The terrorist attacks on September 11th and the subsequent demonstrations of anti-Americanism throughout the Middle East increase the saliency of America’s dependence on oil imports from the Gulf states. The United States now imports more than half of all the oil that we consume. One fourth of those imports come from Saudi Arabia, Kuwait, and Iraq. If there is no change in policy, that dependence will grow in the future since those three countries plus the United Arab Emirates have more than half of the world’s reserves of oil while the United States has only 2 percent of total reserves.¹

America’s dependence on imported oil is a serious cause of economic vulnerability and a major constraint on our foreign defense policy. The political leaders in the Middle East know that our dependence on their oil gives them leverage over our policies. The possibility of increasing that leverage emboldened Saddam Hussein to invade Kuwait in order to extend the share of mid-East oil controlled by Iraq. And while the governments of Saudi Arabia and Kuwait are basically friendly to the United States, recent events have made it clear how potentially vulnerable those governments are to radical elements within their own countries. All of this is a cloud over the continuation of oil supply from the Middle East.

Political leaders and expert commissions have been calling for a reduction in our dependence on oil imports at least since 1974 when President Nixon established Project Independence with the goal of achieving energy independence by 1980. In fact, however, our dependence on imported oil

¹Even before the terrorist attacks of September 11th, the Bush administration had launched a new energy policy based on an administration committee chaired by Vice President Cheney. The Report of the National Energy Policy Development Group estimates that by 2020 the Gulf area will produce two-thirds of the world’s oil.
was still 42 percent of our consumption in 1980 and has risen to 52 percent in 2000.\textsuperscript{2}

What can be done to reverse this trend? Increased oil production in the United States could help to reduce our dependence on imported oil. Some of the increased domestic production will occur as a natural response to a rise in the world price of oil that results from increasing global demand. A higher price will induce more exploration and more extraction from such higher cost sources as deep wells and off-shore sites. But even with these market forces at work, experts now predict that the oil imports of the U.S. will rise to 70 percent of our consumption by 2020.

Relaxing some of the government restrictions on oil drilling can increase U.S. production further, but the impact on our dependence will be small. For example, although the Administration’s proposal to open some of the Arctic National Wildlife Refuge to oil drilling would eventually increase production in Alaska by an important 600,000 barrels a day, that would only equal about 7 percent of what we now import from the rest of the world.

Our dependence on foreign oil can only be limited in a significant way if we reduce our consumption of oil.\textsuperscript{3} There is substantial room to achieve such reductions since the consumption of oil per dollar of GDP is now more than 40 percent higher in the United States than it is in Germany and France. Politicians have generally been reluctant to pursue this goal aggressively because it has been assumed that doing so would require a European style gasoline tax. As anyone who has driven in France or Germany knows, an important reason for their lower consumption of oil is that their gasoline taxes cause gasoline prices to be nearly three times the level in the United States. The political impossibility of imposing such a tax was brought home very clearly by the abject failure of President Clinton’s 1993 proposal for a general Btu energy tax.

Fortunately, it is possible to provide the incentives needed for a substantial reduction in oil consumption without any new tax by using what I will call tradeable Oil Conservation Vouchers.


\textsuperscript{3}It is not possible to reduce our dependence on Mideast oil by importing more from Mexico, Canada and Venezuela since we already take virtually all of the oil that they have for export.
Before describing how such a voucher system would work, it is useful to review the primary policy tool that has been used by the federal government to reduce oil consumption: the Corporate Average Fuel Economy Standard. Under the CAFÉ standards, automobile manufacturers are required to keep the average number of miles per gallon on the entire fleet of new cars in each model year above some level set by the federal government. That standard has been 27.5 miles per gallon since the 1985 model year, up from 18 miles per gallon for the 1978 model year when the CAFÉ standards were first introduced by President Carter. A motor vehicle manufacturer may have some cars with lower fuel efficiency but these must be balanced by cars that get more than 27.5 miles per gallon so that the average fuel efficiency for all of the cars sold by the company in the year exceeds 27.5 miles per gallon.

There seems little doubt that this standard has forced companies to seek ways to design more fuel efficient cars. Because of the pricing differences that have resulted from the CAFÉ standard, it has also induced many households to shift from conventional autos to sports utility vehicles and other light trucks since these are subject to a different and more lenient fuel efficiency standard (now 20 miles per gallon.) The net effect on fuel economy is therefore difficult to determine.

A more serious weakness of the CAFÉ standard approach to reducing gasoline demand is that it does nothing to change how cars are used. It provides no incentive to drive less, to rely more on car pools or public transportation, or simply to travel less. It also provides no incentive to drive at speeds that reduce fuel consumption. And it does not provide an incentive to scrap an old car in favor of a newer one with better fuel efficiency.

A variety of promising technologies are available to substitute for the traditional internal-combustion engine. These include engines that use natural gas, or that can switch between gasoline and electric battery power, or that are powered by fuel cells based on hydrogen. All three major U.S. auto companies plan to introduce cars equipped in these ways by 2004 or 2005. Although these cars will initially cost more than cars with traditional internal combustion engines, the high price of gasoline in Europe may induce some car buyers there to pay the extra up front cost of the car in order to achieve the subsequent savings in fuel costs. It will however be difficult to induce American car buyers to select these new technologies because of the relatively low U.S. price of gasoline.
If American drivers had to pay what I would call the “full cost” to the nation of driving, there would be a strong incentive here to change driving habits and to seek new technologies with lower fuel costs. By the “full cost” I mean not just the cost of producing gasoline and distributing it through gasoline stations but also the implicit cost to our nation imposed by the national security effects of an increased dependence on imported oil, the adverse environmental effects of air pollution, and the increased risks of automobile accidents that result from a greater number of drivers on the road.

Although the Europeans might use this notion of “full cost” to justify the very high taxes that they put on gasoline, I want to stress that I think that an acceptable solution in the United States must not involve a new large tax on gasoline. Bringing U.S. gasoline prices up to European levels by an additional gasoline tax of two dollars a gallon would impose a tax of about $2,000 a year on the average American household. The government would have new tax revenue of more than $250 billion a year, equivalent to one-fourth of the total current income tax revenue and more than double the annual tax cuts in the recent Bush tax package. While that money could in principle be returned by lower income taxes or a specific tax rebate, most Americans would doubt that the funds would in fact be returned. Such a tax based policy is clearly a political non-starter.

It is possible to achieve the favorable incentive effects of a higher gasoline tax without actually imposing any tax at all by the use of tradeable Oil Conservation Vouchers. Before describing how these Oil Conservation Vouchers would work in practice, I should deal with the false but common argument that it would actually be better to collect the revenue and return it in the form of lower income tax rates because that would not only reduce gasoline consumption but, by lowering marginal income tax rates, would also improve individual work incentives. That argument is false because the higher price of gasoline that would result from a gasoline tax has much the same effect on work incentives as an income tax since the gasoline tax reduces the real value of additional earnings. Every extra dollar of earnings buys less if there is a gasoline tax and the cut in the personal income tax would just offset this higher cost. There is no net gain on work incentives from imposing a gasoline tax and then giving back the revenue through lower marginal income tax rates.

Here’s how the tradeable Oil Conservation Vouchers would work in practice. To be specific,
consider a government policy of cutting the U.S. dependence on oil imports in half, i.e., reducing total imports from the current level of about 130 billion gallons a year to about 65 billion gallons a year. Each Oil Conservation Voucher would permit the owner of that voucher to purchase one gallon of gasoline or other petroleum product (heating oil or industrial raw material). I will focus my discussion on the application of Oil Conservation Vouchers to reducing gasoline consumption, returning briefly after that to discuss how it might be extended to other uses of oil.

Gasoline currently uses about 180 billion gallons of oil per year. Since gasoline accounts for about two-thirds of all oil consumption, a useful starting point would be a reduction in gasoline consumption by two-thirds of the overall desired reduction, i.e., by 43 billion gallons of gasoline. This would reduce gasoline consumption from 180 billion gallons to 137 billion gallons, a reduction of about 25 percent.

The government would therefore distribute 137 billion Oil Conservation Vouchers (OCVs) to American households. There are many ways that these vouchers could be distributed. My current thinking is that this would be done best by the states. A household in a geographically large and rural state is likely to drive more miles per year than one in a smaller or more urban state. The Federal government could distribute the total vouchers among the states in proportion to the miles driven in 2001 (as indicated by the federal gasoline tax collections in each state) and leave it to the states to decide how to distribute the vouchers within the states. They might give an equal number to each household with a car, or an equal number per car, or a number that varies by region within the state. All of this would be easy for the states to do since they register all cars. It would be up to each state to decide what is the fairest distribution under local conditions. Since the vouchers are tradeable, the incentive effects would not depend on this initial distribution.

A household that receives 1,000 OCVs and that drives 20,000 miles during the year at an average of 20 miles per gallon will have just enough OCVs to purchase the gasoline that it uses. If the household that receives 1000 OCVs wants to buy more than 1000 gallons of gas in the year, it will have to buy a voucher from someone who receives more OCVs than they need. A market price would

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4 This reduction would be about the level of our total oil imports from the OPEC countries.
quickly evolve that equates the supply and demand for these vouchers. Gasoline stations, convenience stores and others might provide the service of buying and selling vouchers as a way of attracting customers so that individuals who want to sell or buy would not have to find someone in the opposite situation.

Since the total available number of vouchers is about 25 percent less than the number of gallons that individuals currently purchase, the vouchers would command a positive price. The combination of the price of gasoline at the pump (which would not change unless there is a change in world oil markets) and the price of the voucher would have to be higher than the current price of gasoline in order to induce individuals to reduce their gasoline purchases by 25 percent. Some of that reduction would be achieved by driving less (using car pools and public transportation or simply traveling less) or being more conscious of the driving speeds that save fuel. Further reductions could be achieved over time as old cars are scrapped in favor of newer ones that permit more miles per gallon. The price of a voucher would therefore be higher in the short-run (when it takes a higher price to reduce gasoline consumption) than in the longer run when there are more ways in which demand can be reduced.

A rough guess is that the value of a voucher might be about 75 cents in the first year. If the household that receives 1,000 OCVs wishes to drive 25,000 miles with a fuel efficiency of 20 miles per gallon it will need to purchase an additional 250 vouchers at a cost of about $190. Conversely, if the household that receives 1000 OCVs only wants to purchase 800 gallons of gasoline, it will be able to sell its 200 excess vouchers for $150. Although these cash amounts are not large, the voucher system creates the right incentives because each individual recognizes that the cost of another gallon of gas is both the approximately $1.30 that he pays for the gasoline and the 75 cents that the voucher is worth. The same is true for both someone who needs to buy vouchers for 75 cents and for someone with excess vouchers that he could sell for 75 cents.

Achieving the same 43 billion gallon reduction in gasoline consumption by a 75 cent a gallon gasoline tax would cost the average American household about $750 a year in higher taxes and produce revenue of about $100 billion a year. Moreover, since the 75 cent value of the voucher is just an estimate, there is no guarantee that a 75 cent tax would even achieve the desired reduction. And
just as the price of the voucher is likely to come down (unless the number of vouchers is reduced) as individuals shift to more fuel efficient cars, the gasoline tax would also have to be adjusted over time, making it even less likely that the policy would achieve its desired goal. The voucher system would automatically limit consumption to the desired amount and would do so in a way that gives every gasoline buyer the same incentive to conserve gasoline.\(^5\)

Since higher income households generally consume more gasoline than lower income households, the likely effect of the OCVS system would be to make higher income households buyers of vouchers while lower income households were net sellers. The most recent available data (for 1994) show that households with income below $15,000 consumed about 700 gallons of gasoline per year while those with income over $35,000 consumed an average of about 1250 gallons per year. With a distribution of 750 OCVs per household (about 25 percent less than average current consumption), the lower income households would receive about $170 from selling vouchers while the higher income households would pay an extra $150 to buy vouchers\(^6\).

The Oil Conservation Voucher system could be extended from gasoline to heating oil and other forms of oil consumption. The distribution of heating vouchers might also be left to the states, with the federal distribution to the states reflecting the amount of heating oil currently used in each state. A distribution to households and businesses based on the amount of heating oil that they purchased in the year before the program began might be regarded as the most fair but other distributions taking income and family size into account might also be considered. The desirable incentive effects for reducing oil use would not depend on the initial distribution since these OCVs would be tradeable. Each household or business would face the same implicit price for oil regardless of whether it was a buyer or a seller.

All oil conservation vouchers could be interchangeable. Gasoline vouchers need not be

\(^5\)There is of course an obvious similarity between the Oil Conservation Vouchers and the system of tradeable pollution vouchers that have been successfully used to reduce industrial pollutants.

\(^6\)If the vouchers induce households to reduce consumption by about 25 percent, the lower income households would need only 525 vouchers while the higher income households would need about 950. The lower income households would thus sell 225 OCVs at 75 cents each for $170 while the higher income households would buy 200 OCVs for $150.
Designing OCVs with environmental considerations as well as national security in mind would suggest separate OCVs for industrial raw materials that have lower pollution effect. The relative quantities of the different types of vouchers might be set so that their prices reflected differences in environmental effects while the total number of vouchers was set to achieve the target reduction in oil imports.

I have stressed the importance of reducing oil consumption to strengthen national security. A reduction of oil consumption would of course also cause a reduction in air pollution. For those pollutants that affect the local environment, these reductions would be significant. For carbon dioxide, the environmental effect would not be large because it is diffused into the global atmosphere and represents only a small reduction in global carbon dioxide. It would however have the politically significant effect of reducing U.S. fossil fuel use below the level of use in 1990, a key issue in international discussions of environmental policy.7

There are no doubt ways to improve a system of Oil Conservation Vouchers that I have not considered. The detailed design of the system is not as important as the broad conclusion that it is possible to develop a market-based plan without any tax increase that can substantial reduce America’s oil vulnerability.

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