal, may have expertise tied specifically to the existing and non-flexible regulatory structure, and may want to avoid the devaluation of their own human capital.¹⁰⁷ This self-interested desire to preserve the status quo, and perhaps especially lack of understanding for how the market-based instruments work, can result in a "curious resistance" to compliance flexibilities among some lobbyists, or even a "deep-seated hostility" to among some trade associations, even as individual firms' "senior management" profess their support.¹⁰⁸

Third, some firms may simply find "distasteful" the potential for "transfer payments to competitors" under tradable permit programs.¹⁰⁹

Fourth, firms may not support market-based flexibilities if they are focused on seeking even more aggressive regulatory relief. Industry may only warm up to market-based regulatory reforms once it is clear that outright deregulation is off the table, or that their delay tactics and exemption opportunities have dried up.¹¹⁰ For example, some regulated industries were inherently suspicious of the Carter administration's proposals for compliance flexibilities and so opposed them in the hopes that a future Republican administration would grant more "significant relief" from regulation.¹¹¹

Finally, industry may fear that endorsing a cost-minimizing policy mechanism "may open the way to stricter standards."¹¹² If a regulatory standard's stringency is tied to costs, and if market-based compliance flexibilities bring down marginal costs, the resulting cost savings could be used by agencies as a justification to increase regulatory stringency over time. Market-based approaches hold the promise of either reducing compliance costs to achieve a given regulatory goal, or else to help achieve a more ambitious regulatory goal for a given amount of total compliance costs. While the first formulation

¹⁰⁵ Dwyer (1993).

¹⁰⁶ Hahn & Stavins (1991).

¹⁰⁷ Revesz, Stavins, Keohane at fn104 (citing Kelman; Stewart; Hahn & Stavins; Welch); Dwyer at n.51 (1993) (citing Kelman as reporting that "industry representatives were among the least informed and knowledgeable about arguments in favor of proposals for pollution charge regulations"); *id.* at n.52 (citing Levin as reporting that industry compliance staff prefer to "stick with the devil they knew").

¹⁰⁸ Hahn & Stavins at n.50-51 & accompanying text (1991) (citing Kelman, but noting that Kelman was focused exclusively on emission charges, not marketable permits). See also Welch (1983) (citing Kelman as reporting that only 16% of respondents knew that economists believed that emissions charges were more efficient than traditional regulation).

¹⁰⁹ Meidinger (1985).

¹¹⁰ Dwyer (1993).

¹¹¹ Meidinger (1985).

¹¹² Hahn & Stavins (1991). "Private industry typically is reluctant to endorse any environmental policy mechanism for fear of implicitly endorsing the related environmental goal." *Id.*

of that promise will sound appealing to industry, industry may have little interest in the second formulation unless the increased stringency benefits them in some other way, like as a barrier to entry.

But ultimately, if a regulatory target has been set, industry will generally have “an incentive to lobby for the least burdensome policy approach,”¹¹³ whereas when the regulatory target is less certain, industry may have more mixed incentives and may hold out hope to avoid regulation entirely. The history of introducing market-based regulatory approaches into various contexts largely bears out that prediction.

Industry’s Historical Reactions to the Introduction of Market-Based Approaches

From the 1940s through the 1970s, economists helped develop new ideas for market-based regulatory approaches, such as auctioning radio spectrum,¹¹⁴ trading pollution permits,¹¹⁵ and allocating transferrable quotas for fish catch shares.¹¹⁶ After some false starts politically, with Congress rejecting proposals for air emission taxes and water effluent charges in the early 1970s,¹¹⁷ ideas for market-based flexibilities steadily gained proponents in academic circles, among U.S. regulatory experts, and among regulated industry, and really began to take off starting in the late 1970s.¹¹⁸ The 1990s ushered in an age of growing bipartisan political support, with the creation of the landmark cap-and-trade market for acid rain pollution in the 1990 amendments to the Clean Air Act, passed by overwhelming bipartisan majorities in both chambers of Congress and was signed into law by President George H.W. Bush.¹¹⁹ In 1993, President Clinton signed Executive Order 12,866, which calls for agencies to always assess the possible advantages of alternatives to traditional regulatory approaches, and specifically to consider “economic incentives to encourage the desired behavior, such as user fees or marketable permits.”¹²⁰ Every presidential administration since, including Presidents Bush (43), Obama, and Trump, have all maintained that executive order and its call for market-based regulatory alternatives.¹²¹

This section traces industry’s historical reactions to market-based compliance flexibilities in various regulatory contexts. Case studies are presented roughly in chronological order, dated from the first introduction of a market-based approach into a particular regulatory scheme. This not entirely comprehensive¹²² but thorough survey focuses on U.S. federal regulations, as well as some notable U.S.

¹¹³ Hahn & Stavins (1991).

¹¹⁴ Coase’s 1959 work is often credited with the idea of auctioning radio spectrum, but Coase attributes the idea back to Herzel (1951) and Lerner (1944). See Hazlett (1998).

¹¹⁵ Expanding on Ronald Coase’s influential 1960 article *The Problem of Social Cost*, Thomas Crocker and John Dales developed the idea of tradable pollution permits in the 1960s. See T.H. Tietenberg, *Emissions Trading: Principles and Practice* 2-4 (2006, 2d ed) (Crocker first applied trading to air pollution, Dales to water pollution); Lesley McAllister, *Beyond Playing “Banker”*, 59 Admin. L. Rev. 269 (2007).

¹¹⁶ The idea of individual transferrable quotas for fish, for example, is often credited to a 1973 paper by economist Francis Christy. See Wyman at n.94 (2005).

¹¹⁷ Dewees (1983). Though Nixon’s 1970 proposal for a tax on lead in gasoline did not pass, eventually in 1978 Congress would enact a tax on gas-guzzling cars. Milne, *Carbon Taxes in the United States* (2008).

¹¹⁸ As Richard Revesz and Michael Livermore recount, “The concept entered the [U.S.] political arena in the 1980s, when C. Boyden Gray, then a high-ranking Reagan Administration official, promoted it as a preferable approach to the traditional method of addressing air pollution.” Michael Livermore & Richard Revesz, *Interest Groups and Environmental Policy*, *Envtl. L.* 12-13 (2015).

¹¹⁹ EPA, Legislative Chronology: Clean Air Act Amendments of 1990, <http://www3.epa.gov/ttn/caaa/gen/chron.txt>.

¹²⁰ Exec. Order 12,866 § 1(b)(3) (Oct. 4, 1993).

¹²¹ [CITE OIRA memo on implementing Trump’s Executive Order 13771, which affirmed the ongoing supremacy of Executive Order 12,866 for governing regulatory impact analysis, which includes the consideration of alternatives like marketable permits.]

¹²² Some omissions include:

- water quantity trading. See Welch (1983) (describing the positive reception to a new tradeable property right in water, since there was an existing water market that everyone already understood);
- grazing fees, and federal coal, oil, and gas auctions;
- renewable fuel standard credits. Renewable fuels industry obviously supported, and even critics of some specifics of the RFS program argued instead for other market-based alternatives. <https://fas.org/sgp/crs/misc/R40155.pdf>; earlier version: https://biomassboard.gov/pdfs/crs_rfs_background.pdf
- some early action credit programs, which are really a type of banking. For example, in 1992, EPA allowed early action credits for some hazardous air pollutant regulations. See Tietenberg, Colby.edu.

state and local policies, plus a few federal legislative proposals.¹²³ The survey focuses mostly on market-based approaches that were actually adopted, though it includes some notable legislative and regulatory proposals that failed.

Evidence for the industry’s reactions is largely drawn from public comments on rulemakings, positions taken in litigation, and other public remarks. Some previous academic literature that has summarized industry reactions to some of these market-based regulatory programs has very occasionally conducted interviews with industry officials, but often has relied on public statements as well. Public statements—perhaps especially public comments from industry players on rulemakings that will affect them—may contain puffery, as industry alleges dire consequences in an effort to persuade regulators to relax regulations. James Coleman, for example, found that companies are much more likely to present proposed regulations in a starkly negative light in their comments to regulatory agencies, compared to in their securities disclosures to shareholders, where companies paint a rosier picture of their ability to remain profitable under regulation.¹²⁴ That said, public statements still contain informative reactions, and if industry really does stand to benefit from a market-based approach, they have some incentive to be honest with agencies in their public comments, to build the rulemaking record that agencies will use to justify their adoption of such market-based approaches. Moreover, public comments are typically summarized in the publication of final rulemakings and so are readily available. Indeed, the evidence used in this article of industry’s reaction to the Department of Energy’s proposed addition of market-based approaches to the Energy Conservation Standards is drawn from public comments. Therefore, looking at public comments from historical rulemakings allows for an apples-to-apples comparison with evidence of industry’s reaction to this new proposal from the Department of Energy. Still, it is always possible that industry’s real views are not fully expressed in public comments, but instead are either expressed privately to decisionmakers, or else are kept entirely hidden.

Neither industry nor any other interest group is ever monolithic in their views. Many marketable permit programs have had at least some industry dissenters, and sometimes industry may generally support some compliance flexibilities while opposing other aspects of the regulation. Larger firms tend to support a different mix of flexibilities than smaller firms, or a different method of allocating tradable permits, yet even then disagreement within industry is often more about the design of the flexible program than about the concept of market-based flexibilities altogether.

Overall, this historical survey reveals fairly consistent industry support for at least some types of market-based flexibilities across many regulatory contexts. Some of industry’s skepticism in early years when such flexibilities were still untested eventually gave way to increased reliance on these cost-saving mechanisms in later years. Support for market-based tools is especially common among industry when a regulatory standard has already been fixed and the choice is between either traditional regulatory approaches alone or the addition of some compliance flexibilities.

• some averaging programs; Averaging allowed for some petroleum processing hazardous air pollutant regulations, and for some organic hazardous air pollutant regulations, and for water effluent from the iron and steel industry (kind of bubbling, from a settlement with the American Iron and Steel Institute). See Tietenberg, Colby.edu. Also, Averaging and Trading for Large Municipal Waste Combustors (1995): Plants participated even though those that used averaging were subject to tighter standards.

• various state air trading programs, like Telluride’s fireplace permit program, started in 1987. See Tietenberg, Colby.edu. See Stavins (2002).

¹²³ Not attempting to catalog every failed legislative proposal. President Clinton’s proposed Btu tax failed, but was transmuted into a gasoline tax. Milne (2008).

¹²⁴ James Coleman, *Comparing Companies’ Comments on Regulations with Their Securities Disclosures* (studying the Renewal Fuel Standard, which does have a market-based credit trading program, though Coleman’s work was not specifically focused on industry reactions to the trading component).

Electromagnetic Spectrum Licenses

Overview: Secondary trading of administratively granted licenses for radio, television, and other uses of the wireless spectrum has been allowed since the 1920s and 1930s. Permit auctions were introduced beginning in 1993.

History: An “active secondary market for wireless licenses” has existed since at least 1927.¹²⁵ The idea of license fees was pitched, unsuccessfully, in 1927 by the American Bar Association, and a series of academic articles, as well as presidential speeches and budget proposals, pushed for spectrum auctions from the 1950s through the late 1980s.¹²⁶ But through 1993, industry opposed attempts to shift from granting licenses through traditional administrative proceedings to instead allocating licenses through an auction mechanism.¹²⁷ Existing broadcasters had viewed the cumbersome administrative proceeding process as a useful barrier to new entry, and they were willing to accept some content controls under the “public interest” standard that the government used to grant licenses, in exchange for entry barriers and other rents extracted from the traditional regulatory structure.¹²⁸

Industry eventually relented to auctions, or at least hid any strong opposition, after Congress separately passed various reforms to copyright law and rate controls that were very favorable to broadcasters.¹²⁹ In 1993, Congress at last approved spectrum auctions, touting them largely as a revenue raiser for deficit reduction.¹³⁰

More recently, the Federal Communication Commission’s voluntary incentive auction, designed to reallocate underutilized spectrum owned by broadcasters to new, higher-value broadband uses, received broad bipartisan political support as well as support from key industry players.¹³¹

Takeaways: There is no evidence that industry had any opposition to the idea that their spectrum permits should be tradable. Industry resisted auctions for years, in favor of traditional regulation that combined a free giveaway with a useful barrier to new entry. But industry relented to auctions when appeased by other valuable regulatory concessions. Market-based approaches that are voluntary rather than mandatory, like the broadcast-to-broadband incentive auction facilitated by the FCC, receive greater industry support.

¹²⁵ Hazlett n.17 (1998). Secondary markets for trading spectrum licenses do face constraints, since applicants must demonstrate that the transfer serves the public interest, 47 C.F.R. § 20.22, and the FCC has at times limited sublease and resale, Pablo Spiller & Carlo Cardilli, *Toward a Property Rights Approach to Communications Spectrum*, 16 Yale J. of Reg. 53 (1999). Various legal and technical limits, like potential interference between users of neighboring bandwidth, sometimes block the secondary transfer of spectrum to a different use than the originally approved use. Jessica Elder, *Voluntary Incentive Auctions: The Benefits of a Market-Based Spectrum Policy*, 20 Comm. L. Conspectus 163 (2011); FCC, *Connecting America: The National Broadband Plan 82* (2010) (“In many spectrum bands, the government issues exclusive flexible use licenses that allow licensees to choose what services to offer and to transfer, lease, or subdivide their spectrum rights. Many spectrum licensees, however, have inflexible licenses that limit the spectrum to specific uses.”). The FCC has been working to facilitate the secondary market since 2003. <https://www.fcc.gov/wireless/bureau-divisions/technologies-systems-and-innovation-division/spectrum-leasing/secondary>.

¹²⁶ Hazlett tbl. 2 (1998).

¹²⁷ Congress did grant the FCC permission in 1981 to issue nonbroadcast licenses by lottery, when the FCC was “faced with the daunting administrative task of awarding over 1,400 licenses for cellular telephony.” Yet even then, Congress denied the request for auction authority. Hazlett (1998).

¹²⁸ Hazlett n.45-46 & accompanying text (1998) (explaining the public interest standard’s “chilling effect” on content, and “regulation by raised eyebrow”).

¹²⁹ Hazlett n.112 (explaining “ambitious efforts of the broadcast industry in pursuit of other priorities constrained the ability of broadcasters to effectively and openly oppose spectrum auctions”); *id.* tbl. 6 (“broadcasters [were] indebted to, and dependent on, Congress/FCC for favorable regulation”).

¹³⁰ Auctions were first approved for wireless licenses besides radio/TV; later, in 1997, authority to auction those broadcast licenses was enacted as well, though digital TV and renewals remained exempted. Hazlett (1998).

¹³¹ E.g., <https://www.businesswire.com/news/home/20120516006803/en/CEA-Hails-Unanimous-FCC-Support-Incentive-Auctions>; <https://www.reuters.com/article/us-ces-fcc/fcc-sees-support-for-incentive-auctions-of-wireless-spectrum-idUSTRE80B02L20120112>.

New York City Taxi Medallions

Overview: A cap-and-trade structure for New York City taxi licenses has existed since 1937. Permit auctions were introduced beginning in 1996.

History: New York City taxi licenses were capped in 1937,¹³² with all existing license holders grandfathered into the cap. The resale of licenses was permitted, with restrictions that preserved the proportion of licenses available to independent owner-drivers as compared to large taxi fleets. With that grandfathering structure in place, large fleet owners supported the cap, as did at least some independent owners, though other independent drivers most likely feared eventually being edged out by the larger fleets. By 1947, medallions earned a premium for sellers of their used, licensed taxi vehicles; soon thereafter, medallions were sold independently of vehicles, and by at least the 1960s, a “brisk if limited” secondary trading market had developed.¹³³

In the 1980s, when Mayor Koch proposed adding additional medallions either by auction, lottery, or simply doubling the allocation to existing owners, all such proposals were strongly opposed by the owners of existing medallions.¹³⁴ But years later, at least most of the large fleet owners (though not all the small taxi operators) supported plans from Mayors Giuliani and Bloomberg to auction off additional medallions.¹³⁵ The support that emerged by 1996 from the existing industry for a permit auction that would reduce barriers to entry can be explained because the announced auctions were coupled with “sizeable fare increases that may have more than offset the effect of adding more medallions on medallion values”; because the auctions were styled as revenue raisers for the city, not as attacks on medallion monopolies; and because the auctions were structured to preserve the price of existing medallions and may have helped solidify the belief that medallions were commodities with real value—a belief that benefited the existing owners of medallions.¹³⁶

Takeaways: Existing large fleets and at least some smaller owners supported a cap-and-trade structure that included grandfathering and so served as a useful barrier to entry. Industry opposed auctions or any weakening of the cap until the auction plan was coupled with other valuable regulatory concessions, and the auction was structured to preserve the price of existing permits.

Criteria Emissions Trading Program: Bubbles, Netting, Offsets, and Banking

Overview: In various contexts beginning in the late 1970s, stationary sources of so-called “criteria” air pollutants—like the common, widespread pollutants that form soot (particulate matter), smog (nitrogen oxides), and acid rain (sulfur dioxide)—were allowed to average their emissions across certain sources for purposes of complying with emissions limits or avoiding emissions thresholds that would trigger additional regulatory standards. These averaging programs are referred to here as “bubbles”¹³⁷ and “netting.”¹³⁸ In other contexts, new stationary sources were required to obtain offsetting emissions reductions from existing sources, through either internal or external trading of offset credits.¹³⁹ The Environmental Protection Agency also allowed stationary sources to bank emissions reductions to offset future increases.¹⁴⁰

¹³² To ease congestion and protect taxi drivers, other drivers, passengers, and pedestrians from inefficient competition among too many taxi drivers, which depressed driver wages and encouraged aggressive driving tactics. Wyman (2013).

¹³³ Wyman (2013).

¹³⁴ Wyman (2013). By contrast, Bloomberg’s plan to legalize non-medallion taxi pick-ups in outer boroughs was opposed by medallion owners.

¹³⁵ Wyman n.281-282 & accompanying text (2013).

¹³⁶ Wyman (2013).

¹³⁷ 44 Fed. Reg. 71,780 (1979). Bubbles can be external, according to Hahn & Hester (1989), but it is rare.

¹³⁸ 39 Fed. Reg. 42,510 (1974).

¹³⁹ 41 Fed. Reg. 55,524 (1976); 44 Fed. Reg. 3274 (1979). Offsets can be internal or external, though external happens less often (at least as of 1989). Offsets are mandatory in some areas, a voluntary option in other areas. Hahn & Hester (1989).

¹⁴⁰ 44 Fed. Reg. 3274 (1979); 46 Fed. Reg. 50,766 (1981); 51 Fed. Reg. 43,829, Emissions Trading Policy Statement, (1986).

History: The smelting industry first pitched the idea of emissions averaging to EPA in 1972.¹⁴¹ Industry hoped that averaging could reduce their compliance costs, compared to the existing regulation that placed specific emissions limits on each individual source. EPA initially “resist[ed] the bubble concept in meetings with industry representative,” but in 1974, faced with pressure from the Department of Commerce as well, the agency relented and partially adopted industry’s request.¹⁴² When the smelting industry subsequently sued EPA for even more expansive permission to average their emissions, the Sierra Club simultaneously sued to reject the entire averaging program as beyond statutory authority. The U.S. Court of Appeals for the D.C. Circuit initially agreed with Sierra Club and struck down averaging as inconsistent with the relevant provision of the Clean Air Act.¹⁴³ However, a few years later, EPA revived the concept of bubbling under a different provision of the Clean Air Act, again to “accommodate industry’s expressed concerns.”¹⁴⁴ This time, the D.C. Circuit upheld bubbling,¹⁴⁵ and then the 1984 seminal case *Chevron v. NRDC*, the Supreme Court upheld a further extension of bubbling under the Clean Air Act.¹⁴⁶ As the name of that case indicates, industry widely supported bubbling, and large trade associations intervened to defend the rule before the Supreme Court.¹⁴⁷

The idea of offsets, introduced in 1976, “followed the same logic” as the smelting industry’s proposals on averaging.¹⁴⁸ Offsets also emerged as a necessary solution to a regulatory and political problem: the Clean Air Act’s designation of many urban areas as being out of attainment with minimal air quality standards effectively created a “growth ban” by triggering tight limitations on any new stationary sources seeking to enter (and emit pollution in) those areas.¹⁴⁹ EPA first introduced its offset policy as an interpretive ruling,¹⁵⁰ which essentially grandfathered the historic pollution levels of existing sources, and let new sources develop in non-attainment areas if they paid existing sources to reduce their emissions and sell their grandfathered allowances.¹⁵¹ Congress ratified a similar offset program one year later, in the 1977 amendments to the Clean Air Act.¹⁵² Academic reporting over the following decade characterize industry reaction as ranging from “lukewarm”¹⁵³ to somewhere “between hostility and indifference,” owing largely to beliefs that the program was “so complicated and hard to understand that it would not be very workable.”¹⁵⁴ Environmentalists, meanwhile, opposed it “vigorously” as an erosion of environmental protections.¹⁵⁵ Overall, the offset program’s “novelty” certainly impeded its development,¹⁵⁶ and in the early years, offsets—and especially external offsets traded between different companies—were not used nearly as often as internal averaging.¹⁵⁷ The fact that, in some contexts, offsets were mandatory for new sources rather than just a flexible compliance option, may have also

¹⁴¹ *Asarco Inc. v. EPA*, 578 F.2d 319, 323-24 (D.C. Cir. 1978). Meidinger (1985) places the first pitch in 1971.

¹⁴² *Asarco Inc. v. EPA*, 578 F.2d 319, 323-24 (D.C. Cir. 1978).

¹⁴³ *Id.* at 329.

¹⁴⁴ 43 Fed. Reg. 26,380, 26,394 (1978). Revesz & Lienke at 65 (2016) (“once again, the ‘bubbling’ had not been the EPA’s idea”).

¹⁴⁵ *Alabama Power Co. v. Costle*, 636 F.2d 323, 402 (1979). Revesz & Lienke at 65 (describing the distinction the court drew between this context and *Asarco* as “improbabl[e]”).

¹⁴⁶ 467 U.S. 837, 840, 866 (1984).

¹⁴⁷ *Chevron v. NRDC*, 467 U.S. 837 at n.4 (Chevron, American Iron and Steel Institute, American Petroleum Institute, Chemical Manufacturers Association, General Motors Corporation, and Rubber Manufacturers Association all intervened to support the regulation); *id.* at 839 (American Gas Association filed *amicus* brief supporting the rule).

¹⁴⁸ Lane (2012) (citing Cook 1988).

¹⁴⁹ Lane (2012) (citing Liroff 1980).

¹⁵⁰ 41 FR 55,524 (1976).

¹⁵¹ Greater than one-for-one offsetting reductions were required.

¹⁵² Dwyer (1993) (noting that Congress debated using more ambitious economic incentives, but settled for a “modest” offset program).

¹⁵³ Hahn & Hester (1989).

¹⁵⁴ Meidinger (1985) (citing Kelman; but Kelman was about taxes, not trading).

¹⁵⁵ Hahn & Hester (1989). “Environmental groups initially greeted the concept” of offsets and bubbles under the Clean Air Act “with suspicions,” particularly raising moral objections and concerns about prioritization of goals. Livermore & Revesz at 11-12; *see also* Hahn (1989) (“Environmentalists have been particularly critical.”)

¹⁵⁶ Welch (1983) (citing Liroff 1980).

¹⁵⁷ Hahn (various).

influenced industry’s initial reaction to this market-based tool. Nevertheless, without the program some industries would have had trouble developing in some urban areas, and the speedy ratification by Congress within a year of EPA’s proposal could indicate at least some support for offsets from certain segments of industry.

Finally, in 1979 EPA allowed stationary sources to over-comply with emissions limits for criteria pollution and bank the excess credits for their own future use. In the early years of the banking program, relatively few firms took advantage of the flexibility, leading some observers to speculate that perhaps there was not much industry interest in the creation of the program to begin with.¹⁵⁸ Alternatively, perhaps industry stakeholders were just inherently skeptical of any regulation from the Carter administration, even if the regulation granted flexible regulatory relief.¹⁵⁹

In 1985, Errol Meidinger conducted interviews with industrial representatives and reported on an industry fear that perhaps all this compliance flexibility was “a Trojan horse”:

There seems to have been a sense, thus far expressed only in veiled or oblique ways by industrial representatives whom I have interviewed, that the move to emissions trading might have been a Trojan horse of sorts. Industrial interests were afraid of welcoming it into their midst, only to find in it the sources of more burdensome regulation and expanded bureaucratic power. . . . More concretely, as one especially articulate executive director of an industry association suggested, marketable permits could give regulators greatly increased knowledge of industrial practices, leading to the ability to track them too closely. Indeed, it might embolden them to tighten standards upon finding that particular polluters could afford it.¹⁶⁰

Despite any such initial concerns, industry increasingly grew to rely on the various averaging, banking, and offsetting programs known collectively as EPA’s “emissions trading program,” and within just over a decade of their creation, had used the flexible compliance options often enough to have saved as much as \$12 billion in emissions controls costs.¹⁶¹

Takeaways: Despite some initial reservations about market-based tools’ novelty and potential to lead to increased stringency in the future, it was a request from industry that first set EPA on the path toward its comprehensive emissions trading program, industry defended market-based flexibilities in court, and over time industry benefited greatly from its use of flexibilities, in particular its voluntary use of averaging programs.

Corporate Average Fuel Economy Standards

Overview: Averaging, banking, and borrowing for motor vehicle fuel efficiency standards have been allowed since 1975.¹⁶² In 2007, Congress authorized trading of credits between manufacturers, as well as some averaging of compliance across car and light truck fleets.¹⁶³ The Department of Transportation also permits the generation of some offset credits, from technology that improves on-road fuel efficiency that is not reflected under testing conditions, like start-stop technology for engine idling.¹⁶⁴

History: Since Congress mandated fuel economy standards for motor vehicles in the Energy Policy and Conservation Act of 1975, the standards were designed for manufacturers to comply on a “corporate

¹⁵⁸ Meidinger (1985) (Relatively little use of banking could indicate lack of a clear political constituency that demanded their development.).

¹⁵⁹ Meidinger (1985).

¹⁶⁰ Meidinger at n.24 (1985) (explaining that interviews were conducted with representatives of regulatory agencies, polluting industries, and environmental groups).

¹⁶¹ Hahn (1989).

¹⁶² Energy Policy and Conservation Act of 1975, Pub. L. 94-163 § 301 (amending the Motor Vehicle Information and Cost Savings Act §§ 503(a)(1) (on averaging) and 508 (on banking)).

¹⁶³ EISA of 2007.

¹⁶⁴ https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld_cafe_co2_nhtsa_2127-al76_epa_pria_181016.pdf at tbl.6-82.

average” basis, with at least some limited banking of credits allowed as well.¹⁶⁵ As the legislation was crafted, some small manufacturers, who lacked a diverse product line to average across, feared that averaging would put them at a disadvantage, and sought other exemptions.¹⁶⁶ Ford Motors was an early advocate for banking, claiming that “the market can’t be expected to conform in every year.”¹⁶⁷

In 1979, the Department of Transportation asked Congress to expand the duration of both banking and borrowing provisions, in response to “concerns expressed by manufacturers” about their ability to comply with the standards “in the event of a serious economic downturn,”¹⁶⁸ and their need for greater flexibility to handle unforeseen circumstances like if compliance technology does not perform as expected.¹⁶⁹ In particular, the banking extension was widely seen as a way to bail out American Motors Corporation, which could generate some immediate excess credits but could foresee significant danger of falling out of compliance in the coming years.¹⁷⁰ Public interest groups, like the Center for Auto Safety, supported expanding the banking provisions, but not the borrowing provisions.¹⁷¹ Congress extended banking and borrowing in 1980, to allow a three-year “carryback or carryforward” of credits,¹⁷² with the “unanimous endorsement by all [domestic] manufacturers testifying on these provisions.”¹⁷³

Industry was initially more split on the virtues of adding inter-manufacturer trading. During 2001 congressional hearings, Ford Motors expressed its worry that any trading scheme would transfer wealth from “full line” domestic manufacturers to foreign companies that specialized in smaller vehicles; Honda, perhaps predictably given its more efficient line of vehicles, encouraged Congress to take a

¹⁶⁵ CAFE standards were “enthusiastically supported by the environmental community as the first attempt by the government to affect the fuel efficiency of motor vehicles.” Hahn & Stavins (1991) (citing Crandall et al.).

¹⁶⁶ Hearing before Subcomm. On Consumer Protection and Finance, on H.R. 6943, May 5, 1980, p.91 (statement of Robert McIntosh, Attorney for Checker Motors Corp., recalling the position of small manufacturers in 1975).

¹⁶⁷ Automobile Industry and Its Impact upon the Nation’s Economy, Hearings before the Automobile Industry Task Force of the Committee on Banking, Currency, and Housing, House of Rep., 94th Cong., part 1. April 9-11 & July 29, 1975. Text of remarks by F.G. Secrest, Exec. VP, Ford Motor, March 12, 1975. Ford also expressed concerns that fuel economy standards could perhaps be “especially” hard to achieve “if based on sales-weighted averages,” though this was perhaps less a position against averaging than a position in favor of setting individual standards for each manufacturer, and perhaps even for each model. The UAW Statement helps clarify. *Id.* p.561-62 (Statement of Leonard Woodcock, President UAW, March 13, 1975: “We are also aware that some argue against a uniform sales-weighted average because it ignores differences—whether due to sales mix or otherwise—in the present fuel efficiency level for each manufacturer. Nevertheless, the technology and the market are available to each of the manufacturers.”).

¹⁶⁸ H.R. Rep. 96-1026 at p.9, to accompany S. 2475, May 16, 1980. Committee on Interstate & Foreign Commerce. *See also* Hearings before Subcommittee on Energy and Power, on HR 5140 etc., March 28 & April 15, 1980, p.154 (answer of Ms. Claybrook, NHTSA, that idea for flexibility grew out of conversations with Ford Motor Company, as well as to help AMC/Renault).

¹⁶⁹ *Id.* at 18 (statement of Rep. Sharp); *id.* at 37 (statement of Rep. Scheuer); Hearing before Committee on Commerce, Science, and Transportation, on S. 1583, S. 2010, S. 2035, Jan. 23, 1980, p.95 (statement of Motor Vehicle Manufacturers Association, saying that banking will protect industry from “greater risks in technological development, product design and market acceptance” and they try to meet increasingly stringent standards).

¹⁷⁰ Hearing before Subcomm. On Consumer Protection and Finance, on H.R. 6943, May 5, 1980, p.21 (statement of Joan Claybrook, NHTSA Administrator: credit extension designed to “minimize the potential adverse impacts of the fuel economy program on . . . American Motors [Corp.]”); Hearing before Committee on Commerce, Science, and Transportation, on S. 1583, S. 2010, S. 2035, Jan. 23, 1980, p.27 (statement of Claybrook: “We have accepted on face value what AMC [American Motor Co.] has told us, and they will be carrying forward credits, substantial credits beginning in the year 1982. The proposal that we have made to the Congress of a 3-year carry-back/carry-forward provision would allow them to carry those credits forward so that, for whatever lack of fuel economy they have in the 1982-84 period, those credits would counterbalance much of it.”).

¹⁷¹ *Id.* at 18-19 (answers of Clarence Ditlow, Director of Center for Auto Safety).

¹⁷² Automobile Fuel Efficiency Act of 1980. H.R. Conf. Rep. 96-1402, to accompany S. 2475.

¹⁷³ S. Rep. 96-642, Committee on Commerce, Science, and Transportation, March 25, 1980, p.4; see also Hearing before Subcomm. On Consumer Protection and Finance, on H.R. 6943, May 5, 1980, p.65 (Statement of Helen Petruskas, Ford Motors, noting the support of all domestic automobile manufacturers).

closer look at tradable credits.¹⁷⁴ Sierra Club feared that manufacturers would “gam[e]” a trading program, though notably supported a feebate system.¹⁷⁵

By 2010, when the Department of Transportation had begun regulating vehicle fuel economy in conjunction with EPA’s regulation of greenhouse gas emissions from motor vehicles, industry strongly supported compliance flexibilities as “absolutely necessary.”¹⁷⁶ Industry also began requesting even greater flexibility by, for example, being allowed to generate more off-cycle credits through idle engine start-stop technology or active aerodynamics or external lighting efficiency. Though the inter-manufacturer market was slow to develop, in recent years the fuel economy credit market has been relatively “active.”¹⁷⁷

At the time of this article’s drafting (2018), the future of the fuel economy standards for motor vehicles—and the associated market-based compliance flexibilities—hangs in limbo. The Department of Transportation, together with EPA, has proposed significantly rolling back the fuel economy standards, and even raised the possibility of “potentially eliminating credit trading in the CAFE program.”¹⁷⁸ The agencies also cited the existence and use of tradable and bankable credits as part of their justification for the proposed rollback: Among the many reasons given for this potential deregulation is the fact that manufacturers have been increasingly cashing in credits banked in earlier years to meet their more recent compliance obligations; EPA suggests this drawdown of banked credits is a sure sign that compliance is becoming too difficult, too costly for manufacturers.¹⁷⁹ Of course, another reasonable explanation could be this drawdown is simply the credit market working as planned: manufacturers purposefully banked credits in earlier period to give them greater flexibility for compliance now.

News reports reveal that manufacturers may not all be thrilled with the sweeping proposed rollback, and especially may not like the possibility of “potentially eliminating credit trading.” To the contrary, some manufacturers reportedly have been pushing the agencies to abandon the proposed rollback and instead simply afford them even more compliance flexibility to meet the existing standards. Specifically, manufacturers may prefer expanded opportunities to generate offset credits by installing other fuel-saving technologies, like systems to shut off engines while idling.¹⁸⁰ Some manufacturers have stated on the record that their fear with complete rollbacks is inviting a patchwork of state-based regulations to fill the gap; instead, they would prefer a uniform federal standard, just with more market-based compliance flexibility.¹⁸¹ Some environmental groups suggest instead another hidden motivation:

Environmentalists say that the industry runs the risk of hurting its image with car buyers if it is perceived as supporting a broader rollback of clean-air rules. “They’re nervous about being seen as perpetrators of this attack on human health and the environment,” said Daniel Becker, who

¹⁷⁴ <https://www.gpo.gov/fdsys/pkg/CHRG-107shrg89683/html/CHRG-107shrg89683.htm>. United Automobile Workers later echoed those same concerns.

¹⁷⁵ <https://www.gpo.gov/fdsys/pkg/CHRG-107shrg89683/html/CHRG-107shrg89683.htm>. The Association of International Automobile Manufacturers added more praise for the idea of a trading system.

¹⁷⁶ Alliance of Automobile Manufacturers (5-17); *accord* Kia (page 1-27), Volkswagen (1-54), GM (5-17), Hyundai (5-18), Mercedes (5-18), and so forth, in *Response to Comments*, <https://nepis.epa.gov/Exe/ZyPDF.cgi/P10073MC.PDF?Dockey=P10073MC.PDF>. Also Toyota (5-18) (supports generally but said “although it remains unclear, for competitive or other reasons, the extent to which manufacturers will engage in trading with one another or in trading through a third party. Nonetheless, *this uncertainty does not argue against establishing such a program in the event credit trading makes sense for the parties involved.*”). See also <https://fas.org/sgp/crs/misc/R42895.pdf> at 2 (supported EPA-NHTSA regulation as preferred to piecemeal state-by-state approach). Also, Supported by EDF (“the more flexible the better”) but not Public Citizen, and Sierra Club had concerns (pages 5-19 to 5-20).

¹⁷⁷ EPA & NHTSA, Draft Technical Assessment Report: Midterm Evaluation, 420-D-16-900.

¹⁷⁸ 83 Fed. Reg. at 42,999 (Aug. 24, 2018).

¹⁷⁹ Revised Final Determination.

¹⁸⁰ <https://www.nytimes.com/2018/03/30/climate/epa-auto-pollution-pruitt.html>; see also Doug Obey, *Auto Group Weighs ‘Flexibilities’ Plan that Could Preserve EPA’s GHG Goals*, InsideEPA.com, Apr. 3, 2018 (reporting that the trade association Global Automakers is discussing potentially retaining the standards in exchange for more compliance flexibilities, like “off-cycle” offset credits).

¹⁸¹ NYTimes piece above.

directs the Safe Climate Campaign at the advocacy group Center for Auto Safety. “It’s a big thing to be accused of.”¹⁸²

Whether out of fear of consumer perceptions or of a state-by-state regulatory patchwork, it therefore is possible that automobile manufacturers are now advocating for increased market-based flexibilities not because they really prefer that option over a rollback, but rather for some hidden reason.

Takeaways: At times, the views of vehicle manufacturers on the desirability of market-based compliance flexibilities has split, either between large and small companies, or between foreign companies that built smaller and more efficient cars and domestic manufacturers that had larger, less efficient product lines. At least one expansion of available flexibilities was designed specifically to throw a lifeline to a struggling domestic manufacturer. Over time, industry support for averaging, banking, borrowing, offsets, and trading has grown, to the point where many companies are currently arguing—at least publicly—in favor of more flexibilities rather than a rollback of regulatory stringency.

Water Quality Trading

Overview: State-level pilot programs, administered under the federal Clean Water Act, began with a cap-and-trade-style pilot program in 1981, and an offset credit-style pilot program in 1984. Dozens more state-level programs incorporating various compliance flexibilities would develop under EPA’s auspices.

History: In 1981, Wisconsin innovated the first water quality trading program to add flexibility to traditional regulatory controls under the Clean Water Act. Paper mills and municipal waste treatment plants that discharged into the Fox River were given grandfathered allocations¹⁸³ and allowed to execute external trades (but not internal averaging).¹⁸⁴ Reportedly, relatively “few” of the potential players in the market fully “understood the implications of transferability,”¹⁸⁵ and as a result “the paper mills did not enthusiastically support the idea”¹⁸⁶—though compared to the opposition from environmentalists, the relative position of industry could be characterized as quite supportive.¹⁸⁷

In 1984, with the Colorado Dillon Reservoir in danger of going eutrophic from phosphorous pollution, “a coalition of government and private interests”¹⁸⁸ developed the country’s first trading program between regulated “point” sources of water pollution and unregulated “nonpoint” sources.¹⁸⁹ Existing point sources were allocated allowances based on past production, and unregulated nonpoint sources could develop and sell offset credits by reducing their emissions. The program had near unanimous support from the affected existing industry,¹⁹⁰ and the program’s development was relatively uncontroversial¹⁹¹ because the wastewater producers and environmentalists in fact had “overlapping interests”: the same municipalities and tourist resorts that were largely responsible for emitting the phosphorous also needed to maintain water quality to grow the local economy and increase tourism.¹⁹²

¹⁸² <https://www.nytimes.com/2018/03/30/climate/epa-auto-pollution-pruitt.html>

¹⁸³ Welch (1983) (grandfathered based on 1972 maximum production levels at paper mills, and 1976-77 average wastewater generation for municipalities).

¹⁸⁴ Hahn & Hester (1989).

¹⁸⁵ Welch (1983) (citing David and Joeres).

¹⁸⁶ Hahn (1989) (citing Novotny 1986).

¹⁸⁷ Hahn & Hester n.206 (1989) (citing Liroff 1986; Novotny 1986; and personal interviews) (The development was reportedly “characterized by high levels of controversy” because of sharply dissonant views of industry versus environmentalists).

¹⁸⁸ Hahn & Hester (1989) (citing Northwest Colorado Council of Governments, Point Sources-Nonpoint Sources Trading in the Lake Dillon Watershed Final Report (1984)).

¹⁸⁹ A point source, like a factory sitting on a river, is a regulated source with a measurable flow of pollution, often emitted from the end of a pipe. A non-point source, like a farm, has more diffuse, often un-measurable discharges, and is often unregulated.

¹⁹⁰ Hahn & Hester n.220-221 (1989) (only opposition from two small groups that opposed all regulation, and from groups opposed to any further growth in the region).

¹⁹¹ Hahn & Hester n.207 (1989) (citing Northwest Colorado Council of Governments report).

¹⁹² Hahn & Hester (1989).

By the early 2000s, EPA had been involved in the development of almost three dozen state-level water quality trading programs.¹⁹³ In 2003, EPA issued its first policy statement and guidance on water quality trading programs. At that time, “industry and wastewater treatment groups support[ed]” trading, as did agriculture groups (the latter with some caveats).¹⁹⁴ Industry’s support is further evident by their participation in what is, ultimately, most often a voluntary compliance option. However, compared to air pollution markets, water quality trading has been relatively slow to develop,¹⁹⁵ perhaps due to some lingering uncertainty as to the program’s statutory authority.¹⁹⁶ The members of industry that do participate in water quality trading programs have made various recommendations to EPA on how to expand and strengthen water quality trading nationwide.¹⁹⁷

Takeaways: Though an initial lack of understanding led to some lukewarm industry attitudes toward trading, and though water quality trading programs overall remain somewhat underdeveloped, industry has generally supported water quality trading, and at least some segments wish there were more of it.

Lead Phase-Out from Gasoline

Overview: An inter-firm credit trading program for lead content in gasoline was established for refineries in 1982; the structure of the trading program also effectively allowed intra-firm averaging over the course of a quarterly compliance period.¹⁹⁸ The banking of credits was authorized starting in 1985. The program ended in 1987, when the phase-out of lead in gasoline was completed. Throughout the program, allowances were not grandfathered; instead, credits were generated on the basis of output: for each gallon of gasoline produced with lead content below the maximum level set by a standard, the refinery would generate corresponding credits that could be sold or banked.¹⁹⁹

History: Before the trading program was implemented, there was already “widespread agreement” among political players “that lead was to be phased out of gasoline.”²⁰⁰ Seemingly the only question up for debate was how to most efficiently and fairly reach that target. Lead limits for gasoline existed before 1982, but they were not yet binding on most refineries, since the standards were so lax that most refineries already easily met them. The stringency of the standards increased notably in 1982, in conjunction with the introduction of the trading program; stringency would increase again in 1984, with the introduction of the banking program.²⁰¹

From EPA’s perspective, the agency’s main objective in developing an inter-refinery trading program was to protect small refiners from the costs of the increasingly stringent standards.²⁰² Certainly not all

¹⁹³ Stavins at 24 (2002).

¹⁹⁴ CRS 21403, EPA’s Water Quality Trading Policy (Jan. 29, 2003), https://www.everycrsreport.com/files/20030129_RS21403_27b7a5dca649327bccd6e8b79c1f5957037f9b17.pdf, at 5. Meanwhile, “environmental groups [were] somewhat split” on their support. *Id.* To this day, some environmental groups still oppose, see Food and Water Watch cases; others, like Willamette Partnership, strongly support, <http://willamettepartnership.org/water-quality-trading/>

¹⁹⁵ worldwide only a few dozen active water quality trading programs exist, and globally only \$32 million in water quality trades took place in 2015, compared to hundred of billions of dollars in worldwide carbon markets. Ecosystem Marketplace, State of Watershed Investment (2016); see also Ecosystem Marketplace/Forest Trends, State of Watershed Payments (2010) (\$118 billion in regulated carbon markets. As of 2008, only 100 point sources nationwide had participated in water quality trading, and 80% of participants were under a single program in Long Island Sound. Willamette Partnership, *In It Together: A How-To Reference Part 2* (2012); see also Industrial Economics Inc. (IEc), Water Quality Trading Evaluation (2008, produced for EPA) (reported “limited practical success”).

¹⁹⁶ See *infra*.

¹⁹⁷ EPA & USDA, *Report on 2015 National Workshop on Water Quality Markets* (2016).

¹⁹⁸ Hahn & Hester (1989).

¹⁹⁹ Kerr & Mare (1998). For example, if you produced 100m gallons of gasoline, you received 110m permits worth one gram per gallon each.

²⁰⁰ Hahn (1989). Hahn & Stavins (1991) (explaining that EPA had already decided by 1973 to phase out lead, citing 38 Fed. Reg. 33,734 (1973)). “With the exception of the Lead Industries Association, support for the phase-down was generally widespread.” <http://web.mit.edu/ckolstad/www/Newell.pdf> at 5.

²⁰¹ Kerr & Mare (1998).

²⁰² Hahn & Hester & n.219 (1989) (citing interviews and the proposed rule).

small refiners shared EPA’s positive view of trading.²⁰³ In fact, the Small Refiner Task Force sued EPA over the regulation, arguing before the D.C. Circuit that “EPA improperly used an aggregate model to predict that most small refiners could meet the standard; in particular, the model relies on an untested scheme for interrefinery trading of lead credits.”²⁰⁴ The D.C. Circuit determined that it was reasonable for EPA to predict that an efficient credit market would develop, given both the agency’s successful history with bubbles and offsets for air emissions, and the fact that “many commenters supported interrefinery averaging, and most commenters who opposed [such trading] took for granted that [trading] would take place.”²⁰⁵ Large refiners had somewhat mixed views on trading,²⁰⁶ with some supporting and those more “initially lukewarm”²⁰⁷ partly because the concept was so new that industry was uncertain whether the potential benefits would materialized.²⁰⁸ On the other hand, most firms favored the banking program.²⁰⁹

Whatever their initial views, by 1984, at least half of refiners were actively trading credits in what was, ultimately, a voluntary compliance option.²¹⁰

There was only “moderate resistance from environmentalists” on compliance flexibilities.²¹¹ Environmentalists were “willing to accept” trading and banking because they were accompanied by significant increases in stringency, and because the entire program had a limited life since lead was scheduled to be completely phased out.²¹²

Takeaways: Even without grandfathering, there was some split in the initial responses of large versus small industry players with respect to trading. Banking was more broadly supported, and most of industry quickly warmed to trading as well as they grew more familiar with the market. Because the regulatory goal from the start was a full ban on lead in gasoline, there was no long-term risk for industry that the efficiencies of a marketable permit system be used to justify a future increase in stringency.

Averaging, Banking, and Trading for Mobile Sources of Air Pollution

Overview: For a wide range of mobile source pollution regulatory programs—from passenger vehicles to construction equipment to handheld gardening appliances like leaf blowers and trimmers—EPA has developed a suite of averaging, banking, and trading programs that the agency abbreviates as ABT.²¹³ EPA began introducing averaging in the early 1980s, and by the early 1990s had developed the ABT program.

History: After failing on-road emissions tests for some of its passenger vehicles, General Motors sought EPA approval in 1981 to remedy its noncompliance by offsetting the emissions overages in future model years (essentially a form of borrowing) rather than go through the usual process of recalling the non-conforming older models. The Center for Auto Safety challenged the plan, and in 1984 the U.S. Court of

²⁰³ Revesz, Stavins, Keohane (“smaller refineries were vehemently opposed”; citing *Small Refiner Lead Phasedown Task Force v. EPA*, 705 F.2d 506, 514 (D.C. Cir. 1983)).

²⁰⁴ 705 F.2d 506, 534 (D.C. Cir. 1983).

²⁰⁵ *Id.* at 536. Nevertheless, the court concluded that “EPA improperly relied on lead-credit trading as a reason to believe that small refiners could immediately meet the interim standard.” *Id.* at 544.

²⁰⁶ Hahn & Hester n.216-217 & accompanying text (1989) (citing public comments); see also Revesz, Stavins, Keohane (reporting that larger refiners supported trading).

²⁰⁷ Hahn (1989); see also Hahn & Hester n.207 (1989) (characterizing the lead program’s development as less controversial than other trading programs).

²⁰⁸ Hahn & McGartland.

²⁰⁹ Hahn & Hester n.216-217 & accompanying text (1989) (citing public comments).

²¹⁰ https://archive.epa.gov/international/air/web/pdf/epa_phase_out.pdf at 82-83. “Because interrefinery averaging was offered as an alternative to individual refinery compliance, only those refineries that found this alternative beneficial would use it.” <http://web.mit.edu/ckolstad/www/Newell.pdf> at 7.

²¹¹ Hahn & Stavins (1991).

²¹² Hahn & Hester (1989).

²¹³ Also, some offset credits, like for HFCs for greenhouse gas standards.

Appeals for the D.C. Circuit (in an opinion by then-Judge Scalia) found that EPA lacked authority to implement an offsetting/borrowing plan specifically under the statutory provisions for remedying noncompliance. However, the court mused in dicta that such a flexible compliance scheme could be implemented under EPA’s general enforcement discretion.²¹⁴

In 1983, EPA first adopted averaging for particulate matter emissions from light-duty diesel vehicles.²¹⁵ The idea of averaging emerged as a way to implement President Reagan’s promise to the U.S. automobile industry to reduce the “regulatory burdens” created by the Carter Administration.²¹⁶ Though two smaller manufacturers of diesel vehicles objected to the “substantial competitive impact” that could result from the compliance flexibilities, the “majority” of the nineteen manufacturers and trade associations that commented on the 1983 regulation supported the concept of averaging. Two manufacturers asked for an expansion of the program, to allow averaging between gas-fueled and diesel-fueled vehicles. Several manufacturers further called for the creation of a banking program, which EPA agreed to study for the future. Meanwhile, only the state of California and one environmental group objected to averaging, on the grounds that it would relax the overall stringency of the standard.²¹⁷ Over time, EPA would adopt some restrictions on averaging in an attempt to protect against any environmental or equitable impacts.²¹⁸ For instance, EPA would apply a “20 percent discount on all banked and traded credits,” meaning that credits worth 10 tons of emissions reductions would have to be traded in to allow an engine to emit 8 tons over the standard, thus generating a net emissions decrease.²¹⁹ Discounting credits essentially increases the stringency of the standard for those manufacturers choosing to use banking and trading—and yet, manufacturers continue to find the flexibilities profitable, even with the increased stringency.

A few years later, in 1985, EPA expanded the averaging program to heavy-duty engines. This time, there was more opposition, and not just from public interest organizations worried about detrimental effects on environmental quality.²²⁰ Caterpillar, Chrysler, and AM General all opposed averaging “on the grounds that it would result in adverse competitive impacts on manufacturers with more limited model lines.” Unsurprisingly, the industry groups with a financial interest in requirements for more compliance technology—the Manufacturers of Emission Controls Association—also strongly opposed. Daimler-Benz ask EPA to allow smaller manufacturers to average across subclasses to protect them from anti-competitive effects of averaging.²²¹ General Motors generally favored averaging,²²² as did “numerous” other manufacturers and the Engine Manufacturers Association.²²³ EPA pushed forward with the flexibilities, reminding industry that “participation in the averaging programs is completely voluntary,” and any manufacturer “unwilling to accept the responsibility” of predicting and monitoring its compliance with the averaging program “need not participate.”²²⁴

EPA’s 1985 heavy-duty truck rulemaking had also raised the idea of an inter-manufacturer trading program, which the agency believed could have resolved some of industry’s worries about the

²¹⁴ *Center for Auto Safety v. Ruckelshaus*, 747 F.2d 1 (D.C. Cir. 1984)

²¹⁵ 48 Fed. Reg. 33,456 (July 21, 1983). *Id.* at 33,457-58 (“This rule represents the Agency’s first averaging program for mobile sources.”).

²¹⁶ *Id.* The Reagan administration also separately delayed implementation of the Carter standards. 47 Fed. Reg. 54,250 (Dec. 1, 1982).

²¹⁷ *Id.*

²¹⁸ 54 Fed. Reg. 22,652 (May 25, 1986).

²¹⁹ 59 Fed. Reg. at (Mar. 25, 1994) (amending the heavy-duty averaging, banking, and trading credit accounting regulations). Nevertheless, NRDC at least continued to have “serious reservations” about the environmental effects of the compliance flexibility programs. *Id.*

²²⁰ Environmental groups said averaging was inconsistent with statutory authority, would lead to overall emissions increases, and would create dangerous spatial hot spots of concentrated emissions.

²²¹ *Id.*

²²² General Motors also requested more expansive averaging across classes (as between gasoline and diesel, or between light-heavy and medium-heavy), but others objected that their cross-class averaging proposal would actually exacerbate the anti-competitive consequences of averaging.

²²³ EMA and others proposed a different averaging unit, but did not object to the concept of averaging.

²²⁴ 50 Fed. Reg. 10,606 (Mar. 15, 1985).

competitive impacts of averaging.²²⁵ Manufacturer response was split, with four companies interested in the idea (General Motors, Ford, Daimler-Benz, and Nissan) and four opposing on anti-competitive grounds (Mack, Caterpillar, International Harvester, and Volvo White).²²⁶ EPA concluded that trading required more “careful consideration” and declined to implement a program at the time, though also committed to further exploration.²²⁷

By the following year, in 1986, EPA published a staff report and called for a public workshop on banking and trading proposals for heavy-duty truck emissions.²²⁸ The 1987 public workshop was attended by fifteen different manufacturers as well as several government agencies; EPA reported no environmental groups in attendance.²²⁹ When EPA eventually proposed banking and trading for heavy-duty truck emissions in 1989, the agency claimed that its proposals were “the product of four years of development and reflects input from . . . regulated industry, trade associations, environmental groups, other government agencies, and State governments.”²³⁰

Banking reportedly received “almost unanimous support from commenters.” A few manufacturers advocated for limiting the life of banked credits to prevent any one manufacturer from accruing a very large stash that could then be wielded as a “predatory market tool” to produce cheaper or better performing engines without emissions controls and so dominate the product market.²³¹ A few other manufacturers advocated instead for an indefinite lifespan for credits, to maximize flexibility.²³² But no major objections were raised to banking as a concept.

Manufacturers’ public comments—at least as summarized by EPA—were also largely supportive of trading, as a way to more evenly spread the cost-saving benefits of compliance flexibilities, enhance competition, and remove barriers to entry. EPA did not report a split between large and small manufacturers on the topic of trading.²³³ For EPA’s part, its proposed trading and banking provisions contemplated more than just saving industry money and removing barriers to entry: specifically, EPA touted the ability of the market-based flexibilities to “spur the development” of new control technologies that would then “serve as the technological basis for more stringent emission standards in the future.”²³⁴

In 1990, EPA finalized its addition of banking and trading to its averaging program for heavy-duty truck emissions.²³⁵ EPA noted that several manufacturers complained that the proposed reporting and recordkeeping requirements for the averaging, banking, and trading programs “were unnecessary and burdensome.”²³⁶ In response, EPA relaxed some of the reporting requirements, and emphasized that the quarterly reports of production line counts, and the yearly reports on point of first retail delivery, were only required for those firms voluntarily choosing to participate in averaging, banking, and trading, and in some cases manufacturers’ existing recordkeeping systems could suffice.²³⁷

²²⁵ 49 Fed. Reg. 40,258 (Oct. 15, 1984) (notice of proposed rulemaking).

²²⁶ 50 Fed. Reg. at. The only other commenter on the issue, Rhode Island Department of Environmental Management, opposed allowing manufacturers to “buy their way out” of compliance.

²²⁷ *Id.*

²²⁸ 51 Fed. Reg. 31,959 (Sept. 8, 1986).

²²⁹ 54 Fed. Reg. 22,652 (May 25, 1989).

²³⁰ 54 Fed. Reg. 22,652 (May 25, 1989).

²³¹ *Id.*

²³² *Id.*

²³³ *Id.*

²³⁴ 54 Fed. Reg. 22,652 (May 25, 1989).

²³⁵ 55 Fed. Reg. 30,584 (July 26, 1990). But see Hahn & Stavins (1991) (citing Crandall et al.) (on how environmental groups had “successfully and vigorously” opposed mobile source emission trading, perhaps a reference to the legislation on mobile-refinery trading).

²³⁶ 55 Fed. Reg. at.

²³⁷ *Id.*

The majority of public comments supported banking, with some split opinion between large and small manufacturers on the subject of credit lifespan.²³⁸ Industry views were slightly more mixed on trading, with some smaller firms worried about being shut out by the larger manufacturers.²³⁹ EPA disagreed that trading could hurt small manufacturers, believing instead that trading was “at worst . . . neutral” for small manufacturers and potentially benefited them, though EPA did make one tweak to the program in response to concerns that a certain kind of cross-class trading would have unfairly benefited only one or two manufacturers.²⁴⁰

After ABT was developed for heavy-duty trucks, EPA gradually extended the flexibilities to other mobile sources, including non-road diesel engines used in construction, agricultural, and other uses; marine outboard engines and personal watercraft; and small engines used in various lawn, garden, and other appliances.²⁴¹ The program EPA developed for emissions from small handheld appliances—like chainsaws, trimmers, and leaf blowers—may be especially analogous to the kinds of appliances and equipment that the Department of Energy covers through its energy efficiency standards. When EPA adopted averaging, banking, and trading for small handheld engines, two large trade associations and Suzuki Motor Corp. supported the flexible compliance options generally.²⁴² EPA had also spoken with John Deere about the structure of the program.²⁴³ There was some disagreement between manufacturers (Suzuki and Echo) about whether cross-class averaging should be allowed; Stihl asked for borrowing as well as banking (a request that EPA denied); and other industry players (Husqvarna and Tecumseh) questioned the stringency of the overall standard—but there was no serious opposition raised by industry in their public comments to the general compliance flexibilities.²⁴⁴

Takeaways: Industry was first to propose the idea of flexible compliance for its mobile source emissions, and was involved in the averaging, banking, and trading program’s development from the start. Though there was some split in support based on manufacturers’ size and specific product lines, with some smaller manufacturers worried about the competitiveness effects of a trading program, in general industry supported the idea of compliance flexibilities, especially banking. Even with a 20% discount applied to banked and traded credits, which increases the standards’ stringency for manufacturers choosing to use those flexibilities, manufacturers still find the cost-savings offered by the flexibilities to be valuable. With multiple sales and distribution channels, some of these mobile source categories—like small, handheld appliances like leaf blowers and lawn trimmers—are quite analogous to the appliances and equipment covered by the Department of Energy’s efficiency standards, and so the broad industry support for ABT in these categories could be relevant to the Department of Energy’s proposal.

Landing Slots for Congested Airports

Overview: Landing slots at congested airports (LaGuardia, Kennedy, O’Hare, and Washington-Reagan) are awarded to airlines through an administrative process, but since 1985 airlines may trade slots. A proposal to auction landing slots was finalized by the Federal Aviation Administration in 2008, but quickly blocked by Congress.

History: Before 1985, all landing slots at airports were allocated, for free, by an administrative licensing procedure. In 1985, the Federal Aviation Administration adopted a rule allowing transfers of airport

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ *Id.*

²⁴¹ Pew (2003). See also 58 FR 28809, May 17, 1993 (ABT for NO_x and smoke-opacity from new nonroad compression-ignition engines above 50 horsepower). Also, in 2000, Tier 2 tailpipe emissions, averaging, credit trading, banking, plus one year of borrowing.

²⁴² With a few caveats and recommendations. *Id.*

²⁴³ *Id.*

²⁴⁴ *Id.*

landing slots held by various airlines at some of the nation’s more congested airports.²⁴⁵ A coalition of larger airlines used the occasion of that rulemaking to also express their opposition to the idea of auctioning slots; they instead favored the grandfathering of existing slot allocations, to protect existing carrier investments.²⁴⁶ Smaller airlines (USAir, Republic, Jet America, Muse Air, and Midwestern, among others) opposed the financial windfall conferred by the grandfathering of existing slots, as well as the barriers to entry.²⁴⁷ Instead, these “upstart” airlines preferred that tradable slots be allocated by either auction or lottery.²⁴⁸ Notably, the debate was more over the allocation and design of the trading program, than over whether slots should be tradable. Congress debated blocking the FAA’s plan before it could take effect,²⁴⁹ but did not.

Years later, the FAA returned to the idea of auctions for landing slots at the most congested airports. In 2008, FAA issued rules on slot auctions for three heavily congested New York-area airports: LaGuardia, JFK, and Newark.²⁵⁰ Several “carriers and their associations,” as well as the Port Authority of New York and New Jersey (which operates the airports) objected to the auction and “argued that rather than encouraging a market-based allocation method with a robust secondary market, the proposal would have the opposite effect—imposing a new a more market-intrusive regulatory scheme.”²⁵¹ Virgin America was one of the few commenters “urg[ing] the FAA to expand the number of slots available via auction.”²⁵² The FAA justified its choice to push ahead with auctioning despite industry’s general opposition because the FAA is “a steward of public property,” because other agencies had had success with auctions, and because “a number of papers regarding the societal value of allocating slots via an auction have been published over the past several years.”²⁵³ Notably, there was no reported industry hostility to the idea that slots, however initially allocated, should be tradable. In fact, the trade association called for even more flexibility for a secondary trading market.²⁵⁴

Immediately after the FAA finalized its auction for landing slots, Senator Schumer of New York attacked the program as a “sky tax,” alleging the auction will hurt customers’ pocketbooks. Following a temporary congressional moratorium on the plan, the Obama administration rescinded the rule in 2009.²⁵⁵ Landing slots continue to have some limited transferability between airlines.

Overview: Unsurprisingly, the existing owners of landing slots fought for grandfathered and tradable permits, while “upstart” airlines like Virgin preferred an auction. No segment of industry truly opposed the basic idea of tradability and flexibility, with the only argument emerging on the competitiveness effects of different allocation methods.

Ozone-Depleting CFC Tradable Allowances and Taxation

Overview: A cap-and-trade with grandfathered allowances and an opportunity to generate credits was established in 1988 to reduce the chlorofluorocarbon emissions causing the hole in the ozone layer. The idea for an auction was never implemented, though Congress did subsequently impose an emissions tax.

²⁴⁵ 50 Fed. Reg. 52,180 (Dec. 20, 1985).

²⁴⁶ *Id.* at 52,183-84.

²⁴⁷ *Id.* at 52,184.

²⁴⁸ Revesz, Stavins, Keohane at fn122 (citing congressional hearings).

²⁴⁹ Revesz, Stavins, Keohane at fn122 (citing congressional testimony).

²⁵⁰ 73 Fed. Reg. 60,544 & 60574.

²⁵¹ 73 Fed. Reg. at . carriers (American, British Airways, Continental, Delta, Emirates, and US Airways) and industry associations (AAAE and ATA) said that it is the cap on hourly operations and not auctions that will reduce delays at JFK and Newark.

²⁵² *Id.*

²⁵³ *Id.* at n.26 & accompanying text.

²⁵⁴ *Id.* (“ATA claimed the [existing] provisions governing the secondary market are unduly intrusive and chilling”).

²⁵⁵ 74 Fed. Reg. 52,132 & 52,134. Amazingly, the proposal to rescind only received five sets of public comments, all against.

History: In 1980, EPA was considering various regulatory options to control non-aerosol uses of CFCs for the first time,²⁵⁶ including traditional controls, emissions charges, and grandfathered marketable permits.²⁵⁷ EPA was “keenest on freely distributed marketable permits,” due to some legal uncertainty about the agency’s authority to tax or auction.²⁵⁸ Industry’s response to the marketable permit and emissions charge ideas was “very negative,” and “some of this negativism could be attributed to a lack of understanding.”²⁵⁹ Industry concerns included that wealthy firms would hoard permits and that important applications of CFCs with no available chemical substitute options (like refrigeration) would be left without access to permits.²⁶⁰ Industry’s misunderstandings and concerns seemed resistant even to counterarguments based on “detailed research,” and industry generally “indicated a preference for mandatory controls because they were a known entity.”²⁶¹ Surprisingly, even manufacturers who stood to gain a windfall from grandfathered allocations “argued that they did not want the permits to be allocated to them because they did not want the responsibility of choosing who would get the CFCs and who would not,” and they worried about the optics of exercising that responsibility.²⁶² Industry preferred the “known entity” of mandatory controls to the “unknown associated with the more innovative regulatory approach.”²⁶³ Ultimately, no regulation of non-aerosol CFC uses was adopted in the early 1980s.

By 1988, an international treaty (the Montreal Protocol) had set the United States on the path to phasing out CFCs. Though CFC producers “obviously” resisted regulation up until the Montreal Protocol was ratified, “once it was clear that significant action would be taken,” industry warmed to the idea of cost-minimizing compliance flexibilities.²⁶⁴ The largest producers of CFCs (DuPont and Imperial Chemical Industries) ultimately supported the ban on CFCs because they were best positioned to develop new chemical substitutes.²⁶⁵ The lack of a preexisting regulatory structure on non-aerosol CFC uses meant there was no “industrial constituency wedded to the current policy,” thereby leaving the landscape “wide open” for market-based approaches.²⁶⁶

In 1988 EPA adopted a cap-and-trade regulatory structure with free, grandfathered allocations for manufacturers and importers,²⁶⁷ but the agency also raised the possibility of adding auctions or other options in the future.²⁶⁸ Most of CFC production was then concentrated in a few large manufacturers,²⁶⁹ and those large producers supported grandfathered permits with trading and opposed auctions due to uncertainty about the final allocation.²⁷⁰ Small producers worried that auctions would become dominated by the largest producers, and advocated instead for a free allocation of permits to both manufacturers and consumers, which they hoped would lead to a more competitive market.²⁷¹

²⁵⁶ Shaprio & Warhit (1983) (CFC aerosol propellants had already been banned).

²⁵⁷ 45 Fed. Reg. 66,726 (1980) (ANPR).

²⁵⁸ Shaprio & Warhit (1983).

²⁵⁹ Welch (1983); *accord.* Shaprio & Warhit (1983).

²⁶⁰ Shaprio & Warhit (1983).

²⁶¹ Welch (1983) (citing Shapiro & Warhit); for example, an analysis by Rand had shown why applications with no easy substitutes, like refrigeration, would be least affected by a production cap, but that analysis did not calm industry’s fears. Shaprio & Warhit (1983).

²⁶² Shaprio & Warhit (1983) (“The manufacturers felt they would be too visible and it was not worth reaping the ill-will they believed the permit system would create.”).

²⁶³ Shaprio & Warhit (1983).

²⁶⁴ Hahn & Stavins n.160 (1991).

²⁶⁵ Revesz, Stavins, Keohane fn117 (citing Oye & Maxwell).

²⁶⁶ Hahn & Stavins n.160 (1991).

²⁶⁷ 53 Fed. Reg. 30,566 (Aug. 12, 1988); also credits could be generated for certified destructions of CFCs. T.H. Tietenberg, *Emissions Trading: Principles and Practice* 9 (2006, 2d ed).

²⁶⁸ ANPR 53 FR 30,604 (1988).

²⁶⁹ Hahn & McGartland (1989) (two large manufacturers controlled most production, with really only about three additional domestic manufacturers).

²⁷⁰ Hahn & McGartland (citing public comments from El Du Pont, and testimony of corporate officials at EPA hearing).

²⁷¹ Hahn & McGartland.

Large industrial consumers of CFCs took somewhat divergent positions: some, like General Motors, either wanted free permits for consumers like itself, or else preferred an auction; others, like the Air Conditioning and Refrigeration Institute, believed that if it could not get free allocations for consumers, grandfathered allocations given freely to producers would be less disruptive than an auction.²⁷²

Overall, all other industry players besides General Motors opposed the idea of an auction, largely for fear of uncertainty.²⁷³ The fear of uncertainty may not be surprising given that, at the time, EPA had yet to implement any successful permit auction. Meanwhile, the early successes of the criteria emissions trading programs had helped most of the industry stakeholders embrace the idea of permit trading.²⁷⁴ With only some exceptions, “the majority of commenters . . . including chemical manufacturers and most major CFC and halon user groups, supported EPA’s preference for the allocated quota system” with trading, which was viewed as an “administratively straightforward” option to achieve “low cost, market-based reductions.”²⁷⁵

A few years later, Congress added a supplemental tax on CFCs in response to the perception that CFC allowances holders under the marketable permit program had received an unearned windfall; Congress wanted that windfall for itself, to generate revenue to offset a budget deficit.²⁷⁶ Over time, the emissions tax supplanted the cap-and-trade program as the binding regulatory instrument.²⁷⁷

Takeaways: Once the regulatory target had been set, industry quickly rallied around the idea of market-based flexibilities to reduce their costs. Even smaller companies seemed to prefer a grandfathered cap-and-trade structure to an auction mechanism. EPA’s earlier successes with air emissions trading helped convince industry that a market-based approach would work here as well.

Acid Rain Pollution Market

Overview: The acid rain cap-and-trade program would become the nation’s paradigmatic cap-and-trade program. It required major emission reductions of sulfur dioxide from the power sector.²⁷⁸ Most allowances were allocated through grandfathering, though there is a small auction.²⁷⁹ Despite seeing significant trading activity through much of its life, recently the acid rain market has become somewhat less important, as other regulations have partly superseded it.²⁸⁰

History: The Acid Rain Market was created by the 1990 Clean Air Act Amendments. By 1989, a “political consensus had emerged . . . for a ten-million ton reduction in annual sulfur dioxide emissions”²⁸¹—the remaining question was how to best achieve that target. In the run-up to the 1990 amendments, there was growing “interest in incentive-based approaches within the administration, the environmental community, and private industry,” including the publication of the influential *Project 88* report on “Harnessing Market Forces to Protect the Environment.” The *Project 88* report was commissioned by Senators Wirth and Heinz and involved input from Bethlehem Steel, Chevron, ARCO Chemical, and the

²⁷² Hahn & McGartland. Meanwhile, small consumers largely teamed up with the large producers and took their position.

²⁷³ Some environmental groups, meanwhile, wanted EPA to explore auctions or fees, so the government and not private industry would capture the windfalls. Hahn & McGartland fn68. Other environmental groups preferred engineering controls or product bans. 53 Fed. Reg. at 30,578.

²⁷⁴ Hahn & McGartland (“It is highly unlikely that nearly all parties would favor permit trading had there been no experience with similar mechanisms.”).

²⁷⁵ 53 Fed. Reg. 30,566, 30,577 (Aug. 12, 1988).

²⁷⁶ Tietenberg, *in* Sterner (1994).

²⁷⁷ Stavins at 26 (2002).

²⁷⁸ <https://www.epa.gov/airmarkets/acid-rain-program> (also trading for nitrogen oxides, but they were not capped).

²⁷⁹ <https://www.epa.gov/airmarkets/so2-allowance-auctions#tab-2>

²⁸⁰ Benjamin Leard & Virginia McConnell, *New Markets for Credit Trading under U.S. Automobile Greenhouse Gas and Fuel Economy Standards* (Resources for the Future Discussion Paper 15-16, 2015). See <https://www.epa.gov/airmarkets/so2-allowance-auctions> (whereas credits at auction used to sell for millions of dollars total, now all the credits bought barely clear \$10,000).

²⁸¹ Hahn & Stavins (1991).

Environmental Defense Fund.²⁸² The American Petroleum Institute also published a study supportive of market-based approaches to control acid rain.²⁸³

Nevertheless, not all of industry was on board with a market-based approach. Most notably, the American Electric Power Co. initially opposed the acid rain market, for fear of hurting its Midwest coal plants. However, after compromises were made to give coal-burning plants in Midwestern states 200,000 “bonus” allowances, “the trading program’s fiercest opponents [were] at least somewhat mollified,” and the acid rain pollution market was enacted as part of the 1990 Clean Air Act Amendments “with overwhelming bipartisan support.”²⁸⁴ Eventually, even industry groups that initially opposed the program “came to appreciate the success and cost-saving measures,” with the CEO of the American Electric Power Co., Mike Morris, subsequently exclaiming that marketable permits had “turned out to be a beautiful idea.”²⁸⁵

Takeaways: With the regulatory target already set, most of industry favored using market-based flexibilities to achieve that target most efficiently. Segments of industry facing disadvantages under a market-based program were brought on board with the concession of more valuable and freely allocated credits.

Tradable Fish Catch-Shares

Overview: Various cap-and-trade programs, where fishing vessels receive individual and tradable permits for shares of a fishery’s total allowable catch, have been developed by regional councils since 1990.

History: Tradable fish catch-shares began in 1990, with the Mid-Atlantic Regional Fishery Council’s approval of a program for surf clams and ocean quahogs.²⁸⁶ Previously, the fishery had been managed through a combination of quarterly quotas, size limits, and time restrictions; permits were required, and though the total number of permits available was not officially capped, there was a moratorium on new entrants into the fishery from 1977 until 1990, when the tradable catch share program was implemented.²⁸⁷ Those various restrictions were “cumbersome and costly to enforce,” resulted in a large but underutilized fleet, and “cheating . . . was alleged to have been rampant.”²⁸⁸ The tradable catch share program was seen as a way to reduce costs, increase value, and allow new entrants into the fishery.

Fishery-management measures, including catch share programs, usually must originate with one of eight Regional Councils, before being approved by the National Oceanic and Atmospheric Administration. The regional councils are “collective decisionmaking bodies made up of representatives who are very susceptible to interest group pressures,” with most voting members drawn from the commercial and recreational fishing community.²⁸⁹ The councils have a strong preference for consensus measures that satisfy a broad range of fishing interests, and typically have not moved forward with a catch share program without at least two-thirds, if not unanimous, support.²⁹⁰ Votes for tradable catch shares have passed with a low of 64% support (the North Pacific Council’s 1991 plan for halibut and sablefish) to a

²⁸² https://scholar.harvard.edu/files/stavins/files/project_88-1.pdf. Some environmental groups remained skeptical, Livermore & Revesz at 12, n.52., but Natural Resource Defense Council’s eventual endorsement was “particularly important” to its passage. Hahn & Stavins (1991).

²⁸³ https://scholar.harvard.edu/files/stavins/files/project_88-2.pdf at n.4 (citing Anderson, Robert C., Lisa A. Hofmann, and Michael Rusin. *The Use of Economic Incentive Mechanisms in Environmental Management*. Washington, D.C.: American Petroleum Institute, June 1990.).

²⁸⁴ Revesz & Lienke at 106 (vote was 401-25 in the House and 89-10 in the Senate).

²⁸⁵ Livermore & Revesz at 11.

²⁸⁶ <https://www.fisheries.noaa.gov/national/commercial-fishing/catch-share-programs-council-region>; but Bluefin tuna.

²⁸⁷ GAO.

²⁸⁸ GAO.

²⁸⁹ Wyman (2005).

²⁹⁰ Wyman (2005). A new fish catch-share program in New England or the Gulf or Mexico, for example, requires a two-thirds vote approval on referendum to current permit holders. 50 C.F.R. § 600.1310.

high of 100% support (for the South Atlantic Council’s 1991 wreckfish plan, the Pacific Council’s 2000 sablefish plan, and the North Pacific Council’s 2002 crab plan).²⁹¹ The first approval, of Mid-Atlantic surfclam and quahog, passed with 84% support.²⁹²

That said, the regional councils are not always representative of the entire fishing community. They tend to over-represent the “larger, better-capitalized segments of the fishing industry,” and some surveys of individual fishing captains have indicated only a minority of support for a catch share program in the year before its implementation.²⁹³ In the early 1990s, some “disgruntled commercial fishing interests” challenged various catch share programs in court, and from 1996-2002 a coalition of some disadvantaged segments of the fishing industry together with environmentalists convinced enough key Senators—including Ted Stevens, Trent Lott, John Kerry, and Olympia Snowe—to impose a temporary moratorium on new catch share arrangements.²⁹⁴

Takeaways: When smaller industry players, who may oppose market-based regulatory approaches, are shut out of the rulemaking process, they may resort to seeking protection from the courts or the Senate.

Transferrable Permits for Aircraft Noise

Overview: A proposed trading scheme was never adopted, though some intra-fleet averaging was incorporated into the final rule in 1991.

History: In 1991, the Federal Aviation Administration proposed adding compliance flexibilities to regulations that restricted the noise levels of individual aircraft during taxi and takeoff.²⁹⁵ The FAA indicated it would adopt a market-based approach unless public commenters opposed it. Air carriers, airplane owners, and airplane lessors all supported transferable rights in general, but the various segments of the industry could not come to consensus on the best structure for the program to recommend to the FAA. In particular, some smaller carriers preferred only intra-firm averaging or banking, not inter-firm trading. Because citizen groups and municipalities strongly opposed the program,²⁹⁶ and because industry could not even reach a consensus on what structure to support, the FAA jettisoned the idea of tradable permits, though it kept some intra-fleet averaging.

Takeaways: Even when industry generally supports using market-based compliance flexibilities, their inability to get behind a single proposed structure may, in the face of other opposition, be sink the adoption of market-based tools.

Wetland Mitigation Banks and Habitat Banks

Overview: Offset credits can be purchased so development projects affecting wetlands, streams, or habitat for endangered species can mitigate their impacts by funding the off-site preservation of other suitably equivalent habitat. Wetland mitigation banks first developed in 1993,²⁹⁷ and expanded after the creation of federal guidance in 1995. Habitat conservation banks soon developed after 1995 as well.

History: The Army Corps of Engineers, in consultation with EPA, issues permits for development projects affecting wetlands, streams, and other aquatic resources. Under Section 404 of the Clean Water Act and Sections 9 and 10 of the Rivers and Harbors Act of 1899, the Corps requires permittees first to avoid

²⁹¹ Wyman at n.167 (2005).

²⁹² *Id.*

²⁹³ Wyman at n.169 (2005).

²⁹⁴ But even during the moratorium, some new tradable quota programs were created through appropriations riders, shepherded through by Senator Stevens. Wyman (2005).

²⁹⁵ See 56 Fed. Reg. 48,628 (1991).

²⁹⁶ Almost without exception, individual commenters, citizen groups, airports, and municipalities’ opposed transferrable permits as “work[ing] to the detriment of airport neighbors by lessening noise reduction.” 56 Fed. Reg. 48,628, 48,635 (Sept. 25, 1991).

²⁹⁷ <https://www.epa.gov/cwa-404/mitigation-banking-factsheet> (but some earlier projects under FWS guidance in 1983).

impacts and then to mitigate any unavoidable effects. Such mitigation can take the form of the creation, restoration, expansion, or preservation of other aquatic resources.

In the 1980s, EPA and the Corps disagreed on whether mitigation should be done exclusively on-site by the individual permittees themselves, or if off-site mitigation was also permissible, either through off-site mitigation undertaking by the permittee (a kind of averaging) or through mitigation banks (a kind of offset).²⁹⁸ In 1993, EPA and the Corps issued interim guidance—later finalized in 1995—on the use of wetland mitigation banks, wherein permittees purchase mitigation credits from third parties that complete verified creation, restoration, or preservation projects. Approval for “in-lieu fees” soon followed: in-lieu fees are essentially mitigation banks from which credits can be purchased, for a fee, in advance of the mitigation actually being accomplished; by contrast, mitigation banks sell credits for already-completed mitigation projects. By 2014, 52% of projects requiring mitigation used either banks or in-lieu fees rather than permittee-conducted efforts, though in terms of total acres of mitigation, permittee-responsible projects continue to outpace mitigation banks.²⁹⁹ Nearly 1500 banks and in-lieu instruments have been approved.³⁰⁰

Copying the model of wetlands mitigation,³⁰¹ the Fish and Wildlife Service (FWS) implemented a conservation bank program for habitat mitigation. Section 10 of the Endangered Species Act allows FWS to grant permits for incidental harms to endangered species.³⁰² After permittees first try to avoid impacts, they must develop a habitat conservation plan that includes mitigation for the incidental harms.³⁰³ In 1995, the California Department of Fish and Game innovated the first conservation bank,³⁰⁴ and FWS now allows both conservation banks and in-lieu fees for the required habitat mitigation nationwide.³⁰⁵ The National Oceanic and Atmospheric Administration (NOAA) is responsible for certain endangered species permits affecting marine resources, and some regional offices of the National Marine Fisheries Service (NMFS) also allow use of conservation banks, though FWS-approved banks far outnumber NOAA-approved banks. As of January 2017, 158 conservation banks had been approved (including 23 sold-out banks and 12 banks pending approval).³⁰⁶ As with wetlands, use of mitigation banks and in-lieu fees continues to lag slightly behind reliance on permittee-responsible mitigation projects for habitat conservation.³⁰⁷

Though evidence of industry reactions during the creation of the banking programs is hard to come by, their eventual support is evident from the impressive use of natural resource mitigation banks. For example, as of 2011, U.S. wetland, stream, and habitat conservation banking programs had \$2-\$3.4 billion in transactions, with 15,000 hectares traded annually.³⁰⁸

Takeaways: Successful market-based approaches get copied by agencies into new, similar regulatory contexts.

²⁹⁸ U.S. Army Corps-Jacksonville District, Key Concepts of Mitigation Banking (2003).

²⁹⁹ U.S. Army Corps, Institute for Water Resources, The Mitigation Rule Retrospective (2015) (stats for years 2010-2014); see also Corps-EPA, Final Rule: Compensating Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,593 (2008) (In 2005, permittee-responsible represented 60% of acres, banks 33%).

³⁰⁰ U.S. Army Corps, Institute for Water Resources, The Mitigation Rule Retrospective (2015).

³⁰¹ FWS, Guidance for the Establishment, Use, and Operation of Conservation Banks (2003).

³⁰² Also, Section 7 of the Endangered Species Act requires mitigation for actions by federal agencies.

³⁰³ FWS, Guidance for the Establishment, Use, and Operation of Conservation Banks (2003).

³⁰⁴ *Id.*

³⁰⁵ Notice of Final Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016).

³⁰⁶ U.S. Army Corps, Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS), https://ribits.usace.army.mil/ribits_apex/f?p=107:2.

³⁰⁷ Ecosystem Marketplace, State of Biodiversity Markets (2011) (In 2011, 67% of mitigation was from permittee-responsible activity, 26% from mitigation banks, and 7% from in-lieu fees).

³⁰⁸ *Id.*

RECLAIM

Overview: A regional cap-and-trade program for nitrogen oxides and sulfur oxides to control smog in California’s South Coast Air Basin, with grandfathered allocations for large sources, plus offset programs through which smaller stationary sources and mobile sources could generate credits.³⁰⁹

History: The Regional Clean Air Incentives Market (RECLAIM) was developed by California’s South Coast Air Quality Management District (SCAQMD) in 1994. The “biggest firms,” including utilities, oil companies, and some aerospace firms, “supported the RECLAIM concept from the start,” as it essentially amounted to a “rule of relaxation” for them by adding much desired flexibilities to existing requirements for reductions of smog-forming pollutants.³¹⁰ Notably, even though in 1990, under an earlier program that allowed for banked credits, SCAQMD had “discounted most banked credits by eighty percent, thereby confirming industry’s fears about regulators’ confiscatory tendencies,”³¹¹ four years later, industry was back negotiating for more marketable permits.

Smaller firms, including Small Business Coalition, also “participated actively in RECLAIM development,” though no consensus view ever developed among small businesses as to whether RECLAIM should be adopted.³¹² Some small businesses may have felt disadvantaged by the grandfathered allocation of permits, though others may have seen opportunities in the voluntary credit program for smaller sources.

Despite some initial setbacks—including significant early noncompliance rates,³¹³ huge price volatility and emissions overages during California’s 2000-2001 electricity crisis,³¹⁴ and some evidence of pollution hot spots³¹⁵—the market remains active to this day, with hundreds of thousands of credits traded every year, both between and within regulated entities.³¹⁶

Takeaways: Despite the history of SCAQMD “confiscat[ing]” banked credits under a previous program of compliance flexibilities, the potential regulatory uncertainty of placing another trading program under the management of SCAQMD did not prevent industry from continuing to advocate for more compliance flexibilities.

Interstate Air Pollution: NOx SIP Call, CAIR, and CSAPR

Overview: Interstate trading programs to reduce large sources’ emissions of nitrogen oxide and ozone pollution (which drift downwind and so are difficult for any single state to control), beginning with a voluntary state compact in 1994, and expanded by federal regulation starting in 1998.

History: In 1994, a group of twelve northeastern states created a voluntary regional trading program for nitrogen oxide (NOx) emissions. In 1997, eight of those states petitioned EPA to make interstate NOx and ozone reductions mandatory.³¹⁷ By 1998, EPA had capped various states’ contributions to downwind NOx and ozone pollution, and had designed a model compliance program that states had the option of adopting in their state. EPA included in its model program for states several options for flexible compliance, including banking and interstate trading.³¹⁸ The emissions caps, or “budgets,” that EPA set for each individual state were based on total reductions that could be achieved at a reasonable

³⁰⁹ Nash & Revesz.

³¹⁰ OTA (1995). Meanwhile, environmental groups opposed the freely grandfathered allocations, and environmental justice groups expressed strong concerns about trading. *Id.*

³¹¹ Dwyer (1993).

³¹² OTA (1995).

³¹³ Lesley McAllister, *Beyond Playing “Banker”*, 59 Admin. L. Rev. 269 (2007).

³¹⁴ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 182 (2006, 2d ed).

³¹⁵ Richard Drury et al., *Pollution Trading and Environmental Injustice*, 9 Duke Envtl. L. & Pol’y Forum 231 (1999).

³¹⁶ ftp://ftp.aqmd.gov/pub/rtc/rtc_listing.xls (listing last 400 days of trades).

³¹⁷ Revesz & Lienke at 108-09.

³¹⁸ 63 Fed. Reg. at 57,457-58 (also including cap-and-trade option).

compliance cost, and to calculate likely compliance costs, EPA presumed that a cost-minimizing emissions trading system would be adopted in each state.³¹⁹

Though “coal interests” challenged (unsuccessfully at first) the so-called “NOx SIP Call” in court on the grounds that it was illegal for EPA to base states’ individual emissions budgets by reference to compliance costs—including the presumed compliance costs savings that could be achieved through a market program³²⁰—“no one . . . challenged [EPA’s] adoption” of the trading program as an option for states to use to achieve their emissions budgets once those budgets were set.³²¹ Indeed, during the rulemaking process, public comments were “generally supportive of including banking in the trading program,” which was “seen by many commenters as a critical tool for sources to respond to uncertainty.”³²² “The vast majority of commenters, including States, industry, and environmental groups, supported a market approach over traditional ‘command and control’ mechanisms to fulfill reduction requirements.”³²³ The more critical comments from industry were focused more narrowly on arguments that the stringency of the regulation (i.e., the allowance budget) should not be set by reference to the cost efficiencies that trading provides, and that such a stringently set cap would not leave enough surplus allowances to support an active, liquid market.³²⁴ EPA did note that “several” commenters (though did not identify whether they were environmental groups or industry representatives) remained “wary of the use of market approaches for environmental regulation.”³²⁵ At least in EPA’s characterization of comments, however, these concerns about trading were a distinctly minority position.

In 2005, EPA finalized regulation for an even broader interstate trading program: the Clean Air Interstate Rule (CAIR). “CAIR was generally supported . . . by the regulated community,”³²⁶ North Carolina, a few other states, and a few utilities “that felt they were unfairly treated by the rule’s emissions budgets” challenged the rule in the D.C. Circuit,³²⁷ but they were not joined by “[t]he overwhelming majority of utilities in the CAIR Region,” nor by the utility industry’s trade associations.³²⁸ To the contrary, in an intervenor brief, the Utility Air Regulatory Group and the National Mining Association argued that “North Carolina’s . . . ill-defined objections to CAIR’s interstate trading fail.”³²⁹ CAIR’s challengers won the argument in court, but in victory many of them actually lamented the demise of the rule: both Duke Energy and Entergy would subsequently claim that they really only had wanted to tweak the permit allocation scheme, and that “[i]t was not the intent of Duke Energy’s participation in this litigation to overturn EPA’s Clean Air Interstate Rule.”³³⁰ The D.C. Circuit remanded CAIR without vacatur in 2008.

In 2011, CAIR was replaced by the Cross-State Air Pollution Rule (CSAPR). Though industry opposed many aspects of CSAPR and would vigorously challenge it in court, as EPA noted:

³¹⁹ 63 Fed. Reg. at 57,400 (“In determining the cost of NOx reduction . . . EPA assumed an emissions trading system.”).

³²⁰ 63 Fed. Reg. at 57,400 (“In determining the cost of NOx reduction . . . EPA assumed an emissions trading system.”).

³²¹ *Michigan v. EPA*, 213 F.3d 663,676 (D.C. Cir. 2000).

³²² 63 Fed. Reg. 57,356, 57,430 (Oct. 27, 1998) (the only exceptions EPA notes are: some commenters encouraging bank management and regular audits to ensure that banking does not have a detrimental environmental impact; utility and industry commenters opposing the application of discounts or other constraints on banked credits).

³²³ 63 Fed. Reg. at 57,457.

³²⁴ *Id.*

³²⁵ *Id.*

³²⁶ <https://fas.org/sgp/crs/misc/R42895.pdf> at 6.

³²⁷ <https://fas.org/sgp/crs/misc/R42895.pdf> at 6.

³²⁸ <https://www.nrdc.org/experts/john-walke/demise-clean-air-interstate-rule-blame-shame-thy-name-duke-energy>

³²⁹ Joint Br. of Industry Intervenor-Respondents, 2007 WL 4935261. “CAIR was generally supported by environmentalists.” <https://fas.org/sgp/crs/misc/R42895.pdf> at 6. Environmental groups certainly mourned the demise of CAIR.

<https://www.nrdc.org/experts/john-walke/demise-clean-air-interstate-rule-blame-shame-thy-name-duke-energy>

³³⁰ See Felicity Barringer, *Decisions Shut Door on Bush Clean-Air Steps*, *New York Times*, July 12, 2008 (citing both Duke Energy and Entergy as saying they only wanted to tweak the permit allocation scheme; “It was not the intent of Duke Energy’s participation in this litigation to overturn EPA’s Clean Air Interstate Rule.”).

The great majority of public comments supported the preferred trading remedy. Most of these commenters voiced their support for the broadest possible trading mechanism because it allows for the most cost-effective implementation of any emission controls. . . . Some commenters that supported the preferred remedy felt that, while not ideal, the interstate trading remedy was preferable to the alternative options of intrastate trading or direct control. . . . They stated that [such] lack of flexibility would unnecessarily increase the cost of emission reductions.³³¹

In other words, if there had to be regulation of some kind, most stakeholders wanted trading.

Though CSAPR was struck down by D.C. Circuit for basing state budgets on costs, the ruling was soon reversed by Supreme Court in 2014. In their 6-2 majority opinion, the Court acknowledged that trading would reduce costs,³³² and held that EPA could set state budgets after considering compliance costs.³³³

Takeaways: Industry may object to setting a rule’s stringency by considering the cost-minimizing potential of market-based compliance flexibilities. But once the rule’s stringency has been set, industry typically prefers more flexible compliance options.

Clean Air Mercury Rule

Overview: In 2008, the D.C. Circuit overturned this interstate, inter-plant cap-and-trade program for mercury emissions, but on grounds unrelated to trading. For statutory reasons, its replacement program did not include trading.

History: In 2005, the George W. Bush administration’s EPA issued the Clean Air Mercury Rule, which set limits on mercury emissions from power plants to be implemented by the states. The Rule encouraged inter-plant and interstate trading of emissions allowances. The Rule was vacated by the U.S. Court of Appeals for the District of Columbia in 2008, but on grounds completely unrelated to trading. Essentially, the court found that mercury emissions needed to be controlled under a different provision of the Clean Air Act than the one EPA first picked: Section 112, instead of Section 111(d). Under the Obama administration, EPA determined that Section 112 generally, and mercury emissions in particular, were not good candidates for marketable permits, and opted for a prescriptive standard instead.

With a few exceptions, many regulated utilities and associated industries had supported the cap-and-trade mechanism as the “most cost-effective way of achieving substantial emission reductions.”³³⁴

Cap-and-Trade Legislation for Greenhouse Gases

Overview: Initial industry support collapsed because of, among other factors, a disagreement over the allocation of grandfathered permits.

History: Various legislative cap-and-trade proposals, going back to the 2003 McCain-Lieberman bill, failed for different reasons, and each proposal’s failure likely has multiple explanations. But by the 2008 presidential election, both major party presidential candidates supported a nationwide cap-and-trade program for carbon dioxide emissions. In January 2009, the U.S. Climate Action Partnership—“a coalition of major environmental groups and Fortune 500 corporations”³³⁵—announced its preference

³³¹ 76 Fed. Reg. at 48,272 (Aug. 8, 2011). Though many environmental groups supported trading, some environmental justice groups, and others, opposed: “Some commenters, who support direct control, voiced concerns that the other emission trading approaches would disadvantage poor and minority communities or allow increased emission impacts in neighborhoods near power plants.” *Id.*

³³² 572 U.S. 489 at n.10 (2014).

³³³ *Id.* at

³³⁴ https://www3.epa.gov/airtoxics/utility/sec_111_respcom_oar-2002-0056-6206.pdf at 5-1 (citing comments from Southern Company, Xcel, Edison Electric Institute, National Association of Manufacturers, Cinergy, National Mining Association, etc.). While several public interest groups and many states supported, *id.* at 5-3 (3 public interest groups, 18 states), a number of other states and U.S. Senators opposed, *id.* at 5-6 to 5-9 (New Jersey DEP, Ariz. PUC, Mass. DEP, etc.), and a coalition of environmental groups opposed the plan as illegal, *id.* at 5-12 (comments of Clean Air Task Force).

³³⁵ Revesz & Lienke at 127.

for cap-and-trade, with an auction to be phased in over time.³³⁶ The fact that, without new legislation to preempt EPA’s obligation under the Clean Air Act to control greenhouse gas emissions, a less flexible regulatory scheme might be imposed on large sources under that existing statutory authority, likely contributed to the appeal industry saw in a newly designed, more flexible legislative solution.

To pass their cap-and-trade bill through the House, Representatives Waxman and Markey needed to negotiate with Virginia coal country Democrat Representative Boucher—“and, through him, Duke Energy’s CEO, Jim Rogers.”³³⁷ The result was a huge free allocation (35% of all allowances) of grandfathered permits for the electricity sector, thus “provok[ing] outrage from the oil industry, which had been allocated only 2 percent of total allowances.”³³⁸ The oil companies withdrew from the Climate Action Partnership in protest,³³⁹ and the American Petroleum Institute “began an aggressive (and effective) public relations campaign against the bill.”³⁴⁰ Though the Waxman-Markey bill passed the House, it was now doomed to failure in the Senate, and by early 2010, “the *New York Times* was ready to declare cap-and-trade dead.”³⁴¹ By the time of the 2010 midterm election campaign, the concept of cap-and-trade was effectively rebranded by opponents as “cap-and-tax,” and so was demonized.³⁴²

Takeaways: A disagreement between the electricity industry and the oil industry over the *design* of a cap-and-trade program helped contribute to the demise of the program, despite general and initial support for the *concept* of a flexible, market-based approach. While the possibility of potentially less flexible, future regulation under the Clean Air Act likely contributed to industry’s initial support for cap-and-trade legislation, the fact that no regulatory controls yet existed in the status quo likely helped industry feel comfortable abandoning what otherwise should have been an attractive combination of flexibility and grandfathering.³⁴³

Regional Haze Trading Program

Overview: A regional cap-and-trade program to reduce haze in western states and over the Grand Canyon.

History: In its 1999 regulations on regional haze, EPA adopted the Grand Canyon Visibility Transport Commission’s recommendations, including on cap-and-trade.³⁴⁴ The Transport Commission in turn had relied on the “consensus recommendations” of a Public Advisory Committee, which included representatives of both business and environmental interests.³⁴⁵

Five environmental groups, including Sierra Club and WildEarth Guardians, challenged EPA’s approval of the trading program,³⁴⁶ though the challenge was more about the program’s overall stringency than

³³⁶ Revesz & Lienke at 130.

³³⁷ Revesz & Lienke at 131.

³³⁸ Revesz & Lienke at 132.

³³⁹ Livermore & Revesz at 11, 15 (“the collaboration between centrist environmental groups and industry plays ultimately disintegrated.”).

³⁴⁰ Revesz & Lienke at 132-33.

³⁴¹ Revesz & Lienke at 133.

³⁴² House Republicans, *A Pledge to America: A New Governing Agenda Built on the Priorities of Our Nation, the Principles We Stand for & America’s Founding Values* 43 (2010).

³⁴³ Revesz and Livermore trace industry opposition to a cap-and-trade program for greenhouse gas emissions not to any ideological or practical problems with market-based approaches in general, but rather to a political calculus that defeating the cap-and-trade proposal would result in no regulatory restrictions whatsoever on carbon emissions: “[I]n the 1970s and 1980s, the choice was between command-and-control standards favored by environmental groups, and marketable permit schemes favored by industry groups. Now, the choice is often between marketable permit schemes and no regulation at all, with environmental groups favoring the former and industry groups supporting the latter.” At 16.

³⁴⁴ 64 Fed. Reg. 35,714 (July 1, 1999); 770 F.3d 919 (discussing history, “In 1999, the EPA adopted the Transport Commission’s recommendations in its Regional Haze Rule . . . [including] the Transport Commission’s cap-and-trade program.”).

³⁴⁵ <https://www.wrapair.org/WRAP/reports/GCVTCFinal.PDF>

³⁴⁶ *WildEarth Guardians v. EPA*, 770 F.3d 919 (10th Cir. 2014).

about the trading mechanism itself.³⁴⁷ Regulated utilities like PacifiCorp and Basin Electric Power Cooperative intervened to defend EPA’s approval of the regional trading program.³⁴⁸ The American Coalition for Clean Coal Electricity submitted an amicus brief praising the trading programs for “achieving more emissions reductions than would be achieved under” traditional, prescriptive regulation, while balancing compliance costs.³⁴⁹

Indeed, because of the statutory provision of the Clean Air Act under which the regional trading program was approved, the trading program was required to achieve greater emissions reductions than traditional, prescriptive regulation would.

Takeaways: Despite the fact that opting for a trading program essentially increased the overall stringency of the emissions standard, industry still helped develop the cap-and-trade program and defended it in court.

Clean Power Plan

Overview: Under the Clean Power Plan, EPA has encouraged states to use flexible compliance options and has designed both a mass-based cap-and-trade program and a rate-based trading program, as well as offsets, as model programs for states to opt into. The Clean Power Plan was developed during the second term of the Obama administration, but was stayed by the courts, and as of 2018 the Trump administration has proposed further delays and repeals of the Clean Power Plan.

Brief History and Takeaway: Nearly all industry commenters strongly supported allowing trading and averaging as compliance mechanisms, even though many opposed setting the standard’s stringency with reference to the abatement opportunities opened by market-based approaches.³⁵⁰

The Energy Conservation Standards Program

As described in the introduction, the Department of Energy’s Energy Conservation Standards (ECS) program sets energy efficiency standards for a wide range of residential appliances and commercial equipment, from major home appliances like dishwashers, to industrial air compressors, to lightbulbs. The ECS program is regarded as a tremendous success by industry³⁵¹ and public interest groups³⁵² alike, and yet industry often pushes back against new or upgraded efficiency standards as too expensive in terms of allegedly growing compliance costs and supposed limits on consumers’ willingness-to-pay for increased energy efficiency.³⁵³ This section provides some additional background about the ECS program’s traditional approach to regulation, before recounting the Department of Energy’s proposed shift toward market-based approaches.

The ECS Program’s Traditional Approach to Regulation

Since the 1975 Energy Policy and Conservation Act (EPCA), Congress has steadily increased the responsibility and authority of the Department of Energy to improve the efficiency of appliances and

³⁴⁷ 770 F.3d at n.13 (noting that, unlike in the *North Carolina* case against the Clean Air Interstate Rule, here “the environmental groups do not assert that shifting of emissions between sources would allow the participating states to avoid their statutory duties”).

³⁴⁸ *WildEarth Guardians v. EPA*, 770 F.3d 919 (10th Cir. 2014).

³⁴⁹ *Br. ACCCE as Amicus in Support of Intervenor-Respondents at 10, 22*, 10th Cir. No. 12-9596 (Dec. 6, 2013) (available on Westlaw, case document 10131282).

³⁵⁰ Jack Lienke & Jason Schwartz, *Regulating Greenhouse Gas Pollution from Existing Power Plants: The State of the Debate* (2014), http://policyintegrity.org/files/publications/Regulating_Greenhouse_Gas_Pollution.pdf.

³⁵¹ Joint Industry Comments (“The Appliance Standards Program has been successful over its more than 30 year existence—efficiency gains have been significant.”).

³⁵² NRDC Comments (“By all measures, the program is a success: it generates trillions of dollars in savings for consumers, provides manufacturers with regulatory predictability, and sets up a level playing field for industry regardless of where products are manufactured.”).

³⁵³ See, e.g., Zero Zone litigation over commercial refrigeration standards.

equipment.³⁵⁴ Through various statutory amendments—including the National Appliance Energy Conservation Act of 1987, the Energy Policy Acts of 1992 and 2005, and the Energy Independence and Security Act of 2007—Congress not only directly set minimum statutory standards for many products, but also charged the Department of Energy with covering new products, regularly reviewing old standards, and generally pursuing the “maximum improvement in energy efficiency . . . [that] is technologically feasible and economically justified.”³⁵⁵ To gauge whether a standard is “economically justified,” the agency must “determine whether the benefits of the standard exceed its burdens” after considering several factors: impacts on manufacturers and competition; impacts on consumers including purchase price, operating costs, and product utility; energy savings; and “the need for national energy . . . conservation.”³⁵⁶ The agency has historically defined the need for national energy conservation to include the need for energy security, energy reliability, environmental benefits, and public health benefits.³⁵⁷ The U.S. Court of Appeals for the Seventh Circuit confirmed that “[t]o determine whether an energy conservation measure is appropriate under a cost-benefit analysis, the expected reduction in environmental costs needs to be taken into account.”³⁵⁸

Standards typically define either the “maximum energy use allowed in kilowatt-hours per year” for specific products like refrigerators,³⁵⁹ or the “ratio” of useful output per energy used, like the lumen output of a lamp divided by its wattage.³⁶⁰ Once a standard is set, the agency must review the standard for possible amendment at least every six years.³⁶¹ In amending standards, the agency “may not prescribe any amended standards which increases the maximum allowable energy use . . . or decreases the minimum required energy efficiency, of a covered product.”³⁶² This prohibition on efficiency rollbacks is known as the anti-backsliding provision.

The agency also develops test procedures to gauge each manufacturer’s compliance with the standards.³⁶³ The testing procedures use different product-specific metrics to assess energy efficiency, such as how much energy consumed is when a dishwasher is loaded with ten dinner plates, soiled with instant mashed potatoes, and run on a certain cycle at a certain temperature with a certain kind of detergent.³⁶⁴ Products that, under the testing procedure, fail to meet the applicable energy conservation standards, cannot be sold in the United States.³⁶⁵

Finally, the Department of Energy also works with the Federal Trade Commission to require Energy Guide labels that disclose to consumers information like estimated yearly electricity use and estimated yearly operating cost of an appliance.³⁶⁶ Labels may also feature the Energy Star logo on products that meet an even higher level of energy efficiency, with these higher voluntary targets set in collaboration between the Department of Energy and the Environmental Protection Agency.³⁶⁷

³⁵⁴ <https://www.energy.gov/eere/buildings/history-and-impacts>

³⁵⁵ 42 U.S.C. § 6295(o)(2)(A). Also to set water efficiency standards for plumbing products.

³⁵⁶ 42 U.S.C. § 6295§ (o)(2)(A)-(B). (As well as “other factors the Secretary considers relevant”).

³⁵⁷ E.g., 81 Fed. Reg. 62,980, 62,992 (Sept. 13, 2016); 82 Fed. Reg. 31,808, 31,821 (July 10, 2017) (“DOE maintains that environmental and public health benefits associated with the more efficient use of energy are important to take into account when considering the need for national energy conservation.”).

³⁵⁸ *Zero Zone v. Dept. of Energy*, 832 F.3d 654, 677 (7th Cir. 2016) (emphasis added).

³⁵⁹ § 6295(b)(1).

³⁶⁰ § 6291(30)(M).

³⁶¹ § 6295(m).

³⁶² § 6295(o).

³⁶³ § 6295(s); § 6293.

³⁶⁴ 10 C.F.R. 430 subpt. B, appendix C1.

³⁶⁵ § 6302(a)(5). There is some grandfathering of older products that passed prior test procedures.

³⁶⁶ § 6294.

³⁶⁷ § 6294a.

All these regulatory steps—the energy conservation standards, the testing procedures, the labels, the Energy Star targets—currently apply to each individual covered appliance or piece of equipment sold in the United States.

The Proposed Shift toward Market-Based Flexibilities in the ECS Program

On November 28, 2017, the Department of Energy announced that it was considering shifting the focus of its regulatory obligations from individual products to perhaps whole categories of products, or to manufacturers' complete lines of products, or to the entire appliance industry. In a Request for Information, the agency called for public feedback on adding “compliance flexibilities” to the ECS program, “with the goal of reducing compliance costs, enhancing consumer choice and maintaining or increasing energy savings.”³⁶⁸

For historical precedents, the Request for Information focused largely on the cost savings and other successes under the Department of Transportation's Corporate Average Fuel Economy (CAFE) standards for vehicles. The Request for Information spoke at length about the CAFE program's use of averaging and trading; banking and the availability of a fine as a backstop are mentioned in passing. The CAFE program's provisions for borrowing and offset credits are not mentioned.³⁶⁹ The Request for Information also briefly discusses a handful of other U.S. and international examples of market-based programs, including state-level renewable electricity portfolio requirements that feature tradable renewable certificates. Though the Request for Information does not go into detail on these tradable renewable certificates, it is important to note that some state renewable electricity certificate programs (as well as some foreign renewable electricity portfolio programs) do allow electric utilities to meet a portion of their obligations by funding energy efficiency programs, for example by subsidizing the purchase of more efficient residential appliances.³⁷⁰ Such state-level programs may involve the same appliances and equipment covered by the ECS program, and essentially allow such appliances to be used to generate offset credits into the state-level renewable electricity programs. Such programs are therefore related to the idea of compliance flexibilities under the ECS program, but do not themselves constitute an example of a compliance flexibility for purposes of meeting the ECS standards.

The Department of Energy's Request for Information called for public comments on the “advantages and disadvantages” of adding market-based flexibilities to the ECS program,³⁷¹ on specific design challenges,³⁷² as well as for suggestions of product categories suitable for a pilot program.³⁷³ The agency highlighted “market-based policy mechanisms such as averaging, credit trading, or feebates” as being “[o]f particular interest,”³⁷⁴ and briefly mentioned the role of banking,³⁷⁵ though the agency also remained open to suggestions on “other program flexibilities.”³⁷⁶

³⁶⁸ 82 Fed. Reg. 56,181, 56,181 (Nov. 28, 2017).

³⁶⁹ 56,182-82; 56,184 (“In the remainder of this document, CAFE is used as an example to discuss some of the specific points on which DOE seeks feedback.”).

³⁷⁰ DOE, *Renewable Energy and Energy Efficiency Portfolio Standard*, <https://energy.gov/savings/renewable-energy-and-energy-efficiency-portfolio-standard> (describing North Carolina's program); North Carolina Utilities Comm., *Biennial Report Regard Proceedings for Electric Power Suppliers* 9 (2013), <http://www.ncuc.net/reports/EE-DSM%20Report.pdf> (noting Duke's residential smart saver energy efficient products program for lights, HVAC, and heat pumps). See also, e.g., Italy's white certificate program to implement the energy efficiency directive: https://www.researchgate.net/profile/Luis_Mundaca/publication/268153798_Markets_for_energy_efficiency_Exploring_the_new_horizons_of_tradable_certificate_schemes/links/546332680cf2cb7e9da68218/Markets-for-energy-efficiency-Exploring-the-new-horizons-of-tradable-certificate-schemes.pdf & <https://link.springer.com/article/10.1007/s12053-008-9017-7>. See also the Clean Power Plan's demand-side credits.

³⁷¹ 56,181.

³⁷² 56,184-85.

³⁷³ 51,182.

³⁷⁴ *Id.*

³⁷⁵ 56,184.

³⁷⁶ 56,182.

The Request for Information assumed that an averaging or trading program would necessarily have to track sales data from all manufacturers, retailers, distributors, and importers, “as under the current CAFE program.”³⁷⁷ The implicit idea is that every individual product sold that tested above its minimum standard for energy efficiency would generate credits, based on energy saved over the product’s expected lifetime.³⁷⁸ Those credits could then be averaged or traded against other individual products sold that tested below their minimum efficiency standards, to cover the shortfall in energy consumed over the product’s expected lifetime. The agency noted that neither production or sales data is currently collected. The Request for Information did not consider any other means of implementing a market-based compliance flexibility.

The Request for Information did not mention the concept of offset credits, though it did raise the possibility of starting a pilot test of market-based tools with currently unregulated products subject only to voluntary industry standards, such as set-top boxes.³⁷⁹ However, the Request for Information did not connect the idea of a voluntary pilot program for unregulated products with the broader idea that unregulated products like set-top cable boxes could generate offset credits for sale to cover regulated product lines.

The Request for Information did not mention the concept of borrowing. Grandfathering and auctioning were each mentioned once in a background section, but were not specifically discussed as options to incorporate into compliance flexibilities for the ECS program. Apart from when describing feebates, stand-alone taxes were not mentioned either. The idea of banking received relatively little attention as a possible tool for the ECS program.

The Department of Energy opened a sixty-day public comment period on its Request for Information starting on November 28, 2017.³⁸⁰ In February 2018, in response to stakeholder requests, the agency extended the comment period through March 26, 2018.³⁸¹

A Funny Thing Happened on the Way to the Appliance Market

By March 2018, the agency had received and posted to its regulations.gov rulemaking docket 74 comments on its Request for Information on introducing market-based flexibilities into the ECS program.³⁸² Of those, 28 comments (some with multiple signatories) were from industry,³⁸³ representing 13 trade groups with thousands of members in aggregate, 20 individual companies, and 3 coalitions of business interests and other stakeholders.

Of all those industry commenters, only two regulated companies embraced the concept of market-based compliance flexibilities for the ECS program. Samsung Electronics America was perhaps most enthusiastic, “support[ing] exploration” of these “innovative” ideas, especially feebates.³⁸⁴ Acuity Brands (an Atlanta-headquartered provider of lighting and building management systems) offered more lukewarm “general . . . support” for trading and averaging, mixed with “caution” and “concerns.”³⁸⁵

³⁷⁷ *Id.*

³⁷⁸ Some energy-equivalent value would be required to trade credits between electric-powered and gas-powered appliances.

³⁷⁹ https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=27&action=viewlive

³⁸⁰ 82 Fed. Reg. 56,181 (Nov. 28, 2017).

³⁸¹ 83 Fed. Reg. 8016 (Feb. 23, 2018).

³⁸² Two additional comments, from Edison Electric Institute and AHRI, were requests for extension of the comment period.

³⁸³ This count of 28 comments from industry includes mixed coalitions like the Alliance To Save Energy, E2, and NEEP, as well as comments that may have been submitted on behalf of sole proprietors (Nayes Assoc., Gleason Partners, Stella Group). Of the remaining 46 comments: two were from environmental groups, two from state governments, one from Canada, three from think tanks (including a set submitted by the author), 19 from individuals, and 19 almost certainly from internet bots.

³⁸⁴ EERE-2017-BT-STD-0059-0078.

³⁸⁵ EERE-2017-BT-STD-0059-0041.

A few even more mixed views were given by six other stakeholders from regulated and non-regulated industries. While Carrier did not believe any market-based approach would be “practical” for the heating, ventilation, and air-conditioning industry, it thought such approaches “may work in other industries” and should be an option available during negotiated rulemakings, and further suggested that the idea of feebates warranted more analysis.³⁸⁶ The North American Association of Food Equipment Manufacturers had concerns about the effects of market-based approaches on small businesses, but was “open to exploring” feebates, offsets, or banking.³⁸⁷ Philips Lighting submitted somewhat ambivalent comments, on the one hand “applauding DOE for the innovative approach they propose” while also preferring the agency focus on enforcing existing standards and simultaneously endorsing the harshly critical comments on marketable permits submitted by their trade association (the National Electrical Manufacturers Association).³⁸⁸ The Consumer Technology Association took no position directly on credit trading, averaging, banking, or feebates, but suggested “voluntary agreements” were another “flexible solution” worth considering.³⁸⁹ Southern Company—not a regulated industry itself but a utility with significant interests in being able to forecast their consumers’ electricity demand—thought that averaging was “an intriguing concept” but that the agency would need to overcome “significant barriers and challenges.”³⁹⁰ Finally, the National Association of Home Builders—also not a regulated industry but rather one of the largest purchasers in aggregate of major home appliances—called credit trading a “potentially viable option.”³⁹¹

All other industry comments ranged from, at best, lack of any support³⁹² to some rather harsh denunciations of the idea. The tone of those condemnations spanned from mild concern—“difficult . . . to envision”³⁹³; “not clear the necessary characteristics exist” to succeed in the appliance industry³⁹⁴; “may work in other industries” but not here³⁹⁵—all the way up to total rebuke:

- “ill-conceived”³⁹⁶;
- “ill-timed and ill advised”³⁹⁷;
- “not...any of the RFI’s market-based mechanisms are viable and sustainable”³⁹⁸;
- a government attempt to “manipulate ‘market’ dynamics”³⁹⁹;
- “unnecessary, burdensome, and costly to consumers and manufacturers alike.”⁴⁰⁰
- “a litigation-prone regulatory foray...a misguided use of government and stakeholder resources.”⁴⁰¹

³⁸⁶ EERE-2017-BT-STD-0059-0066.

³⁸⁷ EERE-2017-BT-STD-0059-0065.

³⁸⁸ EERE-2017-BT-STD-0059-0067.

³⁸⁹ EERE-2017-BT-STD-0059-0076. This article would define voluntary agreements as a non-regulatory solution, not a market-based regulatory solution.

³⁹⁰ EERE-2017-BT-STD-0059-0058.

³⁹¹ EERE-2017-BT-STD-0059-0073.

³⁹² Several comments were off topic, with industry using the comment opportunity to raise other concerns. E.g., comments from Dow Chemical, Proctor & Gamble, HIA-C, Sidel, and Gleason Partners. These seemingly off-topic comments are still notable for their complete silence on, rather than praise for, marketable permits.

³⁹³ Ingersoll Rand, EERE-2017-BT-STD-0059-0053.

³⁹⁴ Edison Electric Institute, EERE-2017-BT-STD-0059-0048.

³⁹⁵ Carrier/United Technologies, EERE-2017-BT-STD-0059-0066.

³⁹⁶ Lennox International, EERE-2017-BT-STD-0059-0055.

³⁹⁷ Northeast Energy Efficiency Partnership, EERE-2017-BT-STD-0059-0054.

³⁹⁸ Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056; *accord*. Rheem, EERE-2017-BT-STD-0059-0059.

³⁹⁹ Lennox International, EERE-2017-BT-STD-0059-0055.

⁴⁰⁰ Whirlpool, EERE-2017-BT-STD-0059-0052.

⁴⁰¹ Lennox International, EERE-2017-BT-STD-0059-0055.

Most comments from environmental groups and from state and foreign governments were also strongly critical,⁴⁰² with several expressing concerns not just for their public citizen constituents but also for the “extreme cost,”⁴⁰³ “significant impact,”⁴⁰⁴ and “add[ed] burden”⁴⁰⁵ that marketable permits would allegedly inflict on industry.

In fact, Lennox International (an HVACR company) predicted that the only comments in support of adding market-based flexibilities to the ECS program would come from “academics, Washington-focused ‘think tanks’ or entities otherwise not responsible for designing and selling equipment that consumers will purchase.”⁴⁰⁶ Indeed, perhaps the most favorable comments came from an economist with the U.S. Department of Treasury who submitted on his own behalf,⁴⁰⁷ while two think tanks supported market-based approaches in theory but raised substantial legal, economic, and practical challenges for the actual design and implementation of market-based approaches for the ECS program.⁴⁰⁸

Overall, public comments from industry and others included a range of concerns, including lack of statutory authority, litigation delays and regulatory uncertainty, whether a market could really reduce compliance costs for the ECS program, potentially increased or infeasible reporting burdens, whether market-based compliance programs could lead to anticompetitive results and barriers to entry, among other stated concerns. Of course, not all of industry’s reasons for opposing market-based flexibilities were necessarily included in their public comments. Though it is possible that the concerns raised in public comments are in fact not legitimate concerns of industry, but rather subterfuge to cover industry’s real, hidden objections or objectives, more likely is that the concerns raised in public comments are legitimate concerns *and also* industry has additional hidden concerns.

The next section of the article will explore both the stated and potentially hidden objections of industry to adding market-based compliance flexibilities to the ECS program. Both the stated views of the appliance industry and such potentially hidden motivations can be assessed in light of the historical performance of marketable permit programs. If, for example, the appliance industry’s stated reasons for disfavoring marketable permits are undermined by the evidence from history, then hidden motivations could be driving the conversation. At the same time, the assumptions underpinning possible hidden motivations—like a fear that markets will ultimately lead to increased stringency or that markets would reduce barriers to entry in ways detrimental to established industry players—may or may not find corroboration in the history of marketable permits. The following sections examine each of the appliance industry’s reasons against compliance flexibilities, whether stated or hidden, in light of the successes and failures of previous marketable permit programs.

⁴⁰² The Northwestern Power and Conservation Council, a regional energy planning collaboration of Idaho, Montana, Oregon, and Washington, ultimately “supports in concept” the idea of market-based mechanisms, but “urges caution in significantly revamping a system that has been shown to work well.” They speculated that the right market-based mechanism could cause the ECS program to “gain greater support of industry.” EERE-2017-BT-STD-0059-0017. The California Energy Commission also eventually capitulated that, while market-based approaches were not “appropriate” as a replacement for minimum efficiency standards, they “may be reasonable” for either setting a second, above-minimum standard or for regulating currently uncovered products. But before that capitulation, their comments vigorously attacked the idea of market-based approaches, on behalf of their own interests (will complicate the demand forecasting on which state energy planning relies) as well as the interests of consumers (backsliding to less efficient products harms consumers) and industry (data collection will be “extremely costly,” manufacturers will have to spend heavily to retool their product line, and the approach will introduce “market uncertainty”). EERE-2017-BT-STD-0059-0028.

⁴⁰³ California Energy Commission, EERE-2017-BT-STD-0059-0028.

⁴⁰⁴ Natural Resource Canada, EERE-2017-BT-STD-0059-0018.

⁴⁰⁵ NRDC, EERE-2017-BT-STD-0059-0057.

⁴⁰⁶ EERE-2017-BT-STD-0059-0055.

⁴⁰⁷ Chris Soares, EERE-2017-BT-STD-0059-0075.

⁴⁰⁸ RFF and Policy Integrity (the latter submitted by the author). The Center for Regulatory Effectiveness used the comment period as an opportunity to promote “private, voluntary standards.” EERE-2017-BT-STD-0059-0071.

Examining the Appliance Industry’s Stated Objections in Light of History

Legal Risks

In many of industry’s public comments, the first objections raised against the idea of marketable permits in the ECS program were a variety of legal risks. While every marketable permit program has its own unique statutory context, such that the legality of one program may not necessarily mean much for a new proposal, there are still lessons to learn from the history of marketable permit programs’ legal footing. Ultimately, this section is somewhat less interested in trying to resolve whether the legal obstacles to adding marketable permits to the ECS program can be overcome without legislative intervention, and instead is more interested in why industry seems relatively resigned in assuming the legal challenges here are insurmountable and relatively uninterested in asking for a congressional fix.

Does Lack of Explicit Authority Bar Marketable Permits?

A few industry comments made the most extreme legal argument: that lack of explicit authorization for marketable permits in the Energy Policy and Conservation Act (EPCA) precluded use of any compliance flexibilities. According to these comments, market-based approaches were “simply never contemplated” by EPCA, or could be challenged as “inconsistent” with EPCA.⁴⁰⁹ Others flatly stated that EPCA “precludes” any market-based approaches, though perhaps markets could be applied to appliances and equipment that fall outside the scope of the ECS program’s existing coverage.⁴¹⁰

In fact, many robust marketable permit programs have been established without any explicit statutory authorization. To list some of the most prominent cases:

- EPA’s inter-refinery trading system to help phase out lead from gasoline never had explicit statutory authority.⁴¹¹ Section 211 of the Clean Air Act broadly authorizes EPA to “control or prohibit” the manufacture of fuels and fuel additives, but never mentions marketable permits or averaging.⁴¹²
- EPA’s various “averaging, banking, and trading” programs for mobile source emissions—including emissions from vehicles, construction and agricultural equipment, and handheld appliances like leaf blowers and lawn trimmers—have, with very few exceptions, no explicit authorization in statute.⁴¹³ Instead, the Clean Air Act broadly authorizes EPA to develop “standards” for mobile source emissions.⁴¹⁴ EPA has interpreted the statutory silence as permissive, and the agency views compliance flexibilities as a useful tool to advance the statutory mandate to set standards while considering compliance costs.⁴¹⁵ The U.S. Court of Appeals for the D.C. Circuit has upheld such programs, finding that given the “lack[of] any clear

⁴⁰⁹ Edison Electric Institute, EERE-2017-BT-STD-0059-0048. California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072.

⁴¹⁰ Alliance to Save Energy, EERE-2017-BT-STD-0059-0049.

⁴¹¹ 47 Fed. Reg. 49,322.

⁴¹² 42 U.S.C. § 7545(c).

⁴¹³ See 75 Fed. Reg. 25,412 (saying, without mentioning any statutory authority, that Averaging, Banking, and Trading (ABT) of emissions credits has been an important part of many mobile source programs under CAA Title II, both for fuels programs as well as for engine and vehicle programs). But see Credit trading for reformulated gasoline emissions, under 42 U.S.C. § 7545. §213(a)(3) does contemplate that EPA could regulate classes of nonroad engines, rather than individual engines.

⁴¹⁴ 42 U.S.C. § 7521. Note that the Department of Transportation’s related credit trading and fleet-wide averaging systems for fuel efficiency are specifically authorized by two energy policy statutes. EISA and EPCA, *supra*.

⁴¹⁵ E.g., 64, Fed. Reg. 40,940, 40,951-52 (July 28, 1999) (for nonroad engines under §213); 48 Fed. Reg. 33,458 (finding authority in the silence and “wide discretion” of §202); 54 Fed. Reg. 22,652, 22,666-67 (May 25, 1989) (finding that banking and trading promote the purposes of the Clean Air Act by encouraging new technology, and concluding that EPA has statutory authority for averaging, banking, and trading under Title II despite the D.C. Circuit’s reservations in *NRDC v. Thomas* regarding the legislative history and references to testing individual vehicles).

congressional prohibition on averaging” in the statutory language or legislative history, EPA had discretion to using compliance flexibilities.⁴¹⁶

- Section 169A of the Clean Air Act requires individual “sources” to install the “best available retrofit technology” to control regional haze. EPA’s regulations allowed states to use marketable permits to comply with these standards if the program would achieve “greater reasonable progress” toward reducing regional haze than a prescriptive, source-specific standard would.⁴¹⁷ The U.S. Court of Appeals for the Tenth Circuit upheld the trading program in 2012.⁴¹⁸
- Water quality trading under the Clean Water Act is not explicitly authorized, though EPA believes that the statute nonetheless provides “clear legal authority” to trade.⁴¹⁹ The U.S. Court of Appeals for the Ninth Circuit once strongly implied, in dicta, that the lack of either statutory or regulatory authority for water quality trading meant it was not permitted.⁴²⁰ Nevertheless, water quality trading has continued. Some scholars suggest that, for cooperative federalism structures like certain water pollution limits under the Clean Water Act, explicit statutory authority is not required for a market-based implementation structure because states retain their plenary powers to implement the federal standards however they see fit.⁴²¹
- There is no explicit authorization in the Endangered Species Act to allow conservation banking to achieve mitigation. Indeed, the Fish and Wildlife Service even admits that its authority to require permits achieve no net loss of critical habitat is “limited.”⁴²² Nevertheless, conservation banking continues to flourish.

The Supreme Court ruling in *FEA v. Algonquin SNG* provides one very strong precedent for finding implicit authority for market-based regulatory tools in broad statutory language.⁴²³ The Trade Expansion Act allowed the President to “take such action . . . as he deems necessary to adjust the imports . . . [to protect] national security.” In 1975, finding that a system of quotas no longer adequately controlled petroleum imports, President Ford switched to a system of license fees. A legal challenge alleged that the President only had statutory authority to adjust imports through quantitative tools like quotas, not monetary tools like fees. The Supreme Court concluded there was no reason to read the word “adjust” as limited to quotas and excluding fees.⁴²⁴ The Court relied on the broad statutory language and evidence in legislative history that Congress did not intend to tie the President’s hands.⁴²⁵ The Court concluded with a note of warning, that its ruling would not allow the President to take any action no

⁴¹⁶ Natural Resource Defense Council challenged EPA’s averaging program as contrary to statutory authority and, specifically, that averaging “flout[ed]” congressional intent in mandating certain noncompliance penalties. In *NRDC v. Thomas*, the U.S. Court of Appeals for the D.C. Circuit found that “lacking any clear congressional prohibition on averaging” in the statutory language or legislative history on noncompliance penalties, EPA had discretion to allow trading. 805 F.2d 410, 425 (1986). However, in a footnote, in dicta, the court discussed an issue “not raised by any party before the agency”: that perhaps statutory language and legislative history requiring the testing of individual vehicles (“a” or “such” vehicle) is inconsistent with the idea of averaging. *Id.* at n.24. Ultimately, while finding the language and history “troubling,” the court did not rule that such language blocked averaging, and the court continued to concede that the agency may have considerable “discretion” in determining how testing is carried out. *Id.* In subsequent rulemakings, EPA has not been troubled by the court’s concerns, and indeed continues to cite *NRDC v. Thomas* for the proposition that the agency has considerable discretion in interpreting its authority to permit averaging, banking, and trading. *E.g.*, 54 Fed. Reg. 22,652 & 55 Fed. Reg. 30,584 (July 26, 1990) (developing counterarguments to these concerns from *NRDC v. Thomas*); *see also e.g.* 71 Fed. Reg. 39,154, 39,159 (July 11, 2006) & 80 Fed. Reg. 40,138 at n.55 (July 13, 2015) (citing *NRDC v. Thomas* as lending support for EPA’s authority to implement averaging, banking, and trading).

⁴¹⁷ 40 C.F.R. § 51.309(d)(4)(i); *WildEarth Guardians v. EPA*, 770 F.3d 919, 925 (10th Cir. 2014).

⁴¹⁸ *WildEarth Guardians v. EPA*, 770 F. 3d 919 (10th Cir. 2014).

⁴¹⁹ EPA, Water Quality Trading Policy, 68 Fed. Reg. 1609 (Jan. 13, 2003) (statute and regulations together provide “clear legal authority”).

⁴²⁰ *Friends of Pinto Creek v. EPA*, 504 F.3d 1007, 1012 (9th Cir. 2007).

⁴²¹ William Buzbee, *Federalism-Facilitated Regulatory Innovation and Regression*, 28 *Georgetown Envtl. L. Rev.* (2016).

⁴²² Notice of Final Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016).

⁴²³ 426 U.S. 548 (1976).

⁴²⁴ *Id.* at 561.

⁴²⁵ Statement of Richard Hembra, GAO, before Subcomm. Hearing on EPA Ozone, 1989 (see *babel/hathitrust*).

matter how remote the impact on imports.⁴²⁶ A few years later, the U.S. District Court for the District of Columbia acted on this warning and ruled that a fee was not authorized when its purpose was not directly to control imports, but rather to raise oil prices and reduce consumption generally, with only an indirect effect on imports.⁴²⁷ Together, these cases stand for the proposition that when statutory language and legislative history support a broad reading of regulatory authority, a variety of quantitative and market-based tools are implicitly authorized, so long as the tool directly targets a legitimate regulatory purpose.⁴²⁸

One example of using legislative history to support implicit authority for market-based regulatory approaches is EPA’s program to control chlorofluorocarbons. In 1989 Congress held hearings on whether EPA had authority to auction off emissions allowances for ozone-depleting substances under Section 157(b) of the Clean Air Act, which authorized the “control” of emissions.⁴²⁹ When that section was added in 1977, Congress clearly expressed that it “does not wish to tie the Administrator’s hands or confer an authority which is cumbersome or unduly difficult to use, administer, or enforce.”⁴³⁰ Congress further explained that “control” included any “other measures as may be necessary to assure protection for health and environment.”⁴³¹ EPA interpreted “control” in 1988 to allow tradable permits for ozone-depleting substances,⁴³² and the agency began exploring whether an auction would also be permitted.⁴³³ A memorandum submitted by the Department of Justice for the 1989 congressional hearing found that the scope of authority under the section was “sweeping” and further argued that Congress knew about economic incentives and specifically did not prohibit them.⁴³⁴ At the hearing, Senator Lieberman opined that the conclusions of that memorandum seemed sound but that Congress should make sure EPA’s authority was even clearer in future legislation.⁴³⁵

In general, a court will not apply the canon of negative inference unless it is “confident” that Congress likely considered and intended to preclude the unmentioned options in that specific context.⁴³⁶ In 1989, the Department of Justice argued that, since marketable permits had become such an obvious regulatory strategy for the Clean Air Act, if Congress “did not prohibit them” and “instead used general language permitting a wide scope of regulatory measures,” no negative inference against market-based regulations should apply.⁴³⁷ Several legal experts have similarly concluded that lack of a prohibition on

⁴²⁶ *Nat’l Cable* at 571.

⁴²⁷ 492 F. Supp. 614 (D.D.C. 1980).

⁴²⁸ Statement of Richard Hembra, GAO, before Subcomm. Hearing on EPA Ozone, 1989 (see *babel/hathitrust*) (“Regulatory fees” may be upheld by courts either if “expressly provided” in statute or if “deemed necessary to accomplish a legitimate regulatory purpose under a broad grant of statutory authority.”).

⁴²⁹ Section 157(b) was later replaced by Section 615.

⁴³⁰ H.R. Rep. No. 101-294 (1977).

⁴³¹ *Id.*

⁴³² Protection of Stratospheric Ozone, 53 Fed. Reg. 30,566 (Aug. 12, 1988) (codified at 40 C.F.R. pt. 82).

⁴³³ Advance Notice of Proposed Rulemaking, 53 Fed. Reg. 30,604 (Aug. 12, 1988).

⁴³⁴ Memorandum from Douglas Kmiec, Asst. Attorney General, Office of Legal Counsel, to Alan Raul, General Counsel, White House Office of Management and Budget (May 15, 1989) (“It is thus clear that Congress was cognizant of economic forms of regulation, did not prohibit them, but instead used general language permitting a wide scope of regulatory measures for the control of CFCs.”).

⁴³⁵ *Proposals to Control the Manufacture, Use, and Disposals of Ozone-Depleting Substances: Hearing Before the Subcomm. On Env’tl. Pollution of the S. Comm. On Env’t and Pub. Works*, 101st Cong. (May 19, 1989).

⁴³⁶ For example, in *Shook v. District of Columbia Fin. Responsibility and Management Assistance Auth.*, 132 F.3d 775, 782 (D.C. Cir. 1998), the D.C. Circuit stated: “We have recognized, however, that [] maxim [of *expressio unius est exclusio alterius* (the mention of one thing implies the exclusion of another)] is often misused. Sometimes Congress drafts statutory provisions that appear preclusive of other unmentioned possibilities—just as it sometimes drafts provisions that appear duplicative of others—simply, in Macbeth’s words, ‘to make assurance double sure.’ That is, Congress means to clarify what might be doubtful—that the mentioned item is covered—without meaning to exclude the unmentioned ones. The maxim’s force in particular situations depends entirely on context, whether or not the draftsmen’s mention of one thing, like a grant of authority, does really necessarily, or at least reasonably, imply the preclusion of alternatives. That will turn on whether, looking at the structure of the statute and perhaps its legislative history, one can be confident that a normal draftsman when he expressed “the one thing” would have likely considered the alternatives that are arguably precluded. For that reason, we think the maxim should be used as a starting point in statutory construction—not as a close-out bid.”

⁴³⁷ Memorandum from Douglas Kmiec, *supra* note 150.

marketable permits is usually sufficient to authorize marketable permits.⁴³⁸ At the same time, Congress was definitely aware that referencing certain market-based regulatory tools in one provision could accidentally imply a limitation of such tools in another provision, and at least once Congress modified a proposed amendments to the Clean Air Act to avoid that result.⁴³⁹ Despite such over-abundance of caution occasionally exhibited by Congress, courts are unlikely to bar a marketable permit program on the grounds of a negative inference. Indeed, despite the Clean Air Act’s repeated explicit authorization of market-based tools in some sections, courts have repeatedly upheld the use of market-based regulatory approaches under sections of the Clean Air Act that are completely silent on the issue.⁴⁴⁰

Ultimately, given the number of successful marketable permit programs that operate without any explicit statutory authority, it is perhaps surprising that no industry comments tried to analogize to any of these prior programs.

Is EPCA’s Anti-Backsliding Provision a Legal or Practical Bar to Marketable Permits?

Most industry comments expressing legal concerns focused not on the general lack of explicit authorization, but instead the complications posed by EPCA’s anti-backsliding provision. Recall that EPCA prohibits the Department of Energy from revising an existing standard in a way that “increases the maximum allowable energy use . . . or decreases the minimum required energy efficiency, of a covered product.”⁴⁴¹ The Department of Energy’s Request for Information itself flagged this provision as a potential sticking point, since any of the proposed market-based flexibilities—trading, averaging, banking, feebates—would allow some products to sometimes slip below the baseline efficiency standards, which seemingly would violate the anti-backsliding prohibition. The Request for Information suggested one possible solution: the agency could keep existing standards as a minimum floor and layer on top a new, slightly more stringent standard, around which trading or averaging or other flexibilities could operate even as all products remain subject to the universal floor.⁴⁴²

Industry comments raise two concerns with such a proposal. First, some claimed that creating such a two-tiered system of standards would violate EPCA. Under EPCA, their argument goes, the minimum standard already must achieve the greatest efficiency that is technologically feasible and economically justified; any standard more stringent than what has been found to be technologically feasible and economically justified is therefore, by definition, not justified under EPCA.⁴⁴³ Second, other comments worried that, even if permissible, any two-tiered system will necessarily increase industry costs, as they then would have to comply with two standards instead of just one.⁴⁴⁴

Having raised such concerns, comments from regulated industry then surprisingly did not attempt to resolve them. In fact, Southern Company—an electric utility with great interest in efficiency standards, but not itself a regulated entity—was the only industry commenter to try to interpret the statute in a way consistent with market-based approaches. Southern Company suggested that the anti-backsliding

⁴³⁸ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 24 (1981); Dave Owen & Colin Apse, *Trading Dams*.

⁴³⁹ See 136 Cong. Rec. H12845 (daily ed. Oct. 26, 1990) (statement of Rep. Anderson, chair of the H. Comm. On Transportation and Infrastructure, regarding the Conference Report) (“The conferees also adopted the Senate version of Section 108(f), with some modifications. Among the modifications, the reference to road charges, tolls, parking surcharges, and other pricing mechanisms was deleted from (1)(A)(vii). *These economic strategies were deleted from this clause of Section 108(f) in order to avoid the implication that such strategies were available only in downtown areas, or other areas of emission concentration, or during periods of peak use. Section 172 (c) of the bill establishes the general requirements for implementation plans in non-attainment areas. The general plan provisions include the use of economic incentives, such as fees, marketable permits, and auctions of emission rights The limited context for the use of such strategies suggested by Section 108(f)(1)(A)(vii) was potentially inconsistent with the general provision of the bill and was therefore removed.*”) (emphasis added).

⁴⁴⁰ NRDC v. Thomas re: Title II. WildEarth re: regional haze. Supreme Court re: CSAPR (though it is mentioned for SIPs).

⁴⁴¹ §6295(o)(1).

⁴⁴² 82 Fed. Reg. at 56,184 & n.24.

⁴⁴³ Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056.

⁴⁴⁴ Joint Industry Comments, EERE-2017-BT-STD-0059-0060. Lennox International, EERE-2017-BT-STD-0059-0055.

provision’s reference to “maximum allowable energy use” could be interpreted on a class-wide basis; even then, though, Southern Company notes that reinterpretation may not work for the various products for which Congress set minimum efficiency floors in the statute.⁴⁴⁵

Neither the Request for Information nor any industry comments analogize to an existing marketable permit program that currently operates despite its own anti-backsliding provision: water quality trading. Under the Clean Water Act, EPA and states are prohibited from issuing new water pollution permits that are less stringent than those established in a previous permit.⁴⁴⁶ Though the Clean Water Act contains some useful exceptions to this anti-backsliding provision (EPCA’s anti-backsliding provision does not contain any such analogous exceptions),⁴⁴⁷ EPA has taken a broader interpretation of how its anti-backsliding provision applies—or, rather, does not apply—to water quality trading. In EPA’s *Water Quality Trading Toolkit* for state permit writers, the agency explains that issuing a new permit that allows water quality trading (1) is not necessarily a “revision” of the permit’s pollution limits and (2) is not necessarily “less stringent,” because the facility remains ultimately responsible for achieving the same aggregate pollution reductions: it has simply been given a new compliance option.⁴⁴⁸ Importantly, under water quality trading, the regulated facility retains all liability, such that if a purchased credit ultimately turns out to be fraudulent or otherwise not deliver the promised water pollution reductions, the original facility is legally responsible and subject to legal penalties.⁴⁴⁹

Yet with almost no analysis or comparison to other marketable permit program, the appliance industry has proclaimed EPCA’s anti-backsliding provision to be the nail in the coffin of market-based compliance flexibilities for the ECS program. One possible explanation is that industry also saw other potentially even more problematic statutory problems—like the arguments highlighted by Sierra Club and Earthjustice that perhaps EPCA’s statutory structure and legislative history are inconsistent with marketable permits—but had ulterior motives for not calling attention to these potential statutory limitations. Rather, industry may have focused on the anti-backsliding provision because the Request for Information had already flagged that as a potential problem.

Legislative Ratification or Fixes

Regardless of which statutory issue industry chose to fixate on, and regardless of whether the statute’s supposed limitations are insurmountable, the statutory language is not immutable. Samsung, a rare industry proponent of market-based approaches for the ECS program, suggested that legislative reforms to EPCA may be required to authorize market-based approaches.⁴⁵⁰ Yet Samsung was a lone and relatively timid voice: why did industry not explicitly call on Congress to provide firmer statutory authority for market-based flexibilities?

The ability of past sessions of Congress to create or ratify marketable permit programs may not tell us much about the ability of the current Congress to do so, given today’s idiosyncratic political landscape. Nevertheless, the sheer number of times when Congress has done exactly that, often with large bipartisan majorities, certainly suggests that given favorable political conditions, it can be relatively straightforward for Congress to explicitly authorize a marketable permit program.

Many, but certainly not all, existing marketable permit programs have explicit statutory authority: the acid rain program;⁴⁵¹ various state and federal implementation plans under the Clean Air Act, including

⁴⁴⁵ Southern Company, EERE-2017-BT-STD-0059-0058.

⁴⁴⁶ CWA § 402(o) & 303(d)(4).

⁴⁴⁷ §303(d)(4)(A), 402(o)(2).

⁴⁴⁸ <https://www.epa.gov/sites/production/files/2016-04/documents/wqtradingtoolkit.pdf>

⁴⁴⁹ EPA, Water Quality Trading Policy, 68 Fed. Reg. 1609 (Jan. 13, 2003).

⁴⁵⁰ EERE-2017-BT-STD-0059-0078.

⁴⁵¹ Clean Air Act Title IV.

the Cross-State Air Pollution Rule⁴⁵² and the Clean Power Plan;⁴⁵³ electromagnetic spectrum auctions;⁴⁵⁴ renewable fuel standard credits;⁴⁵⁵ and the Department of Transportation’s tradable fuel efficiency requirements for vehicles⁴⁵⁶ (though not EPA’s related greenhouse gas and emissions standards for vehicles).

Several programs currently have explicit statutory authority but once existed without it, suggesting that Congress may be happy to affirm an agency’s implicit authority to establish marketable permit programs:

- In 1976, EPA issued guidance creating an offset program for new sources seeking to develop in areas that were out of attainment for minimum air quality standards to obtain offsetting credits for emissions reductions from existing sources. In the 1977 Clean Air Act amendments, Congress effectively ratified that program by explicitly providing authority for a similar offset scheme.
- In 1988, two years before the Clean Air Act Amendments of 1990 added explicit authorization for trading allowances for ozone-depleting substances,⁴⁵⁷ EPA interpreted a broad statutory mandate to “control” such emissions as authorizing a tradable allowance system.⁴⁵⁸ That same year, the Department of Justice concluded that EPA not only had the authority to use marketable permits, but that the agency could auction off the initial allocation as well.⁴⁵⁹ At a congressional hearing, Senator Lieberman opined that the conclusions of that DOJ memorandum seemed sound, but that Congress should make sure EPA’s authority was even clearer in future legislation.⁴⁶⁰ The 1990 Amendments gave EPA that explicit authority to allow trading.
- Amendments to the Magnuson-Stevens Fishery Conservation and Management Act added the term “individual fishing quota” for the first time in 1996, six years after the first system of tradable catch shares was created for surfclams and quahogs.⁴⁶¹ Those amendments also imposed a temporary congressional moratorium on new catch share programs, which was not lifted until 2002.⁴⁶²
- Nothing in Section 404 of the Clean Water Act explicitly gives the Army Corps of Engineers the authority to allow wetland mitigation banking and in-lieu fees; indeed, only the interplay between Sections 403 and 404 even gives the Corps the general authority to require minimizing impacts to wetlands.⁴⁶³ Neither does anything in the Rivers and Harbors Act of 1899 give the Corps explicit authority to allow mitigation banking for impacts to streams and other aquatic resources. Yet since the 1990s, the Corps has allowed mitigation banking, and beginning in 2008, the Corps has expressed a strong preference for banking over other approaches to mitigation for

⁴⁵² Clean Air Act § 110; Policy Integrity Amicus Brief in CSAPR Case 14 (2013) (“Congress Explicitly Authorized EPA and the States to Use Market Mechanisms to Address Interstate Air Pollution in Order to Achieve Environmental Goals Cost-Effectively”).

⁴⁵³ The authority is more indirect, through Clean Air Act § 111’s reference to § 110. *See also* the non-attainment new source review program, 42 U.S.C. § 7502 [did these first exist through regulations, which Congress later ratified?], and the federal ozone standards, 42 U.S.C. § 7511b.

⁴⁵⁴ 47 U.S.C. § 309(j); FCC, About Auctions, *supra* note **Error! Bookmark not defined.** (competitive bidding first allowed by Congress in 1993; auction authority expanded in 1997).

⁴⁵⁵ Energy Policy Act of 2005 § 1501.

⁴⁵⁶ *See* Energy Policy and Conservation Act, as amended by Energy Independence and Security Act.

⁴⁵⁷ Clean Air Act title VI, § 607, as added by Pub. L. 101–549, title VI, § 602(a), Nov. 15, 1990, 104 Stat. 2660.

⁴⁵⁸ Protection of Stratospheric Ozone, 53 Fed. Reg. 30566 (Aug. 12, 1988) (codified at 40 C.F.R. pt. 82).

⁴⁵⁹ FTC, Comments of the Staff of the Bureau of Economics on Protection of Stratospheric Ozone (1988) (citing DOJ Comments on Proposed Rule on Protection of Stratospheric Ozone, A-87-20, Feb. 8, 1988).

⁴⁶⁰ *Proposals to Control the Manufacture, Use, and Disposals of Ozone-Depleting Substances: Hearing Before the Subcomm. On Env’tl. Pollution of the S. Comm. On Env’t and Pub. Works*, 101st Cong. (May 19, 1989).

⁴⁶¹ Nat’l Res. Council, *Sharing the Fish: Toward a National Policy on Individual Fishing Quotas* (1999). The Magnuson-Stevens Act also authorized auctions or other collection of royalties, on top of cost recovery. 16 U.S.C. § 1853a(d)-(e).

⁴⁶² Mark Fina, *Evolution of Catch Share Management*, 36 Fisheries 164 (2011).

⁴⁶³ Nat’l Res. Council, *Compensating for Wetland Losses under the Clean Water Act* 64 (2001) (supplemented by § 307 of the Water Resources Development Act, which instructs the Corps to pursue “no overall net loss”).

wetlands, streams, and aquatic resources.⁴⁶⁴ In the National Defense Authorization Act of 2004, Congress implicitly acknowledged the Corps' authority for wetland mitigation banks by requiring the Corps to issue regulations "establishing performance standards and criteria for the use, consistent with section 404 of the [Clean Water Act], of on-site, off-site, and *in-lieu fee mitigation and mitigation banking as compensation for lost wetlands functions* in permits."⁴⁶⁵ Notably, that 2004 legislation did not mention streams or other aquatic resources, even though the Corps continues to allow mitigation banks for such impacts as well.

Litigation Delays and Uncertainty

Finally, several industry commenters objected to the idea of market-based compliance flexibilities because they allegedly carry higher risk of litigation and greater associated regulatory uncertainty than traditional regulatory approaches.⁴⁶⁶ According to some industry commenters, even when explicitly authorized (like with the acid rain market or the corporate average fuel economy standards for motor vehicles), market-based programs have been controversial and spawned numerous "protracted and contentious" lawsuits; and here, with no explicit authority, industry worried that the litigation risks only multiplied.⁴⁶⁷ Industry highlighted that some past marketable permit programs were either overturned by courts (like the Clean Air Interstate Rule or the Clean Air Mercury Rule) or were only reinstated by courts after lengthy and uncertain litigation (like the NOx SIP Call and the Cross-State Air Pollution Rule).⁴⁶⁸

To begin, it is ironic that some of the trade associations raising the specter of litigation over market-based flexibilities represent companies responsible for instigating the lengthy litigation over the Cross-State Air Pollution Rule.⁴⁶⁹ More importantly, litigation today is a nearly universal risk for all environmental and energy regulations, not just those regulations involving market-based approaches. For example, the Clean Air Mercury Rule, which proposed to states a model cap-and-trade structure for the control of mercury pollution from power plants, was issued in 2005 but vacated by the U.S. Court of Appeals for the D.C. Circuit in 2008 on grounds entirely unrelated to the rule's trading provisions.⁴⁷⁰ In 2011, EPA finalized its replacement Mercury and Air Toxics Standards for power plants, which did not use any compliance flexibilities.⁴⁷¹ That non-market-based regulation was first upheld by the D.C. Circuit

⁴⁶⁴ Corps-EPA Final Rule, Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,593 (2008).

⁴⁶⁵ National Defense Authorization Act of 2004 § 314; Pub. L. 108–136, div. A, title III, §314(b), Nov. 24, 2003, 117 Stat. 1431. (and those regulations should "maximize available credits and opportunities for mitigation.")

⁴⁶⁶ Lennox International, EERE-2017-BT-STD-0059-0055. Other comments were concerned about Risk of permanent misalignment in international regulatory harmonization, with effects to international trade. Natural Resources Canada, EERE-2017-BT-STD-0059-0018. Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056. Lennox International, EERE-2017-BT-STD-0059-0055. Others raised Concern that complex market will reduce regulatory transparency, Lennox International, EERE-2017-BT-STD-0059-0055., or Potential for fraud, abuse, arbitrage in credit markets, Acuity, EERE-2017-BT-STD-0059-0041. Lennox International, EERE-2017-BT-STD-0059-0055. Other Comments on the potential to disrupt existing energy planning and incentives: Complicates demand forecasting for state energy planning, California Energy Commission, EERE-2017-BT-STD-0059-0028, and for utilities' incentive programs for appliance efficiency. Northeast Energy Efficiency Partnership, EERE-2017-BT-STD-0059-0054. California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072. States may need to reevaluate their rights and ability to set their own efficiency standards. California Energy Commission, EERE-2017-BT-STD-0059-0028. If states do create patchwork regulations, that is costly for industry. Lennox International, EERE-2017-BT-STD-0059-0055. Complicated interactions with or disruptions of the popular and successful Energy Star program. E2, EERE-2017-BT-STD-0059-0050. Northeast Energy Efficiency Partnership, EERE-2017-BT-STD-0059-0054. If sale of a higher efficiency product just produces a credit that allows a counteracting sale of a lower efficiency product, then the aggregate savings anticipated from Energy Star or from utilities' incentive programs will disappear. Southern Company, EERE-2017-BT-STD-0059-0058.

One set of comments, from Acuity, argued the opposite, that a market-based approach would increase certainty, especially if a market-based approach is combined with setting several future standards at a time many years ahead, allowing for better long-term planning, and that Banking and trading provides a helpful compliance "buffer." Acuity, EERE-2017-BT-STD-0059-0041.

⁴⁶⁷ Lennox International, EERE-2017-BT-STD-0059-0055. Edison Electric Institute, EERE-2017-BT-STD-0059-0048.

⁴⁶⁸ Edison Electric Institute, EERE-2017-BT-STD-0059-0048.

⁴⁶⁹ Edison.

⁴⁷⁰ *New Jersey v. EPA*, 517 F.3d 574, 584 (2008) ("In view of our disposition, the court does not reach other contentions of petitioners or intervenors.")

⁴⁷¹ Signed December 2011, published February 2012.

Court in 2014, then overturned on appeal to the Supreme Court in 2015, then challenged again in the D.C. Circuit in 2016 after remand to EPA, only to see litigation stayed in 2017 by the Trump administration, and most recently the Trump administration has proposed starting from scratch by repealing the underlying analysis that triggered the regulation in the first place. If anything, the litigation history over the non-market-based mercury standards has been much lengthier and more tortuous than the litigation of the market-based Clean Air Mercury Rule. Finally, it is not as if current non-market-based energy conservation standards avoid litigation.⁴⁷²

In fact, as noted above, many legal and economic experts on market-based regulation predict that such approaches should ease disputes between agencies and regulated entities. Because trading lowers compliance costs, it lowers the incentive for firms to lobby or litigate for delay or to entertain noncompliance strategies: it simply may be cheaper to comply than to dispute.⁴⁷³ Overall, market-based regulatory tools are thought to remove some of the friction between regulators and the regulated.⁴⁷⁴

Arguments about regulatory uncertainty almost prove too much. Even though keeping existing levels of regulatory is likely more “certain” than advocating for deregulation, industry often does advocate for deregulation when the potential cost savings outweigh the benefits of the certainty of existing regulations. The same should be true of adding market-based compliance flexibilities to existing regulatory schemes: potential increases in regulatory uncertainty should not automatically bar industry support if the promise of efficient cost savings is sufficient.

California’s RECLAIM market provides an interesting example. In 1990, under a program that allowed for banked credits, the South Coast Air Quality Management District “discounted most banked credits by eighty percent, thereby confirming industry’s fears about regulators’ confiscatory tendencies.”⁴⁷⁵ Nevertheless, four years later, industry was back negotiating for more marketable permits, and helped the district develop the RECLAIM cap-and-trade program. The RECLAIM program suffered numerous early setbacks, including huge price volatility and emissions overages during California’s 2000-2001 electricity crisis.⁴⁷⁶ Yet the market recovered and remains active to this day, with hundreds of thousands of credits traded every year, both between and within regulated entities.⁴⁷⁷ Despite uncertainty, industry is usually unwilling to pass up market-based compliance flexibilities when they present an opportunity for significant net cost savings.

Economic Efficiency Consequences

The classic economic case for market-based regulation is to lower compliance costs, incentivize innovation, and ease administrative burdens compared to traditional regulatory approaches, all while—in theory—achieving policy goals with greater certainty. Industry commenters raised doubts about whether market-based regulation could achieve any of these economic efficiencies in the ECS program. This section will explore each of these doubts in turn.

Lower Marginal Abatement Costs?

Except for Samsung’s brief reference to the possibility that market-based approaches might lower regulatory costs in the ECS program,⁴⁷⁸ the vast majority of industry commenters simply did not believe that market-based approaches could reduce ECS compliance costs.⁴⁷⁹ Put most simply, several

⁴⁷² See Zero Zone.

⁴⁷³ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 176 (2006, 2d ed).

⁴⁷⁴ Lesley McAllister, *Beyond Playing “Banker”*, 59 Admin. L. Rev. 269 (2007).

⁴⁷⁵ Dwyer (1993).

⁴⁷⁶ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 182 (2006, 2d ed).

⁴⁷⁷ ftp://ftp.aqmd.gov/pub/rtc/rtc_listing.xls (listing last 400 days of trades).

⁴⁷⁸ EERE-2017-BT-STD-0059-0078.

⁴⁷⁹ Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

commenters essentially wondered: Why should we shake up a regulatory system that is working well?⁴⁸⁰ As one commenter wrote, the appliance markets themselves are well functioning, highly-competitive, and attuned to consumer preferences: the industry does not need or want “new, federally-imposed ‘market-based’ regulations.”⁴⁸¹

Some industry comments suggested that the variation of abatement opportunities necessary to drive a permit market’s efficiency did not exist in the appliance industry, because appliances are relatively uniform in many respects, as compared to the different fuels and emissions profiles of power plants that drive the efficiency of air pollution markets.⁴⁸² Comments from Southern Company—not a firm regulated by the ECS program, but a utility with a keen interest in predicting the energy demands from major appliances and equipment—question the relevance of marketable permits to the appliance industry in a way that no comments from regulated entities directly did. Southern Company asked: what is the profit-driven financial case for credit trading in the appliance industry? According to Southern, unlike in the car industry where manufacturers sell high-efficiency but low-profit-margin vehicles in order to generate credits to cover their sales of high-profit but low-efficiency luxury vehicles, in the appliance industry the high-margin products *are* high-efficiency, while the cheap, low-efficiency commodities have lower profit margins.⁴⁸³ According to Southern, no regulated manufacturer raised these concerns in their comments because anti-trust considerations prevent any regulated manufacturer in the appliance industry from speaking publicly about their profit margins on different products.⁴⁸⁴

Other commenters claimed that most covered products were already at their upper limits for possible efficiency gains,⁴⁸⁵ suggesting that the standards are already so stringent that few efficiency trading opportunities remain. Some trade groups wondered why corporate competitors would ever want to trade credits with each other in a permit market.⁴⁸⁶ One commenter noted with skepticism that the Department of Energy had offered no engineering data or other quantitative evidence of likely compliance cost savings.⁴⁸⁷

Contradicting these industry doubts, one set of comments submitted by an economist with the Treasury Department (who submitted on his own behalf) did conduct a quantitative analysis. These comments by Chris Soares applied a simple model to the Department of Energy’s own data to calculate that if current efficiency standards for various appliances had instead been implemented with market-based flexibilities, compliance costs would be anywhere from 10% to 25% lower.⁴⁸⁸ This analysis suggests there is considerable variability in abatement costs both within and between product categories.

Similarly, records of products that have met the higher voluntary efficiency targets of the Energy Star program suggest that manufacturers can increase efficiency more easily for some product categories than for others. For example, residential clothes dryers and washers are often bought together, yet 215 dryer models have qualified for Energy Star,⁴⁸⁹ versus only 161 washer models.⁴⁹⁰ Industry’s comments

⁴⁸⁰ Northwestern Power and Conservation Council, EERE-2017-BT-STD-0059-0017. Joint Industry Comments, EERE-2017-BT-STD-0059-0060. Association of Pool and Spa Professions, EERE-2017-BT-STD-0059-0069 (why “discard something that is working?”).

⁴⁸¹ Lennox International, EERE-2017-BT-STD-0059-0055.

⁴⁸² Edison Electric Institute, EERE-2017-BT-STD-0059-0048.

⁴⁸³ Cite.

⁴⁸⁴ *Id.*

⁴⁸⁵ Acuity, EERE-2017-BT-STD-0059-0041. Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁴⁸⁶ Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁴⁸⁷ Lennox International, EERE-2017-BT-STD-0059-0055.

⁴⁸⁸ EERE-2017-BT-STD-0059-0075 (the model imagined a flexible standard set at the stringency of the most recent rulemaking, layered on top of a minimum floor set at the stringency that existed prior to that most recent rulemaking, so as not to violate backsliding).

⁴⁸⁹ <https://www.energystar.gov/productfinder/product/certified-clothes-dryers/results> (only 156 are listed as available to pair with Energy Star clothes washers).

⁴⁹⁰ <https://www.energystar.gov/productfinder/product/certified-clothes-washers/results>

also ignore the possibility that currently uncovered products could generate offset credits at lower marginal abatement costs.⁴⁹¹

Another line of argument questioned the financial case for investing in the development of products with efficiencies below the existing minimum standards. Industry reported having already invested heavily to ensure all its products meet existing standards, and so the comments suggest that letting some products backslide to lower levels of energy efficiency would undermine those investments and consequently is not likely an economically attractive option.⁴⁹²

These arguments, like many of industry's concerns, seem to assume that use of the market mechanisms would somehow be mandatory for all appliances. Instead, market-based compliance options are simply *options*. For example, facilities that need water pollution permits may have the option of buying offset credits from other sources of pollution, but they also could continue to install traditional control technologies on their own effluent; construction projects that affect wetlands may have the option of buying conservation credits from a verified bank, but they also could continue to complete their own mitigation projects. Similarly, only those appliance manufacturers that could save money by retooling the efficiency of their products would do so under a market-based ECS program; no investments would be forcibly undermined. Industry's skepticism that a market-based approach could do anything to help industry comply more efficiently with existing standards also assume that the existing standards will never be updated with increased stringency, which seems like wishful thinking on industry's part.

Finally, all of industry's arguments clash with the weight of evidence from other marketable permit programs, which strongly suggests that market-based flexibilities tend to save industry money. Evidence from economic models and empirical data suggests marketable permit programs have efficiency advantages. Reviewing the literature, economist and expert on marketable permits Tom Tietenberg concludes that, assuming adequate enforcement, trading either lowers compliance cost of emissions reductions or increases the value of the resource.⁴⁹³ For example, a study by Winston Harrington and Richard Morgenstern identified six case studies where the United States and European Union countries picked different regulatory approaches, to compare prescriptive regulation against economic incentive systems (both cap-and-trade programs and taxes). Examining the case studies on sulfur dioxide, nitrogen oxides, water point sources, leaded gas, ozone-depleting substances, and chlorinated solvents, Harrington and Morgenstern found overall evidence that economic incentives were more efficient.⁴⁹⁴

The following specific evidence exists for U.S. marketable permit programs:

- The Clean Air Act's program to allow new sources to trade offsetting credits of "criteria"⁴⁹⁵ pollutant reductions, by one estimate, resulted in \$5-\$12 billion in compliance cost savings.⁴⁹⁶
- Compared to the counterfactual costs of regulating lead without trading, EPA's inter-refinery trading system for phasing out lead from gasoline saved approximately \$250 million per year, or 20% of total costs.⁴⁹⁷

⁴⁹¹ California Energy Commission, EERE-2017-BT-STD-0059-0028.

⁴⁹² Joint Industry Comments, EERE-2017-BT-STD-0059-0060. Ingersoll Rand, EERE-2017-BT-STD-0059-0053. *See also* California Energy Commission, EERE-2017-BT-STD-0059-0028 (Costly to retool manufacturing processes and marketing to reintroduce less efficient products.).

⁴⁹³ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**.

⁴⁹⁴ Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases* 116, in *Moving to Markets*, *supra* note 21.

⁴⁹⁵ Criteria pollutants are the six widely emitted pollutants for which EPA sets ambient air quality standards: particulate matter, sulfur dioxide, nitrogen dioxide, ground-level ozone, carbon monoxide, and lead.

⁴⁹⁶ Stavins, *Market-Based Enviro. Policies*, *supra* note **Error! Bookmark not defined.**, at 7.

⁴⁹⁷ *Id.* at 9; Robert Stavins, *U.S. Cap-and-Trade System to Address Global Climate Change* 9 (Harvard Kennedy School Reg. Pol'y Prog. Paper 2007-04).

- The acid rain market achieved cost savings (versus non-trading alternatives) estimated in the range of 15-90%, or \$250 million to over \$1 billion annually.⁴⁹⁸
- For fisheries, there is evidence that transferable catch shares help create more efficiently sized fleets that extract the resource at lower cost and with greater profitability.⁴⁹⁹ In Alaska’s halibut and sablefish fisheries, for example, tradable catch shares decreased operating costs and resulted in higher prices for caught fish at the docks.⁵⁰⁰ (However, the halibut and sablefish tradable catch share program also showed signs of increased administrative costs and negative distributional effects like layoffs and barriers to entry.)
- Evidence of efficiency in water quality trading is harder to come by. According to EPA, Virginia’s nutrient trading program for stormwater phosphorous saved over \$1 million.⁵⁰¹ Some models have predicted that traditional water quality regulation is between 12% and 200% more expensive than marketable permits.⁵⁰²
- There is anecdotal evidence that conservation banks save project applicants time and money, simplify compliance, and improve regulatory predictability.⁵⁰³

Though critics of marketable permit programs dispute some of these findings,⁵⁰⁴ overall, the weight of the evidence does suggest marketable permit programs can improve efficiency in at least certain regulatory applications. While it is possible that the ECS program and the appliance industry would not follow this pattern, industry has not yet made a compelling case why that would be true.

Increased Reporting Burdens?

Though Acuity Brands (a lighting and building management systems company) anticipated that shifting to a market-based regulatory approach could reduce recurring requirements for product testing and certification,⁵⁰⁵ all other industry comments universally raised the specter of heavily increased reporting burdens under a market-based approach. Together with legal challenges and doubts about the economic case for permit markets, reporting burdens ranked as one of industry’s top objections to adding market-based flexibilities to the ECS program.

The two specific concerns were (1) the release of confidential information, and (2) the infeasibility of collecting the necessary information. To enable manufacturers to trade compliance obligations across products, a market-based program will require some metric to compare energy saved by one appliance with energy spent by another appliance. The Department of Energy’s Request for Information assumed that the most likely designs for such a metric would require combining some reliable estimate for total

⁴⁹⁸ *Id.* at 7, 15; Stavins, *Market-Based Enviro. Policies*, *supra* note **Error! Bookmark not defined.**, at 7; H. Ron Chan et al., *The Net Benefits of the Acid Rain Program* 1 (RFF 15-25, 2015). As much as 5% of these savings (\$1.3 billion of \$20 billion in cumulative cost savings) may be ascribed specifically to the banking provisions. T.H. Tietenberg, *Emissions Trading: Principles and Practice* 114 (2006, 2d ed).

⁴⁹⁹ NOAA Catch Share Policy (2010); *see also* Katrina Wyman, *The Recovery in U.S. Fisheries*, J. Land Use (forthcoming).

⁵⁰⁰ Pew Env’tl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁵⁰¹ Ann Mills & Ellen Gilinsky, *EPA and USDA Pledge Actions to Support America’s Growing Water Quality Trading Markets*, EPA Blog, Aug. 1, 2016.

⁵⁰² Bruce Ackerman & Richard Stewart, *Reforming Environmental Law: The Democratic Case*, *supra* note **Error! Bookmark not defined.**, n.11.

⁵⁰³ FWS, *Guidance for the Establishment, Use, and Operation of Conservation Banks* (2003); Notice of Final Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016). Also tellingly, in a Statement of Policy and presumably based on at least anecdotal if not empirical evidence, President Obama affirmed that conservation banks reduce timelines for developers. Presidential Memorandum, *Mitigating Impacts on Natural Resources from Development*, Nov. 3, 2015.

⁵⁰⁴ For example, Driesen argues that the millions of dollars allegedly saved by the acid rain market came not from the efficiencies of trading (which was very rare in the early years anyway, accounting for less than 4% of allowances), but rather simply because the ex ante cost estimates had been overinflated. David Driesen, *Is Emission Trading an Economic Incentive Program?*. *Reviews of water quality trading note that, of the 37 pilot projects and programs that have existed, 26 have not yet seen actual trades, others have very few trades, and overall there is little empirical evidence of cost savings. For example, Wisconsin’s Fox River program only had 1 trade before going defunct. James Boyd, New Face of the Clean Water Act: A Critical Review of the EPA’s New TMDL Rules*, 11 *Duke Env’tl. L. & Pol’y Forum* 39 (2000). [But that review is now nearly two decades old.] Similar skepticism has been expressed over whether wetlands mitigation banks have really lowered the costs of mitigation. Tom Tietenberg, *Tradable Permits in Principle and Practice* [again, an old review.]

⁵⁰⁵ Acuity, EERE-2017-BT-STD-0059-0041.

energy used over a product’s lifetime, with reliable estimates of product-specific sales data.⁵⁰⁶ Manufacturers justifiably regard their product-specific sales data as confidential business information, and they are almost universally resistant to releasing such data even to the government, given the risk of accidental public disclosure.⁵⁰⁷

Even if manufacturers were confident that government would keep such data confidential and protect it well against release, manufacturers still insist that collecting such data is nearly impossible, or at least prohibitively expensive. To begin, product-specific sales data is not currently collected, let alone integrated with installation-specific efficiency data, and it is impossible to predict future sales.⁵⁰⁸ The appliance industry contends that its sales distribution channels are much more fragmented than other industries. For example, to compile the data needed to comply with the corporate average fuel economy standards, vehicle manufacturers simply need to coordinate with new car dealerships, with whom they are already closely connected. In contrast, appliance manufacturers would need to coordinate and share data with countless wholesalers, storefront retailers, online retailers, distributors, installers, and importers.⁵⁰⁹ A significant time-lag exists between when a manufacturer sells a product and when the end-consumer purchases that product and has it installed.⁵¹⁰ Appliance installers include small businesses and independent contractors who may especially lack the capability to gather and report consumer data.⁵¹¹ When there are regional standards, as there are for some heating and cooling appliances, it will be even more challenging to get region-specific data.⁵¹²

In addition to the problems with collecting sales data, challenges exist for pairing it with accurate efficiency estimates. The exact efficiency of a given product may depend on installation and interaction with other products, especially in the context of heating, ventilation, and air-conditioning, where many different types of systems must work together.⁵¹³ For other products, like LED lights, rapid technological developments can mean that a product line’s efficiency can change significantly within the span of a single year, complicating efforts to track real-time efficiency.⁵¹⁴ Other industry comments wondered who would be responsible for testing new, less-efficient products, and at what cost.⁵¹⁵

Finally, industry contends that even if the Department of Energy did not require such detailed data in real time, manufacturers would still need to collect it in real time to implement effective compliance strategies. For manufacturers to hit their efficiency targets each compliance period, they may need to adjust product prices or offer other incentives to guarantee the sales of additional high-efficiency products at certain times. Tracking sales in real-time could be very expensive for industry.⁵¹⁶

⁵⁰⁶ Some comments also feel it will be impossible to develop a workable cross-fuel, cross-product energy-equivalency metric. Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056.

⁵⁰⁷ California Energy Commission, EERE-2017-BT-STD-0059-0028. Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056. Lennox International, EERE-2017-BT-STD-0059-0055. Northeast Energy Efficiency Partnership, EERE-2017-BT-STD-0059-0054 (noting that utilities have long tried, and failed, to get manufacturers to release their sales data to help with electricity demand forecasting). Rheem, EERE-2017-BT-STD-0059-0059 (opposed to giving data to any third party, including government).

⁵⁰⁸ California Energy Commission, EERE-2017-BT-STD-0059-0028. Acuity, EERE-2017-BT-STD-0059-0041. Joint Industry Comments, EERE-2017-BT-STD-0059-0060. Southern Company, EERE-2017-BT-STD-0059-0058 (noting that, at recent negotiated rulemakings for residential central air, neither the Department of Energy nor the trade groups had complete market data; the agency hires contractors to make estimates for purposes of cost-benefit analysis, but that level of accuracy will be insufficient when penalties for noncompliance are on the line).

⁵⁰⁹ Lennox International, EERE-2017-BT-STD-0059-0055; Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁵¹⁰ Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056.

⁵¹¹ Association of Pool and Spa Professions, EERE-2017-BT-STD-0059-0069.

⁵¹² Southern Company, EERE-2017-BT-STD-0059-0058.

⁵¹³ Lennox International, EERE-2017-BT-STD-0059-0055. Rheem, EERE-2017-BT-STD-0059-0059 (every installation is unique). Carrier, EERE-2017-BT-STD-0059-0066.

⁵¹⁴ Acuity, EERE-2017-BT-STD-0059-0041.

⁵¹⁵ Lennox International, EERE-2017-BT-STD-0059-0055.

⁵¹⁶ Acuity, EERE-2017-BT-STD-0059-0041.

On the other hand, as some other commenters observed, the Department of Energy already bases its standard-setting process on estimates of lifetime kilowatt-hours consumed by products. Though such estimates are subject to uncertainty, uncertainty over the quantification of credits exists and is managed in many other successful marketable permit programs, including water quality trading.⁵¹⁷ Water quality trading often features the generation of offset credits from otherwise unregulated “non-point sources.” In contrast with point sources that emit measurable quantities of effluent into a defined waterbody through a fixed discharge source like a pipe, non-point sources, such as large farms, emit hard-to-measure, variable quantities of pollution runoff over large areas from multiple, irregular pathways. Because non-point source water pollution is hard to measure, water quality regulators often calculate credits by developing site-specific models or applying pre-determined rates based on best professional judgment, such as assuming so many pounds of water quality credits per acre of cover crops planted on a non-point farm.⁵¹⁸ The science of water quality and ecosystem services is so complex that inevitably there will be some degree of uncertainty about credits. Trading ratios are therefore often applied to adjust for such uncertainty, requiring more credits than even the best available quantification tools would predict are needed to offset the licensed action. For example, a common uncertainty ratio for water quality trading is 2:1, requiring at least two credits to offset a single ton of emissions.⁵¹⁹ To conduct these challenging calculations and verifications of credits in water quality markets, regulators sometimes rely on third party verifiers. Third parties may have more individualized knowledge of the practices being implemented, may have an easier time charging fees for inspections, and can staff up or down more flexibly than an agency in response to changing transaction volumes.⁵²⁰ Trading ratios and third-party verifiers could have a similar role in helping to manage the uncertainty in calculating credits in a hypothetical ECS credit market.

Water quality trading also offers other useful lessons for the ECS program. Like the appliance and equipment markets, water quality trading also involves coordinating data from a variety of actors, from the large industrial plants that discharge effluent into rivers, to the small-scale farmers generating water quality credits by reducing their fertilizer runoff. Each actor on each waterbody may require a unique method for quantifying and verifying credits, just as different appliances would need different testing procedures to measure credits in a market-based ECS program. Finally, in water quality trading, only those facilities willing to bear the expense of tracking the necessary data decide to participate in the market. The concerns raised by the appliance industry about adding compliance flexibilities to the ECS program seem to assume that all manufacturers would be forced to track sales data under a market-based approach. But presumably, a safe harbor compliance option would remain, under which manufacturers could continue using regular testing procedures to ensure all its products meet a minimum standard. Only those manufacturers that believe the benefits of trading justify the increased reporting costs will undertake those additional burdens.

Water quality trading is not alone in having already addressed and resolved some of the monitoring challenges that would face a market-based ECS program. For example, monitoring tradable catch share programs in regional fisheries requires harvester-specific information to be collected at each port of

⁵¹⁷ In other context: [car manufacturers successfully do averaging and trading even though the manufacturer cannot guarantee the accuracy of efficiency calculations, which will vary depending on uncontrollable factors like which octane fuel the consumer will use or whether the consumer will keep tires inflated]

⁵¹⁸ *Id.*

⁵¹⁹ WRI, *Addressing Risk and Uncertainty in Water Quality Markets* (2014) (some water quality programs have uncertainty ratios as high as 3:1). Applying conservative assumptions to credit calculations may also be appropriate. EPA, Water Quality Trading Policy, 68 Fed. Reg. 1609 (Jan. 13, 2003).

⁵²⁰ Willamette Partnership, *Verification in Markets for Water Quality and Habitat* (2014); Willamette Partnership, *In It Together: A How-To Reference Part 2* (2012); Dennis King, *Managing Environmental Trades: Lessons from Hollywood*; Nat’l Network on Water Quality Trading, *Building a Water Quality Trading Program* (2015). EPA also relies on third party engineering reports to verify production of credits in its Renewable Fuel Standards market. RIN Alliance, *Making the RIN Program Work* (2011).

sale; and yet those monitoring challenges have not stopped the spread of catch share programs to migratory fisheries, including the highly migratory Bluefin tuna, which have a large geographic area meaning even more ports of sale.⁵²¹

Even more relevant, EPA has created averaging, banking, and trading (ABT) programs for many mobile source categories of air emissions. Some of these categories—like small, handheld appliances with engines, such as leaf blowers and lawn trimmers—may be quite analogous to the appliance and equipment market in terms of their distribution channels and challenges with tracking sales. In applying ABT programs to these source categories, EPA avoid the problem of needing to track individual sales by instead calculating credits based on the production levels for different engine lines, along with their expected useful life and other parameters.⁵²² Whereas the Department of Energy’s Request for Information and industry’s comments both focused on comparing the alleged difficulty of tracking sales in the appliance industry against the ease of tracking sales in the passenger vehicle industry, EPA’s ABT program for handheld engine appliances may offer a solution.⁵²³

Regarding concern with confidential data, some past marketable permit programs have been extremely protective of data. For example, under the ozone-depleting substance market, EPA kept all information on trading confidential, even aggregate credits traded and average prices, thus making it difficult for the public to gauge the program’s effectiveness.⁵²⁴ Different water quality trading programs have handled the issue of revealing the location of credit generating projects differently. The Ohio River Basin trading program, for example, withholds the project location to protect the privacy of farmers and other landowners, while Florida’s water quality trading programs disclose the identity of both buyer and seller, so the public can feel confident and confirm that the credits reflect real reductions.⁵²⁵

In short, many of the alleged problems that the appliance industry raised on the workability of monitoring credits in a market-based ECS program have already been addressed by other existing and well-functioning market-based regulatory programs.

Better Incentivize Innovation?

Industry said relatively little about innovation in their comments on the Request for Information. E2 Environmental Entrepreneurs, a collective of clean energy investors and business leaders, vaguely fretted that a market-based approach could lead to less innovation, but did not really explain how that might occur.⁵²⁶ A group of investor-owned utilities from California—not regulated entities, but interested stakeholders—asserted that the current regulatory structure already sufficiently advances innovation, and does so without letting inferior products into the marketplace as credit trading allegedly would.⁵²⁷ That same group also hypothesized that a market-based approach will hurt small businesses and new entrants unable to handle the steep reporting costs, and reduced competition in the industry will lead to less innovation.⁵²⁸ On the other hand, Samsung favored market-based approaches for their

⁵²¹ Wyman (2005).

⁵²² <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100K555.PDF?Dockey=P100K555.PDF>.

⁵²³ Interestingly, [Early in drafting the CAFE averaging provisions, the Senate considered that the Department of Transportation may consider regulating so the average standard would be weighted not just for sales but also for miles driven, suggesting perhaps that Congress felt that even more complicated tracking would be possible in the CAFE program. S. Rep. 93-526 (1973).

⁵²⁴ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 9 (2006, 2d ed).

⁵²⁵ Nat’l Network on Water Quality Trading, *Building a Water Quality Trading Program* (2015).

⁵²⁶ E2, EERE-2017-BT-STD-0059-0050.

⁵²⁷ California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072.

⁵²⁸ California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072.

ability to incentive innovation,⁵²⁹ and Acuity Brands was eager to gain more agility under a market-based approach to explore new technologies.⁵³⁰

Overall, a concern for innovation was not a major argument from those industry commenters opposing market-based programs. Nevertheless, given that incentivizing innovation is one of the three main efficiencies promised under the theory of marketable permits, it is worth exploring whether even the mild concerns expressed about decreasing innovation find support in the history of existing marketable permit programs.

Several scholars have commented on how few empirical studies have analyzed innovation under marketable permit programs.⁵³¹ The limited evidence provides somewhat weak support for the theory that marketable permit programs incentivize innovation better.⁵³²

The clearest evidence comes from the lead phase-out and acid rain markets.⁵³³ The lead phase-out program resulted in “measurable incentives” for diffusion of cost-saving technologies.⁵³⁴ The acid rain market at least likely contributed to the operational innovation of identifying fuel switching as a cheap compliance option,⁵³⁵ and some studies have found the acid rain permit market helped diffuse critical technological advances.⁵³⁶

Other examples of innovations in production include:

- By allowing trading and leasing of electromagnetic spectrum, spectrum users may arrange to share channels and voluntarily accept more interference than FCC typically allows in its direct licensing.⁵³⁷
- Under a tradable program of individual catch shares, fishers no longer have to race to catch a fishery-wide maximum of Alaskan halibut and sablefish, leading to longer seasons and increased profitability.⁵³⁸
- The Fish and Wildlife Service asserts, though without citing empirical evidence, that conservation banking consolidates scientific expertise and financial resources into larger projects compared to small-scale mitigation by individual permittees, and economies of scale lead to the creation of even more ecosystem services and credits.⁵³⁹

Though the evidence is somewhat weak for marketable permit programs increasing innovation, there definitely does not seem to be support for a concern that marketable permit programs somehow significantly decrease innovation.

⁵²⁹ Resources for the Future, EERE-2017-BT-STD-0059-0025. Samsung, EERE-2017-BT-STD-0059-0078 (market-based approaches will drive innovation).

⁵³⁰ Acuity, EERE-2017-BT-STD-0059-0041.

⁵³¹ David Driesen, *Is Emission Trading an Economic Incentive Program?*, *supra* note **Error! Bookmark not defined.**.

⁵³² Harrington et al. (2004) find general, but not universal, support that market-based provide greater incentives to innovate than traditional regulation; Tietenberg reports “some support” for innovation, though not a “ringing endorsement.” Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**; Harrington & Morgenstern, *supra* note 494, find some support, but mixed.

⁵³³ Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases 119*, *supra* note 494.

⁵³⁴ *Id.* at 9; Stavins, *U.S. Cap-and-Trade System*, *supra* note 497, at 9; Kerr and Newell (2003) find greater technological adoption because of trading in lead phase-out.

⁵³⁵ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 68 (2006, 2d ed) (citing Taylor et al (2005)).

⁵³⁶ Chan, Stavins et al., *supra* note **Error! Bookmark not defined.**, at 25 (crediting the market with the wave of scrubber installments as well as the diffusion of low-sulfur coal mining and blending techniques). See also Revesz & Lienke at 107 (citing EPA’s 2005 Acid Rain Progress Report, and attributing the 40% cost savings to both reduced rail costs/fuel switching, and technological innovation).

⁵³⁷ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative 4* (1981).

⁵³⁸ Pew Env’tl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁵³⁹ FWS, *Guidance for the Establishment, Use, and Operation of Conservation Banks* (2003).

Save Administrative Resources?

Several industry comments expressed concern for the enormous agency resources it would take to design and implement a market-based approach to the ECS program.⁵⁴⁰ These concerns were sometimes indirectly paired with a request: industry would prefer that the agency prioritize either other regulatory reforms⁵⁴¹ or meeting existing statutory obligations on time and enforcing existing standards.⁵⁴² As discussed above, it is possible that the appliance industry's opposition to market-based standards was tacitly motivated in part by desire to keep the agency focused on even more radical regulatory reforms and rollbacks that, if implemented, would render superfluous the cost-saving potential of market-based approaches. This possibility raises the question: is the development and implementation of a market-based approach so draining on agency resources that it would distract from other priorities?

Literature reviews find some evidence that trading eventually lowers administrative costs, but also that trading changes bureaucratic functions as monitors replace engineers and could result in some short-term cost increases.⁵⁴³ Harrington and Morgenstern, for example, find reasonable evidence that economic incentives have a lower information burden than traditional regulation, but they find only mixed evidence that economic incentives have lowered administrative costs.⁵⁴⁴ For example, EPA's lead trading program was so complex that unintentional violations in early years increased monitoring costs.⁵⁴⁵ Meanwhile, though the U.S. acid rain market did have impressively low administrative costs, achieving nearly 100% compliance rates with only about 100 EPA staff,⁵⁴⁶ administrative costs were also quite low for Germany's prescriptive regulations for sulfur dioxide from power plants.⁵⁴⁷ Harrington and Morgenstern also point out that marketable permit programs explicitly authorized by statute, like the acid rain program, may have no advantage over prescriptive regulation for adapting to new information, because it would take an act of Congress to change the sulfur dioxide cap.⁵⁴⁸

Evidence from other programs is also mixed. There is some evidence that in fish catch share programs, the market can automatically adjust to socio-economic changes to the relative demand between commercial and recreational fishers.⁵⁴⁹ Canada notably has long relied on fish catch share programs as a cost-effective way to manage a large number of fishers and fisheries in the face of inadequate technological solutions to prevent overfishing.⁵⁵⁰ However, Alaska's halibut and sablefish tradable quota program has seen increased administrative costs.⁵⁵¹ For conservation banking, it is perhaps notable that after two decades of activity, in Fish and Wildlife Service reaffirmed in 2016 its belief that conservation banking reduces the workload for its staff.⁵⁵² On the other hand, conservation bank sponsors complain about the lack of defined timeline for review, insufficient agency staff, and long review times: it

⁵⁴⁰ E.g., Air-Conditioning, Heating, and Refrigeration Institute, EERE-2017-BT-STD-0059-0056 (worrying it is impossible for the agency to track and verify all this sales data).

⁵⁴¹ Joint Industry Comments, EERE-2017-BT-STD-0059-0060. Ingersoll Rand, EERE-2017-BT-STD-0059-0053. Lennox International, EERE-2017-BT-STD-0059-0055 (do not even "waste resources vetting a pilot program").

⁵⁴² Northeast Energy Efficiency Partnership, EERE-2017-BT-STD-0059-0054. Philips Lighting, EERE-2017-BT-STD-0059-0067 (would prefer the agency focus on enforcing existing standards).

⁵⁴³ T.H. Tietenberg, *Emissions Trading: Principles and Practice* 71 (2006, 2d ed).

⁵⁴⁴ Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, at 117.

⁵⁴⁵ *Id.* at 126.

⁵⁴⁶ Lesley McAllister, *Beyond Playing "Banker"*, 59 Admin. L. Rev. 269 (2007).

⁵⁴⁷ Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, at 126.

⁵⁴⁸ Though, if Congress built in safety valves to relax or increase the cap stringency based on price, a marketable permit program established by statute could still automatically respond to new information. Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, at 134.

⁵⁴⁹ NOAA, *Catch Share Policy* (2010).

⁵⁵⁰ Katrina Wyman, *Why Regulators Turn to Tradable Permits: A Canadian Case Study*, 52 U. Toronto L.J. 419 (2002).

⁵⁵¹ Pew Env'tl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁵⁵² Notice of Final Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016).

reportedly takes about about 2.5 years to plan and get approval on a conservation bank, and about 40% of the time is spent waiting for FWS input.⁵⁵³

In conclusion, marketable permit programs may help reduce administrative costs over the long term. But, they can also increase upfront administrative costs. If the appliance industry is hoping that the Department of Energy will prioritize more radical reforms to the ECS program, then, given limited agency resources, that could be a reason to why industry is opposing the consideration of market-based approaches.

Barriers to Entry and Anticompetitive Effects

Some commenters expressed concern that adding credit trading to the ECS program would lead to anticompetitive concentration, as competitors tried to leverage their positions in the credit markets to increase market share in the appliance market.⁵⁵⁴ Others worried that smaller firms would lack the ability to absorb the increased monitoring and transaction costs, and could disproportionately suffer under a market-based approach.⁵⁵⁵ These concerns focused not just on negative effects to industry, but also negative effects to consumers, who could suffer loss of choice or higher prices if anti-competitive behaviors that lead to industry concentration.⁵⁵⁶

Besides concerns about smaller manufacturers, domestic manufacturers worried about losing out to foreign competitors under a market-based system. Some comments expressed fear for allowing increased imports of low-cost, low-quality, low-efficiency foreign products will harm U.S. consumers and U.S. jobs.⁵⁵⁷ Meanwhile, Samsung's nearly lone stance in moderate support of market-based flexibilities could have also been motivated by its competitiveness relative to domestically headquartered manufacturers. Note that Samsung spent the first half of its comments documenting its "commit[ment] to innovation and investment within the United States," including supporting U.S. jobs.⁵⁵⁸

Market power can be difficult to detect in tradable permit programs. It remains unclear, for example, whether the hoarding of renewable fuel credits by certain banks helped cause a huge price spike in the credit market in 2013.⁵⁵⁹ Similarly, the market for trading emissions credits among passenger vehicle manufacturers is relatively thin, with only about twenty car manufacturers actually subject to the regulation. In this constrained market, market thinness and the lack of transparency about buyers' offer prices and sellers' asking prices likely were responsible, among other factors, for the dearth of trades between companies in early years.⁵⁶⁰ Additionally, since only six car manufacturers hold nine of every ten permits, the lack of trades may be due to a monopoly-like attempt to restrict permit supply in the market's initial years to drive up permit prices in later periods.⁵⁶¹ However, as stringency has increased over time, the vehicle emissions market has become thicker: through the year 2013, only 2.6 million credits total had been traded cumulatively, but in 2014, another 7.2 million were traded, and in 2015, 10.2 million were traded.⁵⁶² The number of buyers and sellers has likewise increased.⁵⁶³

⁵⁵³ DOI, Office of Policy Analysis, Results from a Survey of Conservation Bank Sponsors (2016).

⁵⁵⁴ Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁵⁵⁵ NAFEM comments.

⁵⁵⁶ Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁵⁵⁷ Lennox International, EERE-2017-BT-STD-0059-0055. California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072.

[there is more on theory on competition in the ACUS marketable permit report.]

⁵⁵⁸ Samsung.

⁵⁵⁹ Robert Glicksman, Regulatory Safeguards for Accountable Ecosystem Service Markets in Wetlands Development, *supra* note **Error!**

Bookmark not defined.

⁵⁶⁰ Leard & McConnell, *supra* note 280, at 2, 7, 15, 26.

⁵⁶¹ *Id.* at 28.

⁵⁶² EPA, Manufacturer Performance Report for 2015 MY (2015); *compare* EPA, Manufacturer Performance Report for 2014 MY.

⁵⁶³ In 2015, there were 5 sellers and 7 buyers, up from 3 and 3 in 2013. EPA, Manufacturer Performance Report for 2015 MY.

One market with a real risk for monopoly power was the ozone-depleting substance market. The Federal Trade Commission calculated the market's Herfindahl-Hirschmann Index: a metric of market competition with a scale of 0 to 10,000, with any score over 1500 signifying a risk of market power. The ozone-depleting substance market scored 2958. The Federal Trade Commission recommended that EPA retain the right to take back any credits being hoarded.⁵⁶⁴ In the conservation banking context, some banks have a de facto monopoly on certain types of credits in certain areas (though of course permittees could always implement their own mitigation).⁵⁶⁵

In general, though, market power has not been a significant issue in most permit markets. In some marketable permit programs, the accumulation of allowances is unlikely to generate monopoly-type powers, either because of the high number of market participants (as with air markets) or because the underlying good is a globally competitive market (as with fish).⁵⁶⁶ Regulators have also often preempted the risk of hoarding and market power by imposing position limits, either on the purchasing or the holding of allowances, including the total banking of allowances.⁵⁶⁷ For example, the Federal Communications Commission limits stockpiling and speculative trafficking,⁵⁶⁸ and California's cap-and-trade program for greenhouse gases has both purchase and holding limits.⁵⁶⁹ Exchanges also typically set their own purchase limits.

Position limits to protect against market power can be derived from formulas based on elasticities and other factors. However, regulators may want to go beyond the minimum limit necessary to prevent market power, in order to prevent inequitable concentrations short of monopolies, or to further other management goals.⁵⁷⁰ For example, most fisheries score low on the Herfindahl-Hirschmann Index for market concentration: the red snapper fishery's scores were all below 190 (recall that anything under 1500 suggests no market power).⁵⁷¹ Yet most fish catch share programs have position limits. These limits are designed more to protect traditional fishers and communities than to prevent true monopolies.

Several other regulatory tools besides position limits can minimize the risk of market power and ensure sufficiently thick markets. Monopoly risk is less common in auctions.⁵⁷² Regulators can reserve a supply of allowances to be sold at set price in case of hoarding. Position accountability triggers would simply require a permit holder wishing to exceed a certain threshold of allowances to submit to additional reporting and oversight.⁵⁷³ Regulators can help minimize transaction costs and ensure adequate participation by supporting or operating brokerages or exchanges.⁵⁷⁴ Finally, credit generators will be reluctant to spend money generating credits if they are not confident that sufficient market demand will exist to sell their credits at a profit. To counteract uncertainty for would-be market participants about whether supply or demand will exist, regulators can support the use of clearinghouses, which guarantee performance and so lower risk for buyers and sellers.⁵⁷⁵

⁵⁶⁴ FTC, Comments of the Staff of the Bureau of Economics on Protection of Stratospheric Ozone (1988).

⁵⁶⁵ Stratus Consulting for Northwest Fisheries Science Center, NOAA, A Nationwide Survey of Conservation Banks (2003).

⁵⁶⁶ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁵⁶⁷ EDF Comments to CFTC (2010).

⁵⁶⁸ Pablo Spiller & Carlo Cardilli, *Toward a Property Rights Approach to Communications Spectrum*, *supra* note **Error! Bookmark not defined.**

⁵⁶⁹ C2ES, *supra* note **Error! Bookmark not defined.**

⁵⁷⁰ Lee Anderson & Mark Holliday, Nat'l Marine Fisheries Serv., *The Design and Use of Limited Access Privilege Programs* (2007).

⁵⁷¹ Nat'l Marine Fisheries Serv., *Red Snapper IFQ Five-Year Review* (2013).

⁵⁷² Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 20 (1981); see also Hahn (1983), cited in Tietenberg 2006 at 155.

⁵⁷³ CBO, *Evaluating Limits* (2010).

⁵⁷⁴ Project on Alternative Regulation, *Marketable Rights: A Practical Guide to the Use of Marketable Rights as a Regulatory Alternative* 21 (1981)

⁵⁷⁵ Also government guarantee to purchase any unsold credits in early years. WRI, *Addressing Risk and Uncertainty in Water Quality Markets* (2014).

The distributional consequences of marketable permit programs to small entities and communities have attracted the most attention in fish catch share programs. The temporary moratorium on fish catch share programs imposed by Congress was motivated largely by concerns about equity, small communities, and a potential influx of outside investors.⁵⁷⁶ Fishers have often insisted upon various trade restrictions—sometimes over the objections of regulators—in order to protect fishing communities from outside corporate interests.⁵⁷⁷ For example, the Alaskan halibut tradable catch share program prohibits transfers across vessel class size and requires owners to be on board for catch,⁵⁷⁸ and many fish catch share programs have position limits designed to minimize consolidation of permits.⁵⁷⁹ In fact, share caps and other limits to prevent inequitable concentrations are required by statute,⁵⁸⁰ and the regional fishery councils must consider employment and the cultural framework of the fishery in their initial allocations, to protect participation of small owners. The Magnuson-Stevens Act also allows the federal government to help finance the purchase of shares by small or new fishers.⁵⁸¹

Nevertheless, several fisheries have experienced distributional consequences. Alaska’s halibut and sablefish fisheries endured layoffs, with small fishers and small communities hit the hardest.⁵⁸² In a survey of red snapper shareholders, though large shareholders reported being “very satisfied” with the program, small shareholders were quite unsatisfied, and the overall rating of the program’s success was “tepid.”⁵⁸³ Small shareholders felt the program had serious inequalities and resented the creation of a “new class of ‘sea lords’” who own shares but lease them out rather than fish themselves.⁵⁸⁴ In 1990, when the first U.S. tradable catch share program began, there were 117 unique holders of Mid Atlantic quahog allocations; since then, there has been a steady decline, and as of 2013 there were only 40 unique share holders.⁵⁸⁵ Notably, the quahog program did not historically have accumulation limits, relying instead on standard antitrust laws to protect against excessive concentration. But while existing antitrust laws may prevent monopolies, they are insufficient to prevent permit consolidation.⁵⁸⁶

Some markets can reduce barriers to entry (like auctions or open credit markets), but markets could be designed to preserve or increase barriers to entry (like non-transparent inter-firm trading). Wanting to preserve or avoid barriers to entry may at times be a reason for industry to one form of market over another, but is not necessarily a reason to oppose any kind of market whatsoever.

Policy Outcomes

Marketable permit programs aim to increase economic efficiency without sacrificing policy goals or causing unintended negative consequences. Industry raised concerns that adding market-based flexibilities to the ECS program would undermine important policy outcomes, including financial benefits to consumers and total energy consumption goals. It is also possible that some of those stated concerns

⁵⁷⁶ Mark Fina, *Evolution of Catch Share Management*, 36 *Fisheries* 164 (2011); cf. NRC, *Sharing the Fish: Toward a National Policy on IFQs* (1999) (moratorium was because of congressional concerns about social, economic, and biological effects).

⁵⁷⁷ Katrina Wyman, *Why Regulators Turn to Tradable Permits: A Canadian Case Study*, 52 *U. Toronto L.J.* 419 (2002).

⁵⁷⁸ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**. Also, the Pacific Coast Sablefish program prohibits transfers to partnerships or corporations.

⁵⁷⁹ For example, the Sea Scallop IFQ ownership cap is 2.5% per vessel, 5% per entity. NOAA, *Economic Performance of U.S. Catch Share Programs*, NMFS-F/SPO-133 (2013). The Golden Tilfeish IFQ cap is 49%. *Id.*

⁵⁸⁰ 16 U.S.C. § 1853a(c)(5).

⁵⁸¹ 16 U.S.C. § 1853a(g). Such loans do exist, with terms of twenty years or more. Mark Fina & Tyson Kade, *Legal and Policy Implications of the Perception of Property Rights in Catch Shares*, *supra* note **Error! Bookmark not defined.**

⁵⁸² Pew Envtl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁵⁸³ Nat’l Marine Fisheries Serv., *Red Snapper IFQ Five-Year Review* (2013) (survey conducted by Louisiana State University).

⁵⁸⁴ *Id.*

⁵⁸⁵ NOAA, *Economic Performance of U.S. Catch Share Programs*, NMFS-F/SPO-133 (2013).

⁵⁸⁶ NRC, *Sharing the Fish: Toward a National Policy on IFQs* (1999).

were a smokescreen for a more hidden fear: that adopting market-based flexibilities would lead to increased regulatory stringency. This section examines those stated and unstated concerns.

Consumer Effects

A few industry commenters highlighted potential benefits to consumers deriving from a market-based approach. Acuity Brands anticipated gaining increased agility to respond quickly to new consumer demands, especially for new technologies.⁵⁸⁷ The National Association of Home Builders—not a regulated entity, but rather a group whose members are responsible for purchasing a very large number of covered products—also saw several benefits to consumers. For example, a market-based approach could save certain consumer from being forced to undertake costly and dangerous retrofits. A consumer with, for instance, an old non-condensing furnace may be required by the existing rigid efficiency standards to upgrade to a condensing furnace, absorbing both large retrofitting costs plus the associated risk of creating a dangerous backdraft; under a credit market, however, the consumer can purchase a new non-condensing furnace so long as the manufacturer can average or trade credits, thereby avoiding the unintended safety concerns and retrofit costs.⁵⁸⁸ Similarly, southern consumers currently do not operate their furnaces enough days such that lower operating costs payback the upfront purchase price of more efficient furnaces; under a market-based system, they would have the option of buying a cheaper, less efficient furnace.⁵⁸⁹

However, several other industry commenters worried that a market-based approach would harm consumers, either by creating winners and losers, or by creating confusion.

Winners and Losers: First, a market-based approach could create winners and losers among consumers, with some earning a disproportionate share of aggregate cost savings, while others see none. One commenter poetical stated that the “amorphous specter of a ‘normalization of energy savings’” will hurt consumers and asked, somewhat philosophically, whether a watt saved on large commercial equipment was worth the same as a watt saved by a householder air conditioner. More to the point, the commenter asked if it was acceptable not to improve the efficiency of the home air conditioner if it were cheaper to do so by focusing exclusively on the commercial equipment.⁵⁹⁰ The commenter felt the answer was “no”: the purpose of EPCA was not just to reduce economy-wide energy consumption, but to benefit individual consumers; the market will create inequity between consumers who save money and those who do not.⁵⁹¹

Similarly, other commenters worried that a market-based approach would decrease consumer choices, as industry was forced to use financial incentives, direct marketing, or other mechanisms to steer certain consumers toward certain products in an effort to hit overall efficiency targets.⁵⁹² In particular, low-efficiency products might be marketed to low-income consumers or consumers in specific regions, reducing overall consumer choice.⁵⁹³

These concerns about markets creating unacceptable negative externalities or negative distributional outcomes are essentially concerns about whether the credits being traded are sufficiently fungible. This is a common challenge that all marketable permit programs must overcome. The units for trading or averaging must be sufficiently fungible across outcomes. The limits of fungibility will affect the structure and scope of the market. To allow averaging within a single manufacturer’s line of a single product

⁵⁸⁷ Acuity, EERE-2017-BT-STD-0059-0041.

⁵⁸⁸ National Association of Home Builders, EERE-2017-BT-STD-0059-0073.

⁵⁸⁹ National Association of Home Builders, EERE-2017-BT-STD-0059-0073.

⁵⁹⁰ Lennox International, EERE-2017-BT-STD-0059-0055.

⁵⁹¹ E2, EERE-2017-BT-STD-0059-0050.

⁵⁹² Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁵⁹³ California Investor-Owned Utilities Joint Comments, EERE-2017-BT-STD-0059-0072.

category or class where all products use the same fuel, a simple currency, like the kilowatt-hours saved over a product's expected life or the rate of energy used per unit of activity, may seem like an obvious choice—assuming such energy usage calculations are reasonably accurate and not cost-prohibitive. Even such a seemingly straightforward currency design scenario, however, still presents risks of non-fungibility leading to negative policy outcomes. For example, consumers choosing lower energy efficient appliances under a trading regime could be geographically concentrated, leading to higher localized energy consumption and higher associated pollution as compared to under a uniform standard for appliance efficiency.

To develop a workable currency, the Department of Energy would have to determine which policy outcomes it most wants to protect from unintended consequences—consumer costs, energy security, or environmental effects—and whether it cares about outcomes on a regional/local level or only on a national level. Currency options that the agency may want to explore could include: BTUs (or other unit of energy) consumed over product life, consumer savings over product life, or tons of emissions. A hybrid currency could potentially use monetized values of energy security benefits and environmental benefits, along with consumer cost savings, to capture everything the agency cares about. Such an approach may be especially useful to the extent that the ECS's policy objectives (consumer savings, energy security, and environmental effects) are not well aligned, such that improving one objective may not necessarily improve all other objectives in proportion—as may occur, for example, in trades across fuel types with different environmental outcomes. However, such an approach could add some complexity and expense.

If a sufficiently fungible currency cannot be created, one response is to preemptively restrict trades with potentially dissimilar outcomes with respect to negative externalities or distributional consequences. Trading could be limited across product categories, across manufacturers, or across fuel types. For example, water quality trading is limited to within watersheds, regulators can annul trades that lead to destructive localized pollution,⁵⁹⁴ and some pollutants known for creating localized hot spots are excluded from the trading programs.⁵⁹⁵ Here, the Department of Energy could restrict trading to within product categories, or could restrict trades between residential appliances and commercial/industrial equipment. However, such restrictions could reduce overall economic efficiency and create thinner markets, in which the risk of market manipulation may be heightened.

Another potential solution to this problem would be creating some institutional review mechanism, wherein some agency official or computer algorithm checks certain proposed trades for undesirable outcomes and clears trades before they can occur. Though such an approach can work well in certain contexts,⁵⁹⁶ it is not clear how well suited this approach would be to the ECS program.

Another option to manage lack of fungibility in the currency is to impose a trading ratio that will offset some of the risk of undesirable consequences. This again is a common approach in water quality trading, to adjust for effluent discharged at different locations in a watershed can have different effects on water quality. By requiring manufacturers to hold more than one credit to offset each unit of decreased energy efficiency—for example, purchasing credits representing a conservation of two kilowatt-hours over a product's lifespan to offset the increased consumption by another product of one kilowatt-hour over its lifespan (a 2:1 ratio)—the increased stringency acts as a check against undesirable deviations from the

⁵⁹⁴ Andrew Wolman, *Effluent Trading in the United States and Australia*, *supra* note **Error! Bookmark not defined.**; see also EPA, Water Quality Trading Policy, 68 Fed. Reg. 1609 (Jan. 13, 2003). EPA supports trading for total phosphorus and total nitrogen and sediment load, but other pollutants would be subject to higher level of case-by-case scrutiny, implicit concern is hot spots; in particular, EPA does not currently support trading in bioaccumulative toxics, but is open to a pilot project. *Id.*; EPA, Water Quality Trading Toolkit (2009).

⁵⁹⁵ Cite.

⁵⁹⁶ Jonathan Nash & Richard Revesz, *Markets and Geography: Designing Marketable Permit Schemes to Control Local and Regional Pollutants*, 28 *Ecol. L. Q.* 569 (2002) (describing computer algorithm to approve trading credits in criteria pollutants).

baseline. Because some trading ratio may already be desirable to handle other types of uncertainty (such as uncertainty over additionality, or product malfunctions that change energy consumption, or product recalls that take credit-generating appliances off the market), adding an additional trading ratio to handle uncertainty over fungibility may be administratively convenient. That said, a trading ratio may at times unnecessarily restrict otherwise efficient trades, thus limiting the overall economic efficiency of the program.

Because the trading ratio approach works by increasing stringency to create a cushion for error, that solution suggests the final approach: simply increasing the stringency of the standards to counteract the negative externalities caused by imperfectly fungible currencies. For example, in creating the acid rain trading program, Congress to some extent used increased stringency to counteract concerns about pollution hot spots: “[I]t was understood that the greater the overall size of the reduction, the more indifferent society could be to the spatial impacts of trade.”⁵⁹⁷

Consumer Confusion: A few industry commenters worry that consumers may not have access to adequate information to identify the lower-efficiency products being sold under a market-based regulatory approach,⁵⁹⁸ and so allowing products with sub-standard efficiency onto the market will create consumer confusion.⁵⁹⁹ Comments from the Natural Resources Defense Council explained this concern in greater and more accessible detail:

Right now, the beauty of the efficiency standards program is that consumer can be confident that any product on the shelf meets a minimum level of efficiency and won’t unnecessarily waste energy. Moving to a model where manufacturers can trade efficiency credits with each other or develop products with varying energy consumption adds a level of complexity that hurts the integrity of the program. Two otherwise-identical products could have drastically different energy use. How will consumers know the difference? They won’t be able to tell from looking at the outside of the product.⁶⁰⁰

In other words, unless consumers can easily distinguish energy efficiency differences and can readily understand the financial and environmental consequences, the main purposes of the ECS program—reducing consumer costs, conserving energy, protecting the environment, and preserving consumer choices—will be undermined.

A better EnergyGuide label could help prevent some risk of consumer confusion. Currently, the most detailed EnergyGuide labels estimate yearly electricity use and yearly operating costs, compare those costs with a range of costs for similar models, and reserve space for the Energy Star logo for appliances that voluntarily meet higher energy efficiency ratings.⁶⁰¹ Some other labels may only reveal yearly energy costs compared to a range but omit any calculation of total energy used (like the label for room air conditioners) or may only list a relative thermal efficiency rating and nothing else (like the labels for pool heaters and some gas furnaces).⁶⁰² In its Request for Information, the Department of Energy repeatedly analogizes to the credit trading program within the vehicle fuel economy and emissions standards. However, as compared to the EPA/NHTSA Fuel Economy Label,⁶⁰³ the appliance EnergyGuide label lacks several details that help consumers:

⁵⁹⁷ *Id.*

⁵⁹⁸ E2, EERE-2017-BT-STD-0059-0050.

⁵⁹⁹ Ingersoll Rand, EERE-2017-BT-STD-0059-0053.

⁶⁰⁰ <https://www.nrdc.org/experts/lauren-urbanek/changes-standards-program-more-harm-good>

⁶⁰¹ <https://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label>

⁶⁰² 83 Fed. Reg. 7593, 7604-7607 (Feb. 22, 2018).

⁶⁰³ <https://www.fueleconomy.gov/feg/Find.do?action=bt1>

- The Fuel Economy Label discloses not just annual fuel costs, but calculates the total savings or losses compared to the average new vehicle over the duration of typical vehicle ownership (5 years). Not only does this extra calculation give the consumer more useful raw information, but it frames the information with helpful context—not just total gross costs, but savings or loss relative to other options.
- The Fuel Economy Label does not simply compare operating costs on a scale that shows the full range of similar models, as the EnergyGuide label does. Instead, the Fuel Economy Label assigns ratings for fuel economy, greenhouse gas emissions, and smog emissions, on a scale of 1 to 10. These ratings are relative across all vehicle classes,⁶⁰⁴ as opposed to the absolute scale of cost savings that appears on the EnergyGuide label for appliances. This relative scale again gives consumers better informational context to aid comparison across product choices.
- The Fuel Economy Label assigns ratings across all vehicle classes, not just vehicles of very similar models. For example, the EnergyGuide label featured on FTC’s website is specific to refrigerator-freezers with automatic defrost, side-mounted freezer, and through-the-door ice.⁶⁰⁵ Limiting the information in this manner prevents consumers from easily comparing the tradeoff between, for example, energy efficiency versus the optional attribute of having through-the-door ice.
- The Fuel Economy Label directly discloses environmental information, by including ratings for both greenhouse gas emissions and smog, as well as a calculation of carbon dioxide grams per mile. The EnergyGuide label does not include environmental information directly on the label, making it harder for consumers to compare products with different fuel types and to understand and prioritize environmental consequences in their decisions about appliance purchases and uses.
- The Fuel Economy Label features a QR Code for easy scanning for more information. The EnergyGuide label only provides a web link, making additional online information less easily accessible for consumers.

At a minimum, if the Department of Energy moves forward with adding market-based flexibilities similar to the averaging, banking, and trading allowed for vehicle efficiency standards, it should upgrade its EnergyGuide appliance labels to include the additional information provided on Fuel Economy labels, to help mitigate any consumer confusion.

An even better approach would be to conduct tests with different label designs and informational content to help further improve consumer choices in conjunction with market-based standards. Additional information that may help consumers navigate the appliance market under a credit trading or feebate system could include: whether the product’s energy efficiency falls below or above baseline requirements, whether the product required the purchase of additional credits or payment of a fee to come into compliance, or a letter-based grading system to rate energy efficiency and environmental effects relative to a broad category of appliances.

Note that there may be slightly less concern about consumer confusion for industrial and commercial appliances and equipment as compared to general consumer products. However, even companies are ultimately run by fallible people who would benefit from more information and better context. Indeed, the agency routinely calculates consumer cost-savings for efficiency standards for commercial and

⁶⁰⁴ 76 Fed. Reg. 39,478, 39,488 (July 6, 2011).

⁶⁰⁵ <https://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label>

industrial equipment, suggesting that commercial actors are not always selecting the appliances that will maximize their long-term profits.⁶⁰⁶

Energy Efficiency Targets

While several non-industry commenters worried that a market-based approach might cause the appliance industry to fall short of regulatory targets for overall energy consumption, one industry commenter felt the opposite to be true. Acuity Brands, in fact, almost seemed eager for more stringent standards, explaining how a market-based system could let manufacturers shift their focus from the efficiency of individual products in a test setting and instead let manufacturers factor in the operational effectiveness of end-use installations. Acuity noted that, in that way, market-based approaches could lead to even more ambitious energy reduction targets.⁶⁰⁷ Acuity Brands stood alone in voicing support for such an outcome. To the contrary, most industry commenters probably feared that exact result: that market-based approaches would lead to increased stringency. For example, some industry commenters worried that a market-based approach would require manufacturers to over-comply significantly to create enough of a cushion in case of unexpected credit shortfalls, and such over-compliance would effectively increase the stringency of the standards at great cost to manufacturers.⁶⁰⁸ Such fears were at the heart of industry's legal arguments about the anti-backsliding provision and the threat of a two-tiered standard: a minimum floor for all products to meet, plus a more stringent additional target around which trading, averaging, and feebates could operate. Given this undercurrent running through many of industry's comments, we should examine the historical record of past marketable permit programs to ask: did they lead to increases in regulatory stringency?

Features of Marketable Permit Programs That Can Lead to Increased Stringency: The cost savings offered by marketable permit programs may enable regulators to set a more stringent cap than they could under prescriptive regulation, or may even break a political logjam blocking any regulation at all. Though it may not always happen, the cost savings of trading can be channeled back into more stringency:⁶⁰⁹ for any given total compliance cost that is politically acceptable, marketable permits can achieve greater stringency than traditional regulation. A set cap may also achieve targets with greater certainty and transparency versus technological design standards, which are prone to both under- and over-compliance.⁶¹⁰

Some evidence bears out these theories. Economists have specifically credited the acid rain market's cost savings as making dramatic cuts to sulfur dioxide pollution both possible and politically feasible.⁶¹¹ The lower costs predicted from trading were also instrumental in negotiating more stringent limits for ozone-depleting substances and California's RECLAIM program, as well as a faster phase-out timeline for lead in gasoline.⁶¹² EPA claims that trading similarly helped it increase stringency earlier for vehicle emissions standards.⁶¹³ The institution of tradable catch shares has sometimes, though not always, resulted in lower total allowable catches.⁶¹⁴

⁶⁰⁶ E.g., 77 Fed. Reg. 28,928, 28,972-28,975 (May 16, 2012) (calculating cost savings for standards for commercial heating, air-conditioning, and water-heating equipment).

⁶⁰⁷ Acuity, EERE-2017-BT-STD-0059-0041.

⁶⁰⁸ Joint Industry Comments, EERE-2017-BT-STD-0059-0060.

⁶⁰⁹ David Driesen, *Is Emission Trading an Economic Incentive Program?*, *supra* note **Error! Bookmark not defined.**

⁶¹⁰ Robert Stavins, *U.S. Cap-and-Trade System to Address Global Climate Change* 10 (Harvard Kennedy School Reg. Pol'y Prog. Paper 2007-04).

⁶¹¹ Dallas Burtraw & Erin Mansur, *The Effects of Trading and Banking in the SO₂ Allowance Market* 20 (Res. for the Future, Disc. Paper 99-25, 1999), <http://www.rff.org/documents/RFF-DP-99-25.pdf>.

⁶¹² Tom Tietenberg, *Tradable Permits in Principle and Practice* *supra* note **Error! Bookmark not defined.**

⁶¹³ EPA, *Manufacturer Performance Report for 2015 MY* (2015).

⁶¹⁴ Tom Tietenberg, *Tradable Permits in Principle and Practice* *supra* note **Error! Bookmark not defined.**

Marketable permit programs can also easily be designed to advance policy goals by requiring trading ratios greater than 1:1. For example, Maryland’s water quality trading program has adopted a retirement ratio of 1.1:1, meaning that for every 10 pounds of pollution emit, 11 offset credits must be purchased, with 10% of all credits bought automatically retired.⁶¹⁵ Similarly, EPA conditioned its approval of a regional cap-and-trade for haze in southwestern states on achieving “greater reasonable progress” in reducing regional haze compared to a non-market approach.⁶¹⁶ Though such retirement ratios can advance policy goals, they undermine efficiency by blocking otherwise efficient trades. Unlike trading ratios used to manage externalities or uncertainties, a retirement ratio imposes an artificial premium on the cost of off-site reductions compared to on-site reductions. When the off-site reductions are cheaper than on-site reductions, but not by more than the artificial premium imposed by the retirement ratio, an otherwise efficient trade will be blocked, resulting in continued reliance on the most costly on-site abatement.⁶¹⁷ If it is important for the marketable permit program to affirmatively advance policy goals beyond even the outcomes prescriptive regulations would achieve, increasing the overall stringency of the cap may be preferable to selectively distort the market through retirement ratios. Note, however, that if a regulator is unable to tighten the cap directly (as, for example, with some state-run water quality trading programs subject to caps set at the federal level by EPA), the regulator may consider whether the tradeoff between efficiency and policy goals justifies a retirement ratio.

Another market feature that can affirmatively further the program’s policy goals is open participation rules. By allowing anyone to participate in the market, public-minded groups or citizens can purchase and retire emission allowances, as they often do in the acid rain market.⁶¹⁸ Other programs have declined to allow such public participation. The National Oceanic and Atmospheric Administration believes, based on the legislative history of Magnuson-Stevens Act, that Congress did not intend for tradable fish share to become a mechanism to reduce the harvest by letting non-fishers buy and retire quota.⁶¹⁹

On the other hand, at least one statutory authorization of marketable permits explicitly prohibits using the cost-savings of trading to justify setting more stringent standards. The Department of Transportation is expressly forbidden from considering the availability of trading when setting the maximum achievable fuel economy standards for motor vehicles.⁶²⁰ When Congress wants to separate regulatory stringency from the efficiency of a market-based system, it knows how to do so.

Policy Performance of Past Marketable Permit Programs: Many marketable permit programs have achieved their policy goals as well or better than prescriptive regulation likely could have. Granted, care must be exercised in drawing conclusions from studies comparing the effectiveness of a market to a

⁶¹⁵ WRI, *Addressing Risk and Uncertainty in Water Quality Markets* (2014). EPA briefly considered requiring a 1.5:1 ratio for purposes of affirmatively improving water quality, Revisions to the National Pollutant Discharge Elimination System Program and Federal Antidegradation Policy in Support of Revisions to the Water Quality Planning and Management Regulation, 64 Fed. Reg. 46,058, 46,063 (Aug. 23, 1999), but ultimately abandoned the proposal, Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,586, 43,640 (July 13, 2000) (“the offset requirement, as proposed, is not the best mechanism to achieve progress in impaired waters in the absence of a TMDL”).

⁶¹⁶ Final Rule, Approval and Promulgation of State Implementation Plans; Wyoming, 77 Fed. Reg. 73,926, 73,927 (Dec. 12, 2012); Final Rule, Approval, Disapproval and Promulgation of State Implementation Plans; Utah, 77 Fed. Reg. 74,355, 74,357 (Dec. 14, 2012); Final Rule, Approval and Promulgation of State Implementation Plans; New Mexico, 77 Fed. Reg. 70,693, 70,695 (Nov. 27, 2012); Final Rule, Approval and Promulgation of State Implementation Plans; City of Albuquerque-Bernalillo County, 77 Fed. Reg. 71,119, 71,121 (Nov. 29, 2012).; see also 40 C.F.R. § 51.309(d)(4)(i); upheld by *WildEarth Guardians v. EPA*, 770 F.3d 919, 925 (10th Cir. 2014). NAAQS offsets also require affirmative progress on air quality through a greater than 1:1 offset ratio.

⁶¹⁷ Policy Integrity Letter on Water Quality Trading, *supra* note **Error! Bookmark not defined.**

⁶¹⁸ Tom Tietenberg, *Tradable Permits in Principle and Practice* *supra* note **Error! Bookmark not defined.**

⁶¹⁹ NOAA, *Catch Share Policy* (2010).

⁶²⁰ 49 U.S.C. § 32902(h) (but that only applies to trading, transferring, and the availability of credits, not to the backstop penalty).

hypothetical counterfactual regulatory system, as well as judging a program’s success or failure too early.⁶²¹ Furthermore, the causes of effectiveness or ineffectiveness should not be conflated: the environmental effectiveness of the Renewable Fuel Standards has been widely questioned, but due to the lifecycle emissions of ethanol⁶²² and rate-based nature of the cap,⁶²³ not because of the program’s trading elements. Additionally, in some contexts prescriptive regulations might not have been politically feasible, and so absent a market solution no policy goals would have been advanced.⁶²⁴

As summarized previously, there is some evidence that use market tools increased the stringency of regulatory programs. Economists have specifically credited the acid rain market’s cost savings with making dramatic cuts to sulfur dioxide pollution both possible and politically feasible.⁶²⁵ The acid rain market also achieved its emissions targets ahead of schedule.⁶²⁶ The lower costs predicted from trading were also instrumental in negotiating a more stringent limits for ozone-depleting substances and California’s RECLAIM program, as well as a faster phase-out timeline (by perhaps as much as six years⁶²⁷) for lead in gasoline.⁶²⁸ EPA claims that trading similarly helped it increase stringency earlier for vehicle emissions standards.⁶²⁹ The institution of tradable catch shares has sometimes, though not always, resulted in lower total allowable catches.⁶³⁰

Some general studies of environmental markets have found no environmental degradation resulting from major trading programs.⁶³¹ Harrington and Morgenstern’s comparative study finds “mixed” evidence of policy effectiveness, though it notes that the acid rain market’s strong compliance record suggests the program has been highly effective.⁶³² Ellerman concludes that the acid rain market, the NOx trading programs, and even the much maligned RECLAIM program performed better on environmental outcomes than prescriptive regulation would have.⁶³³ Ellerman identifies several features of the markets that contributed to policy effectiveness. First, the markets achieved strong reductions in the early years, accelerated by voluntary banking; prescriptive regulations would not have seen any voluntary early compliance actions. Second, there were no widespread exemptions or waivers or cap relaxations under the market programs; prescriptive regulations are often riddled with exemptions. Third, Ellerman alleges that implementation of prescriptive regulations would have been delayed by litigation, though it is possible the acid rain market only avoided major litigation because key decisions had been made in statute by Congress, not by agencies.⁶³⁴ Nitrogen oxide emissions under RECLAIM did

⁶²¹ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁶²² Ignacy Sachs, U.N. Conf. on Trade & Dev., *The Biofuels Controversy* (2007).

⁶²³ If the total demand for fuel increased—as some projections predict—total emissions will continue to rise. See Lienke & Schwartz, *supra* note **Error! Bookmark not defined.**

⁶²⁴ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁶²⁵ Dallas Burtraw & Erin Mansur, *The Effects of Trading and Banking in the SO₂ Allowance Market 20* (Res. for the Future, Disc. Paper 99-25, 1999), <http://www.rff.org/documents/RFF-DP-99-25.pdf>.

⁶²⁶ *Id.* at 7, 15; Stavins, *Market-Based Enviro. Policies*, *supra* note **Error! Bookmark not defined.**, at 7; H. Ron Chan et al., *The Net Benefits of the Acid Rain Program 1* (RFF 15-25, 2015).

⁶²⁷ Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, *supra* note 494, at 122-123.

⁶²⁸ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁶²⁹ EPA, *Manufacturer Performance Report for 2015 MY* (2015).

⁶³⁰ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁶³¹ Ellerman, *Are Cap and Trade Programs More Environmentally-Effective Than Conventional Regulation?*, *supra* note **Error! Bookmark not defined.** (citing Burtraw & Mansur 1999 and Swift 2000).

⁶³² Winston Harrington & Richard Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, *supra* note 494, at 122-123.

⁶³³ Ellerman, *Are Cap and Trade Programs More Environmentally-Effective Than Conventional Regulation?*, *supra* note **Error! Bookmark not defined.**, at 48.

⁶³⁴ *Id.* at 50, 52.

exceed the cap in one year during an energy crisis, but Ellerman argues prescriptive regulation would have fared no better.⁶³⁵

Allowing the public to participate in markets by purchasing and requiring credits, as with the acid rain market, directly advances the policy objectives. Retirement ratios, frequently seen with water quality trading,⁶³⁶ can do the same, though at the expense of the program's efficiency, as discussed above.

Other evidence of the effectiveness of marketable permit programs includes:

- In 2015, several water quality trading programs were phased out as cleanup goals were met.⁶³⁷ Other still active programs have had notable successes. EPA has recorded the following successes in water quality trading: in Long Island Sound, nitrogen removal was achieved ahead of the TMDL target; in the Lower San Joaquin River, selenium loading decreased in six of seven years; in the Southern Minnesota Beet Sugar Cooperative, trading resulted in more than double the required phosphorus reductions; in North Carolina's Neuse River Basin, the total nitrogen combined estuary loading was 50% of the allocation; and in Oregon's Clean Water Services program, trading significantly increased the pace and quantity of riparian restoration.⁶³⁸
- NOAA claims that annual harvest limits in fish catch share programs are rarely exceeded, because catch shares programs generally include increase monitoring.⁶³⁹ For the Gulf of Mexico red snapper fishery in particular, before establishing tradable catch shares, the fishery saw quota overruns in 11 of 17 years (from 1990-2006); since establishing the program, no quota overruns have occurred,⁶⁴⁰ and the ratio of landed fish to discarded fish improved by three to four times.⁶⁴¹ Katrina Wyman concludes that, while there is no empirical evidence of direct causation, "the health of U.S. fish stocks has significantly improved in roughly the past decade," and catch share programs may be partly responsible.⁶⁴² There is some empirical evidence that catch shares promote better stewardship of the resource among fishers, and that fisheries with tradable catch shares are less likely to collapse.⁶⁴³ The cost savings and increased profitability generated by the market system may also help fishers more readily accept the harvest limits necessary for rebuilding stock.⁶⁴⁴
- The Fish and Wildlife Service (FWS) reports that conservation banking is "generally perceived as successful" and often achieves net benefits to endangered species habitat.⁶⁴⁵ Similarly, President Obama conclusively stated that mitigation banks lower long-term risk to the environment.⁶⁴⁶ In a 2013 survey, 62% of FWS staff felt banks were generally effective at aiding species recovery, and another 18% felt banks did about as well as other mitigation options; only

⁶³⁵ Prescriptive rate-based regulations might not have even registered an increase in total emissions if rate was never exceeded and sources just upped their output, and the retrofits that would have been necessary to have prevented the exceedance would have been very costly. *Id.* at 57.

⁶³⁶ Maryland's water quality trading retirement ratio is 1.1:1, i.e. 10% of all credits bought are automatically retired. WRI, *Addressing Risk and Uncertainty in Water Quality Markets* (2014). Also, Offset ratios can be designed to explicitly to promote policy goals, as with NAAQS offsets, more than 1:1. Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**

⁶³⁷ Ecosystem Marketplace, *State of Watershed Investment* (2016).

⁶³⁸ EPA, *Water Quality Trading Toolkit*, Appendix A (2009) (but also noting that in Wisconsin Red Cedar, water quality improvement, if any, was unknown).

⁶³⁹ NOAA, *Economic Performance of U.S. Catch Share Programs*, NMFS-F/SPO-133 (2013).

⁶⁴⁰ Nat'l Marine Fisheries Serv., *Red Snapper IFQ Five-Year Review* (2013).

⁶⁴¹ Pew Envtl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁶⁴² Katrina Wyman, *The Recovery in U.S. Fisheries*, J. Land Use (forthcoming). Worldwide: Analysis of 20 IFQs in several countries found that 12 populations improved, while 8 continued to decline, though unclear whether improvement or declines could be traced to IFQ or just to development of strict catch share limits and other larger management plans. Pew Envtl. Group, *Design Matters: Making Catch Shares Work* (2009).

⁶⁴³ Katrina Wyman, *The Recovery in U.S. Fisheries*, J. Land Use (forthcoming).

⁶⁴⁴ *Id.*

⁶⁴⁵ Notice of Final Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016).

⁶⁴⁶ Presidential Memorandum, *Mitigating Impacts on Natural Resources from Development*, Nov. 3, 2015.

8% felt banks were generally ineffective.⁶⁴⁷ 57% of FWS staff felt additional species or habitats could benefit from banks.⁶⁴⁸ Because conservation banks require mitigation to be completed before selling credits, banking may provide more certain environmental benefits than permittee-responsible, on-site mitigation, which does not necessarily have to be completed in advance of the habitat impacts.⁶⁴⁹

- The record for permittee-responsible wetland mitigation in the 1980s was abysmal: one study found that 34% of the proposed mitigation [by acreage] had not been constructed, and that 93% of applicants were not in compliance.⁶⁵⁰ In 2001, the National Research Council concluded that the goal of no net wetlands loss was not being achieved under permittee-responsible mitigation, and that mitigation banks could offer advantages.⁶⁵¹

Not everyone agrees with this rosy depiction of marketable permit programs' policy effectiveness. Most prominently, Driesen argues there is little empirical evidence that trading has produced environmental results superior to traditional regulation.⁶⁵² In particular, Driesen asserts that a prescriptive approach to the lead phase-down would have produced the same result more quickly than trading.⁶⁵³ The effectiveness of wetland banking and water quality trading have also faced blistering critiques. In 2008, a consultant hired by EPA reported that of over twenty-five water quality trading pilots and programs, "very few" could claim any significant impact on water quality.⁶⁵⁴ Several environmental law experts question whether wetland banking has improved the environment at all.⁶⁵⁵ As of 2003, the literature suggested that the wetlands program had failed to achieve its goal of "no net loss."⁶⁵⁶ Limited agency resource for enforcement may be partly to blame.⁶⁵⁷ On the other hand, the Army Corps argues that any effectiveness problems at wetlands banks would be the same or worse at permittee-responsible mitigation, because of greater uncertainty; at least banks achieve some compensation before the destruction.⁶⁵⁸ And some of those critiques of marketable permit programs' policy effectiveness are now a decade or two out of date, and more recent data could change the conclusions.

Though not conclusive, there is support in the historical evidence that marketable permit programs may lead to increases in the stringency of regulatory standards. If this fear was motivating the appliance industry's opposition to adding market-based approaches to the ECS program, we can at least conclude that such a fear is not unfounded.

Conclusion

The history and experience with market-based compliance flexibilities in a variety of regulatory contexts undercuts many of the fears given as justifications for the appliance industry's opposition to the proposed addition of market-based compliance flexibilities to the ECS program. Market-based

⁶⁴⁷ DOI, Office of Policy Analysis, Preliminary Analysis of the Conservation Banking Program and Results from a Survey of USFWS Staff (2013).

⁶⁴⁸ *Id.*

⁶⁴⁹ DOI, Office of Policy Analysis, Preliminary Analysis of the Conservation Banking Program and Results from a Survey of USFWS Staff (2013).

⁶⁵⁰ 1991 FDER Study, cited by Corps-Jacksonville.

⁶⁵¹ NRC, Executive Summary (2001).

⁶⁵² David Driesen, *Is Emission Trading an Economic Incentive Program?*, *supra* note **Error! Bookmark not defined.**.

⁶⁵³ *Id.*

⁶⁵⁴ IEC, Water Quality Trading Evaluation, *supra* note **Error! Bookmark not defined.**. Note that the data is ten years old and predates EPA's water quality trading toolkit, which gave state regulators concrete guidance. EPA also commented, on the draft version of this report, that some water quality trading programs are designed specifically to include only a limited number of sources, and so a "significant" effect on overall water quality is not necessarily surprising; additionally, EPA commented that the difficulty with verifying credits is a relevant factor in this 2008 study's claims.

⁶⁵⁵ Tom Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note **Error! Bookmark not defined.**.

⁶⁵⁶ *Id.*

⁶⁵⁷ *Id.*

⁶⁵⁸ Corps-EPA Final Rule, *Compensatory Mitigation for Losses of Aquatic Resources*, 73 Fed. Reg. 19,593 (2008).

compliance flexibilities do not require explicit statutory authorization and do not necessarily create more legal uncertainty than other regulatory reforms. Possible constraints in the statutory language may be overcome, or Congress may be willing to grant new authority to adopt market-based programs or ratify a legally uncertain program. Market-based approaches should be able to lower marginal compliance costs and incentivize innovation in an industry like appliance and equipment manufacturing. Potential challenges with monitoring the creation and use of tradable credits have been overcome in other similar regulatory contexts.

Other possible reasons for industry opposition, whether stated or unstated in public comments on the regulatory proposal, may have more grounding in the lessons from other market-based programs. Market-based programs do have start-up administrative costs, and if industry wants the Trump administration's Department of Energy to prioritize other regulatory reforms or outright rollbacks, given limited agency resources, opposing the addition of market-based approaches may make some sense—though perhaps, in that case, industry should not have so thoroughly burned the bridge to future market-based reforms. The appliance industry may fear that market-based flexibilities could be the gateway to increased stringency of standards in the future. Some evidence from history bears out that fear as potentially legitimate. Yet there are ways industry could have argued to structure a market-based program to minimize the chances for that to happen. Finally, individual industry players may have feared the effects of market-based programs on their competitiveness within the industry. Historically, many concerns about the anticompetitive effects of market-based programs have broken down along the lines of large versus small firms; here, there may also be a division between domestic and foreign manufacturers.

However, both the Department of Energy and industry commenters also failed to consider a number of flexible compliance options and examples from history that may have attracted more support from industry. The Request for Information on adding market-based compliance flexibilities spent almost no time discussing flexible approaches that, in other contexts, have often attracted the broadest and strongest industry support, including banking and trading programs with grandfathered credit allocations. Both the Request for Information and industry commenters focused on the corporate average fuel economy standards and its sales-weighted credit tracking as a model for a potential ECS program, but EPA's averaging, banking, and trading program for mobile source categories of air emissions, and its use of production-weighted credit tracking, may actually provide a better model. The Department of Energy and industry failed to consider a number of similarly useful lessons that can be drawn from the experience with water quality trading, tradable fish catch shares, and other historical examples of market-based programs.

If the Department of Energy continues to pursue adding market-based flexibilities to the ECS program, it would do well to educate itself and industry about a fuller range of historical examples of where market-based flexibilities have worked, have attracted industry support, and have developed solutions to some of the very problems that industry has cited here.