Governance Studies
at BROOKINGS

© Reuters/Larry Downing – Cars line up along freeway heading East to Washington.

The Long and Winding Road: Automotive Fuel Economy and American Politics

Pietro S. Nivola

February 25, 2009

EXECUTIVE SUMMARY

Pietro S. Nivola is a Senior Fellow and holds the C. Douglas Dillon Chair in Governance Studies at the Brookings Institution.

For more than 30 years, the government of the United States has been trying to reduce the nation's voracious consumption of petroleum by regulating the fuel economy of motor vehicles. The project has not been a notable success. As of 2007, the average fuel economy of brand new passenger vehicles in this country was, for all practical purposes, about the same as it had been 20 years earlier (under 27 miles per gallon). Counting *all* passenger vehicles on the road, old as well as new, the average miles traveled per gallon of fuel stood at just 20.4.[1] That fact, combined with a relentless increase in the amount of driving, meant that three decades after Congress initiated the automotive energy conservation program, we were actually consuming more fuel per capita than we had averaged when driving around in the gas-guzzlers of 1975.[2]

In 2007, lawmakers congratulated themselves for finally facing up to this disappointing performance; they enacted legislation requiring new cars and light trucks to attain a combined level of efficiency of 35 miles per gallon by the year 2020. The legislators claimed this change would not only advance (somehow) "energy independence and security" but also substantially curb the heat-trapping gases that are warming the earth's atmosphere. Were the kudos warranted? Thirty-five mpg may seem like a major step compared to today's 27.5 mpg, but it pales in contrast with the efficiency standards set by the European Union and Japan. The EU's vehicular fleet is scheduled to average around *50 mpg within the next three years* (2012).[3]

Why does America's effort to moderate the use of oil in automotive transportation continue to fall so woefully short? The following paper tackles this question, proceeding in six segments. First, the essay outlines in a bit more detail the energy-saving regulatory regime on which our politicians have fastened for more than a third of a century. Second, I describe this system's failures—including the fact that its impact on greenhouse gas emissions has been perforce minimal. Third, the paper shows how other advanced nations have achieved far better fuel economy, and hence are able to aim much higher in their prospective efficiency standards. Fourth, I discuss the political reasons for this country's lag and for Europe's big lead. Fifth, that analysis segues to some basic reflections about what animates our regulatory politics. Finally, the framework for a more enlightened U.S. policy mix is proposed.

---

[1] Federal Highway Administration, *Highway Statistics*, Table VM-1. Figure is for 2006.
[2] U.S. Census Bureau, *Statistical Abstract*, 2008, Tables 2 and 1070. These figures apply to the U.S. population taken as a whole, and only to fuel used in cars and light trucks.
[3] The EU's target for 2012 is the equivalent of 47 mpg for automobiles with gasoline engines and 52 mpg for diesels. *Environment for Europeans: Magazine of the Directorate-General for the Environment* http://ec.europea.eu/environment/news/efe/24/print_article_4119_wn.htm.

Corporate Average Fuel Economy

In the aftermath of the 1974 oil crisis, Congress enacted the so-called Energy Policy and Conservation Act of 1975. To call this measure a "conservation act" was largely a misnomer. By imposing price controls on all domestically produced crude oil, the immediate effect of the legislation was to induce demand for energy, not conserve it.[4] At the time, however, one portion of the law did appear to offer at least some prospect of moderating the use of fuel: As of 1978, automobile companies would be required, through a mélange of legislated directives and Department of Transportation (DOT) rulemakings, to upgrade the overall average miles-per-gallon of the passenger vehicles the firms manufactured. The resulting corporate average fuel economy (CAFE) standards, as they were called, established separate trajectories for different classes of vehicles, with higher standards set for ordinary cars than for light trucks (sport utility vehicles, vans, and pickups below a certain weight). The standard for new cars became an average of 18 mpg, rising to 27.5 by 1990. The light-truck standard moved from 17.2 mpg (in 1979) to 20.7 mpg by 1991. Two Bush administration rulemakings during 2003 and 2006 sought to raise the light-truck target to 24 mpg for 2011, but the second was overturned by the 9th Circuit Court of Appeals.[5] Further improvements for the two varieties of vehicles were not ordered until 2007 and, barring further delays in the courts, will be implemented according to amended DOT rules issued in the spring of 2008.[6]

The old differentiation between cars and "trucks" would eventually prove to be one of the program's fatal flaws.

For reasons to be explained shortly, the old differentiation between cars and "trucks" would eventually prove to be one of the program's fatal flaws, but in fairness, Congress did not foresee its implications, since sport utility vehicles (SUVs) and such comprised barely two percent of the market in 1975.[7] As a general notion, promoting better vehicular mpg made sense: In the United States, the transportation sector accounts for most of the oil the economy burns, and motor vehicles are the dominant users within that sector.

At first blush, results of the CAFE program looked promising. Average passenger car fuel efficiency for the model years of 1978 through 1982, for instance, increased by almost 7 mpg. From 1982 to 1988, the average climbed at a much slower rate. Still, new vehicles at the end of that six year span added another 2 mpg to their average.

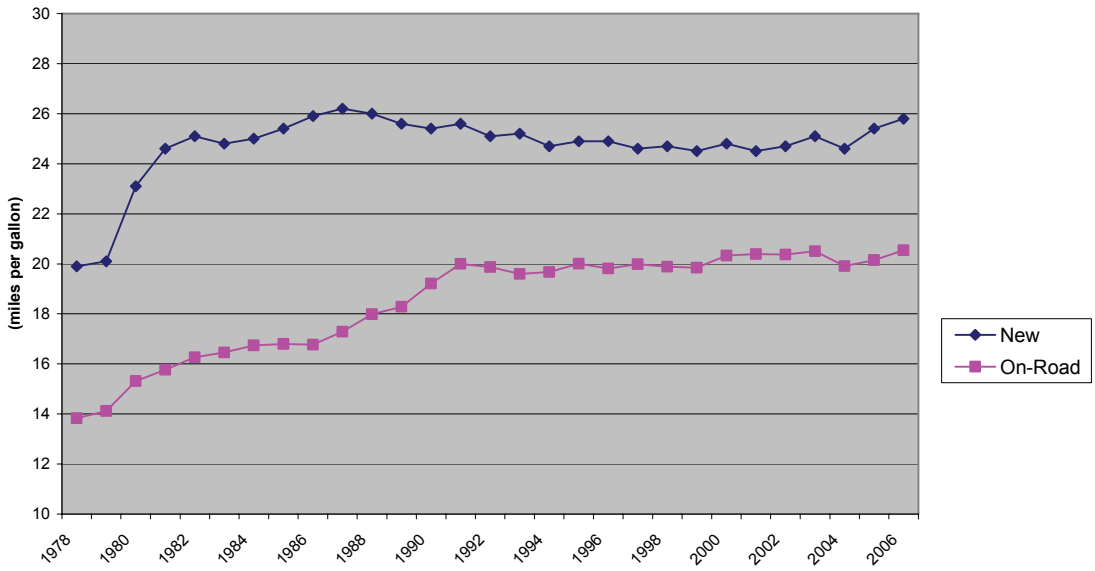
[4] For a wider assessment of the Energy Policy and Conservation Act of 1975, see Pietro S. Nivola, *The Politics of Energy Conservation* (Brookings, 1986), chap. 2.
[5] *Center for Biological Diversity v. National Highway Traffic Safety Administration,* November 2007.
[6] It remains somewhat unclear exactly how much of an improvement will actually occur under the new rules DOT's National Highway Traffic Safety Administration (NHTSA) promulgated in April 2008. The new rules allow standards to vary by vehicle size or "footprint." Hence, the bar appears to be lower for a manufacturer that produces more large cars or trucks than for a manufacturer that makes smaller vehicles. Declining oil prices could re-introduce an incentive favoring the former, so overall fuel efficiency for the vehicular fleet could slip again as the product mix shifts.
[7] Environmental Protection Agency, *Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2008* (EPA, September 2008), p. 17.

The CAFE Conundrum

With sales of SUVs and vans rising at a rapid rate and subject to a lower standard, the average fuel efficiency of the *overall* fleet of passenger vehicles had actually declined as of 2006.

But there, the good news (such as it was) ended. Afterward, new automobile efficiency showed no increase at all until 2002—when average mpg inched to 29 from 28.8, the high-point in 1988. Not only had the fuel efficiency of cars essentially flat-lined over 15 years, but also, this class of motor vehicles no longer claimed the dominant market share. With sales of SUVs and vans rising at a rapid rate and subject to a lower standard, the average fuel efficiency of the *overall* fleet of passenger vehicles (cars and these light trucks) had actually declined as of 2006 (see Figure 1). In 2007, the fleet's average finally topped—albeit by a paltry 0.4 mpg—the level attained 20 years earlier. Even that progression is deceptive. The definition of "light trucks" had become arbitrary; it excluded pick-ups, vans and SUVs with a so-called gross vehicle weight rating above 8,500 lbs but under 10,000 lbs. Amid relatively soft gasoline prices, sales of such vehicles had increased (in 1999, for example, over 521,000 were sold), so by the end of the century about 5.8 million of them were in use.[8] Since these behemoths were not required to meet any mileage standards at all, the true passenger fleet's trend (including them) would have looked sorrier still.

Figure 1. New and On-Road Vehicle Fuel Economy, United States



Sources: New fuel economy data drawn from National Highway Traffic Safety Administration, U.S. Department of Transportation. Revised Summary of Fuel Economy Performance. January 15, 2008. http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/. Other data drawn from Federal Highway Administration, Highway Statistics Summary to 1995, Table VM-201A, and HIghway Statistics, 1996-2006, annual editions, table VM-1 each year. http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.htm.

[8] NHTSA, "CAFE Overview – Frequently Asked Questions," p. 7.

And this inauspicious record was just one part of the picture—the part pertaining to new vehicles. Because new vehicles represent a small fraction of the on-road stock each year, it takes roughly a decade to turn over the entire inventory.[9] CAFE standards governing, as they do, only new models inevitably sink in at a snail's pace. After almost three decades of regulation, the average mpg-level for all the vehicles Americans were driving remained far below the efficiency ratings to which the 1975 legislation had implicitly aspired.

The 30-year regulatory exercise might be said to have reduced that annual torrent of pollution by less than 7 percent—an amount more than offset by China's CO2 output *every month*.

How much did the CAFE apparatus, since its inception, reduce U.S. demand for petroleum, and thus how much impact was made on the emission of greenhouse gases? To date, the most authoritative study of this question is a report issued by the National Research Council (NRC) in 2002. It concluded that, without the change in mpg after 1978, we would have used 2.8 million more barrels of oil per day.[10] What this (and every other) study of the subject could not pinpoint, however, was how much of this savings could be imputed to the CAFE policy as distinct from other forces—most notably, rising energy prices during various intervals. The sharp price increases in the 1970s and early 1980s, for example, may well have done more to boost fuel economy during those years than did any regulatory strictures. Similarly, the upturn in mpg that finally began in 2007 almost certainly has more to do with soaring gasoline prices than with the belated congressional action raising standards through 2020.[11]

A more compelling case for CAFE's effectiveness is that, by setting a floor for fuel economy when energy prices sagged between 1983 and 1988, the program probably helped prop up the mpg numbers during that period. This limited stretch of reasonably unambiguous impact, though, would not seem to offer a sufficient basis for crediting CAFE mandates per se with the full 2.8 million barrels of oil a day that were said to have been conserved over the course of the program's existence. As the NRC itself conceded, it remains "difficult to say what fuel consumption would have been had there been no CAFE standards."[12]

Even if, straining credulity, we assume that the fuel economy regulations somehow accounted for *all* of the estimated fuel savings, how much difference have they made in meeting the most important challenge of energy policy: the battle

[9] This is a conservative time frame. Schipper, for example, suggests that the actual turnover rate is somewhere between 10 and 20 years. Lee Schipper, "Automobile Fuel Economy and CO2 Emissions in Industrialized Countries: Troubling Trends Through 2005-6," *World Resources Institute*: http://www.embarq.wri.org, p. 6. Improvements in the quality and durability of vehicles have lengthened their operational life span.

[10] National Research Council, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards* (Washington, D.C.: National Academy Press, 2002), p. 20.

[11] To the Bush administration's credit, it is possible that the 2003 and 2006 rulemakings may have had a slight positive effect by 2007 by, at long last, requiring better performance from light trucks. Since the new rules were to have a long (2011) lead time, it is highly unlikely that they were more significant than simply the increase in oil prices that began zooming again in 2003. Also, since the courts eventually remanded the second of these new rules, it is unlikely that manufacturers were primarily incentivized by them.

[12] National Research Council, *Effectiveness*, p. 19.

against climate change? Our light-duty vehicles are responsible for only a fifth of U.S. carbon emissions. Lowering the combustion of gasoline by 2.8 million barrels a day diminished the CO_2 level by approximately 367 million metric tons a year, inferring from the NRC report.[13] But at the time of the NRC's estimate, the United States was shoveling more than a total of 5,670 million metric tons of CO_2 into the air annually.[14] (A more current figure, of course, would be considerably worse.) Thus, at the very best, the 30-year regulatory exercise might be said to have reduced that annual torrent of pollution by less than 7 percent—an amount more than offset by China's CO_2 output *every month*.[15]

The meagerness of this result has been no secret to framers of environmental policy, particularly those in active state governments such as California's. In 2002, California launched a program to cut tailpipe emissions of greenhouse gases (GHG) to levels far below those projected for the United States as a whole. The California initiative, and those of other states moving to emulate it, reflected in part keen awareness that the U.S. effort (CAFE) had accomplished too little.

It is imaginable that if the California initiative sticks, and enough other states follow its lead, the deficiencies of the federal government's fuel-economy struggle may become less relevant. State policies would supersede Washington's, and CAFE could gradually fade, literally, to a side-show. The chances of that substitution improved with the arrival of Barack Obama to the White House. Before, neither the Supreme Court's verdict in *Massachusetts v. EPA*, affirming the regulation of CO_2 under the Clean Air Act (CAA), nor a federal court decision in California upholding the state's GHG-based substitute, had deterred the U.S. Environmental Protection Agency (EPA) from preempting state law.[16] By turning down Sacramento's request for a CAA waiver, the EPA had effectively denied the state permission to go ahead with its plan.[17] In January, President Obama promptly directed the EPA to reconsider its position.

Still, it remains far from clear that state-level GHG abatement schemes, even the most aggressive ones like California's, would ultimately add up to a national lid on carbon emissions comparable to those foreseen in Europe and Japan.[18] For there, a rather different, more powerful set of policy instruments is at work.

---

[13] The NRC report does not describe the carbon footprint in the standard fashion: million metric tons of carbon dioxide. The estimate of 367 million metric tons of gas used here equates to the NRC's figure of 100 million metric tons of carbon.

[14] Energy Information Administration, *Annual Energy Review 2006*, Table 12.1: Emissions of Greenhouse Gases, 1980-2005, p. 341.

[15] China's carbon dioxide emissions were estimated in excess of 5,323 million metric tons in 2005. Energy Information Administration, *Annual Energy Review 2007*, Table 11.19: World Carbon Dioxide Emissions From Energy Consumption, 1996-2005, p.375. Since then, Chinese emissions have soared, surpassing U.S. figures in 2007.

[16] *Central Valley Chrysler-Jeep, Inc. v. Goldstone*, December 2007.

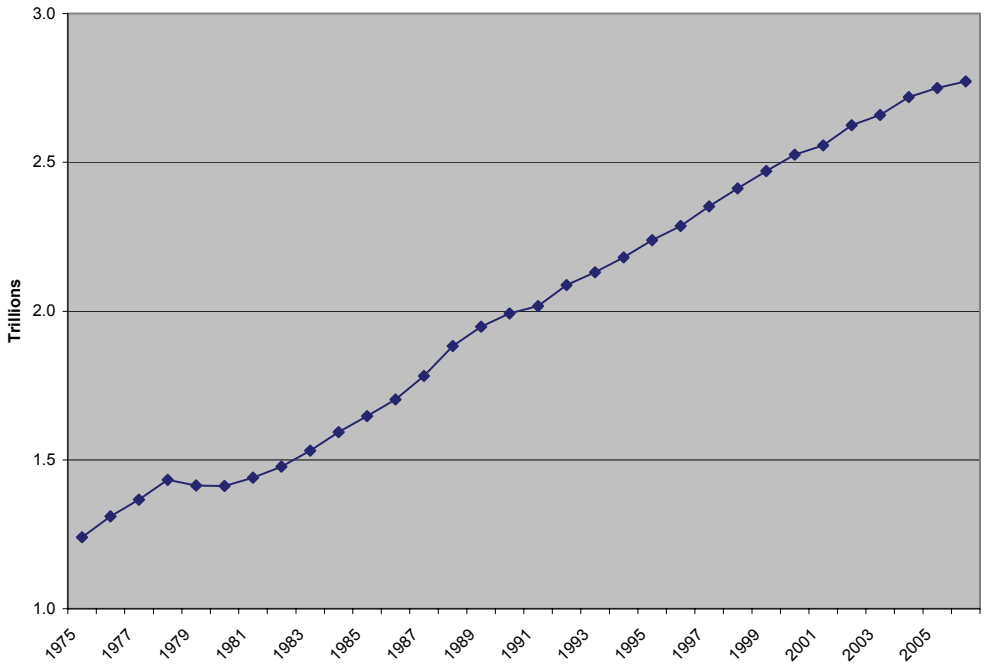
[17] *State of California v. United States Environmental Protection Agency*, January 2008.

[18] Twelve other states and the District of Columbia have embraced the California standard, and six others are considering it. Important though this is, together all these states would cover less than half of the market for new cars in the country.

All of which brings us back, for now, to the CAFE framework and its most abiding defect: While mandating vehicular fuel economy may (slowly) alter the composition of fleets, what, if anything, can it do about the driving habits of motorists? Vehicle miles traveled (VMT) by the U.S. light duty fleet have continued to soar at a pace much faster than growth of our population throughout the life of the regulatory program (see Figure 2). By motoring the equivalent of over 11 million trips to the moon (and rising) every year, the energy-conserving effect of CAFE is undercut. Indeed, if anything, the CAFE program has *induced* some of the unremitting increase in VMTs: Inasmuch as mandated fuel economy lowers the marginal cost of driving during periods of flat or declining gasoline prices, people drive their thrifty cars *more.* Estimates of this boomerang (or "rebound" effect) vary, but even if the consensus is that the magnitude is modest, it presents yet another reason for skepticism that a daily savings of 2.8 million barrels of oil can be imputed entirely to CAFE requirements.

Vehicle miles traveled (VMT) by the U.S. light duty fleet have continued to soar at a pace much faster than growth of our population throughout the life of the regulatory program.

Figure 2. Vehicles Miles Traveled (VMT) for Light-Duty Vehicles, United States



Sources: Federal Highway Administration, Highway Statistics Summary to 1995, Table VM-201, and Highway Statistics, 1996-2006, annual editions, table VM-1 each year.
http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.htm.

As will be discussed below, nations that have been more successful in constraining demand for motor fuel—and thus lowering GHG effluents in their transportation sectors—have done so by improving the efficiency of vehicles *and* encouraging people to drive less. What has helped make this two-pronged approach work is not the imposition of fuel economy standards but rather a longer history of steep prices.[19] The United States, too, could have achieved much greater conservation over the years simply if the price of gasoline had been set consistently higher. Instead, U.S. policymakers have clung to CAFE, which, to paraphrase one wag, has been a little like trying to battle obesity by requiring tailors to make only tight-fitting clothes.[20]

Nations that have been more successful in constraining demand for motor fuel have done so by improving the efficiency of vehicles *and* encouraging people to drive less.

What Other Countries Do

In 2005, per capita consumption of motor fuel in the United States was nearly 620 gallons a year (see Figure 3). Compare that figure to the United Kingdom (224 gallons), France (222), Germany (208), and Japan (195). It is tempting, as a first approximation, to just invoke variations in living standards, geography and transportation systems, and the stringency of European and Japanese regulatory activities, to explain away these striking differences in energy intensity.

America is a wealthy country. Recessionary interludes notwithstanding, most American households have continued to garner rising levels of real compensation decade after decade.[21] Vehicle ownership is more widespread than anywhere else. America is also a vast country, over which people journey long distances, inevitably piling up more vehicle miles traveled. U.S. cities are less dense than European and Japanese urban centers, so naturally more Americans commute by car and fewer of us use alternative modes of urban transportation.[22] Ridership in the transit systems

[19] For a little over a decade, the European Union has pursued the functional equivalent of fuel efficiency goals in the form of voluntary agreements with automobile manufacturers to reduce tailpipe emissions. Only in 2007 did the EU initiate a mandatory effort. Likewise, Canada's fuel economy program, though modeled more closely on the American and initiated in 1976, also was voluntary, as has been Australia's. Before 2007, Japan and China were the only other big countries to have imposed mandatory fuel efficiency standards, Japan in 1999 and China in 2005. The nature and vintage of most of these foreign projects largely suggests that they were of relatively limited consequence for the mpg ranking of their auto fleets over the full life-span of the U.S. CAFE experiment. In some places—the EU and China, for instance—recent tightening of the regulatory screws, however, could prove consequential in the years ahead. For a summary of the various regulatory regimes, see Feng An and others, *Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update* (International Council on Clean Transportation, July 2007).

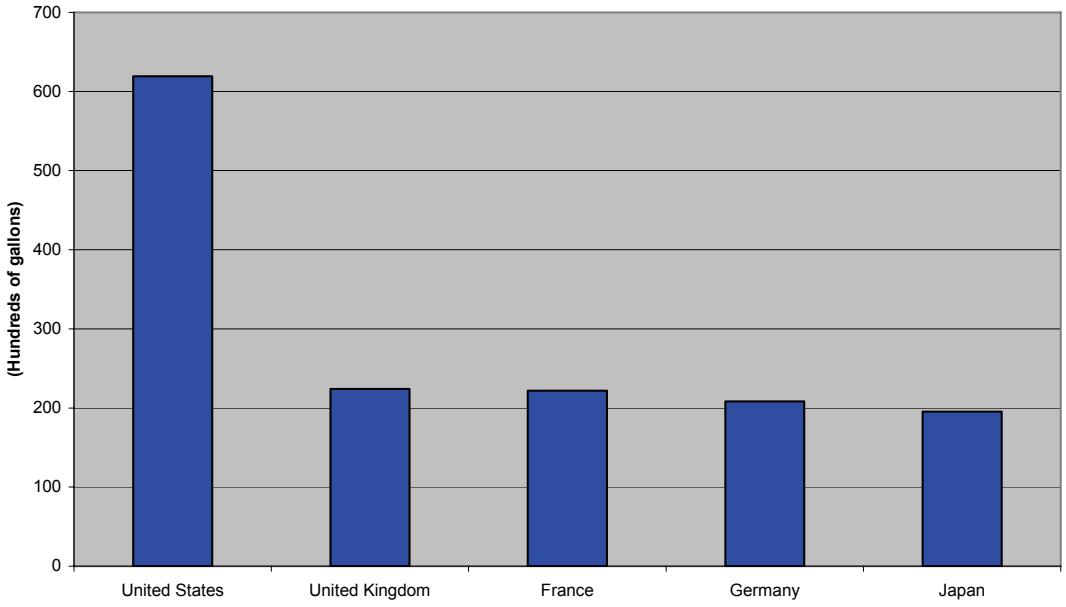
[20] Bob Lutz, *Autoline Detroit*, May 6, 2007.

[21] A widely held view in recent years is that the income growth of "middle class" Americans has stagnated. But as Robert Z. Lawrence has persuasively demonstrated, properly measured, significant real gains have been chalked up over the past 20 years, even for blue-collar workers. See Robert Z. Lawrence, *Blue-Collar Blues: Is Trade to Blame for Rising US Income Inequality?* (Washington, DC: Peterson Institute for International Economics, 2008), Chap. 2.

[22] Pietro S. Nivola, *Laws of the Landscape: How Policies Shapes Cities in Europe and America* (Brookings, 1999).

and trains of Europe and Japan is higher than in the United States, where these alternatives are less well-developed. Finally, we are not the only country that regulates vehicular fuel-efficiency. The EU and Japan have imposed tougher targets than ours, either in the form of direct standards for kilometers per liter (Japan) or through tailpipe-emission regulations to reduce GHG output (the EU).

Figure 3. Per Capita Consumption of Motor Fuel, 2005



Sources: Consumption data drawn from International Energy Agency, *Oil Information 2007* . http://miranda.sourceoecd.org/vl=11522702/cl=17/nw=1/rpsv/~6673/v2007n17/s1/p1l. Population data drawn from Organization for Economic Cooperation and Development, Country statistical profiles 2008. http://stats.oecd.org/wbos/Index.aspx?DatasetCode=CSP2008.

Most of these propositions hold at least a kernel of truth (in some cases, considerable merit), but all told, they do not suffice. The standard of living (GDP per capita) is roughly comparable among industrial countries, and the rate of automobile ownership in Europe now is no longer a distant second. (Europe's rate is converging on 600 vehicles per 1000 persons. Ours is closer to 700 per 1000 persons.)[23] Distances are indeed great in the United States, but 90 percent of automotive trips here are fewer than ten miles long, and the average length of the trips appears to be not much longer than, for example, in the United Kingdom.[24] More than two-thirds

[23] See Schipper, *Automobile Fuel Economy*, p. 16.
[24] Lee Schipper and others, *Fuel Prices, Automobile Fuel Economy, and Fuel Use for Land Travel: Preliminary Findings from and International Comparison* (Berkeley, CA: Lawrence Berkeley Laboratory, 1992), p. 9; National Household Travel Survey, 2001,

of vehicle miles racked up by U.S. passenger vehicles, moreover, take place in urban areas, not the vast expanse of rural hinterlands.[25] Granted, our cities tend to be more spread out than those overseas, hence public transit, bicycling, or walking to jobs and services is often impractical. Yet, far more than we like to admit, Americans tend to decline these options even when they are available and feasible. (Case in point: The overwhelming percentage of people who opt to commute by car in Washington, DC, a city with one of the world's most modern and elegant transit systems.)[26] Yes, our Amtrak sometimes does feel like a third-world passenger rail system in comparison with the rapid trains of Japan and Europe. But, with the exception of only a couple of major corridors, Americans rely not on trains but more extensively on a faster, high-volume mode—airplanes—for long distance travel.

As for the oft-asserted thesis that the Japanese and Europeans are tougher regulators, who therefore get better results, it is simply incorrect. In fact, as noted earlier, neither the EU nor Japan had set mandatory fuel-economy or CO_2 targets for motor vehicles until quite recently. (Japan's mandated program began in 1991. The EU's Environment Council did not get around to setting mandatory standards until June 2007, though the EU had experimented with a series of voluntary agreements with automobile manufacturers a decade ago.)[27] True, the European target now is exemplary: the equivalent of a vehicular average approaching 50 miles per gallon within the next three years. The explanation for so remarkable a goal, however, is not that the EU is a uniquely fierce regulator; rather, it is that European automotive fleets were already within striking distance of the goal, thanks to their pre-existing efficiency. And that long-standing efficiency, in turn, had little do with energy mandates (there weren't any binding ones until last year) and a lot to do with the price of fuel.

Properly understood, it is hard to escape the conclusion that price differentials are the single most telling factor explaining the fuel intensity of automotive transportation in the United States in contrast to most other advanced industrial countries. Figures 4 and 5 display respectively differences in the price of gasoline and diesel fuel at the pump earlier last year. Even a little later, when Americans lamented that the average price of gasoline had topped $4 a gallon, motorists throughout western Europe were paying the equivalent of more than twice that amount.

---

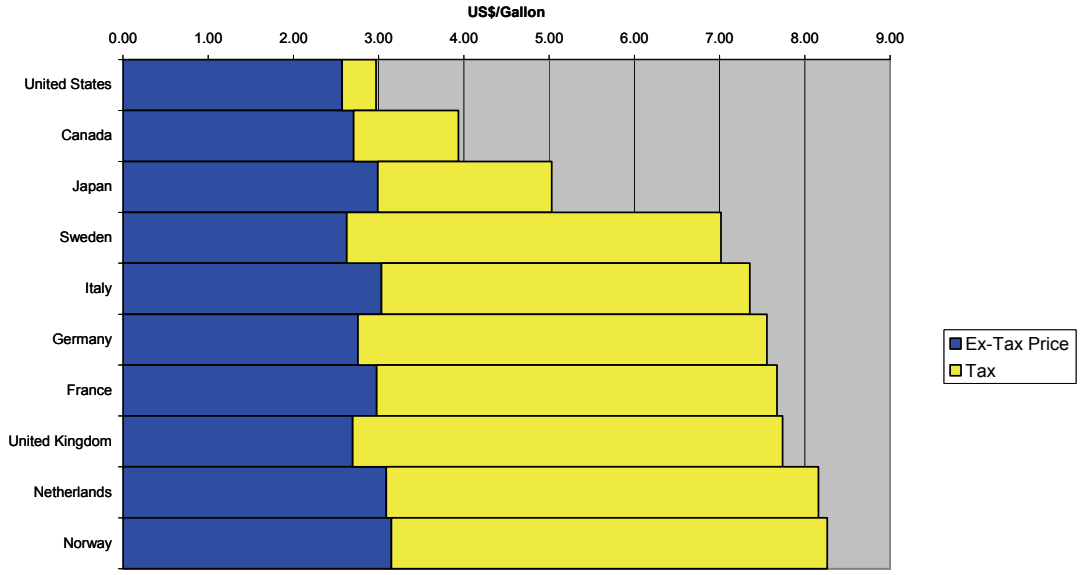
http://nhts.ornl.gov/2001/pub/STT.pdf p. 16; Department for Transport, *Driving Force: Four Fifths of Annual Distance Travelled Is by Car*
http://www.statistics.gov.uk/cci/nugget_print.asp?ID=24

[25] Federal Highway Administration, *Highway Statistics*, Table VM-1.

[26] A *Washington Post* survey in 2005 found fully 86 percent of Washington area commuters commuting by car. http://www.washingtonpost.com/wp-srv/polls/2005027/q5/index.html

[27] ICCT, *Passenger Vehicle Greenhouse Gas and Fuel Economy Standards*, pp. 11-13.

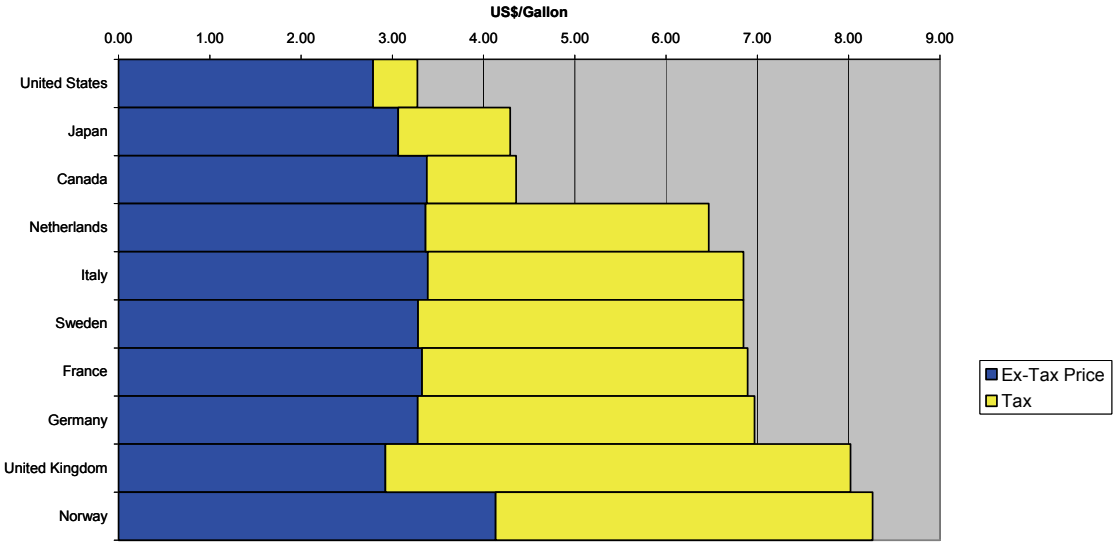
Figure 4. Unleaded Gasoline Prices and Taxes. First Quarter, 2008*



*Or latest available

Source: International Energy Agency, *Energy Prices and Taxes, First Quarter, 2008*. Figure 8. p. xxxiv. http://lysander.sourceoecd.org/vl=4338568/cl=19/nw=1/rpsv/~3804/v2008n1/s1/p1l.

Figure 5. Automotive Diesel Prices and Taxes. First Quarter, 2008*



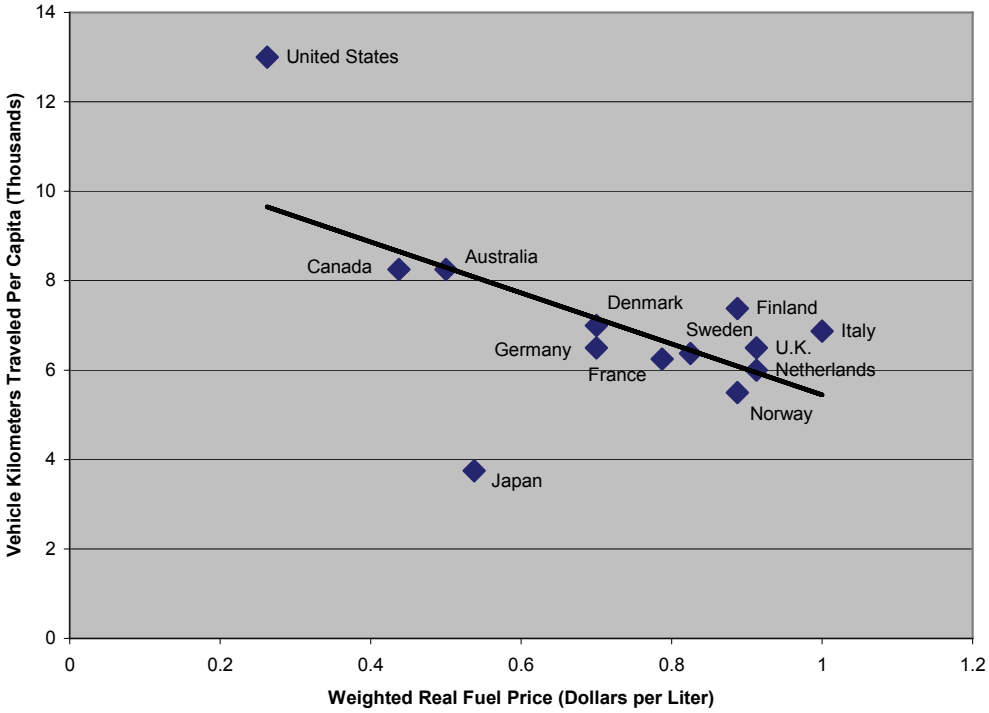
*Or latest available

Sources: International Energy Agency, *Energy Prices and Taxes, First Quarter, 2008*. Figure 9. p. xxv. http://lysander.sourceoecd.org/vl=4338568/cl=19/nw=1/rpsv/~3804/v2008n1/s1/p1l. Canadian price data from Natural Resources Canada. http://fuelfocus.nrcan.gc.ca/prices_bycity_e.cfm?PriceYear=0&ProductID=5&LocationID=66,8,39,17#PriceGraph.

These pricing patterns are inversely correlated with (a) vehicle kilometers traveled per capita and (b) average on-road fuel efficiency of vehicles. Figures 6 and 7 show the relationships unmistakably: Where prices are high, people drive less and, when they drive, tend to do so in more economical vehicles. Over time, the greatest impact of consistently steep fuel prices is in the kinds of vehicles consumers will choose. The price elasticity of demand for fuel-economic vehicles appears to be as high as -0.7, meaning that, say, a 10 percent rise in fuel prices eventually yields as much as a 7 percent decline in vehicular fuel intensity.[28]

Where prices are high, people drive less and, when they drive, tend to do so in more economical vehicles.

Figure 6. Fuel Price and Vehicle Kilometers Traveled Per Capita



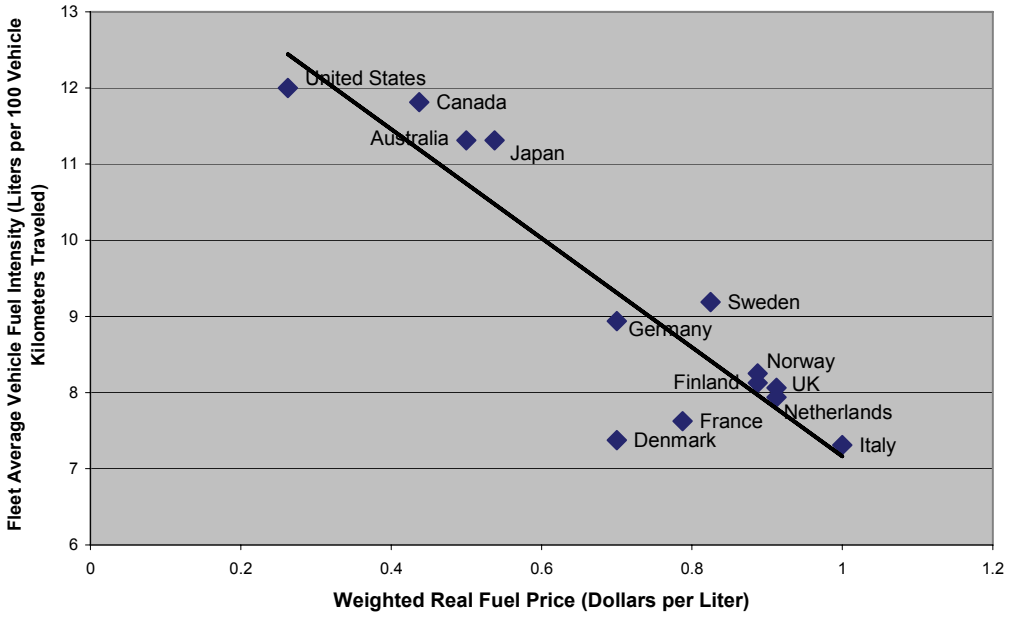
Source: Figure is derived from graph in Lee Schipper, "Automobile Fuel Economy and CO_2 Emissions in Industrialized Countries: Troubling Trends through 2005/6," EMBARQ/World Resources Institute, 2007, p. 13. Note: The slope of the line through the data approximates the relationship between fuel prices and kilometers traveled per capita.

The price elasticity of demand for the *use* of vehicles (that is, the amount of driving) is said to be considerably lower: in the range of -0.2 to -0.3.[29] There is reason, however, to question the low end of this estimate. For one thing, it is likely that the demand response to movements in price is not linear. Rather, it works in

[28] See O. Johansson and Lee Schipper, "Measuring the Long-Run Fuel Demand of Cars," *Journal of Transport Economics and Policy,* September 1997.
[29] Johansson and Schipper, "Measuring the Long-Run Fuel Demand."

quantum steps; when tipping-points are crossed, a game-change occurs. The sudden spikes in energy prices in 1974 and 1979, for example, quickly shifted not only the mix of vehicles purchased but the extent and form of travel. More recently, the critical break-point for U.S. consumers and producers seems to have been the $4 mark for gasoline: upon crossing that threshold, sales of SUVs promptly plunged; smaller cars gained market share; and, for the first time since 1979, VMTs fell off sharply.[30] (For example, the 4.3 percent—or 11 billion miles—drop in VMTs in March of 2007, compared to the same time a year earlier, suggests a price elasticity of demand appreciably greater than the -0.2, or even the -0.3, cited above.)

Figure 7. Fuel Price and Vehicle Fuel Intensity



Source: Figure is derived from graph in Lee Schipper, "Automobile Fuel Economy and CO_2 Emissions in Industrialized Countries: Troubling Trends through 2005/6," EMBARQ/World Resources Institute, 2007, p. 13.
Note: The slope of the line through the data approximates the relationship between fuel prices and vehicle fuel intensity.

Further, the customary view that demand for automotive travel is relatively price-inelastic in the United States is largely predicated on the fact that Americans, more than other people, are impelled to commute to work by car.[31] Be that as it

[30] Steven Mufson and David Cho, "Fuel Prices Challenge Cars' Reign," *Washington Post*, June 10, 2008, pp. A1-A19. Vehicle manufacturers were quick to react. In 2008 Ford Motor Company, for example, slashed its production of pickups and SUVs by 90,000 for the second half of the year. Nick Bunkley, "Ford Delays New Pickup and Reduces Production," *New York Times*, June 21, 2008, p. B3.
[31] Journalistic discussion of motor-fuel price elasticity sometimes seems to view European consumption habits, like American, as seemingly indifferent to high prices, evidence to the contrary. For example, a recent piece in the *New York Times* raised "questions as to how effective high prices by themselves can be in achieving the ambitious targets for reducing carbon dioxide emissions that

may, an elasticity regularly as low as -0.2 presupposes, implausibly, that almost all of our driving is an immutable necessity, insensitive to relative prices. But motorists in this country take approximately twice as many vehicular trips per capita as the Europeans.[32] Necessary travel such as commuting trips alone cannot account for so wide a chasm. A good deal of driving is discretionary in the United States, like everywhere else, and consumers can—and do—alter their behavior by making a variety of adjustments: car-pooling, changing modes, combining trips (what transportation economists call trip-chaining), or even occasional renunciation.

Recently, the critical break-point for U.S. consumers and producers seems to have been the $4 mark for gasoline: upon crossing that threshold, sales of SUVs promptly plunged; smaller cars gained market share; and, for the first time since 1979, VMTs fell off sharply.

If, as is likely, price incentives exert a powerful influence on how motorists consume fuel, two questions ensue: Why are motor-fuel prices so much higher abroad? And how are other countries able to add that premium? The answer to the first is straightforward: As you can tell by glancing again at Figures 4 and 5, most of the disparity in retail rates reflects a far lower excise tax in the United States. The answer to the second query is more complicated: The politics of energy taxation in Europe and America are worlds apart. Complex historical and systemic reasons are involved.

Comparative Governance

A society's relative disposition to tax energy, rather than regulate its consumption in less direct ways, is to an important extent path dependent: Nineteenth century imperial powers such as Britain and France had long financed their extensive central governments by levying sales taxes on everything from salt, tea and tobacco to various forms of fuel, including eventually motor "spirits." Taxation of automotive fuel in the United States got a slower start, and began at a different level: The state of Oregon initiated the practice in 1919. Gradually most other state governments followed during the next couple of decades.

State preemption delayed and constrained national policy. Congress eventually tapped into the new source of revenue but the states had staked a larger, prior claim on it. The dissent of state governors and legislators to proposed federal fuel taxes was to become an obstacle when these tax bills were debated in Washington. The first federal excise, masterminded by President Herbert Hoover and limited to 1 cent a gallon, was not adopted until 1932, many years after the first national fuel excises in Britain.

Federal gasoline taxation made its debut under inauspicious circumstances; the Great Depression, as Franklin D. Roosevelt came to see, was a bad time to be imposing new taxes of any kind. Thus, the 1-cent gas-tax rate remained unchanged until 1940, when revenue needed for military preparations resulted in a half-cent

European leaders have committed themselves to meeting." Yet, in the very next paragraph of the very same article, it was noted that as gas prices hit the equivalent of $10 a gallon, "purchases in Italy dropped 10 percent compared with the year before." See Elisabeth Rosenthal, "Memo From Europe: A Hard Habit to Break, Even With Gas at $10 a Gallon," *New York Times,* August 29, 2008, p. A7.

[32] Schipper, "Automotive Fuel Economy," p. 15.

increase. Strict administrative rationing of gasoline during the Second World War stalled further adjustments, though a 2-cent hike finally occurred in the post-war period with the outbreak of the Korean conflict.

But by the mid-1950s, it was already too late to turn the rate of federal fuel taxation into a fiscal instrument comparable to those in other western countries. Explosive suburban growth in American metropolitan areas was well on its way to establishing an exceptionally "autocentric" society—one intensely resistant to any measures that would raise the operating costs of automobiles.

Dedicated vs. General-Purpose Revenue

In addition, the 1956 legislation that authorized construction of the interstate highway system added what would quickly become an additional constraint: Mimicking the road financing methods of most states, Congress embraced a principle of targeted dedication of revenue to a highway trust fund. Gas-tax dollars fed into the fund soon ensconced a classic iron triangle of construction contractors and users, congressional public works committees, and federal and state transportation agencies whose common interest was plain: to pay for an expansive infrastructure with, in effect, a toll that would remain low enough to maintain robust demand but sufficient to keep replenishing the funding source. Thus, when the U.S. government has succeeded in boosting its gasoline tax, the periodic increases have been, at best, held to a nickel ante—4 cents in 1959, 5 cents in 1982, 5 cents in 1990, 4.3 cents in 1993. These increments were typically justified as surcharges to shore up the nation's roads, bridges, and late in the game, some transit systems.[33]

Notice the importance, and distinctiveness, of this designation. Few other nations earmark fuel-tax revenue in the U.S. fashion. The norm of tax policy in most European countries is that the proceeds of all imposts, whether on consumption or incomes, are commingled as general revenue for public purposes of many kinds. To be sure, there have been occasional restrictions. In Britain, for example, Lloyd George, Chancellor of the Exchequer in 1909, had sought to "hypothecate" money for a special "road fund." However, subsequent treasury ministers repeatedly raided the fund, dismissing as "preposterous" any notion that highway users "are entitled to make binding terms with Parliament as to the application of the taxes levied for them."[34]

Similarly, in France, a separate highway fund existed on paper as of 1952: *le Fonds special d'investissement routier*. But the Ministry of Finance was in the habit of poaching on it and routinely diverted its francs to other priorities.[35] What these

[33] The Surface Transportation Assistance Act of 1982 began for the first time releasing a small share of new gas-tax receipts for mass transit improvements. The 1991 reauthorization finally gave states much wider discretion to apportion trust fund disbursements to transit.
[34] Quoted in William Plowden, *The Motor Car and Politics, 1896-1970* (London: The Bodley Head, 1971), pp. 190-91.
[35] James A. Dunn, Jr. "The Politics of Motor Fuel Taxes and Infrastructure in France and the United States," *Policy Studies Journal,* vol. 21 (Summer 1993), pp. 271-84.

practices have meant in places like France and the United Kingdom is that revenues from fuel taxes tend to be distributed among multiple claimants. The use of levies on motorists to cross-subsidize additional stakeholders (not just municipal public transit operators but railroads and airlines, for instance) widens the array of vested interests in much steeper tax rates.

Other Budgetary Contrasts

The comparatively constrained use of fuel levies in the United States, hence their small scale, also reflects a broader systemic difference in fiscal policymaking.

In Britain, the budget-making process is centralized in the treasury; it decides how and what to tax and spend. The budget—each year's program of taxes and expenditures—is prepared in secret by the Exchequer with limited give-and-take in the cabinet, to say nothing of participation by back-benchers. It is eventually presented to the House of Commons but typically as an indivisible package to be briefly debated and then approved up or down. Parliamentary rejection of any portion, an extreme rarity, is tantamount to a vote of no confidence and grounds for full-blown government crisis. An obvious implication of this modus operandi is that, "the government," if it so desires, ordinarily can raise taxes on petrol more or less at will.

The French government has been known to operate with even fewer checks. There, the Finance Ministry frequently has had carte blanche simply to decree a percentage ad valorem in a national excise tax. With elected representatives in parliament mostly sidelined, public opposition (even when simmering) often has no effective outlet.

Compare such norms to our own. The U.S. constitution vests the power of the purse squarely in the legislative branch. There, responsibilities are divided at least eight ways—among the upper and lower chambers' tax-writing, authorizing, appropriations, and budget committees, each of which jealously guards its prerogatives and can upend what the executive proposes. Indeed, the objections of even just a handful of members in a pivotal committee (Senate Finance, for instance) can suffice to obstruct or alter beyond recognition items in a president's budget.

That's pretty much what happened, for example, to President Clinton's proposal for a substantial energy tax in 1993. Clinton presided over clear Democratic majorities in both houses. Nonetheless, by the time a few senators in his own party had finished grinding down the administration's bill, what finally emerged was an entirely different sausage—a gasoline tax hike of only 4.3 cents.[36]

[36] In the Senate Finance Committee, Senators David L. Boren of Oklahoma and John B. Breaux of Louisiana were able to gut the President's so-called "Btu tax," shrinking it instead to a 7.3-cent increase in the federal excise on transportation fuels. Even that very modest result did not satisfy two other senators. In the end, the committee settled on 4.3 cents.

Party Politics

Republican politicians in the United States have been reluctant to decouple the excise on gasoline from its lock-box—the highway trust, which limits our only national energy tax to a mild user fee. To invite a wider clientele for gas-tax revenue, and thus stir appetites for higher rates, would be to violate party orthodoxy about "new taxes."

Democratic politicians are equally wary, but for a different reason: they deem taxation of motor fuel to be regressive, and therefore to be minimized. Sometimes leading Republicans take this populist tack, too. Senator John McCain and Senator Hillary Clinton adopted identical positions during the 2008 presidential campaign: both championed a gas-tax holiday on the grounds that the beleaguered American consumer needed "a break" (never mind that the U.S. tax is minimal by international standards).[37] With both sides so entrenched, it is no wonder that legislative efforts to increase the tax, even by a few pennies, more often fail than succeed, frequently by margins greater than 4 to 1 in the House of Representatives.[38]

To appreciate how unique this bipartisan roadblock is, gaze again at the political scene in the United Kingdom or France. On the right in Britain, thanks to party discipline in Parliament and less dispersion of fiscal authority, a Tory government like that of Margaret Thatcher had little to fear from the lucrative proceeds of steep consumption taxes. In fact, such taxes rose repeatedly under Thatcher amid extensive privatization, government downsizing, and austerity measures—in short, with little risk of feeding the equivalent of a congressional spending spree. The perpetual tax revolt of supply-siders in the United States reflects at least partly a conviction that a conservative public sector can only be achieved by "starving the beast."

Meanwhile, liberals in America ritually refer to increases in the cost of gasoline as "unfair," "discriminatory," and "unaffordable." Seldom does one hear this rhetoric on the European left. When the socialist government of François Mitterand came to power in 1981, the tax on regular gasoline in France stood at 54 percent of the retail price. By the spring of 1991, the bite was 77 percent.[39] Across the Channel, the British Labour Party has not hesitated to jack up taxes on petrol, either. Indeed, in the elections of 1992, it was the two parties of the left, Labour and the Liberal Democrats, that attached to their respective "programmes" the boldest proposals for higher tolls on roads and fuel. [40]

Why are the socialists of Europe evidently resigned to tax rates like those shown in Figures 4 and 5 while progressives in the United States call the relative bargain

---

[37] Michale D. Shear, "As Prices Soar, McCain Returns to Gas Tax Holiday Proposal." http://blog.washingtonpost.com/the-trail/2008/06/as_prices_soar_mccain-returns.html

[38] Minimal tax increases were defeated, usually in a lopsided manner, on at least five different occasions during the extended "energy debates" of the 1970s.

[39] *Comité professionnel de pétrole 90: Éléments statistique* (Rveil-Malmaison: CMO, 1991), p. D14

[40] Peter Hughes, "Is Transportation Policy Going to Head Left, Right or Center?" *Local Transport Today*, April 2, 1992, p. 11.

here "backbreaking"?[41] Perhaps our left is less confident that the safety nets of the American welfare state can cushion the impact of any added burden on the poor and the middle class. Perhaps, too, officials across the entire U.S. political spectrum are simply less insulated from public opinion. Routinely and overwhelmingly, polls in Europe as well as in the United States indicate that consumers hate higher fuel prices.[42] In a regime such as ours, however, which exposes its politicians to extraordinarily frequent elections and perpetual campaigning, pandering (or sensitivity, take your pick) about energy prices is a perennial spectacle.

The Politics of Regulation

Yet, when crises occur, the same politicians hear a second message: "Don't just stand there. Do something!" In the immediate aftermath of the Arab Oil Embargo in 1973 and the ensuing oil-price shock, pressure mounted to "do something" about the energy crunch. But the one thing no U.S. elective office-holder could do, without self-immolating politically, was to address the problem by flatly telling voters to live with higher fuel prices. Nowhere was this straightjacket more conspicuous than in the big 1975 energy bill which, in the guise of ostensibly sparing consumers, went out of its way to avoid any tax on energy usage and authorized instead convoluted regulation of automobile manufactures (CAFE). The populist approach persists. Nearly a third of a century later, amid renewed demands for action on the energy problem, Congress's answer is similar: Under the 2007 energy act the consumer gets another pass; the auto industry is further regulated.

If one wishes to put the best face on this formula, it could be regarded as a second-best solution, constrained by political realities. CAFE, the argument goes, was genuinely intended to prod short-sighted automakers, not their hapless customers, and it does save at least some fuel. A less charitable interpretation is that the architects of this edifice sought to have things both ways: yes, obtaining some "conservation," but in an oblique fashion, so as to take no flak from motorists. Indeed, the CAFE framers designed a system replete with safety-valves, arguably, to minimize the political heat from the regulated industry and its workers as well. By legislating miles-per-gallon standards for some classes of vehicles but not others, delegating to DOT the power to make downward adjustments, permitting companies to bank "credits," pulling the purse strings on regulatory budgets, and preempting proactive state governments, Congress put in place elaborate arrangements for blame-avoidance.

---

[41] Bill Clinton and Al Gore, *Putting People First: How We Can All Change America* (Times Books, 1992), p. 91.

[42] On this point and much of the preceding discussion, see in general Pietro S. Nivola and Robert W. Crandall, *The Extra Mile: Rethinking Energy Policy for Automotive Transportation* (Brookings, 1995), especially pp. 63-64. As is well known, U.S. public opinion is overwhelmingly opposed to higher federal gasoline taxes. An ABC/*Washington Post* poll in April 2007, for example, found 67 percent opposed to increasing "taxes on gasoline so people either drive less, or buy cars that use less gas." Only 32 percent favored this simple and effective idea.

Thus, in 1980 when it appeared that the costs of CAFE might become onerous to manufacturers struggling to save jobs in the teeth of competition from Japanese imports, President Carter signed legislation empowering the Secretary of Transportation to lower mileage requirements for four-wheel drive vehicles and light trucks if a manufacturer could demonstrate that it would incur economic difficulties meeting extant standards.[43] (Purveyors of pickups and vans already had a free ride for the vehicles that weighed in at more than 8,500 lbs.) The car companies also won a reprieve for entire fleets that failed to meet standards in a given period (provided they exceeded standards in a subsequent period, thereby gaining "credits" to apply retroactively). Later in the same decade, amid plunging gasoline prices and fewer takers for small, fuel-efficient cars, the companies prevailed on the Reagan administration to lower standards again. Then, between 1996 and 2001, further CAFE pressure on the auto industry more or less came to a complete halt. Congress simply banned the use of DOT-appropriated funds for purposes of new rulemakings entirely, thereby freezing the mpg requirement for light trucks at 20.7. Additionally, as this paper was being written, California, as well as other states following California's lead, had just begun to overcome a federal prohibition on state GHG restrictions that might be stiffer (hence costlier to industry) than the CAFE equivalent.

In sum, the regulatory process has resembled an intricate *pas de deux*, often moving one step forward and one step back. That is not to suggest that every stage of the exercise has resembled only dancing in place, or that society hasn't gained anything at all from it. On balance, as the National Resource Council concluded, the world is slightly better off—in terms of diminished greenhouse-gas emissions—for our having tried to regulate automotive fuel economy than if we had done nothing. There is, however, one important sense in which CAFE's marginal net benefit should be further discounted: So politicized a regulatory intervention has perhaps made it easier for our elected officials to get off the hook. Behind the veneer of an energy policy—which is what the porous and largely symbolic CAFE program amounts to—political leaders can more easily duck a responsibility to craft a more meaningful agenda.

It is to that latter challenge that the final section of this paper now turns.

An Immodest Alternative

Implausible as it is, let us assume for the sake of argument that public attitudes were to change, and political leaders suppressed a tendency to campaign for a seemingly free lunch. The first step policymakers would have to take is to ask themselves a fundamental question: What, precisely, is the point of improving the fuel economy of motor vehicles?

[43] *Congressional Quarterly Almanac* (1980), p. 488.

The "Energy Independence" Mirage

To reflexively invoke the slogans "energy independence" and "security" (as does the 2007 legislation that extends CAFE) is not an intellectually satisfying answer.[44] Oil is sold in a global market, and American consumers will continue to pay the world's price whether or not they are led to consume a little less. With the rest of the world using more oil, thanks in large part to intense demand from gigantic new economies such as China and India, even increasingly stringent efforts to curb consumption in the United States will gain little long-range relief or "independence" from the overall trend in prices.

The same goes for "security." To begin with, the United States purchases only a relatively small share of the oil it needs from insecure or unstable producers. (Nearly 90 percent of our demand for oil is met by U.S. wells and those of suppliers outside the Middle East, and note, we import *no* oil from Iran. Both our NAFTA trading partners supply us more oil than Saudi Arabia does, and both supply more than Hugo Chávez's Venezuela.) True, the disagreeable producers would reap fewer petrodollars if we were less profligate—but not a lot fewer and not for long, since other huge customers such as China would soon snap up the quantities of oil we forfeit. Selling to China, Japan, and Europe, the likes of Iran, for example, will enrich themselves whether or not Americans choose to purchase any of their oil, and will only enjoy a bit less oil wealth if Americans become more abstemious overall.

A serious energy policy ought to shed weak reeds like CAFE and move toward a comprehensive carbon tax.

What's more, if market perturbations arise from sources such as Iran, the U.S. economy along with every other industrial economy will not escape them, because, again, oil is priced in a worldwide marketplace. (Recall what happened in the wake of the Iranian Revolution in 1979? Oil prices doubled everywhere, including the United States.) Bottom line: The United States cannot stop the world and get off. Enthusiasts of remedies such as CAFE regulations would do well to begin by conceding that basic constraint. Their policies, after a great deal of huffing and puffing, might mildly enhance "security," but not by much.

A better argument for regulating the use of hydrocarbon-based automotive fuels is that burning them spews C02, as well as other pollutants, into the atmosphere, and contributes to global warming. But this rationale raises a second basic question: If climate change is the core challenge for a rational energy policy, does it make sense to have, as the policy's centerpiece, a regulatory program that only takes aim at gasoline (one petroleum refined-product) but not the combustion of *all* fossil fuels and derivatives that contribute to climate change? As everyone knows, for example, U.S. coal-fired electric plants, not just Chinese ones, pump much more CO2 into the air than motor vehicles do. To "crack down" on the cars but not the power stations is a little like trying to save a burning house with buckets of water rather than a fire hose.

[44] The 2007 legislation is titled the Energy Independence and Security Act.

Tax Carbon Instead

A serious energy policy—which is to say one confronting the specter of climate change—ought to shed weak reeds like CAFE and move toward a comprehensive carbon tax. A significant tax could reduce gasoline consumption more effectively than has the troubled regulatory regime, and more importantly, it would curtail carbon emissions from other, more damaging sources.

The burden of such an alternative, of course, would not be light. Indeed, its costs would be felt by all fossil-fuel producers and users—that is, by practically everybody, not least average households facing higher energy bills. No wonder that, when surveys ask Americans whether they are willing to countenance "increased taxes on electricity so people use less of it," majorities approaching 80 percent object.[45] To offset the adverse economic impact and regressive effect, and possibly soften some of the public's stiff opposition, the tax should be revenue-neutral, or close to it, and ought to be substituted for other kinds of levies that are even more harmful to the nation's long-term growth and fiscal equity. Displacing the payroll tax is an obvious candidate.

Adoption of a substantial carbon tax could be a key component of a broader overhaul of the nation's skewed tax system, with its lopsided emphasis on punishing activities society should reward—like earning, saving and investing—instead of activities it should discourage, like polluting and over-leveraged consuming. Deficits of historic proportions loom, and new sources of revenues will almost certainly be needed to help trim them. Policymakers should think long and hard before continuing to rely exclusively on higher income and payroll taxation, rather than begin to shift more of the onus onto consumption, as a carbon tax would.

How utopian *is* this proposal? Its odds of becoming politically palatable are long—but maybe not so poor as to be completely out of the question. In the last Congress, there were encouraging signs that senior lawmakers were beginning to take the idea of carbon taxation seriously. Indeed, in the past couple of years, the second-most senior member of the House Ways and Means Committee, California Democrat Fortney ("Pete") Stark, cosponsored a carbon-tax bill with 10th-term congressman, Jim McDermot (Democrat of Washington). Another bill, authored by the veteran John Dingell (Democrat of Michigan), chairman of the House Energy and Commerce Committee, would have phased in a similar tax. A third measure, proposed by Representative John B. Larson, a fifth-term Democrat from Connecticut and vice-chair of the House Democratic Caucus, was perhaps the most interesting, for it would apply carbon-tax revenue to help ease the payroll tax burden on working households.

The Larson bill sought to do this through a partial rebate mechanism which may be complicated and inadequate. (As with almost every energy-related bill in Congress, this one also would have diverted a share of revenues to boost R&D in

[45] See, for instance, the ABC/*Washington Post* poll of April 2007. Seventy-nine percent of respondents opposed such a tax, 20 percent favored it, and 1 percent unsure.

"clean energy technologies," as well as extend adjustment assistance to "negatively affected" industries.) Nevertheless, Congressmen Larson, and his colleagues, were to be commended. Their legislative proposals represented an encouraging start. They just might begin to stir Washington's otherwise largely repetitious and sterile energy debate in a promising new direction.

An earlier version of this paper was presented at the National Conference on Climate Change Governance held at the Miller Center of Public Affairs, University of Virginia, December 11-12, 2008. A revised version will appear in a forthcoming conference volume published by the Brookings Press. The author is grateful for the research assistance provided by Zaahira Wyne.

Governance Studies
The Brookings Institution
1775 Massachusetts Ave., NW
Washington, DC 20036
Tel: 202.797.6090
Fax: 202.797.6144
www.brookings.edu/governance.aspx

Editor
Gladys L. Arrisueno

Production & Layout
John S Seo

Email your comments to gscomments@brookings.edu