March 26, 2018

To: Daniel R. Simmons, Principal Deputy Assistant Secretary, Energy Efficiency and Renewable Energy
CC: Daniel Cohen, Government Member of the Administrative Conference of the United States & Assistant General Counsel for Legislation, Regulation, and Energy Efficiency

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Subject: Comments on Adding Market-Based Flexibilities to the Energy Conservation Standards Program

I recently served as the consultant to the Administrative Conference of the United States (ACUS) on its recommendations to federal agencies on marketable permits.[1] The Department of Energy now seeks information on adding market-based compliance flexibilities to its Appliance and Equipment Energy Conservation Standards (ECS) Program, particularly in the form of credit trading, feebates, or intra-firm averaging. I submit these comments based on ACUS's recommendations and my research in my role as ACUS consultant. These comments are my own and do not necessarily reflect the views of ACUS members or staff.[2]

Market-based flexibilities have performed well in many regulatory context, by lowering compliance costs, incentivizing innovation, and easing administrative burdens without sacrificing policy objectives. In other regulatory contexts, however, market-based flexibilities may not improve economic efficiency or may undermine policy objectives to an unacceptable degree. Determining whether the ECS Program belongs to the former or the latter category will require a thorough empirical inquiry. The Department of Energy has begun to ask some of the right questions, but the agency has not answered any of them yet, and many additional questions must be tackled to determine whether and how to move forward with market-based flexibilities.

1. Will market-based flexibilities improve ECS's economic efficiency without undermining ECS's policy objectives?

The first inquiry the Department of Energy must undertake is to the define and empirically assess the problem: What is the yet-unrealized economic efficiency in the ECS program that the agency is trying to achieve with market-based flexibilities, and can that economic efficiency be achieved without compromising net social welfare, distributional fairness, or other policy goals?

Legal Requirements to Balance Economic Efficiency Against ECS's Purposes

Revisions to ECS regulations must begin with the statute. The agency is required to prescribe the maximum improvement in energy efficiency that is technologically feasible and economically justified, where economic justification is defined by whether total benefits exceed 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 . . .

[1] ACUS, Adoption of Recommendations, 82 Fed. Reg. 61,728 (Dec. 29, 2017). *Also available* at ACUS, Recommendation 2017-4, Dec. 14, 2017, https://www.acus.gov/sites/default/files/documents/Recommendation%202017-4%20%28Marketable%20Permits%29.pdf (hereinafter "ACUS Recommendations"). *See also* Jason A. Schwartz, *Final Report on Marketable Permits: Recommendations on Applications and Management* (Dec. 11, 2017), https://www.acus.gov/sites/default/files/documents/Marketable%20Permits%20Report-final.pdf (hereinafter "ACUS Consultant's Report").

[2] My other titles include adjunct professor and legal director at the Institute for Policy Integrity at New York University School of Law. These comments do not necessarily reflect the views, if any, of New York University. However, the comments are consistent with the views of the Institute for Policy Integrity.

conservation."[3] 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.[4] 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 <u>needs</u> to be taken into account**."[5]

To summarize, the statutory purpose of the ECS program is to reduce energy consumption while maintaining consumer choice and keeping compliance burdens below benefits, in order to save consumers money, advance energy security, and promote environmental objectives. Put another way, decreasing manufacturer costs as a goal unto itself is acceptable *provided* that it does not diminish net social welfare. Decreasing costs while simultaneously improving overall energy conservation would better advance the statutory purpose of the ECS program.

These statutory goals are reinforced by executive orders. Executive Order 12,866 instructs agencies to "assess available alternatives . . . including providing economic incentives . . . such as user fees or marketable permits."[6] But the same order also instructs agencies to adopt regulations only "upon a reasoned determination that the benefits of the intended regulation justify its costs,"[7] and to "maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity)."[8] More recently, Executive Order 13,783 requires agencies to balance the goals of energy independence with economic growth[9] and to reduce unnecessary regulatory burdens, where what is "necessary" is defined by the public interest and statutory requirements.[10]

In other words, market-based compliance flexibilities should advance ECS program objectives and increase net benefits, and not just minimize industry costs. A similar goal is reflected in ACUS's first recommendation on marketable permits, which instructs agencies to "carefully consider whether such a program will best achieve their policy objectives."[11]

Weighing Possible Economic Efficiencies Against Policy Objectives

Market-based mechanisms are typically deployed to reduce compliance costs, incentivize innovation, or ease administrative burdens, ideally with such economic efficiencies channeled back into advancing program objectives, perhaps by making a more stringent standard economically justified. The Department of Energy should clearly define and empirically assess which possible economic efficiency it seeks to advance. The agency should ask itself, for example:

- Do regulated parties or products have sufficiently differing compliance costs such that market-based flexibilities will help prioritize the lowest-cost abatement opportunities?
- Has it been difficult for the agency to accurately discern compliance costs for individual regulated parties and products?

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[3] 42 U.S.C. § 6295§ (o)(2)(A)-(B).

[4] 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.").

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

[6] Exec. Order 12,866 § 1(b)(3).

[7] *Id.* § 1(b)(6).

[8] *Id.* § 1(a).

[9] Exec. Order 13,783 § 1(a).

[10] *Id.* § 1(c).

[11] ACUS Recommendation #1; *see also id.* at page 2 (asking whether a marketable permit program is "the most suitable regulatory tool to achieve an agency's goal").

- Are there unrealized opportunities for low-cost abatement and technological advancement among products that are unregulated and unlikely to be regulated?
- Is consumer willingness-to-pay for efficiency (aided in part by the Energy Star program) insufficient to motivate innovation beyond the minimum standards in ways that would be socially beneficial?
- Will the economic justification for future improvements in energy efficiency for particular products depend on reducing costs to manufacturers?
- See the ACUS Recommendations preamble, at pages 2-3, for more questions to determine the suitability of marketable permits to a particular regulatory context.

Assuming the agency can clearly identify an opportunity for improved economic efficiency through use of market-based flexibilities, the next question is whether such flexibilities can be implemented without undermining program objectives or creating unintentional consequences including distributional concerns. (See ACUS preamble, at page 3, on determining when marketable permits are unlikely to be suitable to a regulatory context.) These issues are discussed in greater detail below, for example in the sections on currency and fungibility. But some initial examples of possible concerns will help frame the inquiry going forward.

The market-based flexibilities under consideration will allow some products on the market to be relatively less energy efficient than the baseline regulatory standard; to offset those less-efficient products, other products will be made to perform with even greater energy efficiency. **Such a marketplace could present several types of challenges for maintaining ECS's policy goals in the face of potential unintended consequences.** For example, through either consumer choice or information asymmetries, it is possible that the purchasers of the less efficient products may systematically be heavier energy users overall. Some manufacturers, for instance, may seek to trade off energy efficiency for performance, and those consumers demanding high-performance/low-efficiency products may be more frequent product users. Under such a market-based regulatory system, national energy consumption would increase as compared to a uniform standard for energy efficiency. Similarly, purchasers of less efficient products could systematically be concentrated geographically, as with a geographically concentrated industry with a willingness to trade off efficiency for other product attributes.[12] Under such a market-based regulatory system, localized energy demand could spike due to the purchasing preferences of local consumers, causing corresponding localized pollution increases compared to under a uniform standard for appliance efficiency.

Another potential problem warrants a more detailed discussion here: consumer choice and confusion.

The Risk of Consumer Confusion and the Need for Better Labels

One key concern about adding compliance flexibilities that will allow some products on the market to fall below the baseline regulatory standards is the risk of creating consumer confusion. As an energy expert at the Natural Resources Defense Council, Lauren Urbanek, has aptly observed:

> 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

[12] Some energy-intensive industries that use regulated equipment may be geographically concentrated. For example, data centers tend to cluster due to location of their customers and availability of cheap power. *See* Rich Miller, *Google Data Center Footprint Growing in Southeast*, Data Center Frontier, Jan. 20, 2016, https://datacenterfrontier.com/google-data-center-footprint-growing-southeast/; *see also* Tom Stabile, *Why Big Data Companies Are Building Sever Farms in Middle America*, Commercial Observer, Oct. 18, 2017, https://commercialobserver.com/2017/10/why-big-data-companies-are-building-server-farms-in-middle-america/ (reporting that Apple, Google, Microsoft, and Facebook have all located data centers in Iowa). Though data centers may seek out the most energy efficient equipment, a hypothetical shift in technological performance could change that, and other industries may have similar geographic concentrations.

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.[13]

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.[14] 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).[15] In this 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,[16] the appliance EnergyGuide label lacks several details that help consumers:

- 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,[17] 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.[18] 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

[13] https://www.nrdc.org/experts/lauren-urbanek/changes-standards-program-more-harm-good
[14] https://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label
[15] 83 Fed. Reg. 7593, 7604-7607 (Feb. 22, 2018).
[16] https://www.fueleconomy.gov/feg/Find.do?action=bt1
[17] 76 Fed. Reg. 39,478, 39,488 (July 6, 2011).
[18] https://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label

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 industrial equipment, suggesting that commercial actors are not always selecting the appliances that will maximize their long-term profits.[19]

The Case for Using Cost-Saving Flexibilities to Increase Energy Efficiency Standards

One rationale for adopting market-based flexibilities for the ECS program is if increase efficiency standards could become economically justified once costs to manufacturers are reduced. Note that it is not at all clear that such compliance cost savings are necessary to justify any tightening of current standards; some current standards may still not be set at the maximum efficiency that is technologically feasible and cost-benefit justified now, even without credit trading or feebates. At the same time, it is possible that market-based flexibilities could justify even greater improvements to energy efficiency standards.

Indeed, one way to address concerns that adding market-based flexibilities to the current standards will undermine goals like consumer savings and environmental outcomes is simply to tighten the overall standards in conjunction with adding market-based flexibilities. There is a long history of regulators channeling the cost savings of marketable permits back into furthering policy objectives, such that net regulatory benefits increase even as marginal regulatory costs decrease compared to the status quo. The following passage is from my consultant report to ACUS:

> 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: for any given total compliance cost that is politically acceptable, marketable permits can achieve greater stringency than traditional regulation. . . . Economists have specifically credited the acid rain market's cost savings as making dramatic cuts

[19] 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).

> to sulfur dioxide pollution both possible and politically feasible. 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. *EPA claims that trading similarly helped it increase stringency earlier for vehicle emissions standards.* The institution of tradable [fish] catch shares has sometimes, though not always, resulted in lower total allowable catches.[20]

Note especially that the stringency of the vehicle efficiency and emissions standards—the program the Department of Energy repeatedly cites here as a useful analogy to the ECS program—was informed by the cost savings from trading. Specifically, EPA writes: "**The [averaging, banking, and trading or 'ABT'] provisions are an integral part of the standard-setting itself, and not just an add-on to help reduce costs**. In many cases, ABT programs address issues of cost or technical feasibility which might otherwise arise, **allowing EPA to set a standard that is more stringent than could be achieved without the flexibility provided by ABT programs**. We believe that the net effect of the ABT provisions allows additional flexibility, encourages earlier introduction of emission reduction technologies than might otherwise occur, and does so without reducing the overall effectiveness of the program."[21]

The Department of Energy has already identified the vehicle ABT program as a useful analogy to—and even a kind of justification for—this new proposal on adding flexibilities to the ECS program. The agency should follow the lead set by the vehicle ABT program and use market-based flexibilities in the ECS program not just to reduce costs, but to help set the optimal energy efficiency standards.

2. Legal Authority and Procedure

As already noted, revisions to the ECS program must begin with the statute. Executive Order 12,866's instruction to consider market-based alternatives is cabined by the phase "to the extent permitted by law,"[22] and the preamble to the ACUS Recommendations also remind agencies that marketable permit programs must be within the agency's statutory authority.[23] The Department of Energy will need to confirm that it has sufficient authority to proceed.

Statutory authority for market-based flexibilities need not be explicit, and several prominent marketable permit programs are based on implicit statutory authority.[24] That said, the statutory framework for the ECS program contains at least one provision that could create some challenges to establishing a market-based mechanism: the anti-backsliding provision. **Feebates in particular could be hard to square with the statute's anti-backsliding requirements,** since a feebate system would allow manufacturers to pay to reduce the energy efficiency of individual products without any guarantee that the lost energy efficiency will be made up elsewhere in the market. The Request for Information suggests one way around the anti-backsliding provision is to layer a class- or category-wide average standard on top of a product-specific minimum standard, and only allow trading and averaging around the former, not the latter. That may satisfy the legal requirements, but as the Request for Information also notes, it would likely reduce somewhat the overall economic efficiency of the program. That said, the loss of economic efficiency could be moderate, depending on the relative stringency of the standards, and the net gains to economic efficiency may still be worthwhile even with a product-specific backstop standard.

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[20] ACUS Consultant's Report at 51 (citations omitted, emphasis added).

[21] EPA, *Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2015 Model Year* at 5 (2016), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100PKP1.PDF?Dockey=P100PKP1.PDF.

[22] Exec. Order 12,866 § 1(b).

[23] ACUS Recommendations at page 2.

[24] See ACUS Consultant's Report at 14-23.

The Department of Energy will have to consider carefully whether it has sufficient implicit statutory authority to create its desired form of market-based flexibilities, or whether the agency must ask Congress for additional authorities. The Department of Energy should communicate with EPA about how that agency's water quality trading guidance handles a similar anti-backsliding provision under the Clean Water Act—though the cross-statute comparison may have limits, as the Clean Water Act has specific exemptions[25] that do not apply under the EPCA. (See ACUS Recommendation #12 on coordinating with and learning from other agencies with more experienced on marketable permits.)

Assuming the Department of Energy has the statutory authority to propose revisions to the ECS program that add market-based flexibilities, the agency should make such changes through notice-and-comment rulemaking. ACUS recommends notice-and-comment rulemaking to create a marketable permit regime, "both in order to reduce uncertainty as to the permanence of the program and to gather public input that may prove beneficial in shaping the program."[26] With this Request for Information, the agency already seems to be properly headed down that procedural path.

The potential changes under consideration will almost certainly constitute a significant rulemaking, and as such **the agency should plan to undertake a full cost-benefit analysis on the addition of any market-based compliance flexibilities to the ECS program**. The Department of Energy should also conduct a trade impact analysis as part of its regulatory impact analysis, especially in light of the concerns about international trading and regulatory cooperation raised by the Office of Energy Efficiency at Natural Resources Canada in their comments.[27] Undertaking an assessment of impacts to international trade and regulatory cooperation is consistent with the agency's obligations under Executive Order 13,609.

3. Credit Currency and Trade Limits: Fungibility, Externalities, and Market Structure and Scope

If the Department of Energy identifies a concrete economic efficiency objective that market-based flexibilities can unlock, and if the agency confirms that it has sufficient statutory authority to implement market-based flexibilities, the next inquiry is whether a credit currency and trading structure can be established that do not create unacceptable negative externalities or negative distributional outcomes. All else equal, a broader market (i.e., allowing trades across manufacturers and across product categories) would be more efficient, as it will create more opportunities to identify the lowest-cost abatement option, aid in market liquidity, and reduce price volatility.[28] That said, constraints on the market's scope and or on types of trades allowed become necessary if a sufficiently fungible currency cannot be established, in order to prevent serious unintended consequences.

Credit Fungibility

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 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

[25] EPA, *Water Quality Trading Toolkit for Permit Writers* 11 (2009).
[26] ACUS Recommendation #3.
[27] https://www.regulations.gov/document?D=EERE-2017-BT-STD-0059-0018.
[28] *See generally* ACUS Consultant's Report.

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 may 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.

Other factors that the agency will need to consider as it creates a currency include: do different products have different rebound effect potentials, especially as energy efficiency is pushed far above or below the baseline standard due to trades?; **are different products used at different times of day, such that trades will shift energy demand and possibly create new demand spikes?; does the accuracy of estimates of lifespan and average energy use over that lifespan differ across products?**; do different manufacturers have different regional distribution networks for marketing their products?

Mechanisms to Counteract Lack of Fungibility

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. However, such restrictions will 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,[29] 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. 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 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.

[29] 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).

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."[30] So long as the more stringent standard remains cost-benefit justified and technologically feasible, this is likely the preferred approach, since it would not restrict any otherwise-efficient trades from occurring.

Market Structure: Credit Trading, Cap-and-Trade, Feebates, and Rates versus Quantity

Creating the currency for trading goes hand-in-hand with designing the market structure. The Request for Information proposes as possible options a credit trading structure (wherein manufacturers can generate as many credits for sale as they want by exceeding the energy efficiency requirements set by a baseline, product-specific standard) and a feebate system (wherein manufacturers with products falling below an efficiency "pivot-point" pay a fee, while products with better efficiency earn a payment). What the Department of Energy refers to as "averaging" is really just restricting a trading structure to intra-firm trades.

The Request for Information does not mention another classic structure for market-based flexibilities: the cap-and-auction or cap-and-trade system. Under a cap-and-auction program, the Department of Energy would determine how many credits to make available per compliance period, most likely based on total energy consumption over product lifetime. Though setting the proper cap can be administratively challenging, as it requires reasonably accurate predictions of consumer demand for products and lifetime energy use per products, these challenges can be overcome. Cap-and-auction or cap-and-trade systems, for example, have performed well in controlling power plant emissions, despite similar uncertainty over predictions for fluctuating electricity demand. There are many tools, such as credit banking and reserve pools, that can manage the uncertainty around setting the proper cap. Moreover, **because predictions about energy use over product lifetimes may already be necessary to operationalize other trading structures under consideration, such as inter-category credit trading, uncertainty around such predictions should not bar consideration of a cap-and-auction structure here.** Because cap-and-auction programs have advantages over other trading structures—by guaranteeing an energy conservation outcome and preventing windfalls to manufacturers that were going to increase efficiency anyway—the cap-and-auction structure deserves consideration by the Department of Energy. (See my ACUS report for more details on how permit auctions and other fee-based regulatory structures can be implicitly authorized by statute.)

Certain market structures cannot guarantee an overall reduction in energy use. For example, a feebate program cannot stop a disproportionate number of manufacturers from choosing to under-comply and pay the fee (rather than meet or exceed the standard), thereby collectively lowering overall energy efficiency.[31] Similarly, a rate-based trading structure would only limit the rate of energy used per

[30] *Id.*

[31] In theory, marketable permits and regulatory fees could be somewhat interchangeable, and setting the pivot point correctly could allow the agency to calibrate the stringency of a feebate system. However, marketable permits and regulatory fees may work differently under real-world uncertainty. "For example, uncertainty about abatement costs may mean that actual emissions reductions cost more than the regulator anticipated. In that scenario, a cap-and-trade program can still guarantee the desired environmental outcome by virtue of the hard cap on total emissions, but the increased demand for allowances will mean the program's total compliance costs will exceed expectations. Uncertainty over abatement costs interacts with a tax in exactly the opposite way: per-unit compliance costs will still be guaranteed because firms facing costly abatement options can opt to pay the set tax, but as more firms opt to pay the tax rather than abate, total emissions will exceed expectations. The same pattern occurs with uncertainty about future economic growth: a cap-and-trade program will

amount of activity, and not the total active use of the product, and so a rate-based program cannot guarantee a target level of energy conservation. Rate-based trading structures cannot counteract the potential for the rebound effect, nor can they offset an increase in overall consumer demand for appliances. By contrast, **a quantity-based cap or credit program, which limits energy consumed over a product's life rather than energy consumed per unit of appliance activity, can avoid certain rebound problems and better guarantee an overall energy conservation outcome**.

Certain market structures also raise problems of additionality: that is, rewarding manufacturers for improvements in energy efficiency they would have designed anyway, instead of rewarding only "additional" improvements. The feebate system most obviously directly rewards manufacturers with payments for improvements that they might have made anyway, but any system that allows manufacturers to generate and sell credits raises similar concerns. Setting the proper baseline is essential to ensure that trades or feebate payments are only for additional improvements to energy efficiency. See below for more details on additionality.

Other Elements of Currency Design

ACUS's second recommendation on marketable permits states: "Agencies should establish and publish clear guidelines containing all of the features of marketable permit programs, including expectations as to the longevity of marketable permits and the precise obligations or authorizations that they convey." **Part of proper credit design, therefore, is precisely defining obligations. One key obligation is liability.** Specifically: is the credit buyer or credit seller responsible if the credit turns out to be fraudulent or to not achieve the promised energy efficiency gain for any reason, such as product malfunctions, recalls, post-sale returns, or any other unanticipated development? In light of the recent scandal over Volkswagen using a defeat device to cheat on emissions tests—what if Volkswagen had used the defeat device to generate credits for sale?—clear parameters for liability are essential.

To the extent the Department of Energy uses the averaging, banking, and trading program for the vehicle efficiency and emissions standards as a guide, the agency should avoid any problematic design aspects of the vehicle ABT program. For example, that program does not fully reflect upstream emissions. When factoring environmental outcomes into currency design and fungibility, **the Department of Energy should count the full-fuel cycle energy use and emissions, including not only the energy used in generating and distributing electricity and natural gas, but the emissions produced in extracting, processing, and transporting fuels**. This approach is consistent with the agency's existing Full-Fuel Cycle methodology to estimate energy savings and reductions in greenhouse gas emissions from energy conservation standards.[32]

Other Factors on Setting the Market's Scope

As already mentioned, provided policy objectives and distributional goals are not compromised, a broader market is more economically efficient and therefore preferred. By allowing the full suite of potential trades—intra-firm averaging, inter-manufacturer trading, and inter-category, -class, and -fuel trading—a broader market would create more chances to identify and prioritize the lowest-cost abatement opportunities, improve liquidity, and control price volatility.

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continue to guarantee a limit on emissions even if demand for the polluting activities rises with economic growth; a tax, on the other hand, cannot stop firms from choosing to simply pay the tax to increase emissions in order to increase output. Some theories predict that marketable permits will perform better than fees in the face of imperfect enforcement; some theories suggest that when marketable permit prices fluctuate too much, fees are preferable for sending the kind of consistent price signals necessary for long-term capital investments." *See* ACUS Consultant's Report at 4.

[32] 76 Fed. Reg. 51,281 (Aug. 18, 2011) (statement of policy for adopting full-fuel cycle analyses into energy conservation standards program); *see also* Policy Integrity, Comments on Full Fuel Cycle Analysis, http://policyintegrity.org/documents/10.19_.10_Comments_on_DOE_Full_Fuel_Cycle_.pdf

Another advantage of a broader market relates to anti-competitive behavior. Manufacturers that directly compete in the appliance markets may be tempted to use the permit market to anti-competitive ends. For example, manufacturers could hoard credits to drive up permit prices and so increase their rivals' production costs in order reduce their rivals' share of the product market. **In a broader, unified market, any two actors competing in the permit market are relatively less likely to also be competing in the appliance market, as compared to in narrower, thinner markets.** It is also more difficult to hoard permits and corner the market in a broader, more liquid permit market. That said, **position limits on buying and holding permits may be desirable to further preempt attempts to corner the market**.

As another way to broaden the permit market, the agency should reconsider any exemptions to energy conservation standards that may have previously been created for small businesses under the Regulatory Flexibility Act. Market structures like a cap-and-auction program effectively place all manufacturers on relatively equal ground, facing the same per-permit compliance costs, such that some small business exemptions may no longer be justified.

4. Setting Caps, Baselines, and Allocations

Setting and Reevaluating the Appropriate Target Over Time

Setting the right target from the start is of paramount importance. As already noted several times, the level of stringency is crucial to avoid problem with fungibility, externalities, and additionality. Under its statutory authority, the Department of Energy should continue to select the maximum efficiency standard that is technologically feasible and cost-benefit justified.

Fine-tuning the standard over time as technology improves and economic conditions change is always important, but may be especially important in establishing a market-based regulatory system. **The confidence of the public and regulated parties in the permit market's economic efficiency and policy effectiveness may depend on the agency's ability to adjust targets as information comes in on the market's performance in early years.** The preamble to the ACUS recommendations notes the importance of an agency having in place the resources and commitment to reevaluate the appropriate target level of activity over time. ACUS's tenth recommendation advises agencies to collect the data necessary to assess the market's economic efficiency and policy effectiveness over time, and the eleventh recommendation instructs agencies to publish appropriate data to help the public also gauge program effectiveness.

Though the statute requires the agency to reconsider standards at least every six years,[33] there is an ongoing pattern of the agency often missing deadlines.[34] **The Department of Energy should move forward with a market-based program only if it can make firm commitments to collect the necessary data to reevaluate the standard and to conduct such a review in a reasonable time.** At least every six years is required, but perhaps every few years would be more advisable during the program's early years. One way to make a firm commitment to review the standards is to create consequences for failing to review, such as prospectively scheduling automatic increases to the standard's stringency (within the bounds of statutory criteria) if no review is completed on time.

Additionality: Baseline, Offsets, Credit Stacking, and Leakage

ACUS's sixth recommendation on marketable permits advises agencies to "verify[ ] that credits represent *real* offsets from regulated activity."[35] As my report as consultant to ACUS further explains, to

[33] 42 U.S.C. § 6295(m).

[34] Appliance Standards Awareness Project, *Missed Deadlines for Appliance Standards*, https://appliance-standards.org/sites/default/files/ASAP_Overdue_Standards_January_2018.pdf

[35] ACUS Recommendation #6 (emphasis added).

be "real," credits must be "additional," quantifiable, sufficiently certain and permanent, and not double counted.[36]

Additionality and Baselines: An additional credit reflects actions that would not have occurred without the financial incentive provided by the regulatory market. In other words, if a manufacturer would have increased appliance efficiency above the baseline standard no matter what, rewarding that increased efficiency with credits would be neither additional nor real. As another example, if different standards are set based on appliance size or weight, manufacturers could be incentivized to alter their appliances' size such that a less stringent baseline standard would apply, allowing the manufacturer to earn more credits—but such credits would be neither additional nor real.[37]

Additionality concerns have long plagued marketable permits programs. For example, in the vehicle efficiency credit program, some credits are currently awarded to firms that have historically and voluntarily over-complied with their regulatory standards anyway.[38] Some analysts have argued that, because credits banked early under the vehicle ABT program will expire and because the stringency of the vehicle efficiency standards will increase over time, such problems of additionality will be minimized over the long term.[39] **The Department of Energy should consider following the vehicle ABT program's response to additionality by setting expiration dates for banked credits and by prospectively planning to increase the stringency of the baseline standards over time**.

Quantification and Uncertainty Trading Ratios: Related to additionality, another risk is awarding credits for energy conservation outcomes that ultimately do not materialize as planned. Most importantly, the calculations used to assign credits, such as estimates of energy use over product lifetime, will likely be methodologically challenging and subject to uncertainty.[40]

In other marketable permit programs, like water quality trading, regulators facing uncertain quantifications of credits often turn to trading ratios. **Trading ratios adjust for uncertainty by requiring more credits than even the best available quantification tools would predict are needed to offset the regulated activity.** 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. EPA also advises state water quality regulators to apply conservative assumptions to credit calculations as appropriate to buffer against uncertainty. The Department of Energy should consider the role of trading rations and conservative assumptions to respond to uncertainty around credit quantification and outcomes.

Leakage and Permanence: Credits must represent some degree of permanence and guaranteed execution. Product malfunctions that change energy consumption, product recalls that take credit-generating appliances off the market, post-sale returns, or other various unanticipated developments could result in credits not delivering the expected energy conservation results over time. Such issues underscore the importance of consistently monitoring both the permit and product markets.

The classic type of leakage in permit markets—where a project earns credits for reducing an activity that ultimately is just shifted elsewhere, like rewarding carbon credits for saving a forest from logging even

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[36] ACUS Consultant's Report at 55-57.

[37] In their comments, Resources for the Future notes that, in vehicle regulation by weight, manufacturers may increase weight to lessen their fuel economy requirements, and note that standards for refrigerators, for example, are currently partly by size. https://www.regulations.gov/document?D=EERE-2017-BT-STD-0059-0025.

[38] See ACUS Consultant's Report at n.486, and p.55 for other examples.

[39] Benjamin Leard & Virginia McConnell, *New Markets for Pollution and Energy Efficiency: Credit Trading under Automobile Greenhouse Gas and Fuel Economy Standards*, (RFF Paper).

[40] As Resources for the Future and other commenters note, tracking credits by, for example, calculating lifetime energy use, is a non-trivial and potentially costly undertaking for administrators.

as the same level of logging simply shifts to another forest—may not have an immediately obvious analog in the appliance context. However, a somewhat related issue could easily arise. Currently, appliance manufactures that sell in the U.S. market make products that all meet minimum efficiency standards, and due to economies of scale likely sell some similar products with similar efficiencies abroad, even in foreign markets that do not necessarily have similar regulatory standards for efficiency. However, the compliance flexibilities contemplated in this Request for Information will allow some manufactures to make less efficient products for sale in U.S. markets. **Due to the same economies of scale, those manufacturers may also export similarly less efficient products to foreign markets that lack minimum standards for efficiency. In that way, adding compliance flexibilities to the U.S. ECS program could affect worldwide energy usage, and associated emissions, in negative ways**. Because some potential emission increases abroad, including foreign increases of greenhouse gases and mercury pollution, will directly affect U.S. public health, environmental quality, and social welfare, the Department of Energy should carefully consider the negative repercussions of any such international leakage caused by adding compliance flexibilities to the ECS program.

Double Counting and Credit Stacking: A new permit market for the ECS program could interact directly or tangentially with other regulatory and voluntary credit markets. In particular, ECS credits could become linked with renewable energy credit markets and greenhouse gas credit markets. For example, North Carolina allows utilities to use energy efficiency programs to meet a portion of their REC (renewable energy credit) requirements.[41] Credit stacking could occur if a single project is allowed to generate credits for sale both in the ECS permit market and in some other related permit market. The concern here is essentially a variation of additionality: by allowing the same activity to count as credit in two different programs, are regulators inefficiently rewarding behavior that would have happened anyway?

The Request for Information begins to ask the right kinds of questions, by calling for information on how compliance flexibilities for the ECS program would interact with EnergyStar and utility product rebates. **The Department of Energy should complete the inquiry by thoroughly surveying how compliance flexibilities for the ECS program could interact with other state-based, federal, or voluntary permit markets, including for renewable energy credits and greenhouse gas credits**.

Offsets: The preamble to the ACUS recommendations recognizes that one advantage of marketable permit programs is tapping into unrealized opportunities for significant technological developments by unregulated actors. Unregulated appliances with the potential for important technological developments include set-top boxes and televisions, among other key categories.[42] **The Department of Energy should carefully consider whether to allow unregulated appliances to generate offset credits.** On the one hand, offsets can greatly enhance a market-based program's overall economic efficiency and can spur innovation in otherwise unregulated sectors. On the other hand, offsets—like all credits—must be verified as real, and the additionality of offsets can often be challenging to monitor.

[41] 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).

[42] *See* Peter Ross, *Appliance & Equipment Efficiency Standards: A Roadmap for State & Local Action* (2017), http://columbiaclimatelaw.com/files/2017/07/Ross_2017-07_Appliance-Equipment-Efficiency-Standards-Working-Paper-RFS.pdf (listing unregulated products, including service lamps, 3-way incandescent lamps, certain general service lamps, shatter-resistant lamps, circulator pumps, computer and battery backup systems, fans and blowers, hearth products, high-intensity discharge lamps, light emitting diode lamps, luminaires, manufactured housing, set-top boxes, televisions).

Temporal Allocation Issues: Banking, Compliance Deadlines, and Reserves

Allowing manufacturers to bank credits for use in future compliance periods can be crucial to letting regulated sources hedge against permit price volatility and unexpected economic changes. On the other hand, current regulated activities may not be perfectly fungible with regulated activities far in the future, and banking can increase the incentive for noncompliance, because any permits not cashed in at the end of a compliance period still have value in future years. For example, in the gasoline lead phase-down trading program, banking credits lead to a strong incentive in the program's early years for fraud and noncompliance. As mentioned above, having expiration dates for early banked credits, as in the vehicle ABT program, may be important to addressing additionality in that permit market.

Another temporal issue is how the agency should time the awarding of credits versus compliance deadlines. Credits could be awarded—in order of increasing certainty about the realness of credits—based on future sales predictions, at the time of sale of products, at the end of a quarterly or yearly sales period, or over time as products' lifetime energy usage is checked and verified. Depending on such choices, **the Department of Energy should consider requiring manufacturers to hold a reserve of excess credits to make up, in near-real time, for any unanticipated shortfalls in earned credits at the end of a compliance period**. Unused reserves could then be banked as credits for future compliance periods, perhaps for a limited duration. ACUS's ninth recommendation advises agencies to consider both reserve pools and permit durations as tools to manage price volatility, but they are also useful to manage uncertainty about compliance obligations.

Allowing Facilitators and the Public to Participate

The Department of Energy will need to determine who can purchase and sell credits. ACUS's fourth recommendation advises agencies to allow market facilitators and the general public to participate in markets, in order to promote liquidity and price discovery.

5. Oversight

ACUS offered several detailed recommendations on oversight of permit markets that the Department of Energy should closely consider.

ACUS Recommendation 5: The oversight of secondary permit and derivative markets can present challenges for an agency with relatively limited experience overseeing such markets. The Department of Energy should, as ACUS's fifth recommendation advises, consider working with other agencies with valuable experience in such areas, like the Commodity Futures Trading Commission on oversight of secondary and derivative markets, and the Federal Trade Commission and Department of Justice on possible anti-competitive effects resulting from the interaction of the appliance product market and ECS permit market.

ACUS Recommendation 6: To ensure compliance with marketable permit programs, agencies need to track permit ownership and transaction, and verify credits. As further explained in the consultant report, unique serial numbers are advisable, as is near-real time tracking. One key question for the ECS program will be whether current efficiency test procedures are adequate for purposes of verifying credits. The Department of Energy may also consider employing third-party verification for awarding and monitoring credits, and ACUS's recommendation includes further guidance on use of third-party credit verifiers.

ACUS Recommendation 7: In designing market-based flexibilities, agencies should ensure it has the resources and regulations to require noncompliant parties to come into compliance, with sanctions that

are of sufficient certainty and size to deter noncompliance.[43] The Department of Energy will have to analyze whether its current sanctions are adequate to deter noncompliance after factoring in the profit motive that a credit trading or feebate system adds to the regulated parties' calculus on compliance.

ACUS Recommendations 8 and 9: Agencies should develop adequate oversight tools to prevent fraud, manipulation, and extreme price volatility in permit markets. The Department of Energy should, for example, learn from EPA's experiences with volatility and claims of manipulation in its Renewable Fuel Standard credit market. In addition to circuit breakers and safety valves, the Department of Energy should consider setting position limits for purchasing and holding of credits.[44]

ACUS Recommendations 10 and 11: The Department of Energy should plan to collect and disseminate data on the operation of its market-based flexibilities, including data on transactions, prices, holdings, and compliance rates. Timely dissemination of sufficient data is essential to facilitate price discovery and allow market actors to make efficient decisions,[45] and to allow the public to assess the effectiveness of the program in efficiently meeting regulatory objectives.

ACUS Recommendation 13: The Department of Energy should develop a clear communications policy for announcements about design or enforcement issues for any market-based program, to prevent information asymmetries that could move the market. One such potential issue is announcements over pilot programs and phasing in covered products over time.

6. Criteria for Pilot Program

The Request for Information asks for suggestions on designing a pilot program. Several criteria can be drawn from these comments, including:

- The agency should be reasonably confident that a sufficiently robust market is feasible for the product(s) chosen for a pilot program. This requires interest and participation by regulated entities that have, or can develop, sufficient knowledge to make efficient decisions in the market. Both the number of regulated entities and number of potential market facilitators will factor into this assessment.
- The agency should be able to make reasonably accurate estimates of energy use over the chosen product's lifetime, to facilitate studying fungibility issues with different currency designs.
- The agency should be certain that the product chosen for the pilot will not result in consumer confusion. The best way to mitigate potential consumer confusion, even among industrial and commercial customers, is to improve the label design for the chosen product.
- To mitigate concerns about fungibility, additionality, and uncertainy, the agency should select for the pilot study a product for which the baseline standard's stringency can be increased as the market-based flexibilities are brought online.

Finally, the success or failure of a pilot study should not be judged too quickly, as it takes time for permit markets to develop.

Sincerely,

Jason A. Schwartz

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[43] By comparison, there is considerable uncertainty over the size of EPA's penalties for noncompliance with its vehicle emissions trading program. *See* Leard & McConnell.

[44] *See* ACUS Consultant's Report.

[45] *See id.* (on relative lack of transparency over prices in the CAFE/ABT program).