2010

Energy Policy for an Economic Downturn: A Proposed Petroleum Fuel Price Stabilization Plan

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A compelling case can be made for reducing America's consumption of petroleum fuels. Nearly all analysts think that the way to slash consumption of petroleum fuels is through an end-user tax. There is, however, widespread public opposition to higher gasoline taxes. Furthermore, in a recession the appropriate fiscal policy is to cut taxes, not to raise them. This paper proposes a method of stabilizing petroleum fuel prices at a sufficiently high level, without reducing aggregate consumer purchasing power. We introduce a revenue-neutral petroleum fuel price stabilization plan, called the "PFPS" plan for short. Under this plan, a government surcharge on the price of oil would phase in and out in an inverse relationship to changes in world oil prices, such that retail prices would rise with increases in the price of oil but would not appreciably fall when the price of oil declines. Any levies collected under the plan would be fully refunded to consumers pro rata. We describe the advantages of such a plan relative to a Pigouvian tax or a program of subsidies and regulatory mandates, as well as its disadvantages. One advantage is that it might incur less political opposition than a tax, because the share of GNP devoted to government would not change (given full refundability), and the government would not be imposing a new cost on voters, but only depriving them of contingent benefits associated with future oil price declines.
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Energy Policy for an Economic Downturn

Introduction

A compelling case can be made for reducing America’s consumption of petroleum fuels. The combustion of petroleum fuels is associated with a variety of external costs, most prominently, but not exclusively, the emission of greenhouse gases that contribute to climate change. The fact that nearly two-thirds of petroleum fuels are imported also has serious implications for national security, by making the United States vulnerable to supply interruptions, and by underwriting oil-rich dictatorships and regimes hostile to American interests. Finally, the heavy dependence on petroleum fuels threatens the economy, as oil price shocks have contributed to three major recessions in the last forty years, including the recession that began in 2008.

We do not believe that targeted government subsidies and regulatory mandates represent an effective strategy for reducing petroleum fuel consumption. The history of such efforts is not auspicious. Subsidies for oil shale in the 1970s cost taxpayers billions of dollars with negligible results. The Corporate Average Fuel Economy requirements for automobile manufacturers, first imposed in the 1970s, promoted a shift from cars to minivans and sport utility vehicles (SUVs), but have had at best a modest impact on aggregate fuel consumption. More recent efforts to promote ethanol production have probably resulted, on balance, in a net increase in energy consumption. Conceivably today’s fashionable ideas, such as subsidies for wind and solar power and for purchasing hybrid vehicles, will fare better. But history suggests that Congress, which will ultimately determine the beneficiaries of targeted subsidies and mandates, has no comparative advantage in picking technological winners and losers. Marching down this road again may result only in wasted resources and further delay in achieving real progress.

Among serious policy analysts, there is nearly uniform support for the proposition that the most efficient way to slash consumption of petroleum fuels is to increase prices. Higher fuel prices should trigger millions of individual adjustments on countless margins, involving which car to drive out of the driveway, whether to make an extra trip to the store for that last dinner item, whether to work at home one day a week, and the like. Over the longer term, the response to higher prices should be even more dramatic, as consumers make different decisions about what kind of car to buy, where to live, and whether to form a car pool, and as entrepreneurs and investors compete to develop promising alternative energy ventures.

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1 See David Pimentel, Ethanol Fuels: Energy Balance, Economics, and Environmental Impacts Are Negative, 12 NAT. RESOURCES RES. 127, 128 (2003) (estimating that "29% more energy is used to produce a gallon of ethanol than the energy in a gallon of ethanol").
Recent extreme swings in oil prices appear to corroborate these predictions, at least for the short term. In the first half of 2008, world oil prices soared, peaking at $147 per barrel in the summer,\(^2\) which caused prices of gasoline at the pump to soar above $4.00 per gallon.\(^3\) As fuel prices rose, Americans drove fewer miles.\(^4\) In the second half of 2008, a major credit crisis plunged the world into a deep recession, and oil prices collapsed. By December, prices had fallen to below $40 per barrel—a dramatic decline of more than two-thirds in under six months. Again, the pricing system worked as predicted, and consumption of fuels began to rise, even though the depressed state of the economy kept consumption from reaching pre-recession levels.\(^6\) In 2009, prices rebounded substantially, although not to their prior highs.

Nearly all analysts think that the way to achieve a price increase that would slash consumption is through an end-user tax. In an ideal world, such a tax would be set at a level equal to the marginal social costs of consuming petroleum fuels, which would cause consumers to “internalize” these costs in making relevant decisions. This is referred to as a "Pigouvian" tax, after the economist who first proposed corrective taxes of this sort.\(^7\) High end-user taxes are common elsewhere in the world,\(^8\) and have had the expected effect of reducing per capita consumption of petroleum fuels relative to American levels.\(^9\)

The problem with pursuing this policy is widespread public opposition to higher gasoline taxes in the United States.\(^10\) In the last

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\(^1\) See Bruce Crumley, *Think Gas Is High? Try Europe*, TIME, May 28, 2008, http://www.time.com/time/world/article/0,8599,1809900,00.html (noting that in May 2008, taxes represented 70% of the price of gasoline in France and the United Kingdom, and only 11% in the United States). Indeed, even China announced in December 2008 that it was increasing its gasoline tax fivefold, from 0.2 yuan per liter (or approximately $0.15 per gallon) to 1 yuan per liter (or approximately $0.65 per gallon). Michael Kitchen, *China Plans Drastic Hike for Gasoline Taxes*, MARKETWATCH, Dec. 5, 2008, http://www.marketwatch.com/news/story/china-raise-gasoline-tax-five-fold/story.aspx?guid=%7B417ASOBB-2E4E-4BB8-8C17-AA8431743446%7D.


\(^6\) See ENERGY INFO. ADMIN., supra note 3.


presidential election, no major candidate advocated raising petroleum fuel taxes. The only significant discussion focused on whether to *forgive* these taxes in a temporary tax "holiday."¹¹ The economic recession provides an additional—and entirely legitimate—objection to higher fuel taxes. In a recession the appropriate fiscal policy is to cut taxes in order to enhance consumer purchasing power, not to raise taxes. Thus, even if a Pigouvian gas tax is otherwise politically feasible, it is not a good idea to impose one in the midst of a major recession.

What is needed is a method of stabilizing petroleum fuel prices at a sufficiently high level without reducing aggregate consumer purchasing power. This Article proposes to achieve these objectives with a revenue-neutral petroleum fuel price stabilization plan, called the "PFPS" plan for short. Our proposal offers many of the important benefits of a Pigouvian fuel tax, but does not reduce aggregate consumer demand and, we believe, has other important incentive effects and political advantages relative to a Pigouvian tax.

The essential idea is to set a floor under the price of gasoline. If the market price fell below this threshold, then consumers would pay an additional levy on petroleum fuels (which we variously call a "charge" or "contribution") to make up the difference. As world oil prices fell, the levy would rise; conversely, as world oil prices rose, the levy would fall; when world prices reached a high enough level, the levy would phase out completely. The net effect, essentially, would be to keep petroleum fuel prices from declining below the price floor. For example, suppose the PFPS plan were designed to stabilize the price at a floor of $3.50 per gallon. If world oil prices declined to the point where the market price fell to $3.00 per gallon, the PFPS contribution would kick in and raise the price by $0.50 per gallon. If world oil prices rose so that the market price were $3.75 per gallon, the levy would kick out and the price would be $3.75.¹²


¹² Our proposal is a "one-way" price stabilization system, which limits downward movements in retail petroleum prices (associated with falling world oil prices) but does not restrict upward movements (caused by rising world oil prices). This is because we are primarily interested in internalization of social costs associated with excessive consumption. In theory, one could also implement a "two-way" version of the plan, which would stabilize prices in the upward direction as well, perhaps to maintain consumer confidence and avoid economic disruptions caused by price shocks or asset bubbles. See Arvind Subramanian & John Williamson, *Put the Puritans in Charge of the Punchbowl*, FT.COM, Feb. 11, 2009, http://www.ft.com/cms/s/0/d21fa536-f850-11dd-aae8-000077b07658.html (questioning whether some sort of outer limits on the prices of commodities, housing, and other assets may be needed to prevent repeated price bubbles). We are skeptical of the two-way version for a variety of reasons, including concerns about the increased complexity of such a plan, how it would be funded, and whether it would interfere with the microeconomic signals provided by the one-way version.
It would be impractical to use the PFPS plan as a source of revenue for government programs, and thus to convert the charges into a true tax. This is because the contributions would be very unpredictable, depending on the ups and downs of world oil prices. If the floor were set at $3.50 per gallon and world oil prices returned to the levels reached in 2008, the PFPS plan would generate zero revenue. In part for this reason, and in part to eliminate any fiscal drag from the PFPS charges, we propose that any revenues collected be fully refunded to consumers pro rata. This aspect of the proposal (which we variously call "refunds" or "benefits") could be administered by the IRS in a manner analogous to recent refundable credit proposals. While consumers as a group would experience no net decline in purchasing power under PFPS, individuals, of course, would be affected: those who consume less than the average amount of gasoline would enjoy a net benefit, while those who consume more would incur a net cost. Thus, the aggregate effect of the PFPS plan would be to create a systematic and long-term incentive to reduce petroleum fuel consumption with a neutral fiscal impact.

What are the social policy implications of adopting this plan? Our proposal would signal to consumers, auto manufacturers, and investors in alternative energy technology that petroleum fuel prices would not decline below the floor price in the future. Armed with this information, consumers, manufacturers, and energy investors would commit to making fundamental changes in their behavior and their investments in new technology—without need of targeted government subsidies—because they would know that their investments would not be undermined by a future collapse in petroleum fuel prices. Such assurances are crucial, as recent events have shown. If our proposal had been enacted in July 2008 with a floor price of $3.50 per gallon, it would have had an extraordinary impact, keeping consumers focused on the need for more fuel-efficient cars and preventing the failure of a host of alternative energy ventures. Yet without a stabilization program in place, the wild fluctuation in oil prices in 2008 has left investors and consumers all the more wary of investing in energy efficiency going forward. Recent announcements of cancellations of new ethanol plants—*notwithstanding* large government regulatory incentives and tariff protections for domestic ethanol production—make the point only too clearly.¹³

Our proposal also has significant political advantages over an ordinary excise tax increase or a carbon tax. To the extent that opposition to gas taxes is grounded in concerns that they will dampen private economic activity or encourage the growth of government, the inability to harness the PFPS plan as a stable source of government revenue and the refund

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feature of the plan address these concerns. Moreover, if the floor on gas prices were set below the level of gas prices when the program was enacted—something that is easy to do when prices are high—then voters could take comfort in the fact that they would never have to make any payments under the program as long as oil prices did not decline. A policy change that threatens to deprive voters of only a hypothetical future benefit—in the form of falling gasoline prices—and that would be revenue neutral if it did have this result, should encounter less opposition than proposals like President Clinton’s BTU tax of 1993, which promised to raise everyone’s energy bills in order to sustain government programs.14

Of course, if the price floor were set at a low level, the program would have less impact. This likely would be the case if the plan were adopted at a time when gas prices were low, and the price floor was kept at a level below the market price. In response, our proposal could be adjusted in a range of ways, although each presents a tradeoff between regulatory impact and political feasibility. The minimal adjustment would be to index the floor for inflation. Other options would include delaying implementation of the program until gas prices reach a designated high level; adopting a schedule that phases in a progressively higher floor over time; or establishing an automatic reset mechanism that would cause the floor to rise with rises in oil prices, but block retail prices from moving back downward when oil prices fall. Yet even if all these options were rejected, our proposal would still have some effect, even if adopted at a relatively low level when oil prices were low. Moreover, once the program was in place, if public acceptance grew, Congress could always revisit the issue and raise the floor or adopt one of the options for progressively raising the threshold. In that case, putting the program in place is a crucial first step.

The core of our PFPS plan—the idea that an additional charge should apply to energy purchases when market prices are low but not when they are high—has been floated in one form or another by a variety of commentators.15 A variant on the idea was also briefly proposed by the

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14 For an excellent case study of the fate of the BTU tax, see William N. Eskridge, Jr., Philip P. Frickey & Elizabeth Garrett, Cases and Materials on Legislation: Statutes and the Creation of Public Policy 485-508 (4th ed. 2007). In addition to citing its environmental advantages, the Clinton Administration sought to win support for the BTU tax primarily as a deficit reduction measure, not to fund specific new programs. In this sense the argument was that the tax was an alternative to reduced government spending.

Carter Administration in the late 1970s. As far as we are aware, however, no one has sought to spell out in any detail why such a proposal is justified, and how it might be structured and implemented. That is the objective of this Article.

Part I offers a summary of our proposal. Part II develops the advantages of the proposal. Like a Pigouvian tax, our PFPS plan would reduce consumption of gasoline, which would have positive effects on the environment, national security, and urban sprawl and congestion. Yet, as compared to a Pigouvian tax, it would stand a greater chance of gathering political support, while also lending greater stability to petroleum fuel prices. Moreover, because the PFPS contributions would be refunded, the plan generally would not reduce consumer purchasing power or distort the distribution of income or incentives to work and save.

Part III describes the plan’s disadvantages, including the risk that it would be repealed, and that consumers and producers would discount it accordingly. We also consider the possibility that adopting a floor on the price of gasoline would allow producers (including OPEC) to raise prices to a level just above the floor, in effect expropriating the refund checks consumers would otherwise receive. We show how this problem can be avoided by pegging the program to global crude prices instead of local retail prices, and by adjusting the contribution level monthly instead of continuously. Finally, we highlight ways in which our PFPS plan is less comprehensive than a Pigouvian carbon tax. It does not try to set contributions equal to the marginal social harm caused by the relevant externalities, as an ideal corrective tax would, and it also does not reach some substitutes for gasoline, such as natural gas and coal.


16 See James N. Naughton, Carter Shaped Energy Plan with Disregard for Politics; He Vowed to Curb Nation’s Use of Fuel ‘Even If It Costs Me Another Term,’ N.Y. TIMES, Apr. 24, 1977, at 1 (recounting a Carter Administration proposal to impose successive five-cent increases in gas taxes each time the country exceeded a national consumption goal; the taxes would be refunded in the form of income tax credits). See generally Joseph J. Thorndike, Take It Away and Give It Back: The History of Refundable Gas Taxes, TAX ANALYSTS: TAX HISTORY PROJECT, http://www.taxhistory.org/tpg/readings.nsf/artweb/6b51901d5294beb852571a20068ed15?opendocument (tracing the history of the Carter proposal).
I. A Summary of the PFPS Plan

The federal excise tax on gasoline is currently 18.4 cents per gallon.\textsuperscript{17} We propose to designate that tax rate as a minimum, and to provide for a supplemental charge—the PFPS contributions—that would take effect in the future to offset declines in the retail price of gasoline below a designated floor. These PFPS contributions would ensure that consumers pay at least this floor price for gasoline and other petroleum fuels in the future, even if the price of oil fell.

A. Setting the Price Floor

There are three different ways in which the price floor could be established. We will refer to these as the target price, the phase in, and the automatic reset methods. We will begin with the target price, which is the most straightforward of the options.

The target price method simply designates a specific retail price of gasoline as an appropriate floor price in order to achieve downside price stabilization. One plausible choice might be ten percent below the current retail price of gasoline at the time the plan is adopted (for example, a floor of $1.80 if the market price is $2.00). Under this approach, the plan would impose no immediate out-of-pocket cost on taxpayers when enacted. A variation on the target price approach would be to provide that the floor takes effect if and when gasoline prices reach a certain level in the future. For example, the plan could stipulate that when prices reach $3.80 per gallon (on a national basis averaged over some months), a floor of $3.50 is put into effect.

The target price would not necessarily have to be below the current retail price at the time the PFPS plan is adopted. It could be set ten percent above the current retail price, or even one hundred percent above the current retail price, in which case the PFPS plan would result in an immediate increase in the retail price of gasoline. If the plan were adopted at a time when retail prices were low then it would make sense from a policy perspective to set a target price at a higher level in order to discourage consumption of petroleum fuels. We anticipate that, for reasons of political acceptability, the plan would not take this form, but it is one policy option. Whatever number is chosen as a target for the petroleum fuel price floor, it should be subject to a cost of living adjustment each year to preserve its real value.

A second variation would be to phase in the price threshold. Suppose retail prices are $2.00 per gallon at the time the plan is adopted and the appropriate price threshold for policy purposes is determined to be $3.50

per gallon. The threshold could be set at $2.00 at the time the plan is
adopted and could be scheduled to increase in increments of, say, $0.10 per
gallon every quarter for the next fifteen quarters (three and three-fourth
years) until it reaches $3.50. This would ensure, at a minimum, that retail
prices would rise steadily over this period to the target price (they might
rise faster, of course, if world oil prices increased more rapidly). The phase
in approach might be appropriate if the plan were adopted at a time when
petroleum fuel prices were relatively low and policymakers wanted to
assure that consumers would have a period of time to adjust to the
prospect of higher future prices.

A third variation would be an automatic reset mechanism. This
approach would provide that the target price would trail the market price
and automatically reset to some increment below the retail price (say, ten
percent below) as market prices rose, but would not reset as market prices
fell. Thus, if market prices were $2.00 per gallon at the time the program
was adopted, the target would initially be set at $1.80. But if world oil
prices subsequently rose, such that they would cause the retail price to rise
to $2.50 per gallon, the target would reset to $2.25. Presumably the reset
mechanism would be capped at some level determined to reflect a price
that appropriately discourages petroleum fuel consumption (for example,
$3.50 per gallon).18

B. Calculating the PFPS Charges

Although the goal is to maintain a floor on the retail price of
petroleum fuel, the actual calculation of the levy should be keyed to the
world price of crude oil for several reasons. First, crude oil prices are by far
the largest component of petroleum fuel prices, in recent years accounting
for as much as fifty-eight percent of the retail price of gasoline.19 Second,
the world price of crude oil is determined by global forces of supply and
demand, which appear to be largely impervious to manipulation by
domestic refiners, distributors, or retailers. Third, using an input at the
beginning of the production process preserves the benefits of competition
among downstream suppliers, including refiners, interstate pipeline
companies, regional wholesalers, and retail service stations. Fourth, we
assume the PFPS contributions, like the current federal excise tax, will be
collected at the point of distribution of petroleum products to wholesale
distributors, so the levy cannot be imposed at the point of final sale to
consumers even if this is otherwise desirable.

18 We are grateful to Richard Richman for suggesting this automatic reset option.
19 See ENERGY INFO. ADMIN., A PRIMER ON GASOLINE PRICES (2008),
The exact amount of the PFPS contributions should be determined in accordance with a formula, developed administratively, that seeks to determine the relationship between crude oil prices and pump prices. For example, to set the floor at a national average of $1.80 per gallon, we should strip out taxes, including both the existing federal excise tax (which would not change) and state and local taxes. Suppose this yields a national average pre-tax retail price of $1.40 per gallon. Taking this figure, we should then subtract an estimate for refining, distribution, and marketing costs, including a normal profit on all these activities. This gives us the crude oil component price of gasoline. Assume this is $0.64 per gallon, or about $27 per barrel. Armed with this component price, we can now set the PFPS contribution level. If world oil prices fell, say, to $22 per barrel, then we would impose a levy of $5 per barrel. If world oil prices were $27 per barrel or higher, there would be no PFPS contribution.

Under this approach, refining, distribution, and marketing costs obviously have to be determined. The simplest method would be to calculate these costs during a test year in the recent past. In 2007, for example, the average amount of such costs was about $0.76 per gallon. Whichever method is chosen, the objective would not be to fix the retail price of gasoline, but to estimate as accurately as possible the crude oil price component in the retail price of gasoline, and thereby to fix the appropriate levy (if any).

Because the PFPS charges would be calculated based on the price of crude oil, the actual price paid by consumers would vary somewhat from region to region and station to station, depending on regional variations in refining and distribution costs, the level of state and local gasoline taxes, and whether the station is located in an area that has to use more expensive reformulated gasoline under EPA Clean Air Act regulations.

We envision that the PFPS contributions would be applied to all petroleum fuel products, not just gasoline sold to motorists. This would achieve a greater impact, in terms of incentives for conservation and development of alternative fuels. An initial approach, capitalizing on

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20  *Id.* (calculation based on figures for 2007 average retail prices). A more refined method is to determine the national average "reasonable" costs of refining, distribution, and marketing. This can be done in a rulemaking proceeding using the kind of techniques that have been developed to fix maximum reasonable public utility charges. An even more refined method is to determine the "total service long-run incremental costs" for a hypothetical efficient provider of refining, distribution, and marketing services, a technique followed by the Federal Communications Commission in pricing unbundled network elements for purposes of pricing competitive access in the telephone industry. See Ingo Vogelsang, *Price Regulation of Access to Telecommunications Networks*, 41 J. Econ. Literature 830, 840 (2003).

21  The average retail price of gasoline varies by $0.30-$0.40 per gallon between high tax/high cost areas (for example, Los Angeles) and low tax/low cost areas (for example, Houston), with most cities falling somewhere in between. See Census Bureau, U.S. DEP'T OF COMMERCE, *Statistical Abstract of the United States*: 2008, at 477 tbl.711. We would expect a similar spread to continue after the introduction of our proposed levy.
existing administrative mechanisms, would be to impose the PFPS charges on all fuels currently subject to federal excise taxes. Federal excise taxes currently apply to gasoline, diesel fuel, aviation fuel, and motorboat fuel, but not to natural gas, home heating oil, chemical feedstocks, or fuel used on farms. From an environmental perspective, especially one that focuses on climate change, this pattern is not ideal. But as experience with the Clinton BTU tax reveals, the more comprehensive the program, the greater the burden of interest group opposition.\(^2\) The existing pattern of markets subject to the excise tax, which emerged in its present form out of the wreckage of the BTU tax effort, may be a rough guide to what is politically achievable, at least on a first pass, given the constellation of interest groups and their political clout. It also has a certain focal quality, since it is grounded in the status quo, and thus may be useful in fending off proposals for new exemptions. Finally, it has the administrative advantage of piggybacking on the existing excise tax regime.

Although the relationship between crude oil prices and final refined product prices might vary somewhat in different petroleum fuel markets, we think the PFPS charges developed with reference to the retail gasoline market could probably be adopted for use in all markets. If a more fine-tuned approach were desired, a different benchmark retail price and a different levy could be calculated for each product. Later in the Article, we will discuss the possibility of exempting other petroleum fuel markets, or phasing in the extension to other markets, in order to reduce political opposition to the program.

C. PFPS Refunds

The PFPS charges would not be a true tax, in the sense that they would be designed not to collect revenue, but rather to influence behavior. Indeed, PFPS contributions would fluctuate from month to month, and would often be zero, making them very undesirable as a source of government revenue. For this reason, and to prevent fiscal drag, we would propose that every dollar collected under the plan be refunded to taxpayers. There are several issues to be considered about how such a refund would be administered.

First, we believe the refund should be limited to individuals. Business entities, including corporations, partnerships, subchapter S corporations, and nonprofits, would not be eligible for PFPS refunds. This is based on the supposition that the PFPS charges paid by these entities would be passed along to individuals in the form of higher prices for consumers, lower wages for workers, or lower returns for investors. Thus, refunding these contributions to individuals is the right answer on the merits. It is also

\(^{22}\) See ESKRIDGE ET AL., supra note 14, at 485-508.
much easier to do. Devising a refund for businesses and nonprofit organizations would raise administrative questions of great complexity, given the vast differences in petroleum fuel consumption among firms, and the extent to which firms, as opposed to individuals in the firms, pay for the fuel (think of a taxi company or pizza delivery service). Allowing organizations to claim PFPS benefits would also be subject to abuse, such as the creation of multiple corporations to claim benefits, which would be difficult to police.

Second, we believe the PFPS benefits to individuals should be as broad based as possible. Thus, we would not link the refund to either the income tax or the social security payroll tax. Either approach denies PFPS benefits to some retirees and unemployed persons, many of whom purchase gas. Instead, PFPS benefits should be available to all individuals. Although PFPS benefits can also be provided through a refundable tax credit, the benefits will be more salient to taxpayers if provided through a separate payment that they receive periodically, perhaps quarterly.

Third, the refund amount should be based on the total revenue collected under the PFPS plan divided by the total number of Americans of driving age. The “average” American would therefore receive PFPS benefits that completely offset the additional charges she pays in PFPS contributions, as well as the higher prices she pays for goods and services that consume petroleum fuels and any reductions in her wages and investment returns from petroleum-consuming businesses. For those who consume at exactly the average level, the PFPS plan thus would have no net effect (aside from the modest amount lost to the administrative costs of the system). Those who consume less than the average would be rewarded with a net payment, while those who consume more than the average would incur a net cost. Redistributing to those who are energy efficient creates the desired incentive effect.

Fourth, “persons of driving age” should be defined, for purposes of PFPS benefits, to mean all persons who are old enough to drive in their state of residence. This awards PFPS benefits to some persons who do not drive. But since one purpose of the program is to discourage driving, the incentives here are not inappropriate. Moreover, even those who do not

23 Cf. HAMILTON PROJECT, BROOKINGS INST., A CARBON TAX SWAP TO MITIGATE GLOBAL CLIMATE CHANGE (2007), http://www.brookings.edu/~media/files/rc/papers/2007/10carbontax_metcalf /10_carbontax_metcalf_pb.pdf (discussing a carbon tax scheme originally proposed by Gilbert E. Metcalf in which the tax revenue is refunded to individuals through an earned income tax credit).

24 This is the same cognitive bias that causes taxpayers to value receiving a refund when they file income tax returns instead of regretting that they over-withheld during the course of the year.

25 Although it would be administratively simpler to mail only one check per year, a reason to make the payments more frequent is to help potentially illiquid low-income taxpayers who must pay PFPS charges throughout the year, and thus would not want to wait until year-end to receive their refund.
drive would experience higher prices passed along by businesses that purchase petroleum fuel products, and reduced wages and investment returns from petroleum-consuming businesses. We recommend against any adjustment for miles driven or number of vehicles owned, since these adjustments undermine incentives to conserve.

Fifth, although we sometimes call these payments “benefits,” we do not intend for them to be taxable under the income tax (as social security benefits are, for instance). Indeed, if refunds were taxed, but charges were nondeductible, our proposal would impose an unacceptable drain on consumer purchasing power.

Finally, we believe our PFPS plan would not require new bureaucratic agencies or significantly more government employees. The federal petroleum fuel excise tax is currently collected at transfer racks where refined petroleum products are offloaded from pipelines and vessels to wholesale delivery trucks. This arrangement could also be adopted for the PFPS contributions. Substantially more money would be collected, but the number of collections and the routine for assuring proper payment need not change. PFPS benefits, meanwhile, should be processed by the IRS, which already has a great deal of information about taxpayers. Very little additional information would need to be provided, and it could be offered in a short form. Processing these filings would marginally increase the burden on the IRS. Perhaps the most significant new administrative task would be the need for the IRS to compute the amount of the per capita benefit payment for each period.

II. Advantages of the PFPS Plan

Policy analysts frequently advocate substantial increases in the federal gasoline tax as a way of discouraging the consumption of gasoline and thereby reducing the negative externalities associated with such consumption. An ideal Pigouvian tax would be set at a level equal to the marginal social costs associated with petroleum fuel consumption, and would thus internalize those costs to consumers, creating incentives for

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26 Charges will be deductible for those individuals who purchase gasoline for business purposes, since the charge will be included in the retail price and will not be separately stated. For these taxpayers, the refunds should in fact be includible in taxable income to the extent of their business-related gasoline deductions, on the theory that the deduction has been reversed. This would necessitate some refinements to Schedule C for individual business income.

27 In any event, the label attached to the periodic payments should not determine their tax treatment. If it helps secure better tax treatment (or, for that matter, better budgetary accounting) to call these payments “refunds” rather than “benefits,” then they should be called refunds, since we view the label merely as political packaging.

more socially efficient consumption decisions.29 These costs are extremely difficult to compute with precision, and it is unlikely, as a practical matter, that the government would be able to do so. Historical experience with environmental taxes suggests that even though policymakers have been aware of the potential cost internalization case for such taxes, no attempt has been made to equate the level of taxes with some measure of social costs because of the many conceptual and measurement difficulties in doing so.30

Consider in this regard two of the major social costs that any increase in petroleum fuel prices seeks to internalize: the emission of greenhouse gases contributing to climate change, and the national security effects of dependency on imported oil. Even if there is a strong scientific consensus that greenhouse gases contribute to climate change, there is no consensus on the magnitude of the welfare effects of this change. This measurement problem is greatly compounded by the fact that climate change produces both welfare costs and welfare benefits, and these effects do not overlap geographically, creating imponderable normative questions about how to weigh one against the other.31 There is also the question of whether or to what extent future costs net of benefits from climate change should be discounted to their present value. The choice of a discount rate, which again is a sharply contested normative question, makes net costs either enormous or effectively zero.32 With respect to national security, many people share the intuition that America’s dependence on imported oil has made it more likely that we will get embroiled in wars in the Middle East, and that it is undesirable for the United States to spend billions of consumer dollars, directly or indirectly, to prop up existing regimes in countries like Iran, Russia, and Venezuela. But no one has attempted to quantify these costs.33 And there are some offsetting national security benefits from cheap petroleum fuel, such as dispersing the population so as to make it less vulnerable to a terrorist attack.34

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29 See, e.g., Ian W.H. Perry & Kenneth A. Small, Does Britain or the United States Have the Right Gasoline Tax?, 95 AM. ECON. REV. 1276, 1276-77 (2005) (seeking to calculate the optimal Pigouvian tax on gasoline based on the social costs of various externalities).
33 Cf. PAUL N. LIEBY, ESTIMATING THE ENERGY SECURITY BENEFITS OF REDUCED U.S. OIL IMPORTS (2007) (quantifying economic costs of energy insecurity, but not other costs).
34 To cite another difficulty, the marginal social harm would change with the overall level of gasoline consumption. As a result, as Louis Kaplow and Steven Shavell have observed, the
Consequently, our PFPS plan—and, we suspect, any other proposal that raises the price of petroleum fuels—is not based on any quantitative estimate of social costs, as would be true of an ideal Pigouvian tax. The degree to which prices should be raised to constrain these costs is a matter of judgment, and must ultimately be determined politically. Our intuition is that a price floor in the range of $3.50 to $4.00 per gallon is roughly where one would want to start (if only because this price level had a notable effect on consumption in 2008), but we claim no special expertise in selecting the appropriate number. That is for the political system to decide, with input from persons better qualified than we are to attempt at least a partial measurement of the total social costs.

Wherever the price floor is set, our proposal shares many important benefits of an equivalent Pigouvian tax. When gas prices would otherwise fall below the floor, our proposal would force consumers to internalize the difference between the market price and the price with the PFPS contribution, which at least partially reflects the social costs of petroleum fuel consumption. And, like a Pigouvian tax, our proposal would seek to change behavior by changing prices, rather than by having the government impose regulatory mandates or pick and choose which alternatives to subsidize.

At the same time, our PFPS plan has distinct advantages relative to a Pigouvian tax. First, and most importantly, a revenue-neutral PFPS plan has political advantages over a Pigouvian tax, since in most versions it would not impose immediate costs on voters (as long as the threshold is set below the market price on the date of enactment). Second, our proposal would create a stable floor on the price of gasoline, and thus should prove more effective than a Pigouvian tax in persuading consumers and alternative energy producers to make energy-saving investments. Third, the fact that our proposed PFPS charges are fully refundable means that they should neither reduce consumer purchasing power in a time of economic contraction nor reduce incentives to work or save. Fourth, we believe the PFPS plan should not be regressive.

A. The PFPS Plan as a Second-Best Pigouvian Tax

Our PFPS plan, like a Pigouvian tax, reduces consumption of petroleum fuels relative to the levels that would prevail absent the plan. Indeed, PFPS contributions function like a classic Pigouvian tax when petroleum fuel prices fall below the threshold (although, of course, the level of these contributions would not be perfectly calibrated to the social harm).

optimal corrective tax is probably not linear. See Louis Kaplow & Steven Shavell, On the Superiority of Corrective Taxes to Quantity Regulation, 4 AM. L. & ECON. REV. 1 (2002).
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1. Three Familiar Reasons to Reduce Consumption of Petroleum Fuels

   a. *Environment*

   Global warming has been called the most serious environmental issue of our age.\(^{35}\) Emissions of CO\(_2\) are significant contributors to the greenhouse effect, which scientists believe is at least partially responsible for the gradual rise in global temperatures we are currently experiencing. Combustion of gasoline by motor vehicles, in turn, is a major source of CO\(_2\) emissions. Motor vehicle emissions account for approximately one-third of all greenhouse gas emissions in the United States\(^{36}\) and ten percent of all global emissions of CO\(_2\).\(^{37}\) As the Supreme Court has noted, considering just emissions from the transportation sector, the United States would "rank as the third-largest emitter of carbon dioxide in the world, outpaced only by the European Union and China."\(^{38}\) There is no known technology for reducing CO\(_2\) emissions by motor vehicles other than burning less carbon-based fuel. This can be achieved either by improving fuel efficiency, driving fewer miles, or switching to some alternative source of fuel, like electricity generated by means other than carbon fuels.

   Our PFPS plan would significantly reduce emissions of CO\(_2\) in the United States. By placing a floor under the price of petroleum fuels, it would encourage consumers to drive less, join carpools, work from home, relocate to areas better served by public transportation, and purchase more fuel-efficient cars. It would encourage vehicle manufacturers to redesign their fleets to achieve greater fuel economy and eventually to run on sources of power other than gasoline, including hydrogen, solar energy, and rechargeable batteries. Businesses would reduce transportation costs in countless ways, many beyond our current imagination. Anticipating these trends, producers of alternative fuels would redouble their efforts to develop new sources of power that are not subject to the levy and that presumably do not generate equivalent greenhouse gases. The ultimate

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\(^{35}\) See, e.g., Burton Richter, *Learning What Fuel To Burn*, N.Y. TIMES, Apr. 17, 2001, at 19 (expressing a Nobel Laureate's view that "[n]early all scientists" believe that global warming is "the most serious environmental threat").


impact is impossible to predict with any precision and would depend, of course, on the level of the price floor.\(^3\)

Climate change is, however, only the beginning of the environmental story associated with the combustion of petroleum fuels. Internal combustion engines also emit carbon monoxide, particulate matter, nitrogen oxides, and hydrocarbons. Nitrogen oxides and hydrocarbons combine with volatile organic compounds in the presence of sunlight to produce ground level ozone. Carbon monoxide, particulates, and ozone each present serious human health risks. One study by researchers at the Yale School of Forestry & Environmental Studies, for example, concluded that reducing ozone pollution by thirty-five percent would prevent about four thousand deaths annually in the United States.\(^4\)

Tailpipe emission controls on new automobiles in place since 1977 have produced substantial improvements in ambient air concentrations of carbon monoxide and particulates, and, to a lesser degree, nitrogen dioxide.\(^4\) But ozone has been more resistant to improvement, in large part because reductions in emissions of hydrocarbons per mile traveled have been offset by a steady increase in the number of miles driven in the United States.\(^4\)

Our PFPS plan, by imposing a floor on the price of gasoline, could achieve significant additional improvements in air quality associated with motor vehicle pollution. It could do this for two reasons. First, the amount of combustion of motor fuel would fall. Given higher expected prices of gasoline, consumers would increasingly switch to cars that burn less fuel and would alter their behavior in countless ways to cut back on the number of miles they drive. Second, the higher prices of gasoline would create an incentive for more rapid turnover of the existing vehicle fleet, as consumers shift from older, less efficient models, to newer, more efficient models. Older models are disproportionately responsible for emitting the hydrocarbons that produce ozone, as well as other pollutants.\(^4\)

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\(^3\) Borenstein, \textit{supra} note 15, at 5, 11, estimates, using California data, that raising the price of gasoline from $2.50 to $3.00 per gallon would reduce greenhouse gas emissions from transportation sources by nine percent over the long run.


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short time, we would see measurable improvements in air quality and a decline in respiratory diseases and other health effects of auto pollution.44

b. National Security

Reducing our consumption of petroleum fuel also makes our nation more secure.45 Much has changed since the end of World War II, when the United States was almost completely self-sufficient in energy, producing all the oil, coal, and other fuels it needed to power the world's largest economy. The United States still has ample coal supplies. But today, roughly two-thirds of the domestic demand for petroleum products is supplied by imports.46 It would be one thing if the world's oil supply came from stable democracies that could be counted on to remain reliable trading partners with the United States and our allies. In reality, the picture is quite disturbing. After Canada and Mexico, the largest sources of U.S. oil imports are Saudi Arabia (519 million barrels per year), Venezuela (416 million barrels per year), Nigeria (381 million barrels per year), Iraq (202 million barrels per year), Angola (187 million barrels per year), and Algeria (130 million barrels per year).47 Russia and Iran are also important global suppliers. These are countries either led by dictators, experiencing war or significant internal discord, or overtly hostile to the interests of the United States. Furthermore, the strategic petroleum reserve will not suffice to replace any major disruption in imports. The reserve has 689 million barrels of oil—not even enough to offset one year's supply from Saudi Arabia and Venezuela.48

We do not suggest that the PFPS plan offers "energy independence" for the United States, nor do we think such independence is desirable. What it would do, however, is reverse a steady progression of increased reliance on imported oil, in which countries hostile to the United States perceive that we are increasingly dependent on them. This has emboldened these countries to take actions contrary to our national interests. A decline in domestic consumption would change this dynamic at the margins, as the United States switched from increasing dependence to greater independence. For example, an American threat to embargo oil imports from these countries would become more credible. In addition, a decline in American consumption would lead to a price decline in the

44 In contrast to the effect of our proposal on the emission of greenhouses gases, the impact on emissions of conventional pollutants would be of immediate benefit and thus would not pose the same conundrums about selecting an appropriate discount rate.
46 CENSUS BUREAU, U.S. DEP'T OF COMMERCE, supra note 21, at 582 tbl.902.
47 Id. at 581 tbl.901.
48 Id. at 582 tbl.902.
global market. This would serve to transfer resources from oil-producing nations, which are often unfriendly, as noted above, to oil consumers, including allies such as the European Union and Japan.49

Environmental and national security goals are not always in sync. For example, a broad-based carbon tax that discourages the use of both petroleum and coal has beneficial environmental consequences, but works against our desire for more energy independence, given our vast reserves of domestic coal. In the case of our PFPS plan, however, there is no tension between these objectives. Reduced consumption of gasoline and related fuels is good for the environment, and also promotes energy independence.

c. Urban Sprawl and Congestion

Petroleum fuel consumption is also the source of a third important externality. Inexpensive motor vehicle transportation has facilitated suburban and exurban sprawl.50 In a vicious cycle, this pattern of growth has further encouraged the use of motor vehicles, since alternative modes of transportation, such as walking, bicycling, or public transportation, are impossible or inconvenient in suburbs and exurbs. Urban sprawl has a number of undesirable social consequences, including longer commutes, greater segregation of people by race and class, gradual destruction of agricultural lands and woodlands, and larger homes that consume more energy and have larger carbon footprints. Putting a floor on the price of gasoline would begin to reverse the process of sprawl. People would prefer housing closer to employment centers and public transportation. Over time, cities would become denser.

Inexpensive motor vehicle transportation is also responsible for increasing traffic congestion, leading to time wasted in traffic jams and more accidents.51 Heavy vehicles, made economically feasible by cheap motor fuel, pose a particular safety threat to the occupants of other vehicles. According to one study, the cost of congestion-induced accidents alone would justify a Pigouvian tax of $220 billion annually.52 The full

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49 China would also benefit from this change, and China's relationship with the United States is more complicated. An argument against our proposal is that American consumers would make sacrifices, and American businesses would see their costs increase, but some of the benefit from this effort would redound to significant economic competitors such as China. Yet, if the PFPS program does in fact prompt a green tech boom in the United States, then it could bolster the U.S. competitive position by facilitating exports of this alternative energy technology.


51 Insurance data strongly suggest that increased congestion translates into higher accident rates, more personal property damage, and more personal injuries. Aaron S. Edlin & Pinar Karaca-Mandic, The Accident Externality from Driving, 114 J. POL. ECON. 931 (2006).

52 Id. at 951.
measure of externalities associated with sprawl and congestion is unquestionably much higher.

Admittedly, our PFPS plan is an imperfect type of tax to capture these external costs, since consumers might reduce expenditures on gasoline by purchasing more fuel-efficient cars rather than relocating closer to urban centers or taking public transportation. But some substitution away from driving would likely occur, and this would help reduce the external costs associated with sprawl and congestion.

2. Advantages of Using Price Signals to Influence Behavior

There are a number of ways to discourage gasoline consumption, and thus to attain the environmental, national security, and congestion-reducing benefits discussed above. A great advantage of our proposal is that it would not require the government to choose a particular approach at the expense of others, something the government is not well-suited to do.

a. Information and Incentive Problems Faced by the Government

We may ultimately wean ourselves from our dependence on petroleum fuels without any sacrifice in our standard of living through technological innovations. There are numerous possible ways to do this. We obviously do not know which new technology will turn out to be most cost-effective and user-friendly, and which changes in lifestyle will be most attractive. Different responses will appeal to different people. In the face of these manifold uncertainties, we seriously doubt that government officials have the information needed to make reliable predictions about which technologies or practices will prove most successful. In particular, members of Congress—who are the key actors in adopting a comprehensive energy plan—do not have the expertise to assess whether solar or wind energy is more promising, or whether consumers will prefer electric cars to hybrids, high efficiency diesels, or natural gas cars—or, more precisely, which types of consumers would prefer which product.53

In addition to these information problems, government officials also may not have the right incentives. If a suboptimal technology is backed by a powerful interest group, government officials may feel pressured to

53 Under the Energy Policy Act of 2005, Pub. L. No. 109-58, § 1341, 119 Stat. 594, 1038-49, Congress provided subsidies (in the form of tax credits) for purchasing hybrid vehicles. The subsidies are based on a variety of factors, including energy efficiency, weight, and other characteristics, and they phase out when a manufacturer has sold more than sixty thousand hybrid vehicles. A recent study concludes that the implicit price American taxpayers are paying for saving one gallon of gasoline under this Act ranges from $0 (for popular Toyota models, which have been phased out) to $5.59 (for the bulky Chevrolet Tahoe Hybrid, which gets twenty-two miles per gallon). Martin A. Sullivan, Tech Neutrality, Tax Credits, and the Gas Tax, 122 TAX NOTES 619, 621 tbl.1 (2009). It is unlikely that future subsidy programs will avoid similar irrationalities.
support it. The experience with ethanol is not encouraging in this regard. It is a familiar point that ethanol's appeal may derive more from its support among farm-state senators than from its merits. Ethanol is expensive and requires a great deal of energy to produce, once the energy needs of farmers and delivery vehicles are considered; indeed, because ethanol is water-soluble, it cannot be transported by pipeline, which uses water to separate batches of product. Consequently, ethanol must be transported by truck or rail. In addition, there is widespread concern that its use is driving up food prices.

Another apt illustration of the incentives problem is provided by the Corporate Average Fuel Economy (CAFE) program adopted by Congress in 1975 in response to the Arab oil embargo and the ensuing energy crisis. Strengthening the CAFE program in order to reduce fuel consumption is widely touted by politicians as an alternative to raising prices. What is not appreciated is that although the American auto industry initially opposed the CAFE program, the industry and the United Auto Workers (UAW) union were able to influence the form the program took in ways that served their perceived interests. We will highlight three features of the regulatory design of the CAFE program that rendered it largely worthless as an energy conservation program. Even a modest increase in fuel prices would unquestionably do better.

First, the statute directed the National Highway Traffic Safety Administration (NHTSA), the implementing agency, to differentiate between "cars" and "light trucks," in response to pleas from manufacturers that they needed to be able to produce pickup trucks that would get lower fuel mileage than cars. The light truck category, however, was defined

54 See William Tucker, Carbon Limits, Yes; Energy Subsidies, No, WALL ST. J., Dec. 29, 2008, at A11 ("Biofuels have already proven to be … [a] disaster. They've gobbled up 30% of our corn crop and have leveled tropical forests, while replacing less than 3% of our oil.").


56 The following discussion draws upon Federico Boffa et al., CAFE—The Corporate Average Fuel Economy Mandate (Nov. 25, 2008), available at http://www.law.yale.edu/documents/pdf/LEO/Haddock.Bad_Public_Goods_CAFE_Yale_Draft_2008-11-25.pdf. For an earlier assessment, see Robert W. Crandall et al., Regulating the Automobile 135 (1986) (concluding that "the improvement in fuel economy for the industry was very close to what would have been expected without the CAFE standards").


58 Boffa et al., supra note 56, at 3.
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solely in terms of weight rather than function. The upshot, which in hindsight seems inevitable, is that American companies cleverly transformed their vehicle lines away from cars toward a new generation of "light trucks," consisting of minivans and SUVs. European and Japanese manufacturers quickly caught on and followed suit. As a result, the average weight of vehicles purchased by American consumers under the CAFE regime increased rather than decreased, and fuel economy goals suffered.

Second, with respect to the "car" side of the equation, the UAW insisted that American manufacturers not be allowed to count imports from their foreign affiliates in computing corporate average mileage. This provision was designed to force American firms to build their own new line of small cars in addition to the large cars they had traditionally specialized in producing, thereby preserving American manufacturing jobs. The upshot was that American manufacturers rushed to market with a new generation of more fuel-efficient autos (such as the GM X-body car and the Chrysler K car). These models, however, had severe quality problems that arguably proved the undoing of the American auto industry, as consumers lost confidence in American brands.

But there was another, less appreciated consequence of the corporate average provision. The corporate averages were set at levels designed to allow the American firms barely to meet them, assuming the production and sale of a new generation of small cars. Meanwhile, European and Japanese manufacturers had no trouble meeting the corporate averages with their existing line of mostly small cars. In effect, they had a considerable "cushion" under the corporate averages. Again, in what seems fully predictable in hindsight, the foreign producers responded by significantly and steadily increasing the size of cars in their fleets sold in the United States. Consider, for example, the growth in the size and weight of the Honda Accord or the Toyota Camry over the years the CAFE program has been in effect, not to mention the introduction of new luxury divisions like Lexus. In effect, American consumers did not switch from large American cars to small American cars, but from large American cars to large imported cars. Again, fuel economy goals were undermined.

59 Id.
60 Id. at 26-27.
61 Id. at 20.
62 Id. at 26-28.
63 Id. at 5.
65 Boffa et al., supra note 56, at 22-23.
66 Id. at 23-24.
Third, Congress directed that the CAFE program was to be enforced by NHTSA, a small agency that deals solely with auto manufacturers.67 Perhaps not surprisingly, NHTSA implemented the program in ways that largely responded to the interests of the regulated industry. For example, NHTSA declined to make upward adjustments in the corporate averages for either autos or light trucks for twenty-five years (from 1985 to 2010).68 Only recently, in response to the recent spike in petroleum prices, did Congress intervene and mandate increases in corporate fuel averages starting with the 2011 model year.69 NHTSA's passivity, which again seems predictable given public indifference during a period of low petroleum fuel prices, largely neutralized the Act as a force for energy conservation.

One can of course respond that CAFE’s problems can be corrected by drafting a better statute. But this misses the point. Any attempt to achieve energy goals through targeted subsidies and regulatory mandates will be shaped by interest groups, which inevitably have higher stakes in the outcome and more information about the relevant variables than do ordinary citizens and members of Congress. And any system of subsidies and mandates will be gamed by the relevant interest groups in order to advance their own interests, without regard to whether these responses contribute to the policy goals that motivated the enactment of the subsidy or the mandate in the first place.

b. Consumer Incentives

Our PFPS plan would largely avoid these problems, since the key decisions would be made by consumers and producers, instead of by the government. By setting a floor on the price of gasoline, the plan would encourage consumers to reduce their consumption of petroleum fuel, but would leave the choice to individuals about how to do it. Some would move closer to work, others would telecommute or carpool, while still others would experiment with new technologies. Indeed, we know that consumers respond to the price of gasoline, since there were significant changes in behavior when gas prices rose precipitously in 2008—including greater use of mass transit and steep declines in the demand for SUVs—and a reversal of these changes in behavior when prices fell.70 The virtue of

70 See Michael Cooper, Transit Use Hit Five-Decade High in 2008 As Gas Prices Rose, N.Y. TIMES, Mar. 9, 2009, at A13 (noting an increase in the use of mass transit in 2008); Chris Woodyard, Small Used Cars Aren't Big Sellers, USA TODAY, Sept. 18, 2009, at 1A (noting a decline in large vehicle
price-based approaches like our PFPS proposal is that there does not have to be a one-size-fits-all solution. The mix of costs and benefits associated with different technological innovations will appeal differently to different people, and they will gravitate to the innovations they prefer.

c. *Producer Incentives*

The PFPS proposal would have useful effects on producers as well. Auto manufacturers, for instance, would focus their efforts on fuel-efficient cars, knowing that the levy would keep gas prices from falling below a minimum level. One of the significant challenges manufacturers face is that they must design products well in advance of bringing them to market, and uncertainties about the price of fuel leave them unsure about whether to focus on gas-guzzling SUVs or small hybrids. Our PFPS contributions would set a stable price floor, allowing the auto industry to focus on fuel efficiency.

At the same time, producers of alternative energy would feel more secure investing in the research and development that is needed for breakthrough innovations. It is a familiar point that, over the past decades, investors have periodically focused on developing alternative energy, but their investments have repeatedly been wiped out as oil prices have declined. Unfortunately, this happened again to many ventures in 2008. Our PFPS plan would reassure investors that this will not happen again. The result would be a vibrant and competitive market, in which different technologies are developed and different approaches compete to reduce our dependence on gasoline.

d. *A Market-Based Approach*

Unlike credits for ethanol, wind, solar power, and hybrid cars, and other targeted subsidies, or regulatory mandates like the CAFE program, our PFPS plan would not require the government to make judgments about which types of conservation or alternative energy to support. The only decision the government would make is where to set the price floor.

A recent study shows that automobile manufacturers make large compensating adjustments in the prices of cars in response to changes in the price of gasoline, cutting prices on inefficient vehicles when fuel prices rise, and raising prices on inefficient vehicles when fuel prices fall (and vice versa for efficient vehicles). This behavior is consistent with the proposition that automobile manufacturers believe consumers respond to changes in fuel prices. See Ashley Langer & Nathan H. Miller, Automakers' Short-Run Responses to Changing Gasoline Prices and the Implications for Energy Policy (Sept. 2009) (unpublished manuscript, on file with The Yale Journal on Regulation). The authors of that study further note that this pricing behavior dampens the short-run price elasticity of demand for gasoline, since much of the effect of fuel price changes is offset by changes in vehicle prices. In the long run, however, higher fuel prices will result in a shift by manufacturers toward more fuel-efficient cars, since their return on investment in such vehicles will be higher.
Indeed, the conventional wisdom among environmental economists is that gasoline taxes are preferable to direct regulation when the information needed to set the tax is easier to get than the information needed to decide among competing technologies. As discussed, the amount of information needed to set an appropriate price floor is impossibly large, with the result that it will inevitably be somewhat arbitrary where the floor is set. But the amount of information needed to adopt the right mix of technological innovations is even larger.

Our proposal also avoids the line-drawing problems associated with targeted subsidies and regulations. With CAFE standards, we need to know what a car is, as opposed to a light truck, and, as discussed, this line has been gamed in regrettable ways. The proposal further avoids the question of whether to grandfather older technologies. The PFPS plan would apply to a gallon of gas, regardless of who is buying it or what sort of car they will use to consume it. As a result, our proposal would not create perverse incentives to keep old and less energy efficient technologies, a problem that arises when regulations are enacted prospectively with broad grandfathering. There would also be less temptation to cater to well-connected interest groups at the expense of the policy merits.

Our proposal shares the flexibility of a cap-and-trade program, but would be easier to administer for petroleum fuels. A cap-and-trade program, in most versions, sets a limit on the total tonnage of greenhouse gases that can be generated, and creates a market in which generators of greenhouse gases bid for the right to emit CO₂ and similar gases. The virtue of a cap-and-trade program is that generators can make their own choices about whether and how to achieve emissions reductions, just as under our PFPS proposal they can decide whether and how to reduce emissions by conserving gas. But it is difficult to see how a cap-and-trade program can be applied to consumer decisions to purchase petroleum fuels without generating enormous transaction costs. Any cap-and-trade system is therefore likely to be limited to major generators of greenhouse gases like power plants. Yet it is not plausible that placing all of the burden of carbon reduction on power plants is sufficient to achieve climate change objectives. Our proposal is thus a useful complement to a cap-and-trade program for stationary sources.

B. Political Advantages of a Price Floor over a Pigouvian Tax

While a classic Pigouvian tax can also be a valuable complement to a cap-and-trade program, our proposal has significant advantages over a Pigouvian tax. We start with political feasibility.

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71 See generally Kaplow & Shavell, supra note 34, at 2 (arguing that corrective taxes "harness firms' information about control costs, making possible a result in which the level of the externality is optimal (or more nearly so)").
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1. Political Limitations of a Classic Pigouvian Gas Tax: Salient Costs

At one level, it is puzzling that gasoline taxes are so politically unpopular in the United States. Strong policy arguments can be made in favor of such taxes, and voters in other countries obviously support them. In addition, by discouraging negative externalities, the tax should create a surplus that can be used to attract interest group support. For example, a gas tax can lead to less traffic, safer roads, lower auto insurance premiums, and the repeal of counterproductive regulations such as the CAFE standards. It can also lead to reductions in defense spending, and thus permit tax cuts or free up resources for other government priorities.

Yet gas taxes face more of an uphill battle in the United States than in other jurisdictions, for two reasons. First, unlike Europe and Japan, the United States was an oil exporter after World War II, when significant infrastructure and urban design decisions were made. Since the supply of fuel was abundant, U.S. cities were laid out expansively—something that was possible in a sprawling nation that spans a continent—and mass transit was not as high a priority as it had to be elsewhere. There was no collective memory of fuel shortages, as there was in Europe and Japan. As a result, much of the United States became locked into a lifestyle that depends heavily on the automobile.

Second, U.S. political institutions are more attuned to public opinion, for better or worse, than are the parliamentary systems of Europe and Japan. Since our politicians run as individuals, they are particularly focused on the exigencies of fundraising and on popular opinion. As a result, the fact that there would be real pain associated with diminishing our reliance on gasoline is a salient concern to our government officials, as is the fact of interest group opposition.

Given these infrastructural and political realities, there is no mystery why command and control strategies succeed politically while Pigouvian taxes fail. The costs of regulations are not explicitly tied to the regulatory mandate, but instead are quietly passed on by manufacturers in the form of higher prices or lower wages and investment returns, while subsidies are financed by reductions in other government expenditures, higher general tax rates, or new borrowing. Pigouvian taxes, in contrast, promise to impose immediate and visible costs on voters. A new tax on gasoline, for example, is highly visible and inflicts immediate pressure on the voter’s pocketbook—all the more so in the United States, where cars are such an integral part of everyday life. It is hardly surprising that, given a choice between hiding costs and making them highly visible, American politicians,

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who are highly responsive to popular opinion on salient issues, have shunned Pigouvian taxes like the plague. Indeed, Congress has rarely adopted any type of tax for dealing with widespread environmental and national security problems.\footnote{See Thomas W. Merrill, Explaining Market Mechanisms, 2000 U. ILL. L. REV. 275, 284 (reporting that, as of 1998, no major U.S. environmental program relied on pollution taxes as a control strategy); cf. Barthold, supra note 30, at 133-34 (reporting that "the administration, Congress, and environmental groups have shown a much greater interest" in adopting pollution taxes in recent years, but not citing significant enacted programs).}

Our proposal does not escape this political problem completely. After all, the goal of our proposal—and, indeed, of any proposal to raise petroleum fuel prices—is to create incentives for people to use gasoline more efficiently. Those who cannot or will not do so will recognize that they will be penalized under such a measure and will resist it.

2. Political Advantage of the PFPS Plan: Rational Voters

Even so, our proposal alters this political calculus, particularly if it is implemented either by adopting a targeted threshold below existing market prices or by adopting a reset mechanism that shadows increases in market prices. Under either of these variants of the plan, the PFPS contributions would have no immediate impact on retail petroleum prices. The pain associated with the program would be deferred to some indefinite time in the future. Consequently, the PFPS plan, at least in these versions, unlike the Pigouvian tax, would not drain voter pocketbooks beyond what they are already experiencing.

This perception on the part of voters is not solely a function of biases or heuristics. A rational voter should expect a Pigouvian tax to be costlier than the PFPS plan. The Pigouvian tax imposes higher costs with a probability of one as soon as the law takes effect. The PFPS plan, with either a below-market threshold or a reset mechanism, would impose costs on the voter with a probability of less than one, and if it did impose higher costs, this would happen at some uncertain time in the future. Moreover, any higher costs imposed in the future would be of uncertain duration—the PFPS levy might phase in and out as oil prices fluctuated. Therefore, the rational voter would necessarily discount the costs of a proposed PFPS standby levy relative to those of a Pigouvian tax, perhaps by a significant amount.

What is more, under our proposal all funds raised by the levy would be refunded to voters. This refund, of course, can also be linked to a conventional Pigouvian tax. But the typical argument for a carbon tax proposes to use the revenues for subsidies for mass transit, renewable energy sources, and the like. Many voters will quite rationally conclude that this is a losing proposition for them. Money is taken out of the voter's
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pocket and allocated according to a political process that may generate outcomes the voter regards as having less utility than what the voter would do with the money. A credible promise to return the money in the form of periodic PFPS benefit payments should elicit a more favorable response. Indeed, the prospect of receiving these payments should make the program more appealing than a Pigouvian tax, particularly for those who expect to use less than the average amount of gasoline and thus would experience a net gain from the PFPS program.

3. Political Advantage of the PFPS Plan: Psychological Heuristics

Although the rational voter would come to this conclusion, psychological heuristics make our PFPS plan even more appealing compared with a Pigouvian tax. Because people tend to overestimate their abilities—so-called optimism bias—some voters will overestimate their ability to conserve gasoline. Just as everyone is above average in Lake Wobegon, more than half of voters will expect to be among the half who would earn a net transfer from the PFPS program.74

In addition, under the familiar endowment effect, a higher value is placed on impending losses than on foregone gains.75 A Pigouvian tax is plausibly viewed as a loss—money is taken from the voter’s pocket and transferred to the government. The PFPS plan (in its below-market threshold or reset versions) is more likely to be perceived as a foregone gain. Such a levy does not take money from the voter’s pocket. The voter continues to pay the same price for gasoline as before. What the voter gives up is the potential future gain from falling world oil prices. Studies of the endowment effect suggest that voters will be much less concerned about this than about an immediate price rise.76

4. Interest Groups

We also expect the PFPS plan to attract support from organized interest groups, perhaps from some unexpected quarters. The auto industry, for example, may welcome the commitment to a permanent floor

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on gasoline prices. American auto companies have been whipsawed by shifts in consumer demand—from large gas-guzzling cars in the 1960s, to more efficient compact cars in the 1970s, back again to large vehicles like SUVs in the 1980s and 1990s, once again toward hybrids and other fuel-efficient cars in 2008, and now back again. ""Every six months we get called stupid for having the wrong products,"" GM Vice Chairman Robert A. Lutz said after the extreme price oscillations of 2008. ""Far be it from me to be the first auto executive to call for a gas tax. But right now, it's like fighting obesity by requiring clothing manufacturers to make nothing but small sizes."

In contrast, European and Japanese manufacturers have faced a much more stable consumer demand for fuel-efficient vehicles, given the high gasoline taxes imposed in their home markets. This means that they have always had a core of fuel-efficient vehicles in their product lineup, which they can draw upon in the American market when prices rise. After recent price swings, American companies (and the UAW) would very likely welcome a policy commitment that stabilizes American consumer demand in support of higher fuel efficiency. This would allow American companies to redesign their fleets without constantly hedging against future demand for gas guzzlers. Certainly, we would expect American manufacturers, if offered a choice between the PFPS plan and higher CAFE standards, to prefer PFPS, since it would afford greater flexibility in redesigning their vehicle fleets and would allow for production of a broad mix of vehicle types to meet different consumer needs.

Of course, we would also expect interest group opposition. The airline industry and travel industry would likely oppose the PFPS program, since it would increase the cost of flying and at the margin discourage some travel. Interstate trucking firms would likely oppose the plan, since their expected costs of doing business in the future would increase, and it is unclear that they would be able to pass along all these costs to consumers. Similar points can be made about recreational boat manufacturers, parcel delivery services, taxi companies, and so forth.

And of course the oil industry would oppose the plan, since it would depress consumer demand for oil products.

Given these various sources of interest group opposition, one possible response is to adopt selective exemptions or phase-in provisions. We do

77 Lawrence Ulrich, Detroit Show: Revved Down but Charged Up, N.Y. TIMES, Jan. 18, 2009, at A11; see also id. ("Throughout the show, auto executives emphasized that stable fuel prices, or a coherent government energy policy, would help them anticipate what consumers would buy next.").
78 See Sharon Silke Carty, Carmakers Lean Toward Higher Gas Tax; They See It as Incentive To Buy Their Fuel-Efficient Cars, USA TODAY, Jan. 13, 2009, at 1B.
79 Petrochemical firms and manufacturers that use petroleum in their manufacturing processes would not likely be opposed, since we assume that petroleum feedstocks, which are not subject to the federal excise tax, would also be exempt from the PFPS plan.
not recommend this as a policy matter, since it would undermine the cost internalization functions of the PFPS plan. But it might be necessary in order to overcome interest group opposition. For example, diesel fuel, jet fuel, and motorboat fuel are all separate products subject to different levels of excise tax under current law. One way to mute opposition from the trucking industry, for example, would be to exempt diesel fuel, or to adopt a fractional levy or a phase-in for diesel fuel. Similar points can be made about jet and motorboat fuel. Special refunds could be provided for taxi companies or parcel delivery companies that consume large quantities of gasoline, although it would be administratively costly to devise such special provisions.

5. Regional Impact

A particularly difficult political challenge for our proposal is its potential to favor urban over rural areas. The concern is that people who live in rural, or even suburban, areas have no choice but to drive longer distances each day without the option of mass transit. Someone who lives in rural Montana and commutes thirty miles each way to work will find it more difficult to conserve gasoline than someone who lives and works near metro stops in Washington, D.C. As a result, city dwellers are more likely to receive a net benefit under the program, while those in low-density areas are more likely to experience a net cost.

While we have proposed a rebate that is geographically uniform, an adjustment for population density could be considered. One argument for such an adjustment is that people who live in rural areas generally have more nondiscretionary driving than people who live in a city. A further argument is that some negative externalities associated with gasoline consumption—notably, urban sprawl and traffic congestion—are less severe in low-density areas. If these considerations are regarded as persuasive, the size of the PFPS refunds could be varied in inverse proportion to the population density of the zip code of the claimant.

In our view, the policy merits do not justify a density-based adjustment. Such an adjustment adds to the program's complexity and reduces the incentive to conserve gasoline by living in denser population areas with better mass transit. However, including such a feature may be crucial to winning the support of senators from predominantly rural states,

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81 This could encourage a shift from gasoline to diesel-fueled cars, but that would not be bad from an environmental viewpoint. New generation auto diesel engines burn diesel fuel with most of the sulfur removed, and get high mileage, rivaling that of hybrids. Diesel cars are currently selling poorly, primarily because of the high price of diesel fuel relative to gasoline and concerns about fuel availability.
82 By analogy, the permissible rent in federally subsidized housing also varies by zip code.
and this would be a reasonable compromise to secure passage, especially if it were transitional and designed to sunset after a period of time. In our view, a refundable PFPS benefit with a density adjustment would be considerably better than the status quo.

C. Policy Advantages of the PFPS Plan over a Classic Pigouvian Tax

In addition to our proposal's political advantages over a classic Pigouvian tax, it has other advantages as well. It provides a more permanent price signal than a Pigouvian tax, and this would likely enhance the incentive effect. In addition, because the PFPS contributions would be fully refundable, they would not reduce the purchasing power of consumers as a group—something of particular concern during an economic contraction. The refund feature also means that the plan can be tailored to impose only minimal distortions on work and savings decisions and on the distribution of income.

1. The PFPS Plan Provides Greater Price Stability

Unlike a classical Pigouvian tax, the PFPS plan imposes a stable floor on gasoline prices. The PFPS contributions would invisibly rise and fall in inverse relation to world oil prices, producing a sustained and highly visible price signal for consumers (at least on the downside). A Pigouvian tax, in contrast, is tacked on top of market prices, and thus results in fuel prices fluctuating up and down with changes in the pre-tax price. Ordinarily, such fluctuations are desirable, since they reflect real changes in market prices and social costs, which warrant a response from market participants. For example, we generally want firms to account for volatility in their inputs when making investments.

Yet there are reasons to believe that highly unpredictable fluctuations in petroleum fuel prices, such as we witnessed in 2008, can have the effect of dampening the incentive effects that we want higher fuel prices to create. The core of the problem is consumer behavior. Consumer decisions about what kind of automobile to purchase are more significantly affected by the current price of gasoline than by prices averaged over a longer time horizon.83 This does not necessarily suggest that consumers are behaving

83 See Langer & Miller, supra note 70, at 17. Consider in this regard the comments from Mike Jackson, Chairman and Chief Executive of the retailer AutoNation Inc.: You tell me the price of gasoline and I will totally tell you what people will buy and what trade-offs they will make. They are basically looking for a two- to three-year payback. So in ’08, starting the year at $3 a gallon, everybody talked about fuel efficiency but nobody really acted. At $4 a gallon, we had the biggest shift in consumer preference in the history of the business—a stampede to fuel efficiency... Gasoline is now $2 a
irrationally. There is evidence that professional energy economists using sophisticated models have no better track record of predicting future energy prices than would be had by simply assuming the current price will prevail in the future. Consumers who base automobile purchase decisions on current gasoline prices may therefore be using as good a proxy for future prices as is available.

The problem is that, while consumer purchasing decisions can change on a dime, as energy prices change, decisions by manufacturers about what options to offer to consumers cannot. Manufacturers require a multi-year time horizon in developing a product mix that matches consumer preferences. The same is true of investors in alternative fuels and technologies. If consumer preferences are highly unstable, reflecting energy markets that are highly unstable, then manufacturers and investors faced with long investment horizons must adopt a much higher target rate of return in order to justify any new investment, whether it be for new car models or alternative energy sources, in order to compensate for high uncertainty about future consumer responses. Stabilizing prices would stabilize consumer preferences, which in turn would permit manufacturers and investors to adopt a lower target rate of return. This in turn would produce more investment in energy-saving products and alternatives.

Uncertainty about future prices may also result in additional delay in making investments in fuel-conserving measures. One common response to uncertainty about the future is to delay making irretrievable commitments until some of that uncertainty is resolved. The economic recession that began in 2008 was in many respects the result of millions of people delaying decisions to invest (in the broad sense of the word) in response to high levels of uncertainty.

Motor vehicle manufacturers obviously make irretrievable commitments when they decide to build a new model of car, and alternative fuel suppliers make such commitments when they decide to

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84 See Langer & Miller, supra note 70, at 10 n.37 (referencing studies showing that "the current spot price of crude oil outperforms sophisticated forecasting models as a predictor of future spot prices").

85 Absent externalities, we would not be concerned about manufacturers and investors adopting a higher target rate of return in the face of uncertainty, since uncertainty is a real cost that should be taken into account in making investment decisions. In the face of significant externalities, however, there is a social cost rationale for adopting policies that will reduce uncertainty and hence increase the rate of investment, when there is reason to believe a higher rate of investment will reduce these externalities.
build windmill farms. But consumers also make such commitments when they decide where to live, what kind of car to buy, whether to sign up their children for a traveling soccer team, and so forth. All of these decisions entail irretrievable commitments of resources. Anyone facing a high degree of uncertainty about the future price of gasoline might reasonably adopt a wait-and-see strategy before committing to a potentially energy-saving investment.\textsuperscript{86} Creating a stable floor under the price of gasoline would cause many of these potential investors to invest in such savings now, rather than waiting for further clarification about the movement of prices in the future. The PFPS plan, which promotes price stability, can therefore accelerate the process of adopting energy-saving investments, relative to a conventional Pigouvian tax of the same magnitude.

2. The PFPS Plan Would Not Diminish Consumer Purchasing Power

One potential concern is that a petroleum fuel tax (and, indeed, any tax) reduces consumer purchasing power. This slows the economy, which is a particular concern in an economic downturn. Our proposal would not have this effect because the revenue collected would be fully refunded. There would be some redistribution from gas-inefficient taxpayers to gas-efficient taxpayers, but net purchasing power should not be affected. The fiscal impact would be neutral (aside from the program’s administrative costs), whereas a conventional Pigouvian tax creates a fiscal drag.

A further concern is that transportation is an essential precondition to creating or consuming wealth, and thus the economy might slow down because the price of a key input into economic activity would rise. This can be an issue in the short run, but over the long term people should adjust, whether by moving closer to work, carpooling, buying more gas efficient cars, or other similar strategies. Our proposal would help the economy adjust to a future of scarce petroleum. The fact that consumer purchasing power would be undiminished, moreover, should have an overriding effect. When people have money to spend, they find a way to spend it.\textsuperscript{87}

\textsuperscript{86} For a general discussion of the value of waiting in capital investment decisions, see AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY (1994). A dissenting view, keyed to oil markets, is found in PHILIP K. VERLEGER, JR., ADJUSTING TO VOLATILE ENERGY PRICES (1993). Verleger focuses on the effect of price uncertainty on the decision to develop oil reserves. Our concern, of course, is the effect of price uncertainty on consumer behavior and investment in energy conservation measures.

\textsuperscript{87} A possible counterargument would be that targeted subsidies, funded by additional government borrowing, are an even better strategy from a macroeconomic perspective in an economic downturn. If a Pigouvian tax has a negative impact, and the PFPS plan is neutral, targeted subsidies might even have a stimulative impact. This may be the case, although there no doubt are other stimulus measures that might be even better on this dimension—an issue that is beyond the scope of this Article. In any event, it is always necessary to make a judgment about micro- and macroeconomic tradeoffs. The PFPS plan produces strong and positive micro benefits, in the form of an immediate incentive to begin conserving petroleum fuels on countless margins. A program of
3. The PFPS Plan Would Not Diminish Incentives to Work or Save

A standard concern with any tax, of course, is that it might diminish taxpayer incentives to work or save. An advantage of our PFPS proposal is that, in general, it would not do so. Unlike a (nonrefundable) Pigouvian tax, for example, our proposal would impose no net cost on consumers who consume the average amount of gasoline. As a result, these consumers would not experience an income effect (and thus would not have a reduced ability to save). The plan might cause substitution effects, in that people whose decision to work is at the margin might decide not to do so because of transportation costs. Yet this outcome would likely be rare, and should diminish over time, as people adjust to the PFPS program by finding more gas-efficient ways to commute.

Those whose gas consumption is at the extreme—either very high or very low—would experience income effects. Those who receive a very high (or low) net rebate might have reduced (or increased) incentives to work and increased (or reduced) ability to save. But these would still be relatively small effects, and they would affect only a subset of the citizenry.

Of course, our proposal could be revised to create greater incentives to work or save. For instance, like the earned income tax credit, the rebate could be confined to those who work, thereby increasing incentives to be in the workforce. Yet this step would alter the distributional impact of the proposal to the detriment of unemployed and retired people, something we do not favor.

This modification, though, is an example of a broader goal advocated by some commentators. They favor using revenue raised through a gas tax to replace revenue from the least efficient parts of our tax system, so that a gas tax offers not only the benefit of correcting an externality, but has the added advantage of reducing deadweight loss from taxation.

We are reluctant to pursue this “double dividend,” as it is known in the literature, for four reasons. First, as previously noted, the revenue stream generated by our proposal would be very unpredictable because it would fluctuate with the price of oil. This would make it difficult to substitute this revenue for that generated by some other tax. Second, if we

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subsidies creates no micro benefits in the form of improved incentives, and will have at best only long-term payoffs if the subsidies produce technological breakthroughs. Moreover, if subsidies for new energy technologies are packaged with other subsidies for highway and bridge construction, as under the 2009 Stimulus Bill, then the net impact of the stimulus program may be to encourage more driving and fuel consumption rather than less. In other words, the micro implications of a massive stimulus package devoted to “infrastructure investment” may be negative from an energy policy perspective. This is all the more reason to pair such a program with an energy policy that creates the right incentives.

were to use the revenue from the PFPS plan to repeal the least efficient parts of our tax system, we would likely change the distribution of the tax system, since some of the least efficient tax rules especially burden high-income people (for example, the maximum marginal rate for individuals). Third, if we were to keep the distributional impact constant, there would be room to question whether we could, actually, reduce deadweight loss. This would happen only if the prospect of paying a gas tax does not discourage labor to the same extent as the prospect of paying income tax or a broad-based consumption tax, and it is not clear to us why that would be.89

Finally, for reasons of political accountability, we should preserve a clear link between the revenue collected by the PFPS plan and the rebate that it funds. Otherwise, if the contribution side of our proposal were enacted in a compromise that paired it with a tax cut elsewhere in the system—for instance, a reduction in marginal tax rates—such that the two elements of the political compromises were not inherently linked, it would be easier for Congress to reverse the tax cut (for example, by raising marginal rates not long thereafter) while keeping the revenue from the contributions. This would be more difficult if the contributions funded something that was explicitly labeled “PFPS benefits.” We discuss concerns about repeal, and how to address them, in greater detail below.

4. The PFPS Plan Would Not Be Regressive

Another advantage of our PFPS proposal is that it need not be regressive—a common concern about nonrefundable Pigouvian gasoline taxes. It is plausible to assume that low-income taxpayers spend a higher percentage of their income buying gasoline than high-income taxpayers, so that, correspondingly, they would spend a higher percentage of their income on a gas tax.90 Yet the effect is quite different once we factor in the benefits side of our proposal. The fact that the benefit amounts would be

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89 See Louis Kaplow & Steven Shavell, Why the Legal System Is Less Efficient than the Income Tax in Redistributing Income, 23 J. LEGAL STUD. 667, 680 (1994). For instance, this could be the case if gasoline were an especially close complement to leisure, so that taxing gasoline indirectly taxed leisure, but it is not clear that this would be the case since gasoline is, of course, also used by many to commute to work.

90 Although plausible, it is not clear that this assumption is correct. See James M. Poterba, Is the Gasoline Tax Regressive?, 5 TAX POL'Y & ECON. 145 (1991) (finding that low-spending households spend about the same percentage of their income on gasoline as high-spending households). The standard assumption also focuses only on direct purchases of gasoline, without also considering indirect purchases in buying goods and services from businesses that use gasoline. Although low-income taxpayers spend a higher percentage of income on food, whose production is gasoline-intensive, they spend much less, if anything, on gas-guzzling luxuries such as plane tickets, taxis, and ski vacations. When all charges—direct and indirect—are considered, it is possible that petroleum fuel purchases represent a higher percentage of the budget of high-income taxpayers than of low-income taxpayers. Certainly the high-income taxpayers are spending more in absolute terms.
uniform, representing a pro rata share of aggregate collections—such that low-income and high-income taxpayers would receive the same amount—means that the program would tend to redistribute from high-income to low-income taxpayers on a net basis.

To illustrate this point, consider a three-person example in which gas is selling for two dollars per gallon, the PFPS charge is one dollar per gallon, and the following other assumptions also hold:

<table>
<thead>
<tr>
<th>PERSON</th>
<th>INCOME</th>
<th>GAS CONSUMED</th>
<th>BUDGET SHARE</th>
<th>PFPS PAID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$20,000</td>
<td>500 gallons</td>
<td>7.5%</td>
<td>$500</td>
</tr>
<tr>
<td>B</td>
<td>$50,000</td>
<td>600 gallons</td>
<td>3.6%</td>
<td>$600</td>
</tr>
<tr>
<td>C</td>
<td>$100,000</td>
<td>700 gallons</td>
<td>2.1%</td>
<td>$700</td>
</tr>
</tbody>
</table>

In this example, high-income people are assumed to dedicate a lower percentage of their budgets to gasoline, but to purchase more gas in absolute terms. By itself, the tax is regressive. A has an average tax rate ("ATR") of 2.5%, B has an ATR of 1.2%, and C has an ATR of only 0.7%.

Yet once the rebate is considered, the picture changes dramatically. The rebate here is $600 (representing the average gas consumption in this three-person society). Thus, A receives a net payment of $100, representing a subsidy of 0.5%. B’s rebate equals her tax paid, so her ATR is zero. C has a net cost of $100, and thus has an ATR of 0.1%. The ATR is thus increasing with income, the mark of a progressive program. The key, of course, is the uniform rebate, which causes our program to be progressive in the same way that a consumption tax with a uniform demogrant can be.

In any event, this program’s objective would be to redistribute not from high-income to low-income taxpayers, but from those who consume more than the average amount of gasoline to those who consume less. It is possible that low-income people would have somewhat less flexibility to respond to this incentive, at least in the short run, since transition costs may be more daunting for them. They might find it harder to move closer to work, for instance, or to buy a new, more gas-efficient car. Yet it is not clear that this would be the case, since low-income people may be more motivated to respond to the incentive, if only because the dollar amounts at issue would be a greater inducement for them. Given the diminishing marginal utility of money, a $100 net refund would loom larger for someone earning $20,000 than for someone earning $100,000.

91 We are grateful to Bill Gentry for suggesting this example.
92 There is empirical support for this assumption, which requires the income elasticity of gas consumption to be positive but much less than one (if it were greater than one, the budget share would increase). See Jonathan E. Hughes, Christopher R. Knittel & Daniel Sperling, Evidence of a Shift in the Short-Run Price Elasticity of Gasoline Demand, ENERGY J., Jan. 2008, at 113 (suggesting a consensus medium-run income elasticity of about 0.4).
It is possible, of course, to make our proposal more favorable to low-income people. For example, PFPS benefits could be subject to a phase-out, so that people with incomes above a certain level are not eligible, while the rest of the population receives a correspondingly larger benefit.

We recommend against a phase-out because it adds to the proposal's complexity. In addition, as Daniel Shaviro has noted, phase-outs of different credits can interact in unexpected ways to create very steep marginal effective tax rates at the phase-out level. More generally, the goal of this proposal is to encourage conservation and innovation, not to redistribute income. As Kaplow and Steven Shavell have observed, it is generally less distortive to redistribute income through the income tax than through regimes with other goals.

The best argument for a phase-out is a political one, since it will keep opponents of the measure from complaining that multimillionaires will receive as high a rebate as everyone else. But there obviously also is a political case against a phase-out, since it will inspire opposition among high-income taxpayers.

III. Limitations of the PFPS Plan

While our proposal has significant advantages, it is important to acknowledge four limitations as well, which are discussed in this Part. Two derive from the concern that the proposal would be undone, in whole or in part: the first is the risk that some or all of the proposal would be repealed as soon as the price floor started to bite, and the expectation that this would happen would dampen the program's incentive effects; the second is the concern that gas producers would raise prices to a level just above the threshold, depriving consumers of the refund payments. The other limitations derive from the narrowness of the proposal: the fact that it would not correct for the relevant externalities when gas prices are above the threshold (or, for that matter, perfectly correct for them even when gas prices decline), and the fact that it would not cover some substitutes for gasoline that give rise to similar negative externalities.

93 See generally Daniel N. Shaviro, Effective Marginal Tax Rates on Low-Income Households, 84 Tax Notes 1191 (1999) (noting that the phase-out of benefit programs functions as an effective marginal tax rate, and that the fact that these phase-outs are often set at the same level inadvertently creates very steep effective marginal rates). If the gas rebate phases out at the same place as various health, education, and child care credits, then each dollar of income at the phase-out level causes the taxpayer not only to pay the regular income tax, but also to lose these credits, which combine to create a very steep marginal effective tax rate.

94 See Kaplow & Shavell, supra note 89, at 674-75.
A. Risk of Repeal

As noted above, an advantage of the PFPS plan is its promise of stability. By maintaining a floor on petroleum fuel prices, the proposal creates a powerful incentive for consumers and producers to modify behavior. But the program would not have these beneficial effects if people expected that, once oil prices began to fall, Congress would repeal the PFPS plan in order to give constituents the benefits of lower gasoline prices.\(^9\)

The risk here is not insubstantial.\(^5\) Once the PFPS plan kicks in and prevents retail prices from falling in response to declining crude oil prices, repeal could be characterized as a "tax cut," and indeed repeal would result in an immediate financial benefit to consumers in the form of lower gas prices. To be sure, this benefit would be an illusion, or perhaps more accurately would be transitory, since under our proposal the cut in contributions would be matched by a loss of PFPS benefits as well. But one can easily imagine political entrepreneurs seeking to exploit the appearance that they are the agents of instant relief for consumers. Gasoline prices are highly visible—they stare you in the face every time you fill up at the pump—making them perhaps the most salient cost that consumers incur. Moreover, consumers must pay this cost on a recurring basis. PFPS benefits, in contrast, would appear in the mailbox only periodically (for example, once a quarter). Of course, those who are inefficient users of gas would receive a very real benefit from repeal (at the expense of those who conserve and thus would receive a net payment under the program). Given this political dynamic, it would not be unlikely that politicians would be tempted to exploit asymmetries in perception and circumstances by agitating for repeal once world oil prices fell far enough to trigger PFPS charges.

Can we provide an institutional mechanism signaling that repeal would be less likely? One possibility would be to adopt a supermajority requirement for any future repeal of PFPS contributions. For example, the

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95 This point is not new. See Mason Willrich, Energy Independence for America, S2 INT’L AFF. 53, 62 (1976) (noting that a price floor on oil must be sufficiently high so that "the United States, having at considerable cost extricated itself from the world market, [is not] turned around and plunged in once more"); see also Jerry Taylor & Peter Van Doren, An Argument Against Oil Price Minimums, CATO INST., http://www.cato.org/pub_display.php?pub_id=6410 (last visited Dec. 10, 2009). Of course, if the contribution level is as likely to rise as it is to fall, then risk-neutral consumers and producers will disregard the change-in-law risk. See DANIEL N. SHAVIRO, WHEN RULES CHANGE: AN ECONOMIC AND POLITICAL ANALYSIS OF TRANSITION RELIEF AND RETROACTIVITY 27-28 (2000). Yet we believe repeal will be considered more likely, for the reasons advanced in the text. In response, we suggest various institutional constraints on repeal. If these are expected to be effective, then producers and consumers would predict that, if anything, contribution levels would increase, a prediction that would increase the PFPS program’s current impact.

96 For a discussion of the risks of backsliding from commitments made to combat climate change, see Richard J. Lazarus, Super Wicked Problems and Climate Change: Restraining the Present To Liberate the Future, 94 CORNELL L. REV. 1153 (2009).
House of Representatives has from time to time adopted rules requiring a three-fifths majority of those voting to pass an increase in income tax rates.\textsuperscript{97} Similarly, Congress could adopt rules of procedure requiring a supermajority vote to repeal the PFPS contributions.\textsuperscript{98} This would not guarantee supermajority entrenchment, since Congress could also repeal the supermajority requirement by majority vote. But any move to repeal the supermajority requirement would require the separate approval of the Rules Committee and an affirmative vote in support of a special rule, which would draw attention to the action and provide an additional fault line on which opposition could rally. This would provide some additional measure of assurance that repeal is unlikely.

Alternatively, the government could attempt to "lock box" the PFPS contributions. For example, Congress could form a wholly owned governmental entity to segregate these revenues from the rest of the budget. The entity's only asset would be this revenue stream, and its sole responsibility would be to work with the IRS to refund the revenue to taxpayers.

Or, the government could consider entering into specific contractual guarantees, perhaps with the auto industry, assuring that the contributions would not be repealed. This would raise the specter of major breach of contract damages in the event of repeal, which would deter Congress from considering repeal in response to falling prices.\textsuperscript{99} None of these ideas is fail-safe, of course, but in some combination they might provide additional assurances against the risk of repeal.

A further concern is the risk that the contributions would not be rebated, but would be diverted to other ends by Congress. The uncertain magnitude of the contributions militates against this risk. It is irresponsible to fund government programs with a revenue stream that is very unpredictable and may often completely dry up. Also, once the PFPS plan was in place, any diversion would require cutting or eliminating PFPS benefit checks that taxpayers would expect to receive when oil prices fall. The typical household would compare the benefits of the refund it expects to receive to the benefits from the program that Congress is proposing to fund, and would likely conclude that it would prefer the cash. This of

\textsuperscript{97} See, e.g., H.R. Res. 5, 105th Cong. § 106(a) (1997).

\textsuperscript{98} There has been some controversy about the constitutionality of self-imposed supermajority rules. Compare John O. McGinnis & Michael B. Rappaport, The Rights of Legislators and the Wrongs of Interpretation: A Further Defense of the Constitutionality of Legislative Supermajority Rules, 47 DUKE L.J. 327 (1997) (arguing in favor of constitutionality), with Jed Rubenfeld, Rights of Passage: Majority Rule in Congress, 46 DUKE L.J. 73 (1996) (arguing against constitutionality). The better view, we think, is that they are constitutional, on the understanding that such rules can always be repealed by a majority vote.

course is a diffuse sentiment, which may be difficult to organize in opposition to a concentrated interest arguing for a diversion to some pet project, like ethanol subsidies. But the loss of the checks may be salient enough, among enough voters, to discourage politicians from taking this step.

B. Avoiding a Windfall to Producers: The Risk That Producers Would Capture the Refund

There is a risk not only that Congress would take the benefit payments away from consumers, but also that gasoline producers would do so—at least if the contributions were not structured with care—by not allowing market prices to fall below the threshold. This concern would arise, for instance, if the charges were structured so that they would automatically increase to make up for any difference between the retail price of gasoline and the target price. With a structure of this sort, consumers would not be motivated to comparison shop, since they would never pay less than the target price. For example, if the target price is $3.50 per gallon, a gas station that charges $3.45 per gallon with a five cent PFPS contribution will be no more appealing to consumers than one that charges $3.50 per gallon with no PFPS contribution. As a result, producers would have little incentive to let pre-contribution prices fall, and collectively they would be likely to coordinate prices at just above the target price, so that the government would have no revenue to fund PFPS refunds for consumers.100

Of course, even if producers were to prop up prices in this way, the behavioral effects that we intend to create would be preserved. Consumers still would have the incentive to conserve and experiment with new technologies, and alternative fuel producers could rely on the stability of gas prices in making investment decisions. Nevertheless, our goal of allowing consumers to enjoy the economic benefits of price declines—through PFPS benefits, if not directly—would be undercut.101

The challenge of institutional design is to address this concern—ensuring that producers have incentives to cut costs and to let the market price fall, while still assuring the price stability that is needed to encourage conservation and innovation. We offer two ways to thread this needle.

100 Indeed, the price floor has the unintended effect of facilitating such implicit coordination by providing gas stations with a focal point, so that each station knows the price at the pump is supposed to be $3.50—there is no need for a meeting in a smoke-filled room to decide on this level.

101 This scenario is a variation of the familiar reality that the statutory incidence of a tax or refund may not be the same as its economic incidence. The concern here is that the incidence of the refund ultimately would lie with producers instead of consumers.
1. Basing Charges on Crude Price Instead of Retail Price

First, we propose to compute the charges based on changes in the price of crude oil as opposed to changes in the retail price at the pump. This would preserve the benefits of competition among downstream suppliers, including refiners, interstate pipeline companies, and retail service stations. Only fluctuations in crude prices, and not the actions of refiners or service stations, would affect the size of the PFPS contributions. For example, if a gas station tried to add $0.05 to the price per gallon as a way to increase its profits, this step would not reduce the size of the PFPS contribution, which would have already been set based on crude prices. Since retail prices would not be offset by a decline in the contribution level, consumers would prefer to buy at service stations that did not attempt to raise prices in this way. Stations that held the line on prices would attract a higher sales volume to offset their lower profit margin. Thus, refiners and distributors would not be able to pad their profits in a way that is invisible to consumers, as long as contribution levels were based on crude prices.\textsuperscript{102}

Of course, there would still be the risk that producers of crude oil would have a diminished incentive to let prices fall. OPEC, in particular, would have less incentive to allow crude prices to decline if lower prices would not lead to a higher sales volume in the United States. Nevertheless, OPEC is subject to two important constraints. First, although it has significant influence over oil prices, it does not have perfect control because some members defect and other suppliers are not in the cartel. Second, assuming that the rest of the world did not adopt our proposal, consumers outside the United States would benefit from oil price declines below the threshold. As a result, producers would have an incentive to let the price fall for these consumers in order to sell more oil. It would be difficult for OPEC to maintain one price in the United States while letting the price fall everywhere else. The global nature of the market for oil, then, gives some comfort that OPEC would not be able to take our proposed refund away from U.S. consumers.

2. Adjusting Charges Monthly Instead of Continuously

A second element of our plan that would keep producers from capturing the refund is that we would adjust the level of PFPS

\textsuperscript{102} The analysis changes somewhat if the formula for computing the levy makes assumptions about refining and distribution prices. If these assumptions were updated periodically, then refiners and producers could hope that, in padding their prices in one period, they could induce a smaller levy in the next period, leading to the same net price for consumers but a larger share for themselves. Yet as long as the formula's assumptions are not updated, and are based instead on historical experience that predates enactment of the levy, this problem would not arise. Even if the assumptions were updated, then the fact that the levy is recomputed monthly instead of continuously should constrain producer price gouging, as discussed below.
contributions only once a month, and not each time oil prices change. This short-run price fluctuation again would create incentives for consumers to comparison shop. Since they would keep the full amount of any price decline in between monthly adjustments, they would favor gas stations that let the price fall. As a result, gas stations should not be able to cancel out the PFPS contribution by keeping pre-contribution prices artificially high.

For example, in setting the contribution level for the month of February, we would ask what the average pre-contribution price of oil was on a particular date in January (for example, January 28). The PFPS contribution would be based on this date alone. Then the PFPS contribution would remain fixed for the entire month, even as the underlying price of gasoline fluctuated.\textsuperscript{103}

The great virtue of this approach is that it would square an important circle. Not only would it give consumers incentives to monitor and claim pre-contribution price declines, but it also would preserve consumer and producer incentives to conserve and to invest in alternative energy. At first blush, this may not seem to be the case, since the price would be allowed to fall below the floor (for example, $3.50 per gallon) between monthly adjustments to the contribution level. Yet the essential point is that these fluctuations could be in either direction. After the PFPS contribution is set for the month, the pre-contribution price of gas can go up as well as down, and there is no reason to expect a systematic bias one way or the other.

So when producers and consumers are making long-term decisions about which cars to buy or which alternative energy projects to support, they would know that the price would generally be at least $3.50 on average—since each month the contribution level would be adjusted to bring the price back to $3.50, at least initially—and they would know that the price for the rest of the month could vary, but this variation would be random instead of systematic. They could not count on a lower price during the rest of the month, and would be equally likely to pay a higher price than $3.50. As a result, a system based on monthly adjustments would have the important virtue\textsuperscript{104} of creating strong incentives to conserve and invest in

\textsuperscript{103} A possible concern about a monthly adjustment is that, if prices have increased during the month, consumers might delay their purchases until the next month, when the PFPS contribution is expected to be lower; likewise, if prices have declined, they might top off just before the contribution is recomputed. To blunt this effect, the levy could be recomputed more frequently, such as every other week or even weekly.

\textsuperscript{104} Another advantage of adjusting the PFPS contribution monthly, instead of continuously, is that the program is easier to administer. Continuous recomputations would not be necessary, and collection would be easier because auditors would need to know only how many barrels were sold in a given month, and not exactly when each barrel was sold. This is not to say that a monthly adjustment would be completely free of administrability issues. For instance, if producers know in advance which day of the month is the measuring date for next month’s levy, they would have an incentive to raise the price on that day. To head off this abuse, the date should be chosen at random, and after the fact.
alternative energy, while also preventing gas stations from, in effect, taking away the consumer's rebate.\textsuperscript{105}

C. \textit{The Proposal Is Not Sufficiently Comprehensive}

A further limitation of our PFPS proposal is that it is less comprehensive than an ideal Pigouvian carbon tax.

1. \textbf{Charges Are Too Low at Current and Higher Gas Prices}

Obviously, the PFPS program would impose no out-of-pocket cost on consumers when gas prices are above the threshold. Yet the externalities that justify a tax, including environmental harms, national security risks, and congestion costs, still are there. Ideally, the level of a Pigouvian tax is supposed to reflect the marginal cost of these externalities, but our proposal obviously is not structured in that way. Indeed, the PFPS contribution would fluctuate not with the level of the externality, but inversely with the level of gas prices.

This concern would be particularly pronounced if gas prices were relatively low at the time this program was enacted. If prices were already low, they would be unlikely to fall much further, which would mean that the PFPS charges under our program would be limited in size, and thus would be less likely to approximate the social harms. Yet even in this circumstance, having some floor on the price of gasoline would be valuable in offering at least some stability to expectations. As previously noted, the program would be better still if it included either a provision for phasing in increases of target prices or an automatic reset mechanism to increase the threshold if gas prices rose significantly for an extended period of time. Even without this sort of built-in mechanism, Congress could always revisit the threshold if prices rose. Having the price floor in place is an important first step.

\textsuperscript{105} Another option, as Donald Susswein has suggested, would be to structure the charge so that it would not offset the entire gas price decline below the threshold, but only a fraction of it. See Donald B. Susswein, \textit{Will a Floor on Energy Prices Produce Windfall Profits?}, 120 TAX NOTES 591 (2008). For example, the contribution level could be half of a cent for each cent by which the price fell below our threshold of $3.50. If the price of oil fell such that the retail price would fall to $3.40, the PFPS contribution would be $0.05, so the price at the pump would be at least $3.45. The question, of course, is whether producers would allow the price to fall to $3.45. The fact that consumers can claim some of the price decline gives consumers an incentive to comparison shop, and to favor producers who cut their pre-contribution prices. Yet obviously the incentive is only partial, since consumers do not benefit from the entire decline. Even if this approach is sufficient to keep producers from appropriating the contributions, it has the further disadvantage of weakening the main incentive effects we aim to create: the contributions obviously provide less price support, and thus less incentive for consumers to conserve and less incentive for investors to support innovation.
In an ideal world, we might favor a gas tax that is uniform and at an adequate level. We agree that such a tax has valuable incentive effects, since it internalizes the relevant externalities even when gas prices are above the threshold. Such a tax can also be paired with a refund of the sort we have described, rendering the tax fiscally neutral.\textsuperscript{106} And, of course, if the tax is structured in this way, producers have incentives to offer the lowest price, so that the problem described above, of producers in effect expropriating the refund, does not arise.

Yet, as we have said, we do not believe that a more conventional gas tax is politically viable in the United States, at least for now. For the reasons we outlined above, our proposal is more plausible politically. Moreover, our proposal offers additional benefits relative to a Pigouvian tax: it would produce price stability, at least in the downward direction, which should encourage investment in energy conservation; and it would produce an unreliable revenue stream, reducing the risk of diversion of the revenues to other government programs, which in turn would further enhance the plan's political acceptability and ensure its fiscal neutrality. Finally, the PFPS plan offers a great many of the benefits that a conventional gas tax provides.

Conceivably, our proposal could serve to pave the way for a more conventional gas tax. If the public became accustomed to a refundable levy that is contingent on gas price levels, it might ultimately come to accept one that is not. Indeed, if the government were able to use this program to prove its commitment to preserving the refund, it could address an important voter concern—that politicians will claim the revenue for pet projects—so that a refundable levy that applies at all price levels might become an easier political sell.

2. Petroleum Fuels Only Instead of a Broad-Based Carbon Tax

Finally, there is a second way in which our proposal is too narrow: it would apply to petroleum fuels, but not to substitutes that also contribute to environmental harms and national security risks. For example, natural gas and coal contribute to environmental harms, although domestic supplies are more plentiful so the national security analysis is different.

An obvious risk of omitting substitutes is that, at the margin, we would encourage people to substitute one harm, covered by the program, for another harm that is not. For instance, if our program did not apply to jet fuel (for example, if jet fuel were exempted for political reasons), we

\textsuperscript{106} Cf. Gilbert E. Metcalf & David Weisbach, \textit{Will a New Administration Mean a New Policy on Climate Change?}, 122 Tax Notes 625 (2009) (proposing a comprehensive carbon tax that would be revenue and distributionally neutral, without spelling out how this would be accomplished).
would encourage some to substitute flying for driving, an effect that may be counterproductive.

Nevertheless, we have limited our proposal to petroleum fuels for three reasons. First, there already is a federal excise tax on petroleum fuels, and our proposal can simply be added to the existing administrative structure. This would make it easier to implement, and also would provide a principle—building on existing practice—that could be invoked to fend off claims for additional exemptions. Second, the interest group opposition to our proposal would be narrower if the proposal was crafted narrowly. If natural gas were included, for instance, a new set of interest groups would have strong incentives to oppose it. Finally, the incrementalist philosophy we invoked above, in discussing the fact that the PFPS program would not apply above the price threshold, is relevant here as well. It is always possible to begin with petroleum fuel—an extremely important part of the problem—and to broaden the measure over time, as it proves to be workable and gains political acceptance.

Conclusion

This Article has developed an alternative to a Pigouvian carbon tax that offers many of the advantages of an ideal corrective tax, while offering political advantages relative to such a tax. Our PFPS plan is structured to take effect only if the market price of petroleum fuel falls, and any charges levied are fully refundable to consumers.

The PFPS plan would signal to consumers, auto manufacturers, and investors in alternative energy technology that petroleum fuel prices will not appreciably decline in the future. They would respond in a host of ways that, over time, would reduce America’s consumption of oil. The plan offers a powerful incentive for innovation, but with an appropriately limited role for government. Unlike the hodgepodge of subsidies and credits currently under consideration, the PFPS levy does not depend on the government to determine which technologies will succeed.

If our proposal had been in effect in the summer of 2008, it would have encouraged consumers to conserve and would have prevented the failure of a host of alternative energy ventures, while still allowing consumers to benefit from oil price declines through PFPS benefit payments. In short, we would have enhanced the security of the nation and the environment, while enjoying the economic benefits of low gas prices. Even though oil prices have fallen from their 2008 peak, it is not too late to enact this program. Setting a price floor even at a relatively low level would be valuable, and we can either include a mechanism that would automatically reset the price floor in the future, or we can revisit the floor later if prices rise again. Putting the program in place is an important step toward securing the nation’s future.