

TRIPLE-DIVIDENDS: TOWARD PIGOVIAN GASOLINE TAXATION

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Abstract

The American public's demand for inexpensive gasoline and indifference to the risks posed by climate change have shaped the nation's traditional and alternative energy policies. Public opinion encourages lawmakers to implement inconsistent and economically inefficient policies, which not only fail to satisfy the nation's energy needs but produce a host of secondary economic, national security, and environmental problems.

This article advocates replacing the United States' current panoply of ineffective government subsidies and mandates with an efficient, market-driven solution: higher federal gasoline taxes. Whereas previous environmental tax proposals assume constant tax revenue, this article considers the potential to reduce costly foreign policy expenditures in light of decreased domestic petroleum demand. This broader view suggests that Pigovian gasoline taxes would yield triple-dividends, simultaneously benefiting the United States' economy, national security outlook, and environment. Recognizing the incentives responsible for current energy policies provides insight into how higher federal gasoline taxes might successfully be promoted and enacted.

I. INTRODUCTION

The United States' energy policy badly needs reform. Dependent on oil for transportation fuel, the U.S. spares no expense in securing access to a great quantity of foreign oil. At the same time, alternative energy mandates and subsidies promote "green" technologies, such as hybrid cars and "biofuels" distilled from agricultural crops, in order to make these products attractive to American consumers. Working at cross-purposes, these policies not only fail to address the nation's energy needs, but also destabilize the domestic economy, jeopardize national security, and permit environmental degradation. In a paradoxical effect, government energy policy creates the very problems it purports to address with wasteful expenditures on securing oil and subsidies.

The United States can no longer afford to waste money in this way. The recent economic crisis and increased public demand for alternative energy demonstrate the need and provide an opportunity to reevaluate the nation's energy policies. Considering that 70% of total U.S. oil consumption is in the form of

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transportation fuel,¹ the majority of which fuels passenger cars,² policy concerning gasoline is of primary importance.

This article advocates replacing the United States' current panoply of ineffective government subsidies and mandates with an efficient, market-driven solution: higher federal gasoline taxes. In many spheres, government taxes discourage consumption that imposes hidden costs on taxpayers. By definition, a "Pigovian" tax increases the price of a good or service to reflect its true cost, thereby decreasing consumption to the economically optimal level. If imposed on gasoline, a federal Pigovian gasoline tax would simply reduce American gasoline consumption to an efficient level. In so doing, such a tax would enable the federal government to decrease national spending (and income taxes) or at least put tax revenue to better use.

This prediction contradicts the scholarly consensus on "environmental" taxes, which assumes that government tax revenue must remain constant for such taxes to make economic sense. Under this constraint, economists calculate that even considering efficiency gains from lower income taxes, a Pigovian gasoline tax cannot raise enough revenue to produce a national net economic gain, and therefore should not be implemented.³ However, considering the broader impact of increased gasoline prices provides a more encouraging answer. Freed from its addiction to oil, the United States could reduce costly foreign policy spending and discontinue inefficient alternative energy subsidies. Significant spending decreases would result in a net economic gain to the United States. In practice, Pigovian gasoline taxation would actually yield triple-dividends, simultaneously benefiting the United States' economy, national security outlook, and environment.

My argument proceeds in five parts. Part II notes the historical development and current state of the United States' traditional and alternative energy policies. Part III discusses the myriad economic, foreign policy, and environmental harms such policies produce. Part IV proposes replacing these policies with economically efficient Pigovian gasoline taxes, and catalogues the many benefits of doing so. Part V discusses how public aversion to higher gasoline taxes might be overcome. Part VI concludes.

II. CURRENT TRANSPORTATION ENERGY POLICIES

The United States' current energy policies take an ineffective, piecemeal approach to addressing the nation's transportation energy needs—an approach that forestalls a comprehensive, coordinated policy from being implemented.

¹ ENERGY INFO. ADMIN., BASIC PETROLEUM STATISTICS (2007), <http://www.eia.doe.gov/neic/quickfacts/quicoil.html> (last visited Mar. 16, 2009).

² Energy Info. Admin., *Annual Energy Outlook 2008 with Projections to 2030*, at 130, available at [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2008\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2008).pdf) [hereinafter *AEO 2008*] (indicating that 60% of transportation consumption fuels "light-duty vehicles").

³ See, e.g., RUUD A. DE MOOIJ, ENVIRONMENTAL TAXATION AND THE DOUBLE DIVIDEND (2000) (concluding that decreases in gasoline consumption will reduce overall gasoline tax revenue, precluding permanent cuts in income taxes).

A. Traditional Energy Policies

Since the automobile replaced the train as Americans' primary mode of transportation early in the 20th century, United States foreign policy has focused on ensuring American industry and individual consumers have access to inexpensive petroleum. Enormous military and foreign policy expenditures have been maintained to this end. This is not to suggest that such government actions were unwise.⁴ Rather, it shows that government foreign policy expenditures have distorted the market for oil. Foreign policy expenditures represent, effectively, a government subsidy of gasoline's true cost.

Like any cost not realized by market actors, the low price of gasoline has led to overproduction and overconsumption of vehicles. These distortions have shaped the sprawling development of American society, which widespread car ownership made possible, and which requires Americans living in all but a handful of cities to rely on cars. Not only does the low price of gasoline keep car ownership high, it also decreases consumer demand for fuel-efficient vehicles. These trends have produced a country very dependent on artificially inexpensive foreign oil. Indeed, President George W. Bush went so far as to call this dependency an addiction.⁵ But it is an addiction enabled by government policies; if American consumers are addicts, the United States government is their dealer.

B. Alternative Energy Policies

Recent government policies purportedly intended to wean Americans off oil do not correct existing market distortions, but rather impose additional distortions. Moreover, the fact that these policies are not aimed at making Americans drive less, but only at lessening the environmental impact of this level of driving,⁶ suggests that considerations other than efficiency motivate lawmakers.⁷ Initiatives promoting the production of biofuels and the consumption of fuel-efficient vehicles provide evidence of this distorting effect.

⁴ For example, the Interstate Highway System was promoted by President Eisenhower as a Cold War measure to facilitate the transportation of military equipment throughout the lower 48 states in the event of invasion. Federal-Aid Highway Act of 1956, Pub. L. No. 84-627, § 108(a), 70 Stat. 374 (noting the highway's "primary importance to the national defense").

⁵ President George W. Bush, State of the Union Address (Jan. 31, 2006) ("America is addicted to oil, which is often imported from unstable parts of the world.").

⁶ GUNNAR S. ESKELAND & SHANTAYANAN DEVARAJAN, WORLD BANK, TAXING BADS BY TAXING GOODS: POLLUTION CONTROL WITH PRESUMPTIVE CHARGES 9 (1996) ("For cars . . . it is important both to make trips cleaner and to discourage trips—instruments that do both are necessary unless taxes can be levied on individual emissions.").

⁷ "There does not appear to be any justification of this mix of taxes, tax incentives, and subsidies as representing an optimal approach to climate change." John C. Dernbach & Seema Kakade, *Climate Change Law: An Introduction*, 29 ENERGY L.J. 1, 23 (2008).

1. *Biofuel Production Subsidies*

Biofuels such as ethanol and biodiesel have widely been promoted as a panacea to America's dependence on foreign oil.⁸ Touted as providing emissions benefits over fossil fuels,⁹ increasing national security, and revitalizing rural communities economically,¹⁰ biofuels have received substantial political support. However, there is a broad consensus that given the low price of gasoline, these alternative fuels will not be competitive in the absence of government subsidies.¹¹

Among the many subsidies available to producers of biofuels, most notable is the Volumetric Ethanol Excise Tax Credit, or "blender's credit," which credits oil companies with \$.51 for each gallon of ethanol mixed into gasoline sold.¹² Biodiesel blenders receive a similar tax credit of \$1.00 per gallon of "agri-biodiesel," made from plants such as soybeans, and \$.50 per gallon of "wastegrease biodiesel," made from recycled vegetable oils and animal fats.¹³ Until December 31, 2008, small producers of ethanol and biodiesel received a tax credit of \$.10 per gallon of biofuel produced, up to 15 million gallons.¹⁴ In addition, the government rewards fueling station owners with a tax credit of 30% (up to \$30,000) towards the cost of installing biofuel-capable refueling equipment.¹⁵ The federal government also imposes significant tariffs on imported biofuels; imported ethanol is subject first to a tariff equaling 2.5% of its total value, and second to a \$.54 per gallon tariff.¹⁶

⁸ Rudolf M. Smaling, *Environmental Barriers to Widespread Implementation of Biofuels*, 2 ENVTL & ENERGY L. & POL'Y J. 287, 287 (2008). See also President Barack Obama, Inaugural Address (Jan. 20, 2009) ("We will harness . . . the soil to fuel our cars . . .").

⁹ See Karl R. Rábago, *A Review of Barriers to Biofuel Market Development in the United States*, 2 ENVTL & ENERGY L. & POL'Y J. 211, 226-27 (2008) (claiming that climate change concerns drive biofuel development) (citing Natural Res. Def. Council, *Move Over, Gasoline: Here Come Biofuels*, <http://www.nrdc.org/air/transportation/biofuels.asp> (last visited Dec. 29, 2009)).

¹⁰ See John Herbig, Recent Development, *Technical and Legal Considerations for Bio-Fuel*, 2 ENVTL & ENERGY L. & POL'Y J. 343, 354 (2008) ("[B]iodiesel is a cleaner, homegrown fuel that can fit seamlessly into the current diesel infrastructure while simultaneously helping U.S. farmers.").

¹¹ See James A. Duffield et al., *Ethanol Policy: Past, Present, and Future*, 53 S.D. L. REV. 425, 425 (2008) ("The early development of the U.S. ethanol industry was sparked by government policy; the recent expansion in ethanol plant capacity can be directly linked to government regulations; and the future of ethanol will greatly depend on continued government support."); John A. Sautter et al., *Construction of a Fool's Paradise: Ethanol Subsidies in America*, 7 SUSTAINABLE DEV. L. & POL'Y 26, 29 (2007) ("The policy relationships embedded in ethanol production [are] based on ever-growing tax incentives and subsidies."); Chris Stefan, Sustainable Energy, *Fueling the Future: A Policy-Based Comparison of Alternative Automotive Fuel Sources*, 7 SUSTAINABLE DEV. L. & POL'Y 22, 24 (2007) (same). See also Malinda McAleer-Pennington, Note, *Can Biofuels Solve the Problems of American Foreign Oil Dependence?*, 16 SOUTHEASTERN ENVTL. L.J. 457, 465 (2008) (noting that biofuels' lower energy content requires more frequent vehicle refueling).

¹² See American Jobs Creation Act of 2004, Pub. L. No. 108-357, § 301, 118 Stat. 1418 (2005).

¹³ *AEO 2008*, supra note 2, at 24.

¹⁴ *Id.* at 24 n.22.

¹⁵ Energy Policy Act of 2005, Pub. L. No. 109-58, § 1342, 119 Stat. 594, 1050-51 (2005) (amending 26 U.S.C. § 30C).

¹⁶ *AEO 2008*, supra note 2, at 24. However, the Caribbean Basin Initiative ("CBI") provides an exemption, determined by the U.S. International Trade Commission, of up to 7% of the United

2. *Biofuel Consumption Incentives*

The government also provides tax credits to consumers who purchase hybrid vehicles, vehicles that run on biofuels, or other fuel-efficient cars.¹⁷ Since hybrids cost \$2,000 to \$7,000 more than cars that run on gasoline, such incentives are necessary to make alternative fuel vehicles competitive. Savings from these vehicles' increased fuel economy take many years to compensate for the vehicles' higher prices, even when gasoline prices are high. Indeed, "from a short-term payback perspective, without the tax credits, hybrids make no sense for the average driver[.]"¹⁸ However, tax credits available to consumers "start to go away when a car maker sells its 60,000th alternative-fuel vehicle, a level Toyota reached in mid-2006 and Honda hit in the third quarter of 2007."¹⁹ Some states provide consumers incentives to purchase alternative fuel vehicles as well. For example, in California, hybrid and alternative-fuel vehicles are permitted to drive in carpool lanes regardless of the number of passengers they carry.²⁰

These primarily tax-based policies aim to compensate for the low relative price of gasoline by subsidizing biofuel production and consumption, in order to encourage producers and consumers to utilize non-petroleum resources more than they otherwise would. In this way, lawmakers respond to incentives produced by the artificially low price of gasoline by artificially lowering the price of alternatives. However, so distorting fuel markets has created numerous problems, described below.

III. SHORTCOMINGS OF THE CURRENT APPROACH

These problems stem from the economic inefficiency inherent in government policies. Increasing the supply of alternative fuel vehicles rather than addressing the demand for them only encourages dependence on government subsidies, and burdens the government with a role better left to the private sector. As a consequence, the United States' uncoordinated assortment of transportation energy

States' domestic ethanol production from this \$.54 tariff, for countries covered by the CBI. For 2008, the rate was set at 452 million gallons. American Coalition for Ethanol, <http://www.ethanol.org/index.php?id=78&parentid=26> (last visited Jan. 10, 2009).

¹⁷ Energy Policy Act of 2005, Pub. L. No. 109-58, § 1341, 119 Stat. 594, at 1038-49 (amending 26 U.S.C. § 30B). See also Roberta Mann, *Subsidies, Tax Policy and Technological Innovation*, in AM. BAR ASS'N, GLOBAL CLIMATE CHANGE AND U.S. LAW 565, 574-76 (Michael Gerrard ed., 2007) (detailing consumer tax credits).

¹⁸ Mike Spector, *The Incentives to Buy Hybrids are Dwindling*, WALL ST. J., Nov. 6, 2008, at D1 (quoting Kim Korth, president of IRN Inc., a consulting firm in Grand Rapids, Michigan).

¹⁹ *Id.* See also Michael Totty & Spencer Swartz, *How to Kick Our Oil Addiction Despite Plunging Oil Prices*, WALL ST. J., Nov. 17, 2008, at R1 (statement of Rep. Roscoe G. Bartlett) ("Washington should enact new tax rebates to reward purchases of more fuel-efficient automobiles, which would be paid for with tax penalties for the purchase of less fuel-efficient cars.").

²⁰ Tony Bizjak, *Carpool Lanes Open to Hybrids*, SACRAMENTO BEE, Aug. 11, 2005, at A1.

policies poorly addresses the nation's economic, national security, and environmental concerns.²¹

A. Economic Inefficiency

Current energy policies both produce and perpetuate inefficient externalities²² that undermine their success. In the absence of externalities, price information encourages the optimal level of output: that where marginal cost equals marginal benefit. Market prices convey information in two ways; they tell producers what benefits consumers derive from goods and services, and they tell consumers what those goods' and services' production costs are.²³

However, the government's two-sided intervention in the transportation fuel market produces significant externalities unaccounted for in fuel prices. Government policies artificially reduce the cost of transportation fuels such as gasoline. This lower cost inflates consumer demand for these fuels, to the detriment of the United States' economy, national security, and environment.

B. Economic Harm

1. Volatile Gasoline Prices

Economic externalities produced by the government's current energy policies are significant. While American transportation consumes a great deal of petroleum products, especially gasoline, the United States' domestic petroleum resources are limited. As a consequence, American consumers and industry are vulnerable to price shocks in the international oil markets.²⁴ OPEC controls 41% of the world's petroleum reserves, providing member countries significant control over oil production and prices.²⁵ And as is true of any commodity, oil prices are inherently volatile.²⁶ "The price of crude oil fluctuates based on a wide variety of international and political events, seasonal demand, and other factors, with the

²¹ See Rábago, *supra* note 9, at 225 ("[S]ystematic solutions are likely to be more effective than an incremental approach to problem solving.").

²² "An economic externality [is] an economic gain or loss accruing to one or more recipient agents as a result of an economic action initiated by another agent – with the gain or loss not being reflected in market price." Nicholas Mercuro, *Introduction to Ecology, Law and Economics & the Economy*, in *ECOLOGY, LAW AND ECONOMICS: THE SIMPLE ANALYTICS OF NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS* 1, 7 (Nicholas Mercuro ed., 2d ed. 1997) (footnote omitted).

²³ *Id.* at 9.

²⁴ "Reports of America's dependence on foreign oil can be seen almost daily in the news, and this dependence is also evident in the ever fluctuating, and often skyrocketing, gas prices across the nation." Margaret J. Jennings, Note, *Bioenergy: Fueling the Future?*, 12 *DRAKE J. AGRIC. L.* 205, 206 (2007).

²⁵ *AEO 2008*, *supra* note 2, at 50 (projecting that OPEC is likely to retain this market share through 2030).

²⁶ See Rábago, *supra* note 9, at 215 (stating that energy security requires "having alternatives in place to allow us to withstand highs and lows associated with any commodity") (citation omitted).

price of crude [oil] determined in the global market.”²⁷ This renders the gasoline market “vulnerable to hurricanes, accidents, crude supply interruptions, terrorists, and dictators.”²⁸

This volatility interacts with consumer behavior in an interesting way. Although consumer demand for gasoline is relatively price inelastic²⁹ in the short term,³⁰ fluctuations in gasoline prices do affect individuals’ long-term outlook, influencing consumer demand for vehicles, for example. In response to sharp increases in world oil prices during the 1970s³¹ and since 2006, consumers seek more fuel-efficient vehicles, and these preferences correspondingly recede as gas prices drop.³²

However, because vehicle design and production lag behind demand, such drastic short-term shifts in consumer demand cripple the automobile industry. Publicly-traded automakers operate on short timelines. Even if they could accurately predict future consumer demand, automakers report earnings to shareholders on a quarterly basis, face constant operating costs, and must make regular payments on outstanding debt. Automakers therefore must respond to consumer demand tied to volatile gasoline prices, which is easier said than done. All too often, automakers fail to anticipate future demand accurately, causing fuel-efficient vehicles to hit the market just in time for falling oil prices to destroy the demand for them.³³ Indeed, as gas prices plunged in November 2008, “the Toyota

²⁷ Andrew P. Morriss & Nathaniel Stewart, *Market Fragmenting Regulation: Why Gasoline Costs So Much (and Why It’s Going to Cost More)*, 72 BROOK. L. REV. 939, 954 (2007) (citing U.S. GOV’T ACCOUNTABILITY OFFICE, ENERGY MARKETS: EFFECTS OF MERGERS AND MARKET CONCENTRATION IN THE U.S. PETROLEUM INDUSTRY 18 (2004) (“The price of crude oil produced in the United States is determined in the world oil market because the decontrol of domestic oil prices in 1981 has effectively linked the U.S. oil market to the world oil market.”)).

²⁸ *Id.* at 1054 (footnote omitted).

²⁹ Price elasticity measures the sensitivity of consumer demand for a product in response to changes in the product’s price. Consumption of a price-inelastic product would decline less than 10% in response to a price increase of 10%.

³⁰ Inho Kim, *Introducing Oil Cargo Liability in the Oil Pollution Act of 1990*, 33 J. MAR. L. & COM. 179, 182 (2002) (citing Bernard P. Herber, *Pigovian Taxation at the Supranational Level: Fiscal Provisions of the International Oil Pollution Compensation Fund*, 6 J. ENV’T & DEV. 110, 116 (1997)). See also FRANKLIN TUGWELL, *THE ENERGY CRISIS AND THE AMERICAN POLITICAL ECONOMY: POLITICS AND MARKETS IN THE MANAGEMENT OF NATURAL RESOURCES* 42 (1988) (noting that this short-term price inelasticity “tends to exacerbate short-term price fluctuations” in fuel markets).

³¹ In the 1970s, “a foreign cartel imposed a series of very large price increases on us.” TUGWELL, *supra* note 30, at 195.

³² “When the price of gasoline doubled in the late 1970s, for example, the proportion of cars sold with fuel-efficient four-cylinder engines rose sharply, with corresponding declines in the proportions sold with six- and eight-cylinder engines. By the same token, when the price trajectory of gasoline reversed itself in the ensuing years, falling sharply relative to the price trajectories for other goods, the market for cars with larger engines began a robust comeback.” Robert H. Frank, *Progressive Taxation and the Incentive Problem*, in DOES ATLAS SHRUG?: THE ECONOMIC CONSEQUENCES OF TAXING THE RICH 490, 490-91 (Joel B. Slemrod ed., 2000). See also Spector, *supra* note 18, at D1 (noting that hybrids’ high cost and recent decreases in gas prices mean that “it’s getting a lot more expensive to be an environmentally conscious driver”).

³³ Allan Sloan, *Time to Raise the Gas Tax*, FORTUNE, Nov. 18, 2008, http://money.cnn.com/2008/11/17/news/economy/sloan_gastax.fortune/index.htm (stating that such a

Sequoia and Honda Pilot SUVs posted big gains while sales of most other cars plunged.”³⁴

2. *Ineffective, Unfair CAFE Standards*

These dynamics reveal the futility of lawmaker reliance on Corporate Average Fuel Economy (“CAFE”) standards. CAFE standards mandate that automakers produce vehicles that meet certain fuel economy ratings.³⁵ From 1990 to 2007, cars were required to achieve an average fuel economy of 27.5 miles per gallon.³⁶ In an attempt to decrease the United States’ dependency on foreign oil, the 2007 Energy Independence and Security Act (“EISA”) removed the previous CAFE exemption for sport utility vehicles and cargo vans and raised the efficiency mandate for all new passenger vehicles to 35 miles per gallon by the year 2020.³⁷ This standard is projected to decrease United States oil consumption by 2.3 million barrels daily.³⁸

However, such “[g]overnment ‘efficiency’ edicts are never efficient.”³⁹ The availability of efficient cars does not affect consumer purchasing decisions regarding efficiency—only gas prices do that. In the short term, people respond to higher fuel prices by purchasing more efficient vehicles, *not* by driving less.⁴⁰ Such behavior is emblematic of efficiency measures designed to decrease consumption. “The energy saved on a more efficient refrigerator trickles all too easily into a larger one, just as the calories saved with a Diet Coke generally trickle into a brownie.”⁴¹ Ironically, CAFE standards may even work against government policies subsidizing biofuels because improvements in vehicle efficiency may forestall private research and investment in non-petroleum sources of transportation energy.⁴²

“whipsaw” effect will result if lawmakers condition a bailout of American automakers on those companies producing fuel-efficient vehicles).

³⁴ Paul Ingrassia, *The Latest Song of Detroit*, WALL ST. J., Dec. 4, 2008, at A17.

³⁵ These standards are established by the Department of Transportation under the Energy Policy Conservation Act, which was enacted in 1975 in the wake of the 1973-74 oil embargo. Dernbach, *supra* note 7, at 21 (referencing Energy Policy & Conservation Act of 1975, Pub. L. No. 94-163, 89 Stat. 871 (codified at 49 U.S.C. §§ 32901-32919 (2000))).

³⁶ 49 C.F.R. § 531.5(a) (2007).

³⁷ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 102, 121 Stat. 1492 (2007).

³⁸ See AMY MYERS JAFFE & KENNETH B. MEDLOCK III, JAMES A. BAKER III INST. FOR PUB. POL’Y, YOU, YOUR CAR, AND ENERGY POLICY: SUSTAINING CONSERVATION ON THE ROAD 3-4 (2008).

³⁹ PETER HUBER, *HARD GREEN: SAVING THE ENVIRONMENT FROM THE ENVIRONMENTALISTS: A CONSERVATIVE MANIFESTO* 198 (1999).

⁴⁰ IAN W.H. PARRY & KENNETH A. SMALL, RES. FOR THE FUTURE, DOES BRITAIN OR THE UNITED STATES HAVE THE RIGHT GASOLINE TAX? 3 (2004) (citing David M. Newbery, *Should Carbon Taxes Be Additional to Other Transport Fuel Taxes?*, 2 ENERGY J. 13, 49-60 (1992)).

⁴¹ HUBER, *supra* note 39, at xxv. See also Totty & Swartz, *supra* note 19 (statement of Myron Ebell, Dir. of Energy and Global Warming Pol’y, Competitive Enter. Inst.) (“[I]ncreasing energy efficiency almost always leads in the long term to higher energy consumption.”).

⁴² See Rábago, *supra* note 9, at 227 (citing Natural Res. Def. Council, *supra* note 9).

Moreover, CAFE standards, intended to counterbalance incentives produced by other government policies, represent a significant uncompensated government imposition on automakers. When gas prices are low, CAFE standards force carmakers to lose money producing small vehicles for which there is less demand, in order to be allowed to produce the large vehicles that earn a profit.⁴³ Regulators thus dump the true cost of government policies on the private sector, creating the illusion of good government “as they impoverish society as a whole.”⁴⁴

3. Congestion Costs

Traffic imposes enormous costs on the economy—such as congestion and accidents—that are easily overlooked.⁴⁵ A study conducted by the Texas Transportation Institute concluded that in 2005 alone, “[c]ongestion caused urban Americans to travel 4.2 billion hours more and to purchase an extra 2.9 billion gallons of fuel for a congestion cost of \$78 billion.”⁴⁶ Increased driving also increases accident costs borne by the economy as a whole. A 2006 study by economists Aaron S. Edlin and Pinar Karaca-Mandic notes that insurance companies incur a total of \$220 billion in accident costs yearly—costs passed on to consumers in the form of insurance premiums. While congestion and accident costs would be high even in the absence of government policies reducing the price of gas, the congestion encouraged by cheap gasoline significantly exacerbates congestion and contributes to societal economic burdens.

C. Foreign Policy Detriment

In 1828, James Madison expressed his fear that insufficient governmental intervention in economic matters might betray American interests, writing, “[a] nation leaving its foreign trade, in all cases, to regulate itself, might soon find it regulated, by other nations, into a subserviency to a foreign interest”⁴⁷ Just this has occurred in petroleum markets. “To the extent OPEC could maintain high and stable world oil prices, it replaced the [government supply] and import controls that had set the terms for energy markets in the United States for many

⁴³ See Ingrassia, *supra* note 34.

⁴⁴ See HUBER, *supra* note 39, at 201 (“When individual producers can dump the true costs of production onto the environment, they may create the illusion of prosperity as they impoverish society as a whole. When regulators can dump the true costs of government on the private sector, they may create the illusion of good government, even as they impoverish society as a whole.”).

⁴⁵ See Stephen J. Dubner & Steven D. Levitt, *Not-So-Free Ride*, N.Y. TIMES, Apr. 20, 2008, at MM; Jacob Weisberg, *I Smell Gas*, SLATE, Apr. 26, 2006, <http://www.slate.com/id/2140613> (“Cheap gasoline imposes its own costs on society”).

⁴⁶ David Schrank & Tim Lomax, *Urban Mobility Report*, 2007 TEX. TRANSP. INST. 1, available at http://financecommission.dot.gov/Documents/Background%20Documents/mobility_report_2007_wappx.pdf.

⁴⁷ WILLIAM D. GRAMPP, 1 ECONOMIC LIBERALISM: THE BEGINNINGS 131 (1965) (citing Letter from James Madison to Joseph Cabell, in IV ELLIOT’S DEBATES 349 (1937)).

years before the [1973 energy] crisis.”⁴⁸ Since the crisis, OPEC-controlled petroleum markets have cost Americans dearly.⁴⁹ Ensuring a steady supply of foreign oil requires enormous foreign policy expenditures, which must be considered in evaluating the appropriateness of current energy policies.

1. *Wealth Transfers to OPEC*

In 2007 alone, the United States imported over 4.9 billion barrels of oil.⁵⁰ At an average price of \$66.29 per barrel,⁵¹ this works out to over \$325 billion sent overseas. Not only do these expenditures represent lost opportunities for the domestic economy,⁵² but much of this money was sent to countries such as Russia, Iran, and Venezuela—countries whose strategic objectives conflict with those of the United States in many policy areas. Revenue from oil sales provides these countries the financial resources to expand their national powers, potentially to the detriment of the United States.⁵³

Especially problematic is the fact that OPEC member countries control 41% of the world petroleum reserves under national oil companies.⁵⁴ In the middle of the 20th century, the “Seven Sisters,” a group of privately held oil companies, exerted a great deal of control over oil markets, and “responded to price signals to explore, invest, and promote technologies necessary to increase production.”⁵⁵ The oligopoly of national oil companies that now control oil markets operate under vastly different incentives, limiting investment and restricting production to keep prices high and prolong the production horizon.⁵⁶ In so doing, OPEC reaps profits by undermining economic efficiency in world oil markets.⁵⁷

⁴⁸ TUGWELL, *supra* note 30, at 188.

⁴⁹ *See id.* at 39 (“[R]ather than do without [oil] we were willing to pay an enormous tax to monopolists across the ocean.”); President Barack Obama, Inaugural Address (Jan. 20, 2009) (“[E]ach day brings further evidence that the ways we use energy strengthen our adversaries and threaten our planet.”).

⁵⁰ Energy Info. Admin., U.S. Crude Oil and Petroleum Products Imports from All Countries, <http://tonto.eia.doe.gov/dnav/pet/hist/mttimus1M.htm> (last visited Dec. 29, 2009).

⁵¹ Energy Info. Admin., Weekly United States Spot Price FOB Weighted by Estimated Import Volume, <http://tonto.eia.doe.gov/dnav/pet/hist/wtotusaw.htm> (last visited Dec. 29, 2009).

⁵² Smaling, *supra* note 8, at 307.

⁵³ *See* NAT’L INTEL. COUNCIL, GLOBAL TRENDS 2025: A TRANSFORMED WORLD 45 (2008).

⁵⁴ *AEO 2008*, *supra* note 2, at 50.

⁵⁵ NAT’L INTEL. COUNCIL, *supra* note 53, at 42.

⁵⁶ *Id.*; Mercurio, *supra* note 22, at 18. *But see* KENNETH S. DEFFEYES, BEYOND OIL: THE VIEW FROM HUBBERT’S PEAK 33 (2005) (stating that OPEC no longer controls world oil prices). *See generally* Morriss & Stewart, *supra* note 27, at 949 (discussing economic benefits to be gained from collusion).

⁵⁷ Franklin A. Lopez & Patricia E. Norris, *The Economics of Natural Resources*, in *ECOLOGY, LAW AND ECONOMICS*, *supra* note 22, at 125, 139.

2. *Costly International Relations*

Moreover, the United States' military, which maintains bases throughout the world, has as one of its strategic goals ensuring a supply of foreign oil for importation and domestic consumption. Funding such strategic holdings requires enormous annual expenditures. Estimates of the United States' FY 2009 military budget range from \$515.4 billion⁵⁸ to \$713.1 billion,⁵⁹ based on which items are included. Although United States military policy does not consider ensuring an adequate oil supply its only strategic objective, it is safe to assume that defense expenditures could be reduced substantially if foreign oil were less vital to the nation's stability.

High oil demand imposes an additional foreign policy cost on the United States: it raises the cost of international relations. The United States' refusal to participate in international climate change initiatives impairs the country's legitimacy in the global community. This may increase the political costliness of foreign government compliance with the strategic objectives of the United States, requiring greater American concessions in exchange for international cooperation. The historical refusal of the United States to bind itself to multilateral energy use agreements also ensures that Americans will take little part in the deliberation over and drafting of such policies.⁶⁰ International law detrimental to the United States' interests may result.

D. Environmental Damage

Biofuels do not present a cure-all for global warming; in fact, they may increase some types of environmental harm.⁶¹ The principal reason for this contradiction is that current biofuels are primarily derived from agriculturally-grown crops. Indeed, "[t]he present generation of biofuels is too expensive to grow, would further boost food prices, and their manufacture consumes essentially the same amount of energy they produce."⁶² Biofuels also yield less energy by volume than gasoline,⁶³ leading to higher fuel transportation and storage costs. Moreover, widespread biofuel production would require cultivating more land,

⁵⁸ News Release, U.S. Dep't of Def., Fiscal 2009 Department of Defense Budget Released (Feb. 4, 2008), available at <http://www.defenselink.mil/releases/release.aspx?releaseid=11663>.

⁵⁹ Fred Kaplan, *What's Really in the U.S. Military Budget?*, SLATE, Feb. 4, 2008, available at <http://www.slate.com/id/2183592/>.

⁶⁰ See John M. Broder, *U.S. Climate Envoy's Good Cop, Bad Cop Roles*, N.Y. Times, Dec. 10, 2009 (discussing the United States' refusal to ratify the Kyoto Protocol but noting the United States' recent engagement in international climate change negotiations), available at <http://www.nytimes.com/2009/12/11/science/earth/11stern.html>.

⁶¹ See Smaling, *supra* note 8, at 289 ("[T]he rapidly developing oilseeds-to-fuel story is one of potentially serious ecological and environmental harm."); Evan N. Turgeon, *Federal Forests, Biomass, and Ethanol: Energy Security Sabotaged*, 39 ENVTL. L. REP. (Envtl. Law Inst.) 10140 (2009) (discussing environmental problems caused by government ethanol initiatives).

⁶² NAT'L INTEL. COUNCIL, *supra* note 53, at 44.

⁶³ See McAleer-Pennington, *supra* note 11, at 482.

thereby eliminating that land's carbon sequestration benefits.⁶⁴ As a result, greatly increasing biofuel production may increase greenhouse gas levels significantly,⁶⁵ and the huge amounts of water and fertilizer required for biofuel cultivation would create additional environmental problems.⁶⁶ Given that food shortages continue to plague many countries, the adoption of a biofuel-based economy thus seems unlikely to provide global stability.⁶⁷ And even if increased biofuel use reduces greenhouse gas emissions, it will not reduce the congestion or accident costs burdening the United States' economy.

1. *Insufficient Biofuel Volumes*

Projections indicate that government policies are insufficient to successfully produce the huge shift in the national economy that widespread biofuel use would require. The Renewable Fuel Standards ("RFS") in the 2007 Energy Independence and Security Act⁶⁸ attempt to reduce gasoline consumption by mandating yearly increases in the volume of biofuel mixed into gasoline sold in the United States.⁶⁹ However, under current production methods, biofuel manufacturers cannot make enough ethanol and biodiesel to significantly reduce gasoline consumption.⁷⁰ In addition, the estimated twenty-five year time-lag between discovery and widespread commercial use of new technologies suggests that new biofuel production methods, such as commercially-viable cellulosic ethanol, will not save the day.⁷¹ These factors "suggest that available quantities of cellulosic biofuels before 2022 will be insufficient to meet the new RFS targets for cellulosic biofuels, triggering both waivers and a modification of applicable volumes"⁷²

Downward adjustments in biofuel mandates bring projections of biofuel industry self-sufficiency into question. Government projections suggest that flex-

⁶⁴ Living plants store (or "sequester") carbon in their bodies. Destroying native vegetation to permit farming causes the release into the atmosphere of the carbon stored in that vegetation. Avoiding this effect would require additional government subsidies to "support[] the sustainable use of croplands and changes in land use." Smaling, *supra* note 8, at 306.

⁶⁵ See Rábago, *supra* note 9, at 227 ("[I]f climate performance is the only metric for success, it must be acknowledged that, absent a transition to cellulosic biofuels, biofuels are not necessarily the best way to reduce greenhouse gas emissions.") (footnote omitted).

⁶⁶ See Turgeon, *supra* note 61, at 10148-49 (discussing soil erosion, nitrous oxide emissions caused by nitrogen fertilizer use, and Mississippi Delta eutrophication). See also Rábago, *supra* note 9, at 227 ("Simply put, we either will not or will not want to displace high volumes of fossil fuel use solely by growing more corn and soybeans the way we grow them today.") (footnote omitted).

⁶⁷ NAT'L INTEL. COUNCIL, *supra* note 53, at 52.

⁶⁸ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 202, 121 Stat. 1492 (2007) (amending Clean Air Act § 211, 42 U.S.C. § 7545 (1990)).

⁶⁹ *Id.* (requiring an increase from 9 billion gallons in 2008 to 36 billion gallons by 2022).

⁷⁰ *Id.* at 44.

⁷¹ *Id.*

⁷² AEO 2008, *supra* note 2, at 8 (citing waivers authorized by Energy Independence and Security Act of 2007, 42 U.S.C. § 7545(o)(7)(A)) (2008).

fuel⁷³ vehicle sales will “increase from 454,600 units in 2006 to 2.7 million units in 2030” largely “as a result of the growing use of E85 that is needed to satisfy the RFS.”⁷⁴ The government projects this increase to enable it to phase out tax credits to purchasers of flex-fuel vehicles by 2020.⁷⁵ However, less demanding RFS requirements may require the government to continue to provide consumer tax credits after 2020 in order to sustain the market for these vehicles.

2. High Biofuel Costs

Moreover, competition for crops between fuel and food producers increases biofuel crop prices, which comprise the majority of biofuel production costs.⁷⁶ Increases in crop prices threaten the financial viability of the fuels, even with existing government subsidies. In short, “[t]he policy relationships embedded in ethanol production, based on ever-growing tax incentives and subsidies . . .” seem likely to result in “ever-greater dependence on government protection and price supports.”⁷⁷ Such policies produce an inefficient outcome and fail to stabilize transportation fuel prices,⁷⁸ while the government’s sponsorship of the alternative fuels industry discourages private-sector investment in solutions that might be viable in the absence of government subsidies. As economists note, “direct production payments or fuel standards favor the current technology leader, but often retard the development of less commercial, but potentially more efficient, technology pathways.”⁷⁹

3. Little Effect on Gasoline Use

Compared to these enormous costs, biofuel policies will have little impact on greenhouse gas emissions or gasoline use in the coming decades.⁸⁰ “Even with the increase in biofuel use and higher vehicle efficiency standards,” petroleum products are projected to account for 88% of the United States’ total transportation

⁷³ “Flexible fuel vehicles (FFVs) are designed to run on gasoline or a blend of up to 85% ethanol (E85). Except for a few engine and fuel system modifications, they are identical to gasoline-only models.” *Flex-Fuel Vehicles*, www.fueleconomy.gov, <http://www.fueleconomy.gov/FEG/flextech.shtml>.

⁷⁴ *Id.* at 66.

⁷⁵ *Id.*

⁷⁶ McAleer-Pennington, *supra* note 11, at 465-66.

⁷⁷ Sautter et al., *supra* note 11, at 29.

⁷⁸ See TUGWELL, *supra* note 30, at 203 (“When [fuel and agricultural] markets interact, price and supply of energy can be expected to be influenced by the same unpredictable forces that have made food, feed, and fiber markets so unstable. A trend in this direction is already visible in the market for ethyl alcohol to be used as a gasoline additive . . .”); Soren T. Anderson, *The Demand for E85 Ethanol* (2006), <http://www.ucci.berkeley.edu/gasoilmarkets/Papers/2-AndersonSlides.pdf> (demonstrating that gasoline price shocks are replicated in the E85 market, which indicates that biofuel use will not stabilize transportation fuel prices).

⁷⁹ Rábago, *supra* note 9, at 214.

⁸⁰ Evan N. Turgeon, Recent Development, *Renewable Transportation Fuel: A Counterintuitive Windfall to the Oil Industry*, 4 TEX. J. OIL GAS & ENERGY L. 428, 430 (2009).

energy consumption in 2030, compared with 96% in 2006.⁸¹ This percentage decrease will be offset by a 13% increase in overall demand for transportation fuel over that 15-year period.⁸² Therefore, biofuel use will mostly offset growing demand for transportation fuel, rather than reducing domestic oil consumption.

E. Conclusions About Current Policies

How did such inefficient, expensive policies come to be? For one, lawmakers have clear incentives to promote energy policies tailored to their constituents' economic benefit, and to justify those policies by claiming that they are necessary to prevent catastrophe. Such legislative behavior capitalizes on how people think about costs and benefits. Americans object less to paying higher invisible income taxes than to paying visibly higher prices for goods and services. This attitude encourages lawmakers to increase the supply of efficient vehicles rather than the public's demand for them.⁸³ Higher crop prices and job opportunities in the biofuel sector appeal to the nation's agricultural states, and national security appeals to urban voters; but as a whole, the United States' energy policies not only fail to address either concern, but actually hurt the domestic economy, inhibit national security, and preclude strategies effective in combating climate change.⁸⁴ There must be a better way.

IV. A NEW APPROACH: PIGOVIAN GASOLINE TAXATION

Significantly increasing federal taxes on gasoline would generate results vastly superior to those produced by current energy policies. While politically unpopular, such Pigovian taxes promote economic efficiency. In so doing, a meaningful federal gasoline tax has the potential to yield a triple-dividend by

⁸¹ *AEO 2008*, *supra* note 2, at 4.

⁸² *Id.* at 130 (noting that demand will increase from 8.60 million barrels of oil equivalent per day in 2006 to 9.74 million barrels per day in 2030).

⁸³ Lawmakers thus follow Say's (now widely discredited) law that supply creates demand. *See* CHRISTOS PITELIS, MARKET AND NON-MARKET HIERARCHIES: THEORY OF INSTITUTIONAL FAILURE 150 (1991) (discrediting Say's law). *See also* Eric A. Morris, *No Taxation Without Internalization*, Nov. 24, 2008, <http://freakonomics.blogs.nytimes.com/2008/11/24/the-gas-tax-revisited-a-guest-post/#more-3335> (noting that inflation weakens the existing federal gasoline tax, "giving consumers a financial incentive to increase gasoline use").

⁸⁴ *See* Smaling, *supra* note 8, at 307 ("The increased prices have provided some very good news to farmers who have suffered for a decade or more with very low commodity prices for their crops."); Sandra Zellmer, *Boom and Bust on the Great Plains: Déjà Vu All Over Again*, 41 CREIGHTON L. REV. 385, 413 (2008) (book review) ("Although rural communities and family farmers are experiencing short-term gains, the biggest beneficiary of the biofuels mandate is big agribusiness."); Robert J. Samuelson, Op-Ed., *Blindness on Biofuels*, WASH. POST, Jan. 24, 2007, at A23 ("[T]he infatuation with biofuels is a political expediency that will turn into a classic government boondoggle, benefiting selected constituencies and providing few genuine public benefits."). *See also* Stefan, *supra* note 11, at 24 ("While concerns about the environment and energy supply are present amongst the populace, *economics determine consumer actions.*") (emphasis in original).

simultaneously improving the United States' economy, furthering national security, and inhibiting climate change.⁸⁵

The scientific consensus on global warming accepts that reducing greenhouse gas emissions from fossil fuel combustion is necessary to stem the tide of global warming, and that imposing Pigovian taxes would further this goal. However, I argue that such taxes, by reducing domestic oil demand and consumption, would benefit the United States' national security outlook and economy as well. Importantly, these benefits would increase the United States' relative power in the world, and would accrue even if fuel taxes were imposed unilaterally.

A. Economic Efficiency

Many commentators have noted that raising gasoline taxes would increase economic efficiency by forcing drivers to realize the true costs of their driving. Historically, government policy has permitted Americans to externalize the true costs of their driving onto the national commons, which lowers the cost of driving and increases the amount of driving done. Recognition of these inefficient and unfair externalities has prompted proposals to force drivers to internalize the true cost of driving.⁸⁶

1. The Theory of Pigovian Taxation

In his 1920 book, *The Economics of Welfare*, economist Arthur Pigou recommended imposing taxes on polluters to force them to internalize such costs.⁸⁷ Since prices act as a signaling mechanism to consumers,⁸⁸ the easiest way to reduce excess consumption is to raise prices, and the easiest way to raise prices is to impose a tax. A "Pigovian" tax would increase the cost of driving, and thereby reduce the amount of driving done to the optimal level: where marginal cost equals marginal benefit. A Pigovian gas tax thus has the potential to improve societal welfare.

It seems that Pigovian fuel taxation would prove the best method of promoting economic efficiency. Although Pigovian environmental taxes are generally criticized for providing only a "second-best" solution to environmental externalities,⁸⁹ it appears that Pigovian gasoline taxation would provide close to a "first best" solution to the economic, national security, and climate change

⁸⁵ Calculations of the optimal gasoline tax vary widely. See, e.g., PARRY & SMALL, *supra* note 40, at 3 (\$1.01 per gallon); Dubner, *supra* note 45 ("about \$2 per gallon"). Current estimates consider only external costs produced by pollution, congestion, and accidents, and exclude systematic economic and foreign policy costs. Calculating a tax adequate to compensate for these additional costs is beyond the scope of this note. However, adjusting tax levels is administratively simple, should an initial level prove insufficient or excessive. Lopez & Norris, *supra* note 57, at 198.

⁸⁶ See, e.g., Holman W. Jenkins, Jr., Opinion, *Obama's Car Puzzle*, WALL ST. J., Nov. 12, 2008, at A17; Weisberg, *supra* note 45.

⁸⁷ ARTHUR C. PIGOU, *THE ECONOMICS OF WELFARE* (1920).

⁸⁸ Mercurio, *supra* note 22, at 9.

⁸⁹ See, e.g., DE MOOLJ, *supra* note 3, at 152.

externalities discussed here. It would simultaneously address the volatile price of gasoline that produces economic problems, the high American consumption of oil that requires high national security expenditures, and the carbon emissions responsible for climate change.⁹⁰

The principal economic shortcoming of Pigovian fuel taxation is that it “discourages vehicle use uniformly, ignoring differences in emission rates.”⁹¹ As a consequence, it does not perfectly maximize emission reductions. However, higher fuel taxes are fair because the costs of driving would accrue primarily to drivers in proportion to the driving each does, not to all American citizens.⁹² Moreover, “[t]he beauty of the fuel tax is its administrative simplicity[,]”⁹³ which becomes all the more important given the impossibility of monitoring actual vehicle emissions.⁹⁴ The United States already levies a low federal tax on gasoline,⁹⁵ so Pigovian gasoline taxation would require no additional bureaucracy. In addition, such uniform excise taxes are comprehensive, reaching all drivers,⁹⁶ and are difficult for users to avoid.⁹⁷ Given the powerful incentives to evade or exploit government energy initiatives,⁹⁸ such rigidity and uniformity are virtues.⁹⁹

2. *Effects on Gasoline Demand*

The long-term price elasticity of gasoline indicates that increasing fuel taxes will decrease demand for gasoline. While gasoline’s short-term price elasticity is notoriously low, long-term elasticity is significantly higher.¹⁰⁰ Indeed, it seems that “even ‘addicts’ consume less in the long run when prices rise.”¹⁰¹ Changes in

⁹⁰ See PARRY & SMALL, *supra* note 40, at 1 (stating that a fuel tax closely approximates a direct Pigovian tax for carbon dioxide emissions); AGNAR SANDMO, THE PUBLIC ECONOMICS OF THE ENVIRONMENT 129 (2000), available at <http://www.oxfordscholarship.com/oso/public/content/economicsfinance/9780198297987/toc.html> (“More reliance on environmental taxes seems to move the optimal allocation of resources in the direction of the first best.”).

⁹¹ ESKELAND & DEVARAJAN, *supra* note 6, at 16.

⁹² Morris, *supra* note 83.

⁹³ ESKELAND & DEVARAJAN, *supra* note 6, at 16.

⁹⁴ See Andrew J. White, III, *Decentralized Environmental Taxation in Indonesia: A Proposed Double Dividend for Revenue Allocation and Environmental Regulation*, 19 J. ENVTL. L. 43, 46 (2007) (discussing monitoring problems).

⁹⁵ 26 U.S.C. § 4081(a)(2)(A)(i) (2008) (levying a tax of \$0.183 per gallon).

⁹⁶ Dernbach & Kakade, *supra* note 7, at 30.

⁹⁷ Morris, *supra* note 83.

⁹⁸ See Emily Harris, *Loophole in Biodiesel Tax Credit Prompts Outcry*, NAT’L PUB. RADIO, Sept. 2, 2007, available at <http://www.npr.org/templates/story/story.php?storyId=14096723> (last visited Jan. 10, 2009) (discussing the “splash and dash” loophole, in which biodiesel shippers add a splash of American-made biodiesel to a shipment of biodiesel produced elsewhere in order to obtain a U.S. tax credit for the entire shipment).

⁹⁹ ESKELAND & DEVARAJAN, *supra* note 6, at 13.

¹⁰⁰ See Lopez & Norris, *supra* note 57, at 137; Jean-Philippe Barde & Nils Axel Braathen, *Environmentally Related Levies*, in THEORY AND PRACTICE OF EXCISE TAXATION: SMOKING, DRINKING, GAMBLING, POLLUTING, AND DRIVING 120, 143 (Sjibren Cnossen ed., 2005).

¹⁰¹ Bruno S. Frey, *Excise Taxes: Economics, Politics, and Psychology*, in THEORY AND PRACTICE OF EXCISE TAXATION, *supra* note 100, at 230, 236.

consumer's long-term purchasing decisions, such as whether and what type of car to purchase, confirm this.¹⁰² Thus, Pigovian taxes producing high long-term gas prices are likely to encourage efficient consumer behavior.¹⁰³ A corollary of the difference in short- and long-term price elasticities is the "Ramsay Rule," which posits that government policies designed to encourage economic efficiency should tax goods and activities with a low price elasticity more highly than those with a high price elasticity.¹⁰⁴ Pigovian gasoline taxation would correct the government's failure to maximize efficiency in this regard.

In addition, Pigovian gasoline taxation would likely produce efficiency benefits greater than the current regime of CAFE fuel-efficiency standards, even if those standards were abolished. Economists have noted that although effluent charges (taxing a good that pollutes) and effluent standards (capping the amount of pollution each entity can produce) can produce identical results, effluent charges (such as Pigovian taxes) do so at a lower cost. "The nature of the effluent charge is such that it places a greater economic burden on those firms that can avoid polluting at a lower cost thereby saving society the otherwise unnecessary costs associated with a uniform effluent standard."¹⁰⁵ This indicates that higher gasoline taxes would "screen out, systematically, the trips that are worth least to consumers, sparing [] units of gasoline (and trips) that are worth more."¹⁰⁶ Effluent charges, such as federal gasoline taxes, can provide society the same benefits as effluent standards, such as CAFE standards, but at a significantly lower cost. Any lawmaker concerned with the nation's economic health should take advantage of this cost-savings when formulating national energy policy.¹⁰⁷

3. Forcing Innovation

Pigovian gasoline taxation would reduce demand for gasoline and increase the demand for efficient alternative transportation products—products that are deemed efficient by the market, not by politicians. Current policies assume that higher gasoline prices will not provide incentives adequate to foster the research and development necessary to produce biofuels on a mass scale.¹⁰⁸ However, this approach ignores the competitive market's demonstrated ability to force innovation.¹⁰⁹

¹⁰² See *supra* pt. III.B.1.

¹⁰³ See ESKELAND & DEVARAJAN, *supra* note 6, at 8 (stating that "emissions reductions will be attained mostly by demand reductions if demand elasticities are high and control effectiveness is low").

¹⁰⁴ Frey, *supra* note 101, at 232.

¹⁰⁵ Lopez & Norris, *supra* note 57, at 198.

¹⁰⁶ ESKELAND & DEVARAJAN, *supra* note 6, at 21.

¹⁰⁷ Ingrassia, *supra* note 34 ("The reason Europe has fuel-efficient cars is high gas prices, not CAFE laws."); Jenkins, *supra* note 86 (advocating replacing CAFE standards with "an intellectually honest gas tax").

¹⁰⁸ See, e.g., ESKELAND & DEVARAJAN, *supra* note 6, at 12.

¹⁰⁹ CASS R. SUNSTEIN, WORST-CASE SCENARIOS 101 (2007) ("In the environmental domain as elsewhere, markets themselves can be technology-forcing.").

The theory of “induced innovation” posits that “changes in relative factor prices should lead to innovations that reduce the need for the relatively expensive factor.”¹¹⁰ For example, high copper prices during World War II prompted the U.S. government to mint steel pennies in 1943.¹¹¹ History provides examples of induced innovation in transportation fuel market as well. “[W]hen real petrol prices in the USA increased in the period up to the early 1980s, a significant increase in fuel efficiency of new cars occurred. Later, as real petrol prices decreased significantly . . . the increase in fuel efficiency of new cars were brought to a halt.”¹¹²

Indeed, in his 2002 article, *Induced Innovation and Energy Prices*, which compared historical United States patent data against energy price trends to evaluate higher energy prices’ ability to force meaningful technological discovery, David Popp concluded,

The most significant result is the strong, positive impact energy prices have on new innovations. This finding suggests that environmental taxes and regulations not only reduce pollution by shifting behavior away from polluting activities but also encourage the development of new technologies that make pollution control less costly in the long run. My results also make clear that simply relying on technological change as a panacea for environmental problems is not enough. There must be some mechanism in place that encourages new innovation.¹¹³

Popp also noted that with respect to alternative transportation fuels and vehicles, “[t]he price elasticities found suggest [that] the reaction of the research community to a change in policy, such as a carbon tax, will be swift, and that higher prices would quickly lead to a shift toward environmentally friendly innovation.”¹¹⁴

4. *Lessons Learned*

These possibilities demonstrate the shortcomings of current policies.¹¹⁵ As opposed to government edicts, “[i]t is the free market that is efficient, spontaneously efficient.”¹¹⁶ Therefore, the systemic nature of the nation’s energy crisis indicates that lawmakers’ should not be in the business of determining the

¹¹⁰ David Popp, *Induced Innovation and Energy Prices*, 92 AM. ECON. REV. 160, 160 (2002) (referencing JOHN HICKS, *THE THEORY OF WAGES* 124 (1932)).

¹¹¹ See The United States Mint, http://www.usmint.gov/about_the_mint/fun_facts/index.cfm?action=fun_facts2 (last visited Mar. 16, 2009).

¹¹² Barde, *supra* note 100, at 144. See also Popp, *supra* note 110, at 163 (“For most of the technology groups, there was a jump in patent applications during the energy crises of the 1970’s . . .”).

¹¹³ Popp, *supra* note 110, at 178.

¹¹⁴ *Id.* at 176.

¹¹⁵ See PITELIS, *supra* note 83, at 150 (“Say’s (notorious) law, that supply creates its own demand, is rejected (it is hoped) for good.”).

¹¹⁶ HUBER, *supra* note 39, at 198.

best solution, but should leave that to the market.¹¹⁷ While market principles alone may not provide a universal cure-all to government policy problems, the judicious application of market forces would provide significant gains in this case.¹¹⁸

B. National Security Benefits

Pigovian gas taxation has the potential to dramatically improve the United States' national security. Decreasing demand for gasoline will reduce the vulnerability of the United States to price shocks in international petroleum markets. Less exposure to such volatility would decrease the nation's susceptibility to disruptions in supply caused by forces outside the nation's control, such as weather or geopolitics. One such force, OPEC, would lose influence over the United States as the American thirst for oil subsides.¹¹⁹ Such stability furthers national security, but there are other benefits as well.

1. Shifting Terms-of-Trade

Taxing gasoline would alter the terms of international trade in favor of the United States.¹²⁰ Decreasing the domestic demand for gasoline would make alternative domestic sources of transportation comparatively more attractive to American consumers, causing the foreign oil industry to contract and domestic alternative fuel industries to expand. As a result, American industries and products would become more competitive vis-à-vis foreign competitors.¹²¹ In response, OPEC would cut oil prices. This "terms of trade effect" would shift part of the cost of gasoline taxes onto foreign producers of oil¹²² and result in more money spent domestically, stimulating economic activity. Therefore, the economically-optimal fuel tax may be greater than one merely intended to compensate for the environmental harm caused by fossil fuel combustion.¹²³

The national security of the United States would benefit from this trade effect as a result of the negative effects that decreased oil revenue would likely have on exporters of oil. Lower profits reduce an oil exporting regime's ability to exert its will internationally and may weaken its control domestically. This produces a relative benefit for the United States, whose international interests conflict with certain oil exporters, such as Russia, Venezuela, and Iran. With respect to Iran, for

¹¹⁷ See Morriss & Stewart, *supra* note 27, at 1056 ("Congress and the EPA have vastly complicated the gasoline market."); Rábago, *supra* note 9, at 225 (noting that systematic problem solving is difficult for government); Totty & Swartz, *supra* note 19 (statement of Phil Sharp, President, Res. for the Future) ("[G]overnment policies must avoid highly prescriptive regulation and wherever possible capitalize on the dynamism of markets and the power of price.").

¹¹⁸ See SANDMO, *supra* note 90, at 153.

¹¹⁹ See Lopez & Norris, *supra* note 57, at 139.

¹²⁰ See DE MOOIJ, *supra* note 3, at 136 ("This terms of trade improvement boosts private incomes and thus domestic welfare.").

¹²¹ SANDMO, *supra* note 90, at 132.

¹²² DE MOOIJ, *supra* note 3, at 137-38.

¹²³ *Id.* at 137.

example, lower oil prices may increase pressure for economic reform, “potentially putting pressure on the clerical governing elite to loosen its grip.”¹²⁴ The United States might capitalize on oil exporters’ economic weaknesses by establishing aid and trade relationships in exchange for concessions on military and nuclear policies disadvantageous to the United States.¹²⁵ Under pressure to maintain their citizens’ standard of living, Middle Eastern regimes would likely liberalize social policies in an effort to diversify their economies. Resulting industries would expand economic opportunities for youth in these countries, thereby reducing the attractiveness of terrorist groups, which depend on widespread discontent and unemployment for recruitment.¹²⁶

2. Lower Military Spending

Geopolitical changes would, in turn, provide politically-attractive opportunities to reduce the ever-growing military expenditures of the United States.¹²⁷ Although “one cannot attribute all expenditures in the Middle East to defending oil supplies[.]”¹²⁸ preserving American access to inexpensive oil is of the utmost importance to the United States. Estimate of annual military expenditures toward security oil supplies vary widely but are enormous by any estimate, averaging in the tens of billions of dollars per year when the nation is not at war.¹²⁹

However, if the military were not so obligated, the United States could reduce significantly its military presence in other countries or at least deploy its military resources in a more cost-effective manner.

This conclusion follows from a basic mathematical insight. Suppose that you maximize a function of several variables subject to a constraint on some of the variables. Then the constraint is removed and the function is maximized again. The maximal value of the function must be higher in the latter case than in the former.¹³⁰

¹²⁴ NAT’L INTEL. COUNCIL, *supra* note 53, at 46.

¹²⁵ *Id.* at 46.

¹²⁶ *Id.* at ix.

¹²⁷ *See id.* at 93 (“We believe that US interest and willingness to play a leadership role also may be more constrained as the economic, military, and opportunity costs of being the world’s leader are reassessed by American voters. Economic and opportunity costs in particular may cause the US public to favor new tradeoffs.”).

¹²⁸ PATRICIA S. HU, OAK RIDGE NAT’L LAB., ESTIMATES OF 1996 U.S. MILITARY EXPENDITURES ON DEFENDING OIL SUPPLIES FROM THE MIDDLE EAST: LITERATURE REVIEW 2 (1997).

¹²⁹ *See id.* at 1 (“[The United States Government Accountability Office] estimates that a total of \$366 billion of the U.S. military’s dollars were spent on defending oil supplies in the Middle East from 1980 to 1990, about \$33 billion per year (unadjusted for inflation).”).

¹³⁰ SANDMO, *supra* note 90, at 128-29 (discussing the potential of environmental taxes to increase welfare).

Freed from its addiction to oil, the United States' national security outlook stands to benefit enormously from higher federal gasoline taxes.

3. *International Law: A New American Weapon*

Reducing domestic oil consumption provides an additional national security benefit as well. While “the regulatory approach of environmental law in the United States has generally been reactive rather than truly precautionary,”¹³¹ the emissions reductions achieved under Pigovian fuel taxes would enable the United States to take an active part in formulating international law on climate change, yielding the United States significant gains in several ways.

National self-interest powerfully influences international climate change agreements. For example, the Kyoto Protocol's arbitrary, inflexible emissions reduction plan was a production of signatories' “[d]omestic self-interest, rather than sensible policy.”¹³² While that plan's drastic carbon dioxide reductions might inconvenience rapidly emerging economies, they would likely have crippled the economy of the United States.¹³³

However, the reduced greenhouse gas emissions achieved through Pigovian gasoline taxes would enable the United States to participate in international climate change initiatives to its advantage. If the United States were to propose multilateral Pigovian taxes on gasoline, it seems likely that world consumption of fossil fuels would decrease, especially considering that many states actively subsidize gasoline at present.¹³⁴ This would provide worldwide monetary gains in efficiency. Keeping in mind that the developing world would bear the brunt of climate change's negative effects, and that securing the United States' participation is vital to ensuring that meaningful emission reductions are achieved, the United States could work to structure international agreements in such a way as to gain a disproportionate amount of the efficiency surplus, which could take the form of lump-sum payments.¹³⁵ But even in the absence of universal participation and such wealth transfers, projections indicate that the economic gains from Pigovian taxes are largest when also imposed by other countries.¹³⁶

Even if imposed unilaterally, though, Pigovian taxes would likely provide the United States with cost savings in foreign policy. As an additional weapon in the nation's arsenal, climate change agreements present an opportunity for the United States to impose its will on other countries. Diplomats might shape climate change

¹³¹ EDWARD CHRISTIE, FINDING SOLUTIONS FOR ENVIRONMENTAL CONFLICTS: POWER AND NEGOTIATION 185 (2008) (citing Robert V. Percival, *Who's Afraid of the Precautionary Principle?*, 23 PACE ENVTL. L. REV. 21, 23 (2005-2006)).

¹³² SUNSTEIN, *supra* note 109, at 114.

¹³³ NAT'L INTEL. COUNCIL, *supra* note 53, at 54.

¹³⁴ See ESKELAND & DEVARAJAN, *supra* note 6, at 16 (“[A]ll countries interfere in fuel markets (some with a tax, others with a subsidy) . . .”).

¹³⁵ SANDMO, *supra* note 90, at 137-38. *But see id.* at 139 (arguing that participating countries “will have some notions of fair division of the gains which must not be violated if agreement to the treaty is to be assured”).

¹³⁶ See DE MOOIJ, *supra* note 3, at 148, 152.

initiatives to the United States' advantage by promoting American-made technologies, for example. Moreover, such cooperative international engagement is relatively inexpensive in comparison to exercises of military might, thus providing an opportunity to reduce or realign military spending. Not only is the pen mightier than the sword; it is cheaper to use.

C. Economic Benefits

1. Short- and Long-Term Outlooks

Unilateral Pigovian taxes would benefit the United States' economy. This notion is the most controversial aspect of this proposal, and most commentators argue the opposite. As Alan Greenspan once stated, "[a]ll taxes are a drag on economic growth. It's only a question of degree."¹³⁷ A 2001 Organisation for Economic Co-operation and Development ("OECD") survey undertaken among member governments reveals the prevalence of this concern, singling out "the fear of loss of sectoral competitiveness" as a principal reason countries had not undertaken unilateral efforts to combat climate change.¹³⁸

It is true that higher gasoline taxes may produce a brief period of unemployment in industries dependent on inexpensive oil until the nation adapts to lower demand for gasoline.¹³⁹ In addition, recent gasoline price spikes have been blamed for increasing the cost of other goods and products transported to market by truck and train.¹⁴⁰ And the exponential nature of economic growth has caused concern among some that future generations might be impoverished if the present generation were to decide to impoverish itself economically.¹⁴¹ In the short run, these concerns are valid. Like a sailboat that inevitably slows when changing course, the economy may encounter a short-term decline in productivity as a result of increased gasoline prices.

But the long-term outlook is very different. As the demand for gasoline decreases, so will its price.¹⁴² "The benefits of the lower price of polluting inputs accrue to workers in terms of a smaller decline in labor productivity."¹⁴³ Also, it is

¹³⁷ Tom Herman, *A Special Summary and Forecast of Federal and State Tax Development*, WALL ST. J., Mar. 26, 1997, at A1 (statement of Alan Greenspan, Chairman, Bd. of Governors of the Fed. Reserve Sys.).

¹³⁸ Barde, *supra* note 100, at 121 (referencing Org. for Econ. Co-operation and Dev., *Environmentally Related Taxation in OECD Countries: Issues and Strategies* (2001c)). The survey also found concerns over distributional inequality of the utmost importance to member governments. *Id.*

¹³⁹ SANDMO, *supra* note 90, at 132 (discussing "sticky" short-term wages).

¹⁴⁰ See, e.g., Vikas Bajaj, *Wholesale Prices Increased Sharply in July*, N.Y. TIMES, Aug. 18, 2005, at C3 ("Most of the overall rise in both consumer and producer prices was caused by energy costs, which increased 4.4 % in the month.").

¹⁴¹ See SUNSTEIN, *supra* note 109, at 16.

¹⁴² See Duffield et al., *supra* note 11, at 429 ("Supply and demand adjustments helped reverse the trend of rising oil prices evident in the 1970s. OPEC's market power lost its potency, and lower prices prevailed throughout the 1980s and most of the early 1990s.").

¹⁴³ DE MOOIJ, *supra* note 3, at 137.

important to note that “only 3.2 percent of the gasoline used for highway travel in the US is used for medium or heavy trucks, and of the 40 percent used for light trucks probably less than half is part of production.”¹⁴⁴ Consequently, the effect of higher fuel taxes on the prices of goods transported by road and rail will likely be less severe than commonly feared, especially if lawmakers initially exempt diesel fuel from higher federal taxes. Moreover, “[t]o the extent that consumption taxes encourage savings and investment, . . . they may increase productivity and future output.”¹⁴⁵ These effects seem likely to mitigate the initial economic impairments produced by increased gasoline taxes.

2. *The Double-Dividend Debate*

The most significant economic benefit, however, is the potential to reduce income taxes in light of the revenue produced by higher gasoline taxes. Economists have noted that the efficiency benefits of Pigovian taxation produce higher wages and employment overall.¹⁴⁶ Pigovian taxes “provide an overall boost to the economy because the stimulus from a reduction in marginal tax rates on labor and capital will often exceed the drag on the economy resulting from new environmental taxes.”¹⁴⁷ Thus, higher efficient excise taxes enable the government to reduce distortionary income taxes, “lead[ing] to a reduction in the overall efficiency loss from taxation”¹⁴⁸ Combined with the environmental gain, Pigovian taxes thus can yield a double-dividend.

Critics of the double-dividend hypothesis stress that revenue raised from Pigovian taxes is not “free money,” but merely represents the increased costs of production the government transferred onto producers.¹⁴⁹ Consequently, they argue, Pigovian taxes may be economically efficient, but they do not raise revenue. However, such arguments do not apply with equal force to international oil markets. While higher gasoline taxes may impose a burden on producers, the producers in this case are outside the United States. Therefore, Pigovian gasoline taxation results in a net revenue gain to the United States.

Even without this international cost-shifting, a sizeable reduction in congestion and accident costs suggests that Pigovian gasoline taxation would yield a net gain to the United States. Increasing gas taxes will decrease both the number of cars on the road and number of vehicle miles traveled in the United States: the two factors responsible for the huge congestion and accident costs noted

¹⁴⁴ PARRY & SMALL, *supra* note 40, at 31 (citation omitted).

¹⁴⁵ Joe Loper, *Evaluating Existing State and Local Tax Codes from an “Environmental Tax” Perspective: The Case of Energy-Related Taxes*, 12 PACE ENVTL. L. REV. 61, 66 n.12 (1994).

¹⁴⁶ DE MOOIJ, *supra* note 3, at 137.

¹⁴⁷ Loper, *supra* note 145, at 62 (footnote omitted).

¹⁴⁸ SANDMO, *supra* note 90, at 109.

¹⁴⁹ See, e.g., Don Fullerton & Gilbert E Metcalf, *Environmental Taxes and the Double-Dividend Hypothesis: Did You Really Expect Something for Nothing?*, 73 CHI.-KENT L. REV. 221, 224 (1998).

previously.¹⁵⁰ Indeed, the enormity of these costs makes the economic savings of Pigovian gasoline taxes greater than its environmental benefits.¹⁵¹

However, even if higher gasoline taxes hurt the domestic economy, such taxes will likely nevertheless provide the United States a net economic gain. Current double-dividend models assume that government expenditures will not change as higher fuel taxes are implemented, and therefore that overall tax revenue must not decrease. Under this constraint, any reduction in government revenue negates the economic dividend from Pigovian taxes.¹⁵² Such projections note that the desired reduction in the demand for gasoline reduces tax revenue, thereby eliminating any economic dividend.¹⁵³

These analyses fail to consider decreases in government expenditures likely to result from higher gasoline taxes. Eliminating the need for plentiful, inexpensive gasoline enables the government to reduce spending designed to keep gas prices low. Notable among these are the huge government defense expenditures made less necessary by decreased demand for oil and cheaper substitutes such as international law. In addition, transferring responsibility for technological innovation onto the market eliminates the need for government biofuel mandates and subsidies, which encourage inefficient behavior, crowd-out private investment, and inhibit technological innovation. Although a calculation of possible spending reductions is beyond the scope of this article, these decreases almost certainly exceed any eventual decline in government tax revenue, yielding a net economic benefit.

3. *Equity Concerns*

As would be the case with any consumption tax, the proposal to uniformly increase the federal gasoline tax raises equity concerns. Indeed, “[t]he greater the proportion of low-income households’ expenditure devoted to energy, the more regressive will be the impact of the tax.”¹⁵⁴ Since low-income households spend a greater percentage of their income on transportation fuel, some argue that Pigovian gasoline taxation will burden low-income households disproportionately, thus decreasing societal equity. And given that income taxes are progressive and that many low-income households pay little tax,¹⁵⁵ some argue that inequity would only increase if the revenue produced by higher gasoline taxes were used to offset decreases in income taxes.¹⁵⁶

¹⁵⁰ *Supra* Part. III.B.3.

¹⁵¹ *See* ESKELAND & DEVARAJAN, *supra* note 6, at 27 (citation omitted).

¹⁵² SANDMO, *supra* note 90, at 116-17.

¹⁵³ *See, e.g.,* DE MOOIJ, *supra* note 3, at 56 (“[Environmental tax reform] fails to improve the efficiency of the tax system as a revenue-raising instrument” (that is, it yields a negative second dividend)).

¹⁵⁴ Barde, *supra* note 100, at 134 (citation omitted).

¹⁵⁵ *See* SANDMO, *supra* note 90, at 125 (“[T]he main reason that taxes are distortive is that they are intended to be redistributive.”).

¹⁵⁶ *See* DE MOOIJ, *supra* note 3, at 178 (stating that if Pigovian fuel taxes replace progressive income taxes, “the double-dividend involves costs in terms of a less equitable income distribution”);

However, while Pigovian fuel taxes burden drivers in proportion to the amount of fuel each consumes, such taxes do not clearly affect low-income households disproportionately.¹⁵⁷ Again, a broader analysis provides some insight. “[W]hen measures of lifetime, as opposed to annual, income are used as proxies for individual well-being[,] the portion of lifetime income spent on gasoline is only slightly larger for the lowest income decile than for the top income decile, and is greatest for middle-income households.”¹⁵⁸ Indeed, wealthy households own more cars and drive more miles than poor households.¹⁵⁹ And overall, fuel currently comprises only a small percentage of total household expenditures: under 5%.¹⁶⁰ Moreover, highway transportation projects that effectively encourage gasoline usage among all drivers are increasingly financed by state sales taxes,¹⁶¹ which burden low-income households irrespective of their gasoline consumption.¹⁶²

Moreover, if undesirable distributional consequences do result from Pigovian gasoline taxation, a number of measures are available to mitigate such effects. Possible ex-ante measures include tax-free allowances¹⁶³ or a establishing “a dual-rate structure with a reduced or zero rate for low-income households.”¹⁶⁴ Such policies, however, do suffer from several shortcomings: they decrease the desired effect of reducing demand, they increase the government’s administrative costs, and they provide opportunities for politically-motivated exemptions and cheating. Consequently, ex-post measures such as lump-sum transfers¹⁶⁵ or increases in directly redistributive programs provide a better solution. Because such programs can redistribute income effectively, tax “strategies that minimize total costs can be chosen.”¹⁶⁶

4. American Automaker Gains

A Pigovian gasoline tax would provide the United States’ automobile industry with much-needed stability. Constantly high gasoline prices would reduce the severity of price fluctuations in terms of a percentage change, stabilizing the demand for fuel and resulting consumer preferences. Competing automakers would respond to consumer demand for affordable, fuel-efficient vehicles by developing

Barde, *supra* note 100, at 138 (“It is assumed that the regressive impact of the new environmental tax will be compensated by the reduction of other taxes.”).

¹⁵⁷ See ESKELAND & DEVARAJAN, *supra* note 6, at 30 (“[F]or a polluting good, the share of the control costs paid by the rich will be higher, the greater is their role in consumption of that good.”).

¹⁵⁸ PARRY & SMALL, *supra* note 40, at 31 (citing James M. Poterba, *Is the Gasoline Tax Regressive?*, in *TAX POLICY AND THE ECONOMY* 5 (David F. Bradford ed., 1991)).

¹⁵⁹ Morris, *supra* note 83.

¹⁶⁰ *Id.* (citing the Consumer Expenditure Survey).

¹⁶¹ *Id.*

¹⁶² See INST. ON TAXATION & ECON. POL’Y, WHO PAYS?, (3d ed. 2009), <http://www.itepnet.org/whopays3.pdf>, at 1 (analyzing the effects of regressive state sales taxes).

¹⁶³ DE MOOIJ, *supra* note 3, at 178; Barde, *supra* note 100, at 136; Ingrassia, *supra* note 34 (promoting a voucher program).

¹⁶⁴ Barde, *supra* note 100, at 136.

¹⁶⁵ DE MOOIJ, *supra* note 3, at 178; Barde, *supra* note 100, at 137.

¹⁶⁶ ESKELAND & DEVARAJAN, *supra* note 6, at 29.

new technologies and producing cars that satisfy consumer demand,¹⁶⁷ taking existing infrastructure and technology into account. Automakers would thus make money by producing vehicles that satisfy consumer demand, rather than government mandates.

The advantage of such market-driven strategies reveals the shortcomings of the bail out of American automakers. Some proposals conditioned government relief on automakers producing more fuel-efficient vehicles that can use biofuels.¹⁶⁸ These suggestions ignored the reality that in a world of free trade, the cars sold in the United States will reflect consumer demand, regardless of what American automakers produce. Supply does not create demand, and “companies can’t pay their creditors in fuel-economy standards.”¹⁶⁹ Rather than addressing consumer demand, “Washington here is just marching Detroit deeper into an unsustainable business model, requiring ever more interventions in the future.”¹⁷⁰ This demonstrates that government subsidies fail to establish self-sufficient markets, and instead merely perpetuate inefficiencies that require ever-increasing government funding.

D. An Electric Future?

While it is impossible to forecast accurately what solutions market mechanisms might produce, especially considering the potential discovery of revolutionary technologies, market incentives seem likely to produce a post-petroleum regime more efficient than that promoted by lawmakers.

In the absence of government subsidies, the large-scale production and distribution of liquid biofuels would likely be abandoned. If fuel prices remained high, proven technologies such as hybrid gasoline-electric vehicles would become more attractive to consumers. Increased consumer demand for such vehicles seems likely to prompt private-sector innovation and advances in battery design,¹⁷¹ taking

¹⁶⁷ Robert J. Samuelson, Op-Ed., *Stimulus For the Long Haul*, WASH. POST, Oct. 29, 2008, at A17 (“[T]he signal of higher long-term prices should affect Americans’ driving habits and vehicle purchasing preferences.”).

¹⁶⁸ Jenkins, *supra* note 86 (“Barack Obama and Nancy Pelosi now want to bail out Detroit . . . while mandating that the Big Three build ‘green’ cars.”); Totty & Swartz, *supra* note 19 (statement of Amy Myers Jaffe, Fellow in Energy Studies, Baker Inst.) (“Use any Detroit bailout to increase federal fuel-efficiency standards.”); Totty & Swartz, *supra* note 19 (statement of R. James Woolsey, former Dir. of Cent. Intel.) (“Congress needs to condition some part of the \$25 billion for rescuing auto companies on their moving rapidly to produce vehicles that use electric power.”); *Bridge Loan to Nowhere*, WALL ST. J., Dec. 6, 2008, at A10 (noting that automakers’ “restructuring plans are heavy on promises to build the ‘green’ cars that a Democratic Congress wants built”).

¹⁶⁹ *Bridge Loan*, *supra* note 168.

¹⁷⁰ Jenkins, *supra* note 86. See also *Bridge Loan*, *supra* note 168 (“Two economists testified that the ultimate cost of this bailout would certainly be much, much higher than \$34 billion. Mark Zandi of economy.com put the number at up to \$125 billion -- and he *supports* the bailout. NYU’s Edward Altman said the company proposals were ‘doomed to fail.’”) (emphasis in original).

¹⁷¹ See *In search of the perfect battery*, ECONOMIST, Mar. 6, 2008, available at http://www.economist.com/science/tq/displaystory.cfm?story_id=10789409 (last visited Sept. 1, 2009) (discussing the history and future of battery research).

advantage of the United States' strengths in science and technological innovation. As oil reserves dwindle, increasing gas prices would encourage automakers to employ battery technology and embrace the environmental movement's longtime dream: the plug-in electric car.¹⁷² In contrast to biofuels, an infrastructure for the production and distribution of electricity throughout the nation already exists, although it may require upgrades.¹⁷³ Indeed, nuclear power could quench the nation's considerable thirst for electricity under such a system.

The advantages of a market-driven progression are numerous. The market's capitalization on existing technologies and infrastructures provides a swifter and surer path to sensible energy policy than do government subsidies.¹⁷⁴ The nation's overall energy efficiency would surely benefit from the central generation of electricity and its distribution via power lines, as compared to the current scheme of trucking liquid fuels to gas stations and generating power under the hoods of America's millions of cars.¹⁷⁵ In addition, nuclear power does not pollute the environment, provided that nuclear waste can be stored safely, and consumes abundant, domestically-available uranium.¹⁷⁶ Furthermore, "[t]he flexibility to shift among fuels to generate electricity would reduce the oil intensity of the U.S. economy and shrink the financial crises that have tended to go with oil price shocks."¹⁷⁷ Moreover, preeminence in battery and nuclear research would position the United States as a world leader in 21st century technologies,¹⁷⁸ encouraging the world's best minds to continue to flock to the American university system.

E. Encouragement from History

History provides an example of the United States thus capitalizing on its advantages in response to a global environmental threat. The discovery of a hole in the ozone layer in 1974 was heavily covered by the media,¹⁷⁹ producing public pressure that led the United States to unilaterally ban chlorofluorocarbons for nonessential uses in 1978.¹⁸⁰ America then looked to the rest of the world to

¹⁷² See Stefan, *supra* note 11, at 23 ("The attractiveness of [the electric] car is unfortunately limited by a shortfall in battery technology.").

¹⁷³ See *id.* ("[I]ncreases in demand [for electricity] could potentially overwhelm current systems.").

¹⁷⁴ See NAT'L INTEL. COUNCIL, *supra* note 53, at 44 (noting that increases in battery technology would reduce the need for an infrastructure overhaul).

¹⁷⁵ See HUBER, *supra* note 39, at 198 ("It is more efficient, and cleaner, to burn fuel and distribute electricity than to refine fuel and distribute gas or gasoline.").

¹⁷⁶ "Available uranium is likely to be sufficient to support the expansion of nuclear energy without reprocessing well into the second half of the century." NAT'L INTEL. COUNCIL, *supra* note 53, at 43.

¹⁷⁷ Totty & Swartz, *supra* note 19 (statement of Amy Myers Jaffe, Fellow in Energy Studies, Baker Inst.).

¹⁷⁸ See White, *supra* note 94, at 45-46 ("['F]irst-mover' and 'green' image advantages [may] yield[] a competitive edge to certain firms, sectors or countries") (footnote omitted).

¹⁷⁹ SUNSTEIN, *supra* note 109, at 76-77.

¹⁸⁰ 21 C.F.R. § 2.125 (1978).

replicate its work, leading to the 1987 Montreal Protocol.¹⁸¹ Meanwhile, steady demand for propellants forced United States manufacturers to develop alternatives, which they did successfully before foreign firms,¹⁸² no doubt to their competitive advantage.

This history supports the contention that unilaterally implementing Pigovian gasoline taxes will yield economic benefits to the United States and improve American industry's global competitiveness. The likely difference between the government's response to ozone layer depletion and climate change is the public's perception of the risk involved; skin cancer being much scarier than a warmer climate.¹⁸³ This perception problem suggests a need for effective marketing.

V. SELLING TAXES

Despite the potential for Pigovian gasoline taxes to yield triple-dividends, the individual risk perception and preoccupation with short-term effects discourages such policies. Empirical evidence indicates that a risk's visibility, certainty, and moral outrage are factors determinant of whether the public will demand that lawmakers act.¹⁸⁴ In the case of climate change, all three factors deter the public from demanding environmental legislation. As a result, politicians have little incentive to impose the long-term burdens of environmental regulation on industry in the absence of short-term political rewards by voters.¹⁸⁵ Thus, "there is indeed some reason to worry about the ability of a democratic political system to handle environmental problems in a rational manner."¹⁸⁶ However, acknowledging these hurdles suggests how the public and their elected representatives might be convinced to implement efficient, beneficial policies.

A. *The Target Audience*

1. *The American Public*

As it currently stands, Americans do not perceive climate change as a severe threat. Consequently, Americans are unwilling to incur significant costs to mitigate this risk, especially if those costs come in the form of higher gasoline taxes.

¹⁸¹ SUNSTEIN, *supra* note 109, at 77-79.

¹⁸² *See id.* at 80.

¹⁸³ *Id.* at 77.

¹⁸⁴ SUNSTEIN, *supra* note 109, at 57-65; Joni Hersch & W. Kip Viscusi, *Allocating Responsibility for the Failure of Global Warming Policies*, 155 U. PA. L. REV. 1657, 1686 (2007).

¹⁸⁵ *See* SUNSTEIN, *supra* note 109, at 48. *See also* Hersch & Viscusi, *supra* note 184, at 1692 ("Immediate effects receive full weight, indeed, an inordinate weight, compared to any deferred benefits."). Moreover, such actions would likely hurt campaign contributions and other support from industry interests. SANDMO, *supra* note 90, at 149.

¹⁸⁶ SANDMO, *supra* note 90, at 151. *See also* S. Res. 98, 105th Cong. (1997) (known as the Byrd-Hagel Resolution which passed unanimously and urged policymaker inaction on climate change).

Simply put, “the fuel tax is perhaps one of the most resented in our society.”¹⁸⁷ It seems that the public’s hostility to fuel taxes exceeds its general opposition to excise taxes in general,¹⁸⁸ which suggests that opposition more reflects the item being taxed than the method of taxation. Indeed, the public accepts other instances of federal government price manipulation in the name of economic efficiency as a matter of course. The Federal Reserve, for example, routinely adjusts the discount rate and thereby the cost of borrowing to influence consumer purchasing decisions.

This suggests that gasoline taxation provokes an emotional, rather than an analytical, response. That gasoline is widely consumed, that price drives consumer preference, and that prices are visible and volatile likely contribute to this phenomenon.¹⁸⁹ More important still, the car is freighted with notions of “freedom,” given the sprawling development of American society and widespread dependence on cars, almost as the exclusive method of transportation. Increasing the cost of car use is seen as constraining individual freedom of movement.¹⁹⁰ Public attachment to cars by the public partly explains economically inefficient government policies focused on making trips cleaner rather than fewer in number.

2. *Elected Representatives*

But public sentiment is only half the battle; politicians must be convinced of Pigovian fuel taxation’s benefits as well. Even more so than their constituencies, short-term incentives govern the behavior of lawmakers. “[I]n reality politicians are moved by concerns which are entirely different from those of social welfare maximization[,]”¹⁹¹ namely satisfying certain constituent groups in order to survive an upcoming election. So, although the public may demand action on a given issue, an ineffective government response will likely result if politicians are not independently motivated to act.¹⁹² Consequently, “[a]n important means for a government to ensure survival is to finance government expenditures with as little popular resistance as possible.”¹⁹³ Political concerns also motivate the method of government action adopted. “[Politicians] prefer direct interventions via

¹⁸⁷ Morris, *supra* note 83. See also Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, 38 ENVTL. L. REP. (Envtl. Law Inst.) 10287, 10288 n.3 (2008) (“The political climate does not appear to be ripe for carbon taxes.”); See also Stefan, *supra* note 11, at 24 (calling gas taxes “politically unpopular”).

¹⁸⁸ See Morris, *supra* note 83 (“[W]hile voters vehemently oppose fuel-tax increases, they seem happy enough to vote those sales-tax hikes on themselves (we just passed one in Los Angeles County).”); *But see* Frey, *supra* note 101, at 235 (“[A]n effort to influence consumption behaviour via excise taxes does not meet with much popular support, and in many cases will be strongly opposed.”).

¹⁸⁹ Morris, *supra* note 83.

¹⁹⁰ See SANDMO, *supra* note 90, at 147 (noting that some Americans feel that “restrictions on car use entail a major loss of welfare”).

¹⁹¹ *Id.* at 144.

¹⁹² See SUNSTEIN, *supra* note 109, at 37-38.

¹⁹³ Frey, *supra* note 101, at 233.

commands and controls, which have the added advantage that any successes can more easily be attributed to the government's actions."¹⁹⁴

Indeed, the United States' inefficient but politically useful energy policies reflect these motivations. Tepid public desire to secure energy independence and improve the environment provided politicians an opportunity to increase concentrated spending for biofuel subsidies and military operations. Policies that broadly advance societal welfare through economic efficiency enjoy markedly less support from lawmakers. For example, "the Clinton Administration achieved an increase in the federal gasoline tax rate of only [\$.04 per gallon] in 1993, despite a major effort."¹⁹⁵ Large but diffuse benefits thus tend to take a backseat to small but concentrated benefits.¹⁹⁶

B. Effective Marketing

Given these public and lawmaker motivations, proponents of Pigovian gasoline taxation should portray the measure as one designed to prevent imminent harm of a type readily identifiable, or as a way to confer strongly desired benefits.

1. Get Attention

The option of emphasizing imminent harm depends on government actors increasing the public's perception of the risk climate change poses because only severe, readily identifiable risks prompt changes in behavior. "[P]ublic officials could heighten the salience and hence the level of concern about the risks associated with climate change, and hence magnify the public demand for a regulatory response."¹⁹⁷ The media would play an important role in this.¹⁹⁸ Media portrayal of public health crises, acts of terrorism, or domestic natural disasters (such as flooding and drought) as resulting from volatile petroleum prices might drive the public to demand comprehensive transportation energy reforms that could include Pigovian fuel taxes. Representatives of regions made especially vulnerable to climate change effects could push such policies through the legislative process.

But absent a dramatic increase in the salience of climate change's risks, many citizens' instinctive opposition to environmental protection indicates that gasoline taxes should not be portrayed as an environmental measure.¹⁹⁹ Political support from informed environmental groups is likely forthcoming regardless of whether environmental benefits are made explicit. Advertising environmental benefits might therefore galvanize more opposition than support. However, as discussed

¹⁹⁴ *Id.* at 234 (citation omitted).

¹⁹⁵ PARRY & SMALL, *supra* note 40, at 30.

¹⁹⁶ *But see* Dernbach, *supra* note 7, at 30 (citing John D. Dingell, *The Power in the Carbon Tax*, WASH. POST, Aug. 2, 2007, at A21 (claiming that "policy makers may be taking a carbon tax more seriously").

¹⁹⁷ SUNSTEIN, *supra* note 109, at 69.

¹⁹⁸ *Id.* at 58.

¹⁹⁹ *See id.* at 39 ("Many citizens would almost certainly resist a large increase in the gasoline tax, even if the increase were defended by reference to environmental concerns . . .").

previously, these taxes' economic and national security benefits justify their implementation, irrespective of environmental considerations.

2. *Spend Conspicuously*

Pigovian fuel taxation might also be justified by reference to what the revenue it generates will be used for.²⁰⁰ Promoting such taxes as "benefit levies" induces the government "to provide services valued by the citizens."²⁰¹ Although most proponents of Pigovian fuel taxes assume that revenue will be used to offset reductions in income taxes, this might not be the best strategy to convince Americans to accept higher taxes. Although the public must be thoroughly convinced of the enormous importance of whatever benefit lawmakers decide to promote, determining the proper recipient of these funds is not necessary here because the opportunity to reduce government spending significantly justifies higher fuel taxes economically.

Contrary to current proposals,²⁰² it would be important that the government not use revenue from Pigovian fuel taxes to subsidize alternative energy research or facility construction, no matter how wonderful certain proposals may appear. Promoting research fails to recognize the inefficient outcomes inevitably produced by government intervention in the market.²⁰³ Like the current government-sponsored foray into biofuels, any solution funded with government subsidies has not been proven self-sufficient by the market and thus, will not survive without ever-increasing government support. Moreover, evidence suggests that the targeted government sponsorship of research does not expedite scientific discovery.²⁰⁴ Instead, the "political influence on research can be counterproductive even in the more technical areas."²⁰⁵ Rather than mandating the solution, government policies should adjust consumer demand and then put the market to work.

²⁰⁰ See Fullerton & Metcalf, *supra* note 149, at 222 ("[T]he proposal to add an environmental tax is only half of a proposal, because the reform must also specify whether the revenue goes to deficit reduction, a specific spending program, or a specific tax reduction.").

²⁰¹ Frey, *supra* note 101, at 234.

²⁰² See Spector, *supra* note 18 ("[A]uto lobbyists expect lawmakers to focus any new incentives on the next wave of technological advances, such as electric plug-in cars."); Totty & Swartz, *supra* note 19 (statement of R. James Woolsey, former U.S. Director of Central Intelligence: "[T]he U.S. Congress should establish a battery version of Sematech, the public-private partnership that was set up in the 1980s to ensure that the U.S. stayed in the business of developing and manufacturing semiconductors in the face of international competitors that were often heavily state-aided.").

²⁰³ See F. A. HAYEK, *THE CONSTITUTION OF LIBERTY* 260 (1960) ("If the quickest way to a now visible solution becomes the only permissible one . . . we may perhaps reach our present goal sooner, but we shall probably at the same time prevent the emergence of more effective alternative solutions.").

²⁰⁴ See Popp, *supra* note 110, at 177.

²⁰⁵ GERHARD MICHAEL AMBROSI, *KEYNES, PIGOU, AND CAMBRIDGE KEYNESIANS: AUTHENTICITY AND ANALYTICAL PERSPECTIVES IN THE KEYNES-CLASSICS DEBATE* 9 (2003) (quoting John B. Taylor, *The Evolution of Ideas in Macroeconomics*, 65 *ECON. REC.* (Econ. Soc'y of Austl.) 185, 189 (1989)).

3. *Employ Star Power*

The celebrity of the presidency might be required to galvanize public support for Pigovian gasoline taxation. There is reason to believe that Americans “would be willing to accept a gasoline tax if some leader would just frame the stakes for the country the right way.”²⁰⁶ From his “bully pulpit,” President Obama could issue a call for such tax reform in order to maintain the United States’ economic power and national security.²⁰⁷

A president’s ability to influence public opinion and overcome collective inertia by speaking directly to the public is well documented. In 1962, President John F. Kennedy persuaded the public to accept an enormously expensive task “of landing a man on the Moon and returning him safely to the Earth”²⁰⁸ by portraying the mission as one vital “to win the battle that is now going on around the world between freedom and tyranny[.]”²⁰⁹ Even earlier, in 1933, in the wake of his nationally-mandated “bank holiday,” President Franklin D. Roosevelt delivered his weekly radio address to the nation, in which he explained the mechanics of banking to nervous depositors, restoring trust in the banking system, and thereby securing an economically efficient long-term outcome despite conflicting short-term individual interests.²¹⁰ President Obama might enjoy similar success in promoting an economically efficient outcome here.²¹¹

VI. CONCLUSION

The opportunity to reduce federal spending domestically and internationally indicates that taxing gasoline at Pigovian levels has the potential to yield triple dividends, benefiting the United States’ economy and national security outlook, as well as the global environment. While this article paints in admittedly broad strokes, it seems likely that efficiency gains would produce a sizeable surplus providing the United States a significant relative advantage over other countries.

²⁰⁶ Thomas L. Friedman, Editorial, *Who’s Afraid of a Gas Tax?*, N.Y. TIMES, Mar. 1, 2006, at A19.

²⁰⁷ See Totty & Swartz, *supra* note 19 (statement of Andrew Liveris, Chairman and CEO, Dow Chem. Co.) (suggesting that the President use the bully pulpit to promote energy efficiency).

²⁰⁸ John F. Kennedy, Special Message to Congress on Urgent National Needs, 1 PUB. PAPERS 396, 404 (May 25, 1961).

²⁰⁹ *Id.* at 403.

²¹⁰ See Franklin Delano Roosevelt, Radio Address on the Bank Crisis (Mar. 12, 1933), available at <http://docs.fdrlibrary.marist.edu/031233.html>.

²¹¹ See President Barack Obama, Inaugural Address (Jan. 20, 2009) (“[T]here are some who question the scale of our ambitions, who suggest that our system cannot tolerate too many big plans. Their memories are short, for they have forgotten what this country has already done, what free men and women can achieve when imagination is joined to common purpose, and necessity to courage.”). *But see* TUGWELL, *supra* note 30, at 19 (“[B]ecause the lessons political leaders have learned are in many respects the wrong ones, any future interventions are likely to consist of still another series of ad hoc measures that work at cross-purposes and affect our lives in costly and unintended ways.”).

Future economic analyses are needed to determine the tax level that would maximize the United States' gains, as well as to identify how the government might best utilize the revenue such taxes would produce.