Alternative Fuels: Myths And Facts

Proponents of a shift away from oil-based fuels say they should be replaced by "alternative fuels." They argue that gasoline is incompatible with a clean environment and that alternative fuels pollute less, perform well, and are good for jobs and the economy. They further maintain that greater reliance on alternatives would reduce oil imports, fix the U.S. trade deficit, and America's vulnerability to oil supply disruptions, and substantially cut America's defense budget.

In part because of these arguments, the U.S. government and state governments are now spending well over $1 billion of taxpayer money annually to promote programs that either mandate or subsidize the use of alternatively fueled vehicles (AFV's) and alternative fuels.

Yet most of the benefits claimed for alternatives either don't exist or have been substantially overstated. Here are some of the myths advanced to promote alternative fuels and the facts that challenge them.

Myth #1. Gasoline is incompatible with clean air.

*The Facts.* That's simply not true. The air in the United States is cleaner, and growing cleaner still, thanks in large measure to 25 years of improvements to the internal combustion engine and to gasoline itself.

According to the U.S. Environmental Protection Agency (EPA), between 1984 and 1993 (the latest year for which statistics are available) hydrocarbon, carbon monoxide, nitrogen oxide, and lead emissions from highway vehicles declined by 36 percent, 24 percent, 11 percent and 96 percent, respectively. And these reductions occurred even though motorists drove 33 percent more miles.

Moreover, EPA data show that vehicle emissions are a declining percentage of the total emissions pie. For example, in 1983, hydrocarbon emissions from highway vehicles constituted about 40 percent of total hydrocarbon emissions; in 1992, they constituted only about 27 percent.

Another measure of progress: Today, a new vehicle that uses cleaner-burning gasoline emits some 95 percent fewer pollutants than a 1960s-era vehicle.

The decline in vehicle emissions has contributed to significant overall reductions in air pollution. EPA data show that from 1984 to 1993, smog dropped by 12 percent, carbon monoxide levels by 37 percent, nitrogen dioxide levels by 12 percent, and lead levels by 89 percent.

In short, many more people are breathing cleaner air. In 1993, about 190 million Americans, or roughly three-quarters of the population, lived in parts of the country where the air met all of the standards for ambient air quality set by the Clean Air Act. This is over 40 million more people than in 1987.

In addition to improvements in vehicles, five advances in fuels helped contribute to better air quality:
• Low-sulfur diesel fuel, with 85 percent less sulfur to reduce such airborne particles as soot and smoke.

• Lead-free gasoline.

• Gasoline with low Reid Vapor Pressure (RVP) that evaporates more slowly to reduce smog in the summer.

• Oxygenated gasoline that burns more completely to cut carbon monoxide emissions in the winter.

• Reformulated gasoline that further reduces smog and cuts toxic emissions.

The latter three gasolines—low RVP, oxygenated and reformulated—are currently sold in areas of the United States with significant air quality problems.

Myth #2. Oil received help from the U.S. government as a “fledgling industry” during its early years. Now alternatives deserve encouragement from government.

*The Facts:* The oil industry received no federal help in its early years. Not a penny. And the alternative fuels industry, which already receives substantial government support, is hardly a fledgling industry.

From 1859, when the first well was drilled in Pennsylvania, to 1919, when government first provided help to oil because of the strategic value it proved to have in World War I, the oil business did not receive a cent of federal assistance. During that time, the industry grew from a highly speculative venture to one that supplied some 12 percent of the nation’s total energy needs.

On the other hand, many of today’s alternative fuels manufacturers and distributors receive large government subsidies, despite the fact that they are well-established, well-financed companies. Total government subsidies to such companies easily exceed $1 billion a year. One primary beneficiary is Archer Daniels Midland, the agribusiness giant and the nation’s largest ethanol producer. Federal and state subsidies for ethanol alone amount to over $800 million a year, or more than 55 cents for every gallon produced.

Myth #3. Alternative fuels will make a significant difference in air quality.

*The Facts:* This contention is wrong. Alternatives would not make the air much, if any, cleaner for three reasons:

• One, all vehicles, whatever their fuel, have to meet current and prospective air emission standards. Since there is no incentive to exceed the standards, manufacturers will tend to build vehicles that merely meet them. The practical effect is that alternative-fueled vehicles won’t perform significantly better than conventional vehicles.

• Two, technical data show there is only a small difference in emissions performance between the best conventional vehicles powered by cleaner-burning reformulated gasoline and many alternative fuel vehicles. Both the U.S. General Accounting Office and the U.S. Congressional Research Service have stated that it is unclear that alternatives perform significantly better.

• Three, automobiles are responsible for a declining share of the nation’s remaining air pollution problems. For example, in 1993, according to EPA, sources other than highway vehicles produced nearly three-quarters of the nation’s man-made hydrocarbon emissions. As a result, even a large decline in remaining auto emissions may not reduce air pollution much. For example, some scientists have found that even if all auto emissions were eliminated in
Los Angeles, ozone concentrations would decline by only about 10 percent.1

All alternatives produce some pollution, even electric vehicles. According to Amory Lovins, director of research at the Rocky Mountain Institute, electric vehicles are "elsewhere emission vehicles—wholly reliant on electricity whose generation pollutes chiefly (but not exclusively) other airsheds."

Lovins is referring to the air pollution produced by electric power plants, which can be considerable. A study by Sierra Research concludes that, even when power plant emissions are counted, total hydrocarbon and carbon monoxide emissions associated with electric vehicles are far lower than those from gasoline-powered cars; but total sulfur dioxide, nitrogen dioxide, and particulate emissions may be higher and could pose a threat to health.

Methanol and ethanol also produce pollution—and provide little, if any, improvement in emissions, compared to reformulated gasoline.2 Compressed natural gas (CNG) reduces certain emissions more than reformulated gasoline, although some tests show that it generates slightly higher levels of smog-forming nitrogen oxide emissions. Liquefied petroleum gas (LPG), which is manufactured by processing natural gas and refining oil, yields about the same benefits, also producing somewhat higher nitrogen oxide emissions.3

Myth #4. Alternatives offer the public a level of performance and convenience comparable to gasoline.

The Facts. This is untrue. For example, electric cars—one of the most talked about alternatives—suffer from serious performance problems, particularly reduced range. The lead acid batteries that will likely provide power for these vehicles for the near term will take a vehicle 80 to 100 miles at best on a full charge, assuming limited or no use of the heater or air conditioner, no cold weather, and operation on roads over flat terrain. On a cold day, the range of most electric vehicles on the road today drops to about 20 miles. According to the U.S. Department of Energy (DOE), "current technology is best suited for a range of less than 50 miles between charging." As Amory Lovins has pointed out, "Batteries have only one percent of the energy per kilogram that normal fuel does...."

Some people claim that the electric vehicle is the car for the 21st Century. The truth is, it was more suitable for the late 19th Century, when society was geographically compact and people tended to travel much shorter distances.

Warren Brown, automotive writer for The Washington Post, recently pronounced electric vehicles "not ready for prime time." He reported that recharging one electric car's battery to 90 percent capacity—with a conventional, grounded, 110-volt house outlet—took 32 hours, "so slow, you might as well travel by stagecoach." The most widely used power source in electric vehicles today is the lead-acid battery. The life span of such batteries is about two years, and the cost of replacing them is roughly $6,000.

Other alternatives also fail to provide performance equal to gasoline. Both methanol and ethanol pack substantially less

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2 Calvert et al. p. 42.
energy per gallon than gasoline, which means vehicles equipped with a fuel tank the same size as that on a gasoline-powered car have significantly less range. A gallon of methanol, for example, will provide only about half the mileage of a gallon of gasoline.

Compressed natural gas and liquefied petroleum gas contain less energy than gasoline in a given volume. For example, CNG contains only about one-quarter the energy. That's why CNG vehicles must be equipped with large, heavy fuel tanks. The tanks take up most of a car's cargo capacity, yet provide a range of only about 150 miles. LPG vehicles also need larger fuel tanks.

Myth #5. Mandating alternatives will be good for the economy because they will spur new investment and create new industries.

The Facts. No, they won't. That's because alternatives generally cost more than conventional gasoline-powered technology. People will have to pay more for transportation, leaving less to spend on other goods and services. This will hurt the economy. Mandating the use of new products that are not as good as those already available does not promote economic vitality.

The cost of alternative vehicles varies, depending on the alternative. The electric car is one of the most expensive. If larger quantities of electric vehicles are produced in the future, per unit costs will decline, but they are still expected to remain high. For example, the economic consulting firms, DRI/McGraw-Hill and Charles River Associates, estimate that in 2010 the additional cost of manufacturing electric vehicles to meet California's electric vehicle mandate requirements could exceed $20,000 per vehicle. DOE says that by 2010 electric vehicles will cost about $10,000 more than gasoline-powered vehicles.

Most other alternatives are also more expensive. Methanol has historically been somewhat more expensive than gasoline; recently, wholesale methanol prices have increased to two or three times the price of gasoline. Ethanol costs about twice as much to produce as gasoline. New methanol and ethanol vehicles cost up to $250 more than comparable gasoline vehicles.

CNG and LPG are both less expensive than gasoline and both are well-suited for use in fleets, where centralized refueling is possible. However, vehicle costs are higher. According to DOE, new CNG vehicles cost between $3,500 to $7,500 more than conventional gasoline vehicles, and new LPG vehicles cost about $1,000 more. The National Petroleum Council—an advisory panel to the U.S. Secretary of Energy—anticipates lower incremental costs with mass production: $600 to $1,200 more for CNG vehicles and $150 to $675 more for LPG vehicles.

Myth #6. Alternatives are needed because petroleum supplies are dwindling rapidly.

The Facts. Not true. There's enough oil in the earth to last for generations. It's true that "proved" reserves in the United States would last only ten years at current rates of production. However, reserves that are categorized as proved are only a very small portion of the total amount of petroleum expected to be eventually recovered. In fact, recent estimates of the remaining petroleum resources in the U.S., both in known fields and those yet to be discovered, should last between 40 and 80 years at current rates of production. Technological advances, which are making it possible to identify new reserves more efficiently and to extract a greater percentage of oil in each reservoir, could double that estimate.
In 1950, the world consumed about 10 million barrels a day. At that rate, according to annual reports developed by the Oil and Gas Journal, the world had 24 years of proved reserves. Since then, consumption has climbed to a current rate of about 70 million barrels of crude oil a day, yet the world still has 45-years’ worth of proved reserves. In other words, oil companies have been finding oil faster than people have been consuming it—to such an extent that the world’s proved reserves have actually doubled since 1950.

The petroleum industry’s ability to find more oil has been surprising experts for decades. For example, in 1874 a Pennsylvania state geologist predicted that “...the United States [has] enough petroleum to keep its kerosene lamps burning for only four years...” In 1919, the chief of the U.S. Geological Survey predicted that U.S. oil production would soon peak, “possibly within three years.”

In 1944, Harold Ickes, Secretary of the Interior and wartime petroleum czar, predicted that America’s oil would run out in 14 years. America, he pointed out, had only 20 billion barrels of proven reserves. Since the Ickes prediction, America’s oil fields have produced 320 billion barrels of oil, and proven reserves now amount to about 24 billion barrels.

Ultimately, of course, oil is a finite resource. So, in theory, someday we could run out. But this is highly unlikely so long as markets are allowed to operate freely. Long before oil reserves are exhausted, higher costs of production will encourage faster development of substitutes. This is a typical market phenomenon, as history has repeatedly demonstrated—as when whale oil used in lamps was replaced by kerosene, a petroleum-based product. And when oil succeeded coal as the nation’s chief source of energy.

Myth #7. Alternative fuels will reduce oil imports.
*The Facts.* Current programs and proposals for promoting alternatives might reduce oil imports, albeit at a high cost. But many of the alternatives replacing oil also would be imported, in whole or part. That’s true of methanol and natural gas, for example.

In any case, substituting alternatives that cost more than imported oil would make the nation worse off economically. It would raise the costs of energy-intensive goods and services, such as products made from aluminum and fruits and vegetables that are transported great distances. People couldn’t buy as many other goods and services as a result, and demand for them would lessen. Factories would produce less, jobs might be lost, and the ability of U.S. manufacturing facilities owned by firms like Alcoa or Reynolds Metals to compete in world markets would be diminished.

Myth #8. Alternatives will cure our growing trade deficit.
*The Facts.* Just the opposite is likely. Forcing American companies to use more expensive energy in the form of alternative fuels will hurt their competitiveness in world markets and hence is no way to go about reducing the trade deficit. It would take massive government mandates and subsidies to force the switch to alternatives, imposing huge costs on American businesses and consumers. For example, U.S. wheat farmers, forced to use more expensive alternative forms of energy, would be placed at a competitive disadvantage on world markets with wheat farmers from Canada and Argentina. So what the U.S. gained through declining imports of oil not only would be lost through other energy imports but also could

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well result in declining exports of wheat and other products.  

Myth #9. Alternatives will reduce U.S. vulnerability to oil supply disruptions.

The Facts. Not really. We’d still be major participants in the world oil market and so would be directly affected by any such disruptions. But in any case, such vulnerability has already been reduced. There are three major reasons for this. First, the world oil economy has become highly interdependent. Oil exporting nations need U.S. dollars at least as much as the U.S. needs their oil. So there is a huge incentive for both to maintain undisrupted trade.

According to a World Bank report, given “the urgent financial requirements of all oil exporters it is unlikely that a major oil exporter would deny supplies to the U.S.” for political reasons.

Moreover, countries that are successful oil exporters, including those in the Middle East, often buy portions of refinery or distribution operations in other countries. That has happened in the United States, and those investments also moderate any inclination to disrupt oil trade.

Second, U.S. oil companies, as well as companies elsewhere in the world, have been diversifying their sources of production and relying more on futures contracts to buy their oil. As a result of the supply disruptions of the 1970s, the world’s oil industry has stepped up its exploration efforts outside of such volatile areas as the Middle East. In fact, since the mid-1970s, Middle Eastern oil production has declined from almost 40 percent to just over 30 percent of the world’s production. More such diversification is likely in the future. Sizable oil reserves are thought to exist in such countries as Peru, China, and a number of the states of the former Soviet Union.

The third major reason is that the United States now has its own Strategic Petroleum Reserve with nearly 600 million barrels of oil in storage which could replace all oil imports from all countries for over two months in the event of an emergency. According to then-Rep. Philip Sharp (D-Ind.), speaking in Congress at the time of the 1990-1991 Persian Gulf conflict, this reserve “may have prevented a large oil price increase when the tanker war broke out between Iran and Iraq. Its existence may also have limited the price increase we are currently seeing.”

To these three reasons could be added a potential fourth: The best way of reducing oil imports, and thus our vulnerability to supply disruptions, would be to replace imports with energy that costs less than foreign oil. In many cases, that is domestic oil and gas. The U.S. still has plenty of oil and gas to be developed. Some of it lies offshore in areas like the Gulf of Mexico and off the California and Florida coasts. Some of it is located on such federally owned land as the Arctic National Wildlife Refuge. But, unfortunately, the U.S. government has closed many of these promising areas for environmental reasons, despite the fact that it has been demonstrated time and time again that, with appropriate environmental safeguards, wildlife and vegetation and resource recovery can happily coexist. Domestic production would certainly increase domestic petroleum supplies and reduce imports at far less cost than mandating alternatives. Whatever merit lies in reducing oil imports, producing more of the nation’s own oil and gas reserves would achieve that end better than alternatives.

*It should be noted that oil accounts for only a small portion of all goods and services imported into the United States—about 6 percent in 1994. Mandating alternative fuels does nothing about the remaining 94 percent.
Myth #10. Alternatives will substantially cut America's defense costs in the Middle East.

*The Facts.* This isn't likely. America has reasons other than oil—both strategic and historic—to keep a major military presence in that region. In fact, U.S. troops were deployed in the Middle East well before oil supplies from this area were a large source of U.S. imports. Furthermore, even if the U.S. completely eliminated oil imports, the rest of the world would not, including many of our most important trading partners such as Germany and Japan, which rely far more heavily on imported oil than the United States. Because our economic well-being is tied in part to theirs, we have an interest in maintaining the flow of oil to them even if we imported no Middle Eastern oil ourselves. So cutting U.S. imports with alternatives won't eliminate defense expenditures aimed at protecting the international trade of oil.

There are other reasons for our defense presence in the Middle East that are unrelated to oil. For example, the U.S. government wants to contain Saddam Hussein, Iraq's notoriously unstable ruler, who is trying to become a military superpower with a nuclear arsenal and other weapons of mass destruction. The U.S. is also concerned about his next door neighbor, Iran, the source of much terrorism in the world. Indeed, John Litchblau, the noted energy analyst, writing in The Energy Journal in 1994, observed that "there is no direct relationship between the deployment of U.S. forces in the Middle East and our importation of Middle East oil. These forces were deployed there as part of our Cold War global strategy, just as they were deployed in Europe and the Far East."

It should also be kept in mind that the monetary costs of a defense presence are not nearly as great as might be imagined. According to a Congressional Budget Office report, military expenditures during the 1990-91 Persian Gulf War amounted to approximately $49 billion. The Gulf states paid all but about $1 billion of that amount.

Myth #11. Replacing oil with alternative fuels will mean more jobs.

*The Facts.* Actually, it could turn out to eliminate jobs. Some jobs definitely will be created making, distributing and selling alternatives, but they will come at the expense of jobs lost in the traditional automobile and petroleum industries. In addition, if alternatives are more expensive than conventional gasoline fuel/vehicle technology, as would be likely, consumers will have to pay more for them. They will then have less to spend on other products, which will reduce demand for these products and cost jobs. Businesses will also face higher costs, which could diminish their competitiveness in world markets and reduce employment in their offices and factories. Finally, if consumers purchased more domestically produced alternative fuels, countries that now export oil to the United States would have less money to buy our goods and services. This would also tend to reduce U.S. jobs.

Myth #12. Government subsidies for alternatives are a good way to advance new technology.

*The Facts.* This simply isn't accurate. The assumption that lies behind this myth is that government must step in because, if left alone, industry will overlook promising new technology and fail to develop it. This assumption defies history and common sense. The advancing technology we enjoy today is the product of private initiative, and the government's track record directing the development of energy technology is abysmal.
According to Michael McKenna, an energy consultant writing last year in Policy Review, "Since 1980, the United States [government] has spent more than $50 billion of taxpayer money to develop energy technologies that have either failed technically or lacked market appeal. A case in point was the nearly $6 billion the government spent between 1980 and 1992 to develop renewable energy such as solar, geothermal, biomass, wind-generated energy, hydropower and others. Despite the massive investment, energy production from these sources fell by nearly 10 percent by the end of that period.

A classic example of the government's misguided attempts to advance new technology was the Synthetic Fuels Corporation, established in 1980 by the Carter Administration after a major oil supply disruption during the Iranian revolution. The aim of the program was to produce some 2.5 million barrels per day of synthetic fuels (synfuels) by 1990. Synfuels are gas and liquid fuels made from coal or oil shale feedstocks, which the United States has in abundant supply. Despite the expenditure of billions of dollars and the construction of synfuel plants, the program was a failure. The small amount of fuel that was produced cost far more than conventional fuels, and in 1986, Congress terminated the program.

Myth #13. Alternatives deserve subsidies because even today oil is heavily subsidized.

The Facts. Wrong again. The oil industry puts much more into the federal government's coffers than the government puts into the industry's coffers. And what money the industry receives is a disproportionately small share of what the federal government pays out in overall energy subsidies. According to a 1992 report by the Department of Energy's U.S. Energy Information Administration (EIA), the oil industry received about $1 billion of the federal government's $8 billion in annual energy subsidies. This means that while oil meets 40 percent of the nation's energy needs, it receives only 12 percent of the subsidies. One billion dollars in subsidies is about 0.4 cents a gallon of gasoline or other oil products, and much of it goes exclusively to smaller companies within the industry.

What's more, the EIA pointed out that on balance the oil industry has been hurt rather than helped by government intervention. The industry is, in effect, the recipient of a "negative subsidy." That's because, in recent years, the federal government has begun to use the motor fuels excise tax, once reserved exclusively for highway construction and maintenance, for purposes like mass transit and shrinking the national debt. This portion amounts to a subsidy from the oil industry to other programs. In 1992, for example, excise taxes on motor fuels which were not dedicated to highways and roads amounted to more than $6 billion—considerably more than the $1 billion in subsidies the industry received that year.

The oil industry has historically been singled out for additional taxes. From 1980 to 1988, for example, the government collected an additional $78 billion from the petroleum industry through the so-called Crude Oil Windfall Profit Tax. This special tax was imposed only on oil produced in the United States and was paid by oil companies.

The subsidy that critics of the oil industry most often cite is the percentage depletion allowance, a tax deduction intended to reflect the gradual exhaustion of a natural resource, such as oil and gas or other mineral deposits. Some independent oil and gas producers receive limited tax breaks from the percentage depletion allowance, including those independent companies that produce natural gas for use in such alternative fuels as compressed natural gas and methanol. The large, integrated oil producers are not eligible to receive the
percentage depletion allowance. However, companies in every mineral extractive industry retain it.

Myth #14. Oil companies are really opposing alternatives because they fear the competition. They want the market all to themselves.

The Facts. Oil companies don’t in fact oppose alternatives, and many produce one or more of them. What they want is for all fuels to compete on a level playing field. Certainly, like other businesses, oil companies want to be successful. They want to sell as much of their product as possible, and they want to meet and beat the competition—each other as well as the alternative fuels businesses.

But, unlike some alternative fuels interests, oil companies are not asking government to protect them from competition. They want all fuels to compete on their merits—and demerits. And in fact, the energy market continues to be quite competitive. All sorts of energy sources are used to power factories, heat homes and run appliances. While American consumers look to oil-based gasoline as the least expensive, most efficient form of motor fuel, American utility companies look to coal, nuclear and renewable energies to power their electric generators.

So the oil companies don’t oppose alternatives. They do oppose government efforts to pick “winners and losers” by subsidizing certain fuels with taxpayer funds or by forcing consumers to buy alternative fuels and the vehicles that run on them.

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