

Environmental Policy Update #2: Formulating Effective Energy Policy

*Environmental and Natural Resource Economics: A Contemporary Approach,
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Introduction

On August 8, 2005 President Bush signed into law the Energy Policy Act of 2005. Over 500 pages long, the Act's professed purpose is to provide a long-range energy strategy for the United States. This represents the first comprehensive national energy bill in 13 years. What are the central issues of energy policy and how well does this bill address them? We can use resource and environmental analysis to gain insight into these questions (see Chapter 13 in the text).

The U.S. Department of Energy projects that energy demand in the United States will increase nearly 20% between 2004 and 2015.¹ While the Energy Policy Act encourages the domestic production of both renewable and nonrenewable energy sources, it is still expected that the majority of the demand increase will be met by imported fossil fuels. The Act focuses on increasing the production of energy; the American Council for an Energy Efficient Economy estimates that its provisions will reduce overall energy demand in the U.S. by only about 2% in 2020.²

In this update, we first summarize the main provisions of the Act. But to understand the Act, we not only need to consider what was included in it, but also what was excluded. We also discuss some criticisms of the Act and proposed alternatives for formulating effective energy policy.

Provisions of the Energy Policy Act of 2005

The Energy Policy Act provides government funding for energy research and production, while also providing subsidies and tax breaks for numerous energy sources and conservation measures. According to the Congressional Budget Office, the Act will cost approximately \$14 billion between 2006 and 2015.³

The Act has provisions dealing with petroleum production, coal production, nuclear energy, renewable energy, and energy efficiency. We now consider a brief summary of the main provisions of the Act.⁴

¹ Data from the U.S. Energy Information Administration's Annual Energy Outlook 2005. See http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html, Table 1.

² Estimate from the American Council for an Energy-Efficient Economy, see <http://www.aceee.org/energy/05finalnrg.htm>.

³ See <http://www.cbo.gov/showdoc.cfm?index=6581&sequence=0>. The total cost includes both increases in government spending (\$1.6 billion) and reduction in federal revenues (\$12.3 billion).

⁴ For summaries of the Act, see <http://www.cemtp.org/PDFs/EnergyBillHighlights.pdf> and http://en.wikipedia.org/wiki/Energy_Policy_Act_of_2005.

Petroleum Provisions

- Directly provides \$1 billion to six coastal states in proportion to their offshore production of oil and gas.
- Allows for the reduction of royalty payments paid by companies for the right to lease oil and gas production sites from the federal government.
- Provides funding for research on deepwater oil drilling technology.

Coal Provisions

- Provides about \$2 billion in funding for clean coal technology.
- Repeals the 160-acre limit on leases for coal production on federal lands.

Nuclear Energy Provisions

- Reauthorizes the Price-Anderson Act for 20 years. This Act limits the amounts of insurance that operators of nuclear power plants must carry and limits their liability in the case of an accident or sabotage.
- Provides tax credits and cost-overrun assistance for new nuclear power plants.
- Authorizes over \$1 billion to the Department of Energy to build a prototype nuclear reactor in Idaho that will generate both electricity and hydrogen.

Renewable Energy Provisions

- New standards mandating that the amount of biofuel, particularly ethanol, added to gasoline in the U.S. will approximately double by 2012.
- Authorizes subsidies and tax breaks to encourage the production of energy from renewable sources including wind, solar, geothermal, biomass, and tidal.
- Provides incentives for increasing the efficiency of hydroelectric dams.
- Requires that the federal government increase the share of its energy obtained from renewable sources from 3% to 7.5% by 2013.

Energy Efficiency Provisions

- Beginning in 2007, daylight savings time will be extended by four weeks.
- Provides for a tax credit of up to \$3,400 for the purchase of a new hybrid vehicle.
- Provides tax credits for improving energy efficiency in homes and commercial structures.
- Sets energy efficiency standards for various products including commercial refrigerators, ceiling fans, and compact fluorescent lamps.
- Authorizes a public education campaign regarding how to reduce energy use and the benefits of conservation measures.

What Was Left Out of the Energy Policy Act

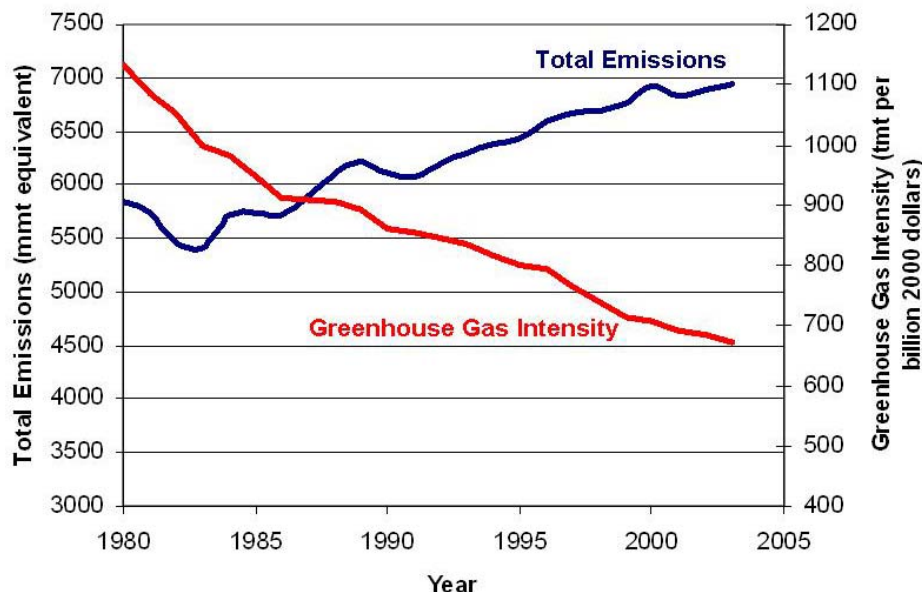
The Energy Policy Act is as notable for what was not in the final bill as for what was in it. Prior to the final legislation, both the House and Senate passed their own energy policy bills. The differences between the House and Senate version were worked out in a conference committee. The two versions varied in several important respects such as:

- The Senate version included a provision that would have required the President to take steps to save one million barrels of oil annually by 2013. This requirement was taken out during the conference committee.
- The House bill allowed drilling for oil and gas in the Arctic National Wildlife Refuge (ANWR) while the Senate version specifically banned it. The final act makes no mention of ANWR, but efforts to open ANWR to oil drilling have continued in Congress.
- The Senate version would have banned the use of the gasoline additive MTBE. This was taken out of the final bill.

Overall, the House version focused more on subsidies and tax credits to increase the domestic production of fossil fuels and nuclear energy, while the Senate version emphasized the development of renewable energy sources and energy conservation. The compromise final version included a very broad array of subsidies and tax credits.

There are also two important aspects of energy policy that were not addressed in either the House or Senate version. First, the Energy Policy Act does not mandate reductions in greenhouse gas emissions, as would be required under the Kyoto Protocol.⁵ Instead, the Act targets a reduction in “greenhouse gas intensity,” which is defined as the ratio of greenhouse gas emissions to economic output. Note that greenhouse gas intensity can decrease while actual emissions of greenhouse gases increase as long as the economy grows at a faster rate than greenhouse gas emissions. As we see in Figure 1, this is exactly what has been occurring historically. Between 1980 and 2003 U.S. greenhouse gas intensity decreased by a seemingly impressive 41%, but during the same period total emissions of greenhouse gases increased by 19%.

Figure 1. U.S. Greenhouse Gas Emissions and Greenhouse Gas Intensity, 1980-2003



Source: Greenhouse gas emissions data from U.S. Energy Information Administration, GDP data from the U.S. Bureau of Economic Analysis.

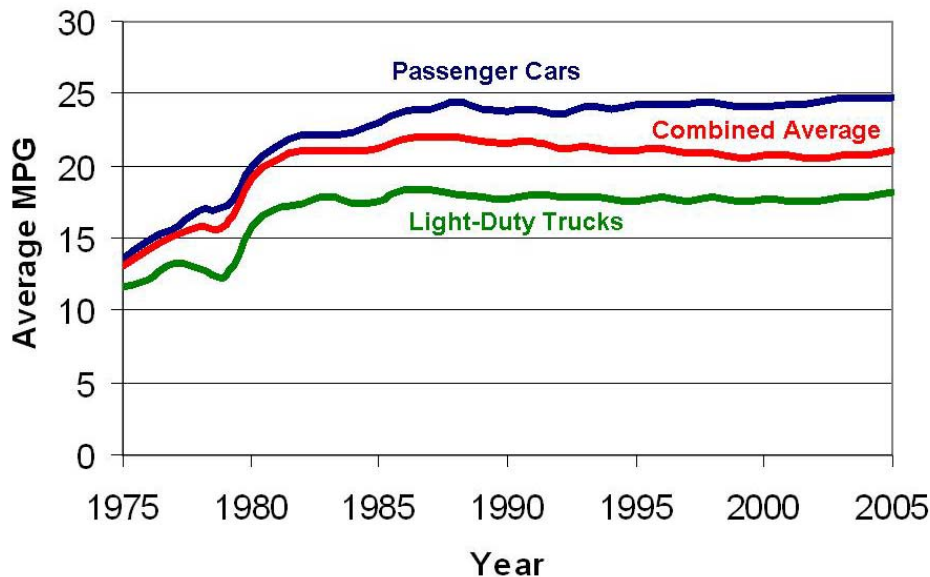
⁵ Under the Bush administration, the U.S. has withdrawn from the Kyoto Protocol (see Chapter 18 in the text, Box 18-4).

The Bush administration has set a goal of reducing greenhouse gas intensity by 18% between 2002 and 2012. But as we see in Figure 1, greenhouse gas intensity declined between 1992 and 2002 by 19%. This suggests that the Bush target represents nothing more than a business-as-usual approach.

The other notable omission from the Energy Policy Act is that it does not increase fuel economy standards for motor vehicles. The Corporate Average Fuel Economy (CAFE) standards were enacted in 1975 and are set at 27.5 MPG for cars and 21.6 for light-duty trucks for model year 2006 vehicles.

As seen in Figure 2, CAFE standards clearly led to significant improvements in fuel economy from 1975 to the early 1980s. Combined average fuel economy then increased slowly until the late 1980s and thereafter began to decline as the market share of light-duty trucks⁶ increased. Average fuel economy of new vehicles peaked in 1987, and was actually 5% lower in 2005 than in 1987.

Figure 2. Average Fuel Economy of New Vehicles in the United States, 1975-2005, by Vehicle Type



Source: "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2005," Robert Heavenrich, U.S. EPA Report EPA420-R-05-001, July 2005.

In most public opinion polls, the majority of Americans favor increasing fuel economy standards.⁷ A majority believe that SUVs should have to meet the same fuel economy standards as passenger cars.⁸ However, the CAFE standards have changed little in the past 15 years. In

⁶ Light-duty trucks include most pickup trucks, minivans, and sport-utility vehicles.

⁷ See <http://www.citizen.org/documents/CAFE%20coalition%20ltr%206-21-05.PDF> and <http://www.climateark.org/articles/reader.asp?linkid=32365>.

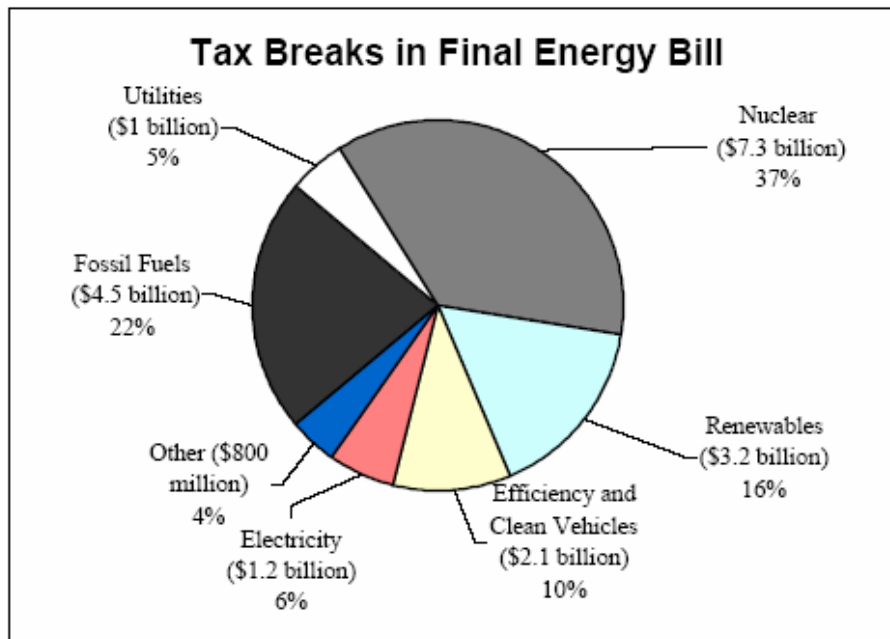
⁸ From a 2003 AP poll, see http://www.usatoday.com/money/autos/2003-07-03-suv-poll_x.htm.

September 2005 a bipartisan coalition of 16 representatives in the U.S. House introduced a measure that would require average fuel economy to increase by over 30% in the next ten years.⁹ Opponents of raising fuel economy standards argue that higher standards will increase the price of new vehicles and increase the number of highway fatalities as automakers downsize their vehicles.¹⁰ Others counter that the technologies exist to significantly improve fuel economy without sacrificing safety.¹¹

Economic Insights into Efficient and Effective Energy Policy

As discussed in Chapter 3 of the text, in the presence of externalities taxes and subsidies can be used to achieve a more efficient social outcome than an unregulated market. The Energy Policy Act provides subsidies to many different forms of energy, including nuclear power, coal, and petroleum. The Act has been criticized for providing large subsidies to “dirty” forms of energy while failing to allocate sufficient resources for developing renewable alternatives (see Figure 3).¹²

Figure 3: Tax Breaks in the Energy Policy Act of 2005



Source: U.S. Public Interest Group and Friends of the Earth, “Final Energy Tax Package Overwhelmingly Favors Polluting Industries,” <http://newenergyfuture.com/final2005energybilltaxanalysis.pdf>. Note: This analysis includes \$6 billion in tax credits for nuclear power that are included in the Energy Policy Act but not accounted for in the official \$14.5 billion estimate of the value of tax credits.

⁹ See <http://www.house.gov/science/press/109/109-119.htm>.

¹⁰ See, for example, <http://www.cei.org/gencon/019,03541.cfm> and <http://www.heritage.org/Research/EnergyandEnvironment/WM85.cfm>.

¹¹ See, for example, http://www.citizen.org/documents/Historical_safety_fact_sheet.pdf and http://www.ucsusa.org/clean_vehicles/fuel_economy/questions-and-answers-on-fuel-economy.html.

¹² See, for example, http://www.citizen.org/cmep/energy_enviro_nuclear/electricity/energybill/2005/articles.cfm?ID=13980, <http://www.energyjustice.net/energybill/>, and <http://www.washingtonpost.com/wp-dyn/content/article/2005/07/29/AR2005072901128.html>.

Through the use of taxes and subsidies, the government can reduce negative externalities and improve social welfare. Economic theory suggests that energy sources causing large negative externalities should be taxed, not subsidized. In providing subsidies broadly across all energy sources, the Act seemingly fails to account for differences in the negative externalities associated with different forms of energy.

As discussed in Chapter 16, economists generally favor market-based regulatory approaches over broad standards. Some economists have suggested that CAFE is not the most cost-effective way to improve fuel economy. As shown in Figure 2, the introduction of fuel economy standards did initially result in gains, but only until automakers met those standards. Once the standards were met, automakers had no further incentive to increase fuel economy, especially with low gas prices during the late 1980s and 1990s. Another limitation of fuel economy standards is that they do not directly alter the marginal cost of driving. If anything, driving more fuel-efficient vehicles could encourage people to drive more.

The United States currently has a federal gasoline tax of 18 cents per gallon. Each state also levies a gas tax, ranging from 8 to 45 cents per gallon.¹³ Gasoline taxes are much higher in Europe – resulting in prices that reached as high as \$7/gal. in September 2005.¹⁴ As one would expect, people drive much less in Europe and tend to drive more fuel efficient vehicles (see Figure 18-8 in the text). Higher gasoline taxes would increase the marginal cost of driving and result in a reduction in the quantity of gasoline demanded. Data on the relationship between gasoline demand and price suggest that an additional \$1/gal. tax would, in the long term, result in a reduction of gasoline demand by about 30%.¹⁵ However, the Energy Policy Act institutes no significant new energy taxes.

A comprehensive energy strategy would increase the taxes on more than just gasoline. As discussed in Chapter 18, a potential response to global climate change would be to institute a broad carbon tax, which would result in higher prices for all fossil fuels. A broad carbon tax would reduce the demand for fossil fuels while increasing the demand for alternative energy sources.

Tax increases are politically unpopular, which is probably a major reason why none were included in the Energy Policy Act. But, as noted in Chapter 18 (see the section on carbon taxes), an energy tax policy could be *revenue neutral*, meaning that the revenues from energy taxes would be used to lower other taxes. That means that the average citizen would pay no net additional tax – higher taxes on gasoline or other fossil fuel products would be balanced by lower income or sales taxes. Alternatively, part of the proceeds of a fossil fuel tax could be used to subsidize alternative energy sources, and the remainder returned to taxpayers through other tax reductions.

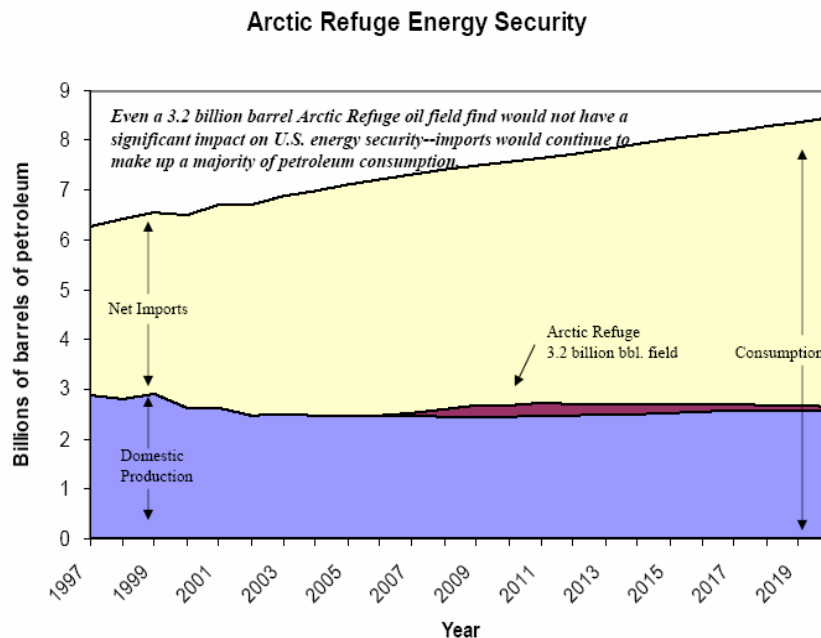
¹³ See http://api-ec.api.org/filelibrary/domestic_gasoline_taxes_9_6_05.pdf.

¹⁴ See <http://www.eia.doe.gov/emeu/international/gas1.html>.

¹⁵ Assuming a gas price of \$2.30/gal. a \$1 tax would represent a price increase of 40%. Using an average long-term elasticity of -0.8 (See “Household Adjustment to Gasoline Price Change: An Analysis Using 9 Years of US Survey Data,” by Steven L. Puller and Lorna A. Greening, *Energy Economics* 21:37-52, 1999), this would imply a demand reduction of 32%.

Perhaps the most important criticism of the Energy Policy Act from an economic point of view is that it focuses almost exclusively on increasing energy supply. As documented by the American Council for an Energy-Efficient Economy, tremendous potential exists for reducing total energy demand through increased efficiency (see <http://www.aceee.org/>). Lower total consumption is essential to reducing import dependence, since even optimistic projections for alternative energy sources do not approach the 20% growth in energy demand now projected by the U.S. Department of Energy for the next decade. Potential new sources of petroleum such as drilling in the Arctic National Wildlife Refuge are dwarfed by the growing gap between oil consumption and domestic production (see Chapter 13, Figure 13-5, and Figure 4 below). Economic theory indicates that higher energy prices are the best incentive for increased efficiency – so while low prices may be popular, they are counterproductive in terms of reducing import dependence, energy-related pollution, and overall carbon emissions.

Figure 4: Arctic National Wildlife Refuge contribution relative to total U.S. demand



Source: Prepared by a consulting firm, Lookout Mountain Analysis, for the Sierra Club. This is based on an estimate of 3.2 billion barrels production from ANWR; the U.S. Department of Energy currently projects a “mean” scenario with production of 4.2 billion barrels. See: <http://www.eia.doe.gov/oiaf/servicerpt/ogp/results.html>

Discussion Questions

1. Some people suggest that the federal government should provide equal subsidies to all forms of energy because it provides for a “level playing field.” Do you agree?
2. Do you believe that gasoline taxes in the United States should be higher? What are the possible objections to higher gas taxes? Can you think of ways to formulate a policy that would address these potential problems?
3. The Energy Policy Act provides significant subsidies for nuclear power. Proponents of nuclear power note that nuclear energy can produce large amounts of energy with very low emissions of carbon dioxide (see Box 13-2 in the text). Opponents point out that nuclear power is not economic without government subsidies, and that problems of nuclear waste disposal are still unsolved. Do you agree that the U.S. should be subsidizing nuclear power?