An Energy Tax Policy For the Twenty-First Century

By Gilbert E. Metcalf and Kevin A. Hassett*

The United States's energy tax policy is rooted in a twentieth century objective to encourage the development of the domestic energy sector. With the new geopolitical realities of the twenty-first century, it is an opportune time to revisit our policies. Current federal energy tax policy is premised in large part on a desire to achieve energy independence by promoting domestic fossil fuel production. This, we argue, is a mistake. The policy also relies heavily on energy subsidies, most of which are socially wasteful, inefficient, and driven by political rather than energy considerations. Finally, the energy taxes that are in place could be more precisely targeted to specific market failures, and these higher taxes themselves would encourage the production of alternatives more efficiently than current subsidies.

We Cannot Drill Our Way to Energy Independence

It is widely held that the United States must reduce its reliance on foreign oil. The concern over our vulnerability to OPEC supply disruption is understandable given the fact that the United States imports over 60 percent of the oil it consumes each year. Of the oil we import, 40 percent comes from OPEC countries and nearly half of that from the Persian Gulf region. Many are also concerned that oil monies help countries like Iran pursue activities that are contrary to American foreign policy.

As a response to these concerns, current tax policy promotes domestic oil and gas production in a variety of ways. We provide a production tax credit for "non-conventional oil," essentially a subsidy for coalbed methane and we provide generous depreciation for intangible expenses associated with drilling as well as generous percentage depletion allowances for oil and gas. In addition, the Bush Administration has consistently lobbied to allow additional drilling on the Alaskan North Slope.

This supply response ignores a fundamental fact: oil is essentially a generic commodity priced on world markets. Even if the United States were to produce all the oil it consumes, it would still be vulnerable to oil price fluctuations. A supply reduction by any major producer would raise prices of domestic oil just as readily as it raises prices of imported oil. In addition, if the U.S. reduces its demand for oil from countries such as Iran, it has little effect on Iran, as that country can just sell oil to other countries at the prevailing world price. Indeed, this effect has been made abundantly clear by historical experience. The U.S. has cut its dependence on Iranian oil to zero, buying no oil directly from that nation since 1991. Despite the U.S. import ban, Iran was the world's fourth-largest net oil exporter in 2005.[1]

A policy of energy independence that depends on boosting domestic oil and gas supply through subsidies has several defects. First, subsidies reduce production costs and so do nothing to discourage oil consumption. Second, the policy encourages the consumption of high cost domestic oil in place of low cost foreign oil. A policy to encourage the United States to use up domestic reserves and so become increasingly vulnerable in the future to foreign supply dislocations seems especially peculiar to us. Third, it is expensive. The five-year cost simply for the incentives mentioned above total nearly $10 billion according to the most recent Administration budget submission.

Assuming reliance on oil is unattractive, a clear sign that policy is headed in the wrong direction is the high and even recently increasing dependence on oil of the U.S. economy. Petroleum comprised nearly 48 percent of primary energy consumption in the United States in 1977. Since this peak, it fell to a low of 38 percent in 1995 before inching up to just over 40 percent in 2005.[2] Even going back to 1977, the 16 percent drop in the oil share from its peak to 2005 falls far short of the percentage reduction in oil share of other developed countries. The United Kingdom, for example, has reduced its oil share from a peak of 50 percent to just under 36 percent, a decline of 29 percent. France has reduced its oil share by 48 percent, and Germany by 22 percent. In Asia, Japan has reduced its oil share by 39 percent and even China has reduced its oil share by more than the United States with a 26 percent reduction. Our current policies are leaving us increasingly vulnerable relative to other major oil consuming nations.

One might argue that because the United States is such a large producer of petroleum products – we are the third largest supplier behind Russia and Saudi Arabia – that our domestic supply incentives help reduce the world price of oil. Our efforts, however, are but a drop in the bucket. One of us has estimated that the domestic oil production incentives in our tax code have lowered world oil prices by less than one-half of one percent.[3]

To summarize, energy independence as popularly construed has little economic content. If reliance on oil is a problem, then supply subsidies make little sense, as they just encourage additional reliance on oil.

* Gilbert E. Metcalf is a Professor of Economics at Tufts University and a Research Associate at the National Bureau of Economic Research. He is a member of the IAEE with a research focus on energy and environmental tax policy. Kevin A. Hassett is a Senior Fellow and Director of Economic Policy Studies at the American Enterprise Institute. His research interests include tax policy, the U.S. economy, the stock market, and investments.

See footnotes at end of text.

Energy Subsidies are Misguided

The single largest energy tax expenditure in the U.S. budget is the tax credit for alcohol fuels, with a five year revenue cost of $12.7 billion. The $.51 per gallon credit primarily benefits corn-based ethanol. The subsidies to corn-based ethanol are politically motivated, as evidenced by the 54 cent a gallon tariff on imported ethanol. There is even debate in the scientific literature about over whether ethanol takes more energy to produce than it contains.[4] Even taking an optimistic read of the literature, corn-based ethanol is expensive, and provides little new energy to the economy. One study indicates that shifting all of the current corn crop to ethanol production would replace just 12 percent of our gasoline consumption. This shift would reduce greenhouse gas emissions by less than three percent.[5]

In addition to the ethanol subsidy, the federal tax code provides investment tax credits for solar and geothermal power production and advanced coal burning power plants under section 48 of the tax code. Recent research shows that the 20 percent investment tax credit for new integrated gasification-combined cycle coal plants makes this technology cost competitive with new pulverized coal plants. The subsidy for solar generated electricity, however, is not large enough to make solar cost competitive with natural gas or other shoulder or peaking power plants.[6]

Section 45 of the tax code provides production tax credits for wind power, biomass, and other renewable power sources. The tax credit is currently 1.9 cents per kWh. The section 45 and 48 tax credits are the second largest energy tax expenditure with a five year cost of over $4 billion. The production tax credit for wind and biomass makes these two power sources cost-competitive with natural gas.[7] The problem with production tax credits is that they must be financed somehow – either with reduced federal spending elsewhere in the budget or with higher taxes. Presumably the credits are in place to encourage non-fossil fuel electricity production. The credit, however, distorts behaviors among non-fossil fuel power sources.

A better approach on both these counts would be to levy a tax on the power sources that one wishes to discourage. If, for example, the concern is carbon emissions, then a carbon tax is an appropriate response. A tax of $12 per metric ton of carbon dioxide in lieu of production tax credits for wind and biomass would make these renewable sources competitive with natural gas.[8] Unlike the subsidies, however, the tax would raise revenue which could finance reductions in other distortionary taxes.[9] In units perhaps more familiar to most readers, a carbon tax of this magnitude would raise the price of gasoline by ten cents if it were fully passed forward to consumers.

Other production tax credits in the tax code include a production tax credit for electricity produced at nuclear power plants (section 45J). Qualifying plants are eligible for a 1.8¢ per kWh production tax credit up to an annual limit of $125 million per 1,000 megawatts of installed capacity for eight years. This limit will be binding for a nuclear power plant with a capacity factor of 80 percent or higher thereby converting this into a lump-sum subsidy for new nuclear power plant construction.

To summarize, alternative energy subsidies that are currently in place play political favorites, and would be unnecessary if the types of energy that policymakers view as undesirable were taxed at an efficient rate.

Poorly Designed Energy Taxes

First, we note that the literature suggests that our energy tax rates may well be too low. Taking into account accident externalities, congestion, and unpriced pollution, one recent paper finds that the optimal gasoline tax in the United States is $1.00 per gallon, over twice the current rate taking into account federal and state motor vehicle fuel taxes.[10]

Second, our one tax policy to discourage low-mileage automobiles, the gas guzzler tax, contains a loophole large enough to drive an SUV through. The gas guzzler tax is a tax on automobiles that obtain less than 22 miles per gallon and explicitly excludes sport utility vehicles, minivans, and pickup trucks. This excluded class of vehicles represents 54 percent of the new vehicle sales in 2004.[11] The light truck category (comprising SUVs, minivans, and pickup trucks) is the fastest growing segment of the new vehicle market, growing at an annual rate of 5.5 percent between 1990 and 2004. In contrast, new car sales are falling at an annual rate of 1.6 percent. Unofficial Congressional estimates suggest that phasing out the SUV loophole over four years would raise roughly $700 million annually once the phase-out was complete. Optimal tax policy does not support treating similar assets differently, and current policy introduces a significant distortion that could easily be fixed.

We Can Do Better

A twenty-first century U.S. energy tax policy would include 1) an end to energy supply subsidies; 2) a green tax swap; 3) an end to the gas guzzler tax loophole and possible use of "feebates"; and 4) conservation incentive programs. Ending subsidies to fossil fuel production would level the playing field among energy sources and shift us from a policy of promoting fossil fuel supply to encouraging a reduction in fossil fuel consumption. In addition, it would move us away from the reliance on inefficient corn-based ethanol.

Second, we should implement a green tax swap. A green tax swap is the implementation of environmentally motivated taxes with the revenues used to lower other taxes in a revenue neutral reform. For example, Congress could reduce reliance on oil and other polluting sources of energy through the implementation of a carbon tax. The revenues could be used to finance corporate tax reform or to finance reductions in the payroll tax.[12] Consider a tax of $15 per metric ton of carbon dioxide. Focusing only on carbon[13] and assuming a short term reduction in carbon emissions of ten percent in response to the tax, a $15 per ton tax rate would collect nearly $80 billion a year, a number which represents 28 percent of all corporate taxes collected in the U.S. in 2005. Assuming the carbon tax was fully passed forward into consumer prices, it would raise the price of gasoline by 13 cents a gallon, the cost of electricity generated by natural gas by 0.6 cents per kWh and the cost of electricity generated by coal by 1.4 cents per kWh.

We note that a carbon tax is preferable to a carbon cap and trade system as is currently implemented in Europe. While a carbon charge and a cap and trade system could be designed to bring about the same reduction in carbon emissions in a world with no uncertainty over marginal abatement costs, the instruments are not equivalent in a world with uncertainty. Given the uncertainties with respect to the introduction of new technologies to reduce carbon emissions, tax and permit systems can have very different efficiency costs. Because global warming depends on the stock of carbon in the atmosphere rather than emissions in any one year, the expected efficiency costs of a carbon charge policy are likely to be much lower than the costs of a carbon cap and trade system.[14]

Moreover, while a cap and trade system could be designed in which the carbon permits are sold rather than given away, experience to date suggests that they will be given away. In that case, governments give up substantial revenue with cap and trade systems with which they could lower other distortionary taxes as discussed in this policy brief. In a related vein, cap and trade systems generate substantial rent seeking behavior as firms lobby for grandfathering and generous allowances of permits once a program is put in place. While firms are likely to lobby over the specific carbon charge rate and possibly coverage of the tax, a carbon charge is not conducive to lobbying over allocations as are permit systems.

If a carbon tax is not to Congress's liking, it could raise the gasoline tax, index it for inflation, and return the additional revenue through a tax reduction. A gasoline tax increase is less efficient than a carbon tax at reducing carbon emissions.[15] The gasoline tax increase, however, would move us in the direction of the optimal Pigouvian tax on motor fuels taking into account other pollution externalities as well as congestion and accident externalities.[16]

Next, we should eliminate the gas guzzler tax loophole for SUVs and light trucks. Congress might also consider strengthening the gas guzzler tax by shifting to a "feebate" approach where low mileage vehicles are taxed at increasing rates as under the current gas guzzler tax and fuel efficient vehicles receive a tax subsidy. This could be structured to be revenue neutral if desired.

Our final energy tax proposal is to increase the conservation investment incentives that were recently introduced in the Energy Policy Act of 2005. In a study of energy conservation incentives contained in the Energy Tax Act of 1978, we found that the tax credit was much more successful at raising investment levels than a comparable energy price increase.[17] We speculated that the credit program may have publicity effects that spur investment that the energy price increase does not have. In addition, uncertainty over the permanence of future energy price increases makes the certainty of the tax credit at purchase more valuable. A conservation credit that is technologically neutral would be a worthy accompaniment of a higher tax on carbon based fuels if reducing reliance on these forms of energy is a policy objective.

The policies we advocate shift us away from fossil fuels and towards renewable energy. They also reduce the cost to federal taxpayers while aligning private and social interests. This is the making of a twenty-first century energy policy.

Footnotes

[1] BP (2006)

[2] Energy Information Administration (2006)

[3] Metcalf (2006)

[4] Pimentel and Patzek (2005), Farrell, Plevin, Turner, Jones, O'Hare, and Kammen (2006).

[5] Hill, Nelson, Tilman, Polasky, and Tiffany (2006).

[6] Metcalf (2006). It may make solar competitive at the residential level in some parts of the country.

[7] ibid.

[8] ibid.

[9] The advantage of taxes over subsidies for clean power extend beyond the distortionary cost of financing the subsidies. The subsidies lower the cost of electricity and so encourage increased consumption.

[10] Parry and Small (2005).

[11] U.S. Census Bureau (2006), Table 1027.

[12] Metcalf (2005) discusses how a carbon tax could be used to finance corporate tax integration.

[13] Greenhouse gases also include methane, nitrous oxide and fluorocarbons.

[14] See Newell and Pizer (2003).

[15] Pizer, Burtraw, Harrington, Newell, and Sanchirico (2006) present model results showing that focusing climate change policies only on the transportation and electricity sectors doubles the cost of a given carbon emissions reduction.

[16] Note too that the motor vehicle fuels tax is sometimes justified as a use charge for highways. To the extent this is true, the current gas tax is even further from its optimal Pigouvian level.

[17] Hassett and Metcalf (1995).

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