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Articles

*1 OIL AND THE ENVIRONMENT: REDUCING OIL DEPENDENCY IN THE AUTOMOTIVE SECTOR [FNa1]

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INTRODUCTION

A variety of factors caused oil prices to rise sharply in 2003 and stay elevated, in contrast to what most experts predicted. [FN1] The increase has been attributed to such factors as "increase[ed] demand . . . terrorism, and the 2005 hurricane season. . ." [FN2] Irrespective of the cause, this rise in oil prices triggered renewed United States' (U.S.) interest in reducing reliance on foreign oil. [FN3] This renewed interest, coupled with acknowledgement that burning oil, as well as other fossil fuels, contributes significantly to the global warming effect, [FN4] supports the need to avoid energy and environmental crises by reducing oil dependence before the consequences reach crisis proportions. [FN5]

Factors such as peak oil, the effects of global warming, and the cost to the U.S. economy from the instability of oil prices and maintaining *2 access to oil drive the timeline to achieve oil independence, and the market alone cannot make the change quickly enough. Since vehicle use consumes significant amounts of oil and emits significant amounts of greenhouse gases, legislation is necessary to create a market for alternative and renewable vehicles and fuels, facilitate the development of new and affordable technologies and distribution infrastructure for renewable and alternative fuels, and encourage land use patterns that reduce U.S. dependence on cars and ultimately on oil.

This article argues that gradually reducing oil dependency is appropriate given the environmental harm oil causes, the global conflicts in which the U.S. must engage to maintain access to oil, and the simple fact that extractable oil is a finite resource. Many argue that market forces are sufficient to enable U.S. oil independence without harming the economy, and that the current level of regulation is sufficient. [FN6] This paper argues that current and proposed legislation is inadequate, and that more incentives and federal assistance are required because the market has been unable to make the move to alternative and renewable vehicles and fuels a reality. This paper focuses on legislation and policies concerning vehicle use, because it is the largest consumer of oil and a significant contributor to global warming and other environmental harms.

BACKGROUND

U.S. Oil Consumption and Fuel Use in Passenger Cars and Light Trucks

Oil consumption in the U.S. became a concern during the 1970s. [FN7] By the second oil crisis in 1979, the U.S. was consuming 18.5 million barrels of oil per day. [FN8] Automobile use accounted for a significant portion of that consumption. [FN9] As a result, Congress passed the Energy Policy and Conservation Act [FN10] in 1975,

which included a set of standards for fuel economy in passenger cars and light trucks. These standards, known as the Corporate Average Fuel Economy ("CAFE") Standards, [FN11] "provide for improved energy efficiency of motor vehicles. . . ." [FN12] From 1979 to 1983, U.S. oil consumption dropped from a high of 18.5 million barrels of oil per day in 1979 to a low of 15.2 ***3** million barrels per day in 1983. [FN13] Considering the significant amount of oil consumed by vehicle use and the "34 percent increase in vehicle miles traveled" (VMT) between 1975 and 1985, [FN14] many experts attributed the reduction in oil consumption during this time to increased vehicle fuel efficiency. [FN15]

As of 2006, the U.S. consumed approximately 20 million barrels of oil per day. [FN16] This amount includes a total of 14.36 million barrels of oil per day by the transportation sector, of which 8.69 million barrels per day are consumed by light duty vehicles. [FN17] At the current rate of consumption, and with little change in policy, the U.S. Department of Energy's Energy Information Administration (EIA) projects that U.S. demand for oil will increase to 26.9 million barrels per day by 2030. [FN18] Projections rank transportation sector consumption at 73 percent of all liquid fuels, [FN19] of which 98 percent is petroleum. [FN20]

Peak Oil

Projections anticipate that global consumption demands for oil will reach 120 billion barrels per day by 2025. [FN21] Discovery and production are expected to peak and then decline sometime between 2004 and 2010. [FN22] In 2006, forecasts of U.S. oil production alone indicate that domestic production will peak at 5.8 million barrels per day in 2017 and fall to 4.6 million barrels per day by 2030. [FN23] In contrast, U.S. consumption of all liquid fuels will increase. [FN24] Partly because of this ***4** supply and demand problem, the price of oil will remain high, conflicts will continue, and oil companies will take bigger risks at higher costs. For example, the search for extractable oil has become more risky and expensive as oil companies have to dig deeper and search longer to find it. [FN25]

Global Warming and Carbon Dioxide Emissions from Automobiles

According to the Intergovernmental Panel on Climate Change, "[t]he global atmospheric concentration of carbon dioxide has increased from a pre-industrial age value of about 280 parts per million (ppm) to 379 ppm in 2005." [FN26] In particular, since direct atmospheric measuring began in 1960, the largest annual growth rate occurred in the ten years between 1995 and 2005 (average: 1.9 ppm per year compared to an average of 1.4 ppm per year from 1960 to 2005) with growth rates varying from year-to-year. [FN27]

Automobile emissions account for a significant amount of the carbon dioxide in the atmosphere. [FN28] Specifically, twenty pounds of carbon dioxide are emitted into the atmosphere for every gallon of gasoline burned by a vehicle. [FN29] This figure alone makes it a significant contributor to global warming. [FN30]

According to the EIA, the transportation sector accounted for 33 percent of all U.S. carbon dioxide emissions in 2005. [FN31] The EIA report also found that "[a]lmost all (98 percent) of transportation sector emissions result from the consumption of petroleum products" with 60 percent coming from automobiles and light trucks. [FN32] For a brief time in the 1980s, vehicle carbon dioxide emissions were offset by the fuel efficiencies achieved during that time. [FN33] However, in the 1990s, there were no improvements to fuel efficiency standards. [FN34] Combined with increased VMT, this failure to increase fuel efficiency in vehicles contributed to a return to higher levels of carbon dioxide ***5** emissions from the transportation sector. [FN35] Furthermore, EIA estimates suggest that the transportation sector's contribution to carbon dioxide emissions will continue to increase based on continuing increases in gasoline use. [FN36]

In summary, the effects of carbon dioxide (along with other greenhouse gases such as methane, nitrous oxide, and chlorofluorocarbons), include, but are not limited to, increases in global surface temperature, declines in snow

cover and mountain glacier, and rises in sea level. [FN37] Although much depends on regional temperature changes, these effects may lead to drought, loss of property from rising sea levels, increased storm intensity, and ecosystem disruptions. [FN38] If sources of greenhouse gas emissions do not change (the "business-as-usual" scenario), scientists predict that "annual global . . . emissions will reach 14 billion tons per year by 2055" and will raise global temperatures by as much as 10 degrees Fahrenheit by 2100, which may cause irreversible and potentially dramatic changes. [FN39]

Other Environmental Impacts of Oil

In addition to carbon dioxide emissions from automobiles, oil exploration, extraction, and transportation have equally negative impacts on the environment. These activities result in damage to land, water, air, health, and the quality of life. [FN40] First, the exploration and extraction of oil disturbs or destroys the habitat of the plant and animal species that live in the area. [FN41] The Government Accountability Office (GAO) reported a specific example of this impact in a 2005 study. [FN42] The study examined the effect of increased oil and gas leases on the Bureau of Land Management's ability to mitigate the impacts ***6** of oil and gas drilling on federal lands. [FN43] The environmental impacts reported in the study range from site specific, such as damage to vegetation from oil well installation, to those that affect a much larger area, such as large-scale habitat interruption. [FN44]

Second, the 2005 GAO report also indicated that oil and gas development sometimes affect local air and water quality. [FN45] Construction of new roads and the use of diesel engines at drill sites can degrade air quality due to increased dust and the presence of nitrogen oxides. [FN46] Water quality may be impacted from runoff and/or accidental spills. [FN47] The mere presence of drilling and production equipment can negatively impact aesthetics and change "a natural setting to an industrial zone." [FN48] Finally, all the drilling activity at a site, from noisy equipment to unnatural lighting, tends to negatively impact nearby habitat, both human and wildlife. [FN49]

In addition, accidents that occur during oil transportation can have devastating effects on the environment. The most notable example was the spill of approximately 11 million gallons of crude oil in 1989 from the tanker Exxon Valdez into Prince William Sound off the coast of Alaska. This spill demonstrated with stunning clarity the adverse effects associated with the transportation of crude oil. Almost 20 years later, aspects of the oil spilled from that tanker remain in the coastal Alaskan ecosystem and recovery of the marine life, waterfowl, and wilderness areas continues. [FN50]

As a mixture of many compounds, the effects of spilled crude oil on the environment varies. The lighter, more poisonous compounds, such as benzene, evaporate rapidly but impact the environment quickly after a spill. [FN51] As described in a news article, "Within days, they can kill fish and other large animals as well as the small crustaceans and plankton that fish eat." [FN52] The heavy tars contained in ***7** crude oil are less poisonous, but cause problems when they stick to animals or are eaten when the animals try to clean themselves or scavenge dead animals affected by the tar. [FN53] Another tanker accident, which was the largest in history, occurred off the coast of France in 1978 spilling 68 million gallons of oil into the Atlantic Ocean. [FN54] As a result of the spill, "a variety of clams were wiped out for two years [and] six thousand tons of oysters were lost." [FN55] Since 1974, the year the International Tanker Owners Pollution Federation, Ltd., (ITOPF) began keeping track of tanker accidents, the ITOPF has reported 1,285 spills of 7 to 700 tons and 449 spills of 700 or more tons with total releases of 5,632,000 tons of oil to date. [FN56]

Maintaining Access to Oil

A role of government is to ensure the adequate distribution of resources to its citizens. [FN57] When those resources become scarce, governments often resort to extreme measures and armed conflict erupts: "by one accounting, there have been 127 wars and violent internal conflicts since 1945. . . ." [FN58] In addition, "[t]he causes of warfare are exceedingly complex, but 'the global or regional shortage, or perceived shortage, of one or

more natural resources. . . [may contribute to] the onset of war. . . .'" [FN59] Currently, the U.S. imports approximately 63.5 percent of the oil it consumes, and approximately 40.4 percent of this oil comes from member countries of the Organization of the Petroleum Exporting Countries (OPEC) and approximately 16.2 percent from other Persian Gulf countries. [FN60] Remaining imports come from non-OPEC countries. Defense of unfettered access to oil became national policy in 1980 with the introduction of the Carter Doctrine. During the State of the Union Address in 1980, President Carter announced that, "any attempt by an outside force to gain control of the Persian Gulf will be regarded as an assault on the vital interests***8** of the United States of America, and. . . will be repelled by any means necessary, including military force." [FN61] Since 1980, the U.S. has been involved in at least four conflicts in the Middle East: the Iran-Iraq war (1980-88), the 1991 Gulf war, the subsequent containment of Saddam Hussain, and the 2003 Iraq war. [FN62]

Notably, the U.S. Central Command (Centcom), which maintains an "area of responsibility" (AOR) that covers 25 mostly oil producing countries, including Iraq, Kuwait, Saudi Arabia, and Sudan, is the only unified command with forces in an active U.S. war zone. [FN63] Centcom's primary responsibility, articulated in the Carter Doctrine, is to "protect the global flow of petroleum." [FN64] Consequently, as part of Operation Iraqi Freedom in 2004, approximately 160,000 soldiers from Centcom were located in Iraq and Kuwait, with tens of thousands deployed elsewhere in the Persian Gulf region. [FN65] Although its purpose is subject to debate, the U.S. invasion of Iraq in 2003 is simply an extension of the Carter Doctrine and part of the Bush Administration's Persian Gulf security policy. [FN66] The actual cost of this military action is difficult to calculate. [FN67] However, in 2003, the Victoria Transport Policy Institute estimated that in 1996 the cost of maintaining access to Middle East oil ranged from "$6 to $60 billion annually." [FN68]

Conflicts with Middle Eastern countries may not be the only military cost the U.S. faces to maintain access to oil supplies. As demand for oil increases around the world and developing countries expand and develop their own economies, the cost to maintain access to oil supplies may lead to conflicts with these countries. For example, one prediction indicates that "[t]he growing demand for oil will most likely lead to growing global conflicts, of which the Gulf War, the 9/11 attack, and the current war in Iraq are just the first three skirmishes. These conflicts pale in comparison to the potential conflict over oil with China." [FN69] A potential conflict with China is a scary prediction, but it is just one example of potential conflicts that will arise, as developing ***9** countries require more and more oil to fuel their growing economies. To be precise, developing countries with lower per capita income levels will be using more oil as they become more prosperous. [FN70]

For example, China's economy is the fourth largest economy in the world behind only the U.S., Germany, and Japan. [FN71] While China currently consumes far less oil than the U.S., its growing economy is increasing its demand for oil. [FN72] This increased demand for oil can be attributed to China's increased automobile usage. [FN73] In 2006, the rate of increased automobile usage in Beijing alone was calculated at 1,000 cars a day, with a projection of 3.5 million vehicles in use by 2008. [FN74] The EIA predicts that Chinese oil imports will "grow fourfold from 2003 to 2030, [partly due to increased automobile use with] much of the increase coming from Persian Gulf suppliers." [FN75] For example, in 2003 China imported 0.9 million barrels of oil per day from Persian Gulf OPEC members and by 2030 its Persian Gulf imports are estimated to total 5.8 million barrels per day. [FN76] The rising dependence of China on Middle Eastern oil supplies is likely to cause complications in the U.S. plan to maintain access to oil in the Middle East.

ANALYSIS

Government Regulation, Oil Independence and the Reduction of Emissions

The U.S. economy operates in a free market and generally relies on market forces to maintain its strength and continued growth. While markets are excellent for determining what commodities will sell and at what price, markets are not perfect. [FN77] Markets cannot account for externalities, markets do not always reflect the values of populations, and markets can fail due to a variety of reasons, such as lack of knowledge, old habits, and

misconceptions. [FN78]

Specifically, a flaw in a market analysis of the automobile and oil industries is the existence of what economists call externalized costs. [FN79]***10** Two externalized costs of using petroleum as vehicle fuel, as noted above, are the environmental impacts of vehicle emissions and the cost of continuing military support to maintain access to petroleum sources. [FN80] The market deems these costs "externalized" because the cost of the resulting environmental damage and the cost of protecting access to oil are not borne by those who produce the oil, but by others not involved in production. [FN81] Therefore, the costs are not reflected in the price of oil or gasoline sold on the market. [FN82] Legislation aimed at reducing U.S. dependency on oil and reducing automobile emissions is necessary because there is little, if any, cost-based economic incentive for the automobile and oil industries to change their behavior voluntarily. [FN83] Namely, the oil industry does not currently pay for the pollution its product produces or the military costs of continuing conflicts in the Middle East.

Conversely, the benefits of reducing vehicle emissions and oil consumption are also external and therefore not reflected in the calculation of automobile manufacturer or oil company profits or losses. [FN84] Consumption of the benefit is collective or simultaneous because once a person receives the product (preserved land, clean water and air, stabilized climate, reduced taxes or increased government services due to reduced defense spending), it is not effectively possible to exclude others from enjoying it as well. The non-excludability characteristic of collective goods causes the market system to produce less of the good. The presence of externalized costs and collective benefits in vehicle use and oil consumption limits the usefulness of a free market analysis in this area, thereby requiring government intervention in the form of regulation.

Moreover, government regulation can be particularly useful for advancing technology in the area of automobile equipment and environmental protection. For example, the "technology-forcing" regulation under the Clean Air Act [FN85] produced the catalytic converter and the three-way catalyst in the 1970s and 1980s. [FN86] These emissions' technologies helped reduce automobile pollution in the face of increased VMT. [FN87] As explained in a study by Carnegie Mellon University, manufacturers have little motivation to develop new technologies absent a compliance requirement or certainty in the marketplace. [FN88] Furthermore, companies are hesitant to invest in research and development ***11** (R&D) for fear that, once a technology is developed, others will be able to duplicate it without the additional R&D costs incurred by the company responsible for the original development. [FN89] That company will have reduced its profits by spending on R&D while the other companies that were able to duplicate the technology will not have spent any money on R&D. [FN90] Regulation requiring a certain technology would force all companies within an industry to develop a product to fulfill the requirement, and even lead to better technologies as companies compete for the most efficient and cost effective product on the market.

Oil Independence with Effective Legislation

Reducing oil dependence is a large task that the U.S. will likely not accomplish in one step. However, reduction in oil use must begin somewhere and should begin with a process that many experts agree has a proven record of success: increasing fuel efficiency in gasoline powered vehicles by mandating higher CAFE standards. [FN91] The next step would be to shift the various tax and other incentives away from the oil industry and toward the renewable fuel industry, thereby fostering the growth of the renewable fuel industry and further reducing oil consumption. [FN92] Finally, or in concert with the first two steps, the federal government needs to encourage the development of reliable, efficient transportation, other than cars, while simultaneously encouraging development around these transportation choices.

Increase Fuel Efficiency

Until very recently, the National Highway Traffic Safety Administration (NHTSA) maintained authority to set fuel economy standards for passenger cars and light trucks according to the Energy Policy and Conservation Act

(EPCA). [FN93] Under this Act, the NHTSA had the ability to adjust the fuel economy standard up and down to achieve the "maximum feasible average fuel economy" and could consider certain factors in doing so, including "technical feasibility, economic feasibility,"***12** and the impact the fuel economy standards may have on "other federal motor vehicle standards." [FN94]

Under EPCA, automobile manufacturers were required to achieve an average fuel economy of 27.5 miles per gallon (mpg) for passenger cars. [FN95] The average fuel economy achieved by a manufacturer is calculated by dividing the number of passenger cars manufactured by the manufacturer in a model year by the sum of the fraction obtained by dividing the number of passenger cars of each model by the fuel economy measured for that model. [FN96] This calculation includes the "equivalent petroleum based fuel economy values" for any electric vehicles manufactured by the manufacturer. [FN97] A passenger car is limited to a vehicle that primarily holds 10 or less people and does not include any vehicle equipped to operate off-road or that weighs more than 6,000 pounds in gross vehicle weight. [FN98]

In addition, as part of the Energy Tax Act of 1978, [FN99] Congress tried to facilitate fuel economy through an excise tax that became known as the "gas-guzzler" tax. [FN100] This tax was imposed on the sale of cars with lower fuel economy standards. [FN101] This section defines an automobile as any vehicle "propelled by fuel. . . which is rated at 6,000 pounds unloaded gross vehicle weight or less." [FN102]

The original success of the EPCA is undeniable. Fuel economy in the year before the enactment of EPCA was 12.9 mpg. [FN103] Between 1975 and 1985 incrementally rising fuel economy standards helped reduce oil consumption in the U.S. [FN104] Specifically, CAFE standards saved approximately 55 billion gallons of gasoline each year (or 3.6 million barrels a day). [FN105] When fuel economy standards remained unchanged from the standard set in 1985 (27.5 mpg for passenger cars) vehicle manufacturers did little to increase fuel economy on their own. [FN106] As a result, a decade and a half later, in 1999, fuel economy for cars and light trucks sold in the U.S. approximately averaged a mere 24 mpg for cars and 20 mpg for light trucks. [FN107] Consequently, between 1990 and 2005 U.S. oil consumption steadily increased from ***13** 16,988 million barrels per day to 20,802 million barrels per day. [FN108] Partly, this increase in oil consumption was the result of increases in VMT and declining average fleet fuel efficiency with the introduction of the sport utility vehicle (SUV). [FN109] Inexpensive oil and a lack of demand for more fuel-efficient vehicles in the market led to an increase in oil consumption in those years. [FN110]

Even though technology exists to achieve greater fuel economy, [FN111] car manufacturers have not implemented the technology and oil consumption has increased. [FN112] One glaring reason for the increase in oil consumption is that EPCA and the Energy Tax Act of 1978 applies only to vehicles under 6,000 pounds. Seeing these "loopholes," car manufacturers built heavier vehicles that can carry more passengers. [FN113] Consequently, CAFE standards need to be reformed to remove the loophole that allows car manufacturers to build heavier vehicles, put more people in them, and call them trucks.

To assist the U.S. in its stated goal of reducing oil consumption, Congress needs to enact legislation that sets a numeric limit for fuel economy, which automatically increases by a given percentage periodically to keep pace with, and actually advance, new technology. Our own history with fuel economy shows that unless fuel economy standards are continuously raised, oil consumption increases due to factors such as increased VMT. [FN114] That is to say, by setting a fuel economy standard that is technically achievable now and standards that increase incrementally, Congress can prevent backsliding and other increases in oil consumption.

In 2005, Congress had an opportunity to revise the CAFE standards with the passage of the Energy Policy Act of 2005 [FN115] (EPAct05). EPAct05 is energy legislation formulated, in part, by President Bush's National Energy Policy Development Group. [FN116] This legislation addressed a variety of energy issues, but failed to make any provisions that would increase fuel economy. Instead, President Bush's team ***14** side-stepped the fuel economy issue and opted to continue favoring the oil industry by creating more domestic production incentives. [FN117]

Most recently, Congress and the Bush Administration passed the Energy Independence and Security Act of 2007 (EISA) on December 19, 2007. [FN118] This new legislation, however, does not advance vehicle fuel efficiency as much as it could. [FN119] Instead, EISA instructs the Secretary of Transportation to prescribe average fuel economy standards for passenger and non-passenger cars beginning with model year 2011 to achieve, "at least" 35 mpg fuel efficiency by 2020 for all cars "manufactured for sale in the United States." [FN120] Through 2030, the average fuel-economy goal for all passenger and non-passenger cars sold in the U.S. will be "the maximum feasible average fuel economy standard for each fleet for that model year." [FN121] In addition, in an attempt to remove the so-called "SUV loophole," the new law increases the maximum weight of an automobile from 6,000 to 10,000 pounds. [FN122] This new law may appear good at first glance--a fuel efficiency standard 7.5 mpg above the current standard--but in reality the proposed legislation barely advances the status quo and does not require the development of new technologies.

Specifically, according to the Union of Concerned Scientists and the National Academies of Science, the technology already exists to achieve a fuel efficiency of 40 mpg in light duty vehicles, which could be phased-in as early as 2015. [FN123] In addition, both groups agree that a fuel economy "standard of 55 miles per gallon by 2020 is [both technically] feasible and cost effective." [FN124] By increasing the average fuel economy of light duty vehicles to these standards, the Natural Resources Defense Council's conservative oil savings estimate, (based on the EIA's 2003 Annual Energy Outlook projections for consumption) indicates that the U.S. could reduce its oil dependency by 1.65 million barrels a day by 2015 and 4.89 million barrels a day by 2025. [FN125] These conservative numbers even take into account the so-called "rebound effect" that occurs when cars become more fuel-efficient and VMT ***15** correspondingly increases. By comparison, with its conservative 35 mpg by 2020 standard, the new CAFE standards will likely not even achieve the 1.65 million barrels a day savings by 2020. [FN126]

Elimination of Oil Production Subsidies

Currently, U.S. law provides a variety of subsidies for oil. [FN127] Most of these subsidies are relics of federal regulation implemented to assist the fledgling oil market at the turn of the Twentieth Century. [FN128] For example, the oil industry benefits from two tax incentives that significantly reduce the taxable income of oil companies. First, percentage depletion allows a company engaged in oil exploration and production to deduct a fixed percentage of the gross value of the annually extracted oil for which it has provided investment capital. [FN129] Second, the deduction for intangible drilling and development costs allows oil companies to take an immediate deduction for costs associated with developing an oil well, such as "labor, fuel, hauling, power, materials, supplies, tool rentals [and] drilling equipment" instead of capitalizing those costs. [FN130] Together, these tax breaks have reduced the taxable income of businesses engaged in oil exploration and production by approximately 46 percent since 1969. [FN131]

In 2005, Congress increased oil company subsidies by reducing royalty payments on oil and gas leases, allowing further exploration and access to federal lands, the Outer Continental Shelf and the Gulf of Mexico, and providing funding for R&D to develop petroleum-based resources such as oil shale and tar sands on federal lands. [FN132] EPAct05 provides other indirect subsidies for oil companies. These include (1) expanded exemptions under the Clean Water Act from the storm water requirements for "oil and gas exploration, production, processing, or treatment operations or transmission facilities" and (2) a streamlined permit process for oil wells on public lands. [FN133] Most recently,***16** with the passage of EISA, Congress had an opportunity to repeal approximately $22 billion in oil and gas subsidies, but the provisions contained in the version of the bill (H.R. 6) passed by the House were removed by the Senate prior to enactment. [FN134]

Together these subsidies and incentives, direct and indirect, make it less expensive for the oil companies to operate, thereby artificially lowering the price of gasoline and distorting the market. [FN135] When gas prices are low, U.S. citizens worry less about fuel economy, energy security, and global warming. The average U.S. citizen is

more concerned about situations that directly affect them, such as what is in their pocketbook. Conversely, a recent study at the Institute for Transportation Studies at the University of California, Davis, reported that gas prices would need to increase significantly and remain high to induce U.S. citizens to change their behavior or purchase more fuel-efficient vehicles. [FN136] This scenario suggests that the market is not the mechanism determining the vehicles U.S. citizens drive and the amount of oil they consume; the federal government is. By continuing to promote oil production through tax breaks, reduced operating costs, and other subsidies, current legislation is driving the market toward lower fuel-efficient and conventional fuel vehicles by creating a situation where oil companies can keep gas prices artificially low.

In addition, promoting domestic oil production negatively impacts the goal of fostering the development of renewable and alternative fuel vehicles. [FN137] As noted in the next section, currently it is risky to enter the alternative and/or renewable vehicle market due to lack of ***17** market share and the cost of the new technology. [FN138] Since U.S. financial resources are arguably not unlimited, it makes little economic sense to promote both domestic oil production and development of renewable technologies. One can see how these policies are at cross-purposes. If these subsidies were eliminated, the price of gas would more accurately, although not completely, reflect the cost of its production. Gas prices would rise naturally and the current higher cost of a renewable energy vehicle and its presumably lower operating costs could be honestly weighed against the higher cost of operating a gasoline-powered vehicle.

Simply eliminating oil subsidies, however, is not sufficient to realize the full cost of gasoline. Legislation is necessary that includes the negative externalities of gasoline use in its price. Currently, the negative impacts of carbon dioxide and other emissions from cars are not included in the price of gasoline. [FN139] Implementing a so-called “carbon tax” on each gallon of gas sold would internalize those negative impacts and correct the failure of the market to reflect the damage caused by them, i.e., economic losses from environmental degradation. [FN140] A carbon tax system would promote the development of renewable fuels by encouraging the purchase of these fuels, which would lack the added cost of the carbon tax. [FN141]

Development and Purchase of Renewable Energy and Alternative Vehicles

Much can be said for encouraging public transportation and increasing transit alternatives to driving, and many Americans cherish the ease and convenience that public transportation provides (i.e., not having to find a parking spot or incur the added costs of owning a car). A corresponding and excellent point, however, is that Ameri- cans enjoy driving for pleasure and the ability to “get away from it all” inside one's own vehicle. [FN142] Consequently, the U.S. has engaged in a variety of attempts to develop and bring renewable and alternative fuel vehicles to the market, such as the Alternative Motor Fuel Act of 1988, [FN143] the Clean Air Act Amendments of1990,***18**[FN144] the Energy Policy Act of 1992, [FN145] the Alternative Fuel Transportation Program, [FN146] and the Clean-Fuel Vehicle Tax Deduction. [FN147]

Many of the provisions in these laws provided tax credits to vehicle purchasers or encouraged the development of the technology for renewable and alternative fuel vehicles by mandating that a certain percentage of federal and state fleets, and eventually private and local government fleets, consist of alternative fuel vehicles. [FN148] In any event, none of these programs have been widely successful in bringing these vehicles to the market. [FN149] The technology to manufacture alternative fueled vehicles has existed for years; [FN150] however, sales of hybrids, arguably the most currently available alternative fuel vehicle, are hardly making an impact. For example, there were approximately 243 million registered automobiles in the U.S. in 2004. [FN151] By comparison, the EIA's most recent and available data projected the total number of alternative fuel vehicles in use in 2004 to be 0.2%. [FN152] In October 2006, hybrids made up just 1.5% of the new vehicle market. [FN153]

To further encourage sales of hybrid and other alternative fuel vehicles, Congress enacted the Energy Tax Incentives Act of 2005 [FN154] (Energy Tax Act) as part of EPAct05 to encourage purchases of alternative fuel vehicles. Specifically, the Energy Tax Act created new tax credits for vehicles using alternative fuels. [FN155]

Taxpayers may take the tax credit for the post January 1, 2006, purchase of a qualified fuel cell vehicle, [FN156] an advanced lean-burn vehicle, [FN157] a qualified hybrid ***19** vehicle, [FN158] or a qualified alternative fuel vehicle. [FN159] The amount of the credit for each vehicle purchased is based on a mixture of calculations: (1) for a fuel cell vehicle, the credit is based on its weight and the 2002 model year city fuel economy for its weight class, (2) for advanced lean-burn technology, the credit is based on the percentage above the 2002 fuel economy standard for a comparable vehicle and a conversion credit based on its estimated lifetime fuel savings, (3) for a hybrid under 8,500 pounds, the credit is the sum of the same two components and is a percentage of the incremental cost over a similar gas-powered vehicle for a heavier hybrid, and (4) for an alternative fuel vehicle, the credit is based on its weight and 50% of the incremental cost of the vehicle plus an additional 30% if the vehicle meets certain emission standards. [FN160]

In order to reduce consumption of oil and stabilize global warming effects, "millions, not thousands," of non-gasoline vehicles need to be placed in service sooner rather than later. [FN161] The current policies will not provide enough incentives to accomplish this goal. Consequently, the downsides to the alternative motor vehicle credit are many. First, the full credit for purchasing a hybrid or advanced lean-burn vehicle may only be taken on the first 60,000 vehicles sold by a manufacturer. [FN162] Thereafter, the credit is phased out "beginning with the second calendar quarter" after the last of the 60,000 hybrids of a manufacturer is sold. [FN163] The rationale behind this provision is to allow multiple automakers to benefit from the demand for alternative fuel vehicles. The provision could backfire, however, and reduce sales if consumers are more attracted to one model than the others and that model's credit has been phased out.

Second, the credit is not enough. Currently, the tax credit for alternative fuel vehicles, as passed by EPAct05 ranges from a low of $250 for a Model Year (MY) 2007 GMC Sierra 2WD Hybrid Pickup Truck to a high of $4,000 for a MY 2007 natural gas Honda Civic GX. [FN164] A comparative***20** example of the price of a car model fueled by conventional fuel versus the price of its alternative fuel counterpart provides a clear illustration that this current tax credit is insufficient to increase the demand for the alternate fuel version. For example, Honda sells the MY 2008 Honda Civic Sedan for prices ranging from $15,010 to $22,460 depending on the trim level. [FN165] The Honda Civic Sedan Hybrid for MY 2008 sells for $24,350 at the high end. [FN166] With its tax credit of $2,100, this Hybrid actually saves the taxpayer/purchaser only about $300 to $400 [FN167] and ends up costing approximately $24,000, approximately $3,000 more than the same model powered by gasoline. In 2001, a GAO report declared that "a very large tax incentive would be needed to result in any significant increase in the use of alternative fuel vehicles." [FN168] Clearly, the current tax incentive is far from large enough to accomplish this goal, as overall sales of alternative vehicles have shown. [FN169]

Third, the credit expires too soon. As currently enacted, the tax credit for buying alternative and renewable fuel vehicles expires in 2010, 2011, and 2015 for (1) hybrids over 8,500 pounds; (2) advanced lean-burn, lighter hybrids, and qualified alternative fuel vehicles, and (3) fuel cell vehicles, respectively. [FN170] If the U.S. wants manufacturers to make alternative and renewable fuel vehicles, there must be enough demand to ensure the manufacturers that new cars will be purchased. Incentives such as tax credits provide stability for manufacturers as well as incentives for purchasers. [FN171] The government should extend tax credits for renewable and alternative fuel vehicles until conventional fuel vehicles are no longer available or the market share for renewable and alternative fuel vehicles establishes a strong foothold, whichever is sooner. [FN172]

A quick review of the success of the petroleum industry incentives illustrates the success of the longevity of tax incentives. Studies show that oil and gas investors received rates of return on their investments that were three to twenty-two percent higher than other industries in the period from 1938 to 1961. [FN173] It is not hard to imagine that a car manufacturer and its investors would be encouraged to produce many ***21** more renewable and alternative fuel vehicles with that kind of profit potential.

Moreover, because of normal vehicle turnover, more fuel-efficient and renewable energy vehicles will become available and affordable to second-owner, lower-income households. To enable "millions of renewable fuel

vehicles" on the road and attract used car purchasers to replace their older, less fuel-efficient cars for cars with advanced technology, Congress could extend the tax credit to the second sale of these renewable and alternative fuel vehicles. Instead of limiting the tax credit to new car purchases only, extending the credit to the second sale of the vehicle could facilitate the turnover of less fuel-efficient, more pollution emitting older cars.

Another government-sponsored program to facilitate the turnover of older cars is a trade-in program for qualified lower income earners to replace their older, traditionally fueled vehicles with new ones that use alternative fuels. [FN174] By implementing a buying program that takes advantage of high-volume discounts, a federal government agency, such as the General Services Administration, which purchases vehicles for the federal government, could lease or sell higher fuel-efficient vehicles to qualified lower income customers. [FN175] Once the transaction is complete, the agency would scrap one older less fuel-efficient, but drivable, vehicle for each new vehicle purchased or leased. [FN176] A government-sponsored loan program similar to the federally insured student loan program could handle the financing terms. [FN177]

Another proven and effective program missing from current law is a direct incentive for purchasing fuel-efficient vehicles. While the actual effect of tax incentives described above has been the subject of debate (and is beyond the scope of this paper), "automakers. . . [have known for a long time] that one-time incentives are a useful tool in encouraging consumers to purchase certain automobiles." [FN178] A one-time incentive has the immediate effect of reducing the price of an automobile, the most important factor in deciding to buy a vehicle. [FN179] In addition, "manufacturer rebates have '[proven] to be an effective tool in influencing***22** the decision-making process of new vehicle buyers."' [FN180] Similarly, federally mandated feebates would encourage new vehicle buyers to purchase more fuel-efficient vehicles by being readily and immediately visible to the consumer. [FN181]

A feebate program is centered on providing direct cash incentives to purchasers of fuel-efficient vehicles. [FN182] The "fee" and the "rebate" are based on a miles-per-gallon fuel efficiency standard. [FN183] Any vehicle that exceeds the pre-determined fuel efficiency standard earns a rebate for the purchaser. [FN184] Conversely, any vehicle that is not as fuel-efficient as the pre-determined standard would have a similar and corresponding fee. [FN185] Feebates could be used to supplement an increased fuel economy standard. Once the entire industry reaches a fuel economy standard, the feebate system would prompt automakers to incorporate even more energy efficiency improvements that cost less than the feebate. [FN186]

Equalize Federal Emphasis Between Highways and Transit

Prior to the "massive government investment in highways," Americans lived in cities. [FN187] Government programs such as federally backed home loans, the home mortgage deduction, the Federal Aid Highway Act of 1956, [FN188] and subsidized parking for employees and shoppers lured Americans away from cities and into their cars. [FN189] Of course, these programs and subsidies were not the only reasons Americans ***23** moved to the suburbs. Suburban life, however, has not always been the standard and government programs, such as those mentioned above, make it easier, and have the effect of directing choice. [FN190]

Current federal policy subsidizes and promotes land use patterns and transportation choices that sustain and increase dependence on automobiles and oil consumption through tax incentives and allocations of federal funding. [FN191] Additionally, the federal government mostly ignores transportation issues such as transit, land use development, and congestion because they are considered local issues. [FN192]

For example, The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users [FN193] (SAFETEA-LU) authorizes funding for highway and transit programs from FY 2005 through FY 2009. The total funding for all highway programs from 2005 through 2009 is $193.1 billion. [FN194] Conversely, the total funding for all transit programs during the same period is $45.2 billion. [FN195] This imbalance of funding encourages dependence on cars for mobility.

Currently, the lack of adequate transit infrastructure prohibits public transportation from being a viable alternative for most Americans. [FN196] Additional public funding is necessary to develop new transit systems, repair older, declining systems, and assist with new development projects such as "transit oriented development" projects. [FN197] Specifically, the American Public Transportation Association has recommended a federal transit funding increase to "at least $65 billion over the next six years." [FN198]

In addition to increased funding, the U.S. needs a national policy directed toward emphasizing transit. The federal dollars that are directed toward transit are provided through appropriations to states and metropolitan planning organizations, which then decide on the use of the funds. [FN199] While it is important to allow states to retain a certain level of control over the use of these funds, a coordinated federal policy, as well as additional funding, would further the goal of ***24** reducing oil consumption and greenhouse gas emissions from automobile use.

For example, Fannie Mae currently participates in a program entitled, Location Efficient Mortgage. [FN200] This program provides home loans in areas that are location efficient communities, which are neighborhoods designed to facilitate use of public transportation and which have amenities, such as stores, schools, and recreation within walking distance. [FN201] The weakness of this program is that it is currently only offered in the San Francisco Bay Area, Los Angeles and Orange Counties, Seattle, and Chicago. [FN202] There are a variety of similar federal programs poised to assist in encouraging public transportation and transportation-oriented development, [FN203] but without additional federal funds, they may not make a difference in reducing oil consumption.

CONCLUSION

Current U.S. policies concerning the use of oil in automobiles are very conflicted. On the one hand, the stated goal by U.S. lawmakers is to reduce U.S. dependency on oil, while at the same time new laws facilitate the production of domestic oil. In addition, old subsidies exist that help the oil industry but hurt its competitor, the renewable energy industry, by distorting the market. In addition, the federal tax and other programs perpetuate the need for an automobile when there is conclusive evidence that the automobile in its current form has harmful effects on the environment and is costly to the U.S. to continue fueling them. The answer to the "automobile issue" will not be one that contains a single solution. Ultimately, the solution will likely include a combination of conservation and the advancement of new technologies that will ease the reliance the U.S. has on oil. In the end, however, the U.S. will need to determine its true goals and implement more aggressive legislation to bring alternative and renewable energy vehicles to market and add more federal programs to provide alternatives, such as public transportation and transit-oriented development for those that want or need them.

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[FN12]. 42 U.S.C. § 6201(5) (2007).

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[FN76]. Id. at 34 tbl.7, Worldwide Petroleum Trade in the Reference Case, 2003 and 2030.

[FN77]. See Lovins et al., supra note 22, at 26.

[FN78]. Id. at 27. See also Tomain et al., supra note 57, at 36-37.

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[FN87]. Id. at 17.

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[FN129]. Id. at 48.

[FN130]. Id. at 49.

[FN131]. Id. at 66.

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such field activities or operations may be considered to be construction activities.' This term is used in section 402(l)(2) of the CWA to identify oil and gas activities for which EPA shall not require NPDES permit coverage for certain storm water discharges. The effect of this statutory change is to make construction activities at oil and gas sites eligible for the exemption established by CWA section 402(l)(2)" . See also Michael Grunwald & Juliet Eilperin, Energy Bill Raises Fears About Pollution, Fraud: Critics Point to Perks for Industry, Wash. Post, July 30, 2005, at A1 (claiming that the Energy Policy Act was a broad collection of subsidies for United States energy companies, in particular, the nuclear and oil industries) available at http://www.washingtonpost.com/wp-dyn/content/article/2005/07/29/AR2005072901128.html.

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[FN147]. I.R.C. § 179A (2007).

[FN148]. See 42 U.S.C. § 6374(a)(1).

[FN149]. Ramish, supra note 142, at 247.

[FN150]. Lovins et al., supra note 22, at 29.

[FN151]. U.S. Dep't of Transp., Bureau of Transp. Statistics, Nat'l Transp. Statistics 2004 38, Table 1-11 (2005), available at http:// www.bts.gov/publications/national_transportation_ statistics/2006/pdf/entire.pdf.

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[FN155]. See 119 Stat. 594, supra note 154, at §§ 1038-1039.

[FN156]. I.R.C. § 30B(b)(3)(A) (West Supp. 2007) (defining a fuel cell vehicle as a vehicle "propelled by power derived from one or more cells which convert chemical energy directly into electricity by combining oxygen with hydrogen fuel which is stored on board the vehicle in any form and may or may not require reformation prior to use.").

[FN157]. Id. at § 30B(c)(3)(A) (identifying a "new advanced lean burn technology motor vehicle" as a passenger car or light truck with an internal combustion engine with direct injection, designed to use more air than necessary for complete fuel combustion, and achieving at least 125% of the 2002 model year city fuel economy).

[FN158]. Id. at § 30B(d)(3)(A)(i), (ii) (defining a qualified hybrid as having both an internal combustion engine and a rechargeable energy storage system and meeting certain EPA emissions standards).

[FN159]. Id. at § 30B(e)(4)(B) (defining alternative fuel as "compressed natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, [and] any liquid at least 85% ... methanol").

[FN160]. Nancy Faussett, Green Vehicles and Alternative Fuels, BNA Software, http://www.bnasoftware.com/media_library/knowledgecenter/ExpertCenter_fx/Green_ Vehicles_and_Alternative_Fuels.pdf.

[FN161]. Lovins et al., supra note 22, at 178 n.740 (quoting Energy Future Coalition 2003, Summary of Recommendations: Trans. Working Group).

[FN162]. I.R.C. § 30B(f)(2).

[FN163]. Id.

[FN164]. Dep't of the Treasury, Internal Revenue Serv., Gen. Instructions for Form 8910, Alternative Motor Vehicle Credit [hereinafter IRS], available at http://www.irs.gov/pub/irs-pdf/f8910.pdf.

[FN165]. Honda Automobiles, http://automobiles.honda.com/civic-sedan.

[FN166]. Honda Automobiles, http://automobiles.honda.com/civic-hybrid.

[FN167]. A tax credit of $2,100 translates to approximately $300-$400 reduction in taxable income.

[FN168]. Hymel, supra note 92, at 74 (citing U.S. Gov't Accountability Office, Alternative Motor Fuels and Vehicles: Impact on the Transportation Sector, GAO-01-957T (2001)).

[FN169]. See supra notes 151-53 and accompanying text; see also, Joe Benton, Hybrid Sales Slow as Gas Prices Rise, Consumeraffairs.com, Feb. 27, 2007, http://www.consumeraffairs.com/news04/2007/02/hybrid_sales.html.

[FN170]. Faussett, supra note 160.

[FN171]. See generally Hymel, supra note 92, at 72-77.

[FN172]. Id. at 78-79.

[FN173]. Id. at 66.

[FN174]. Lovins et al., supra note 22, at 191.

[FN175]. Id. at 193.

[FN176]. Id.

[FN177]. Id. at 194.

[FN178]. Heather Munoz, The Clean-Fuel Vehicle Tax Deduction: Will it Drive an Increase in Fuel Efficiency Standards?, 15 Vill. Envtl. L.J. 115, 130 (2004).

[FN179]. Id.

[FN180]. Id. n.129 (quoting J.D. Power and Associates, Incentives Play Key Role in Decision-Making Process of New-Vehicle Buyers, Aug. 28, 2002, http:// www.jdpa.com) (announcing J.D. Power and Associates 2002 Escaped Shopper and Owner Loyalty Study: The Escaped Shopper and Owner Loyalty Study, based on responses from more than 30,300 new-vehicle owners who registered their vehicle in January and February 2002, listed the "Top 10 Reasons Cited by Vehicle Owners for Rejecting Particular Models." Id. "Total price too high" ranked first. "Was not available with rebates/incentives" ranked sixth. "Was not available with low-interest financing" ranked ninth.).

[FN181]. Lovins et al., supra note 22, at 187.

[FN182]. Id. at 186.

[FN183]. Id.

[FN184]. Id.

[FN185]. Id.

[FN186]. Ellen W. Chu & Elisa Murray, Instead of Drilling ANWR, Let 'Feebates' Push Efficiency, The Seattle Times, Nov. 29,2001, available at http://archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=drilling29&date=20011129&query=Ellen+W.+Chu.

[FN187]. Patrick Moulding, Fare or Unfair? The Importance of Mass Transit for America's Poor, 12 Geo. J. on Poverty L. & Pol'y 155, 156 (2005) ("By the end of World War II, more than 70% of Americans who lived in metropolitan areas lived in central cities, but by 1990 that number was only 40% (and less than a third of all Americans)."). See also Mann, supra note 67, at 590-91.

[FN188]. Pub. L. No. 84-627, 70 Stat. 374 (1956) (Current through Pub. L. No. 110-80 (2007) (codified as amended in scattered sections of 23 U.S.C.).

[FN189]. Moulding, supra note 187, at 162.

[FN190]. See Mann, supra note 67, at 634-639.

[FN191]. Id.

[FN192]. Congressional Research Service, Surface Transportation Congestion: Policy and Issues, May 10, 2007, available at opencrs, http:// opencrs.com/document/RL33995.

[FN193]. Pub. L. No. 109-59, 119 Stat. 1144 (2005) (codified as amended in scattered sections of 23 U.S.C.).

[FN194]. Susan J. Binder, The Straight Scoop on SAFETEA-LU, Public Roads, U.S. Dep't of Trans., Fed. Highway Admin., Mar./Apr. 2006, available at http:// www.tfhrc.gov/pubrds/06mar/01.htm.

[FN195]. Id.

[FN196]. Adrienne Zitka, Road Work Ahead. Slow Down. What About Public Transit?: The Future of the Transportation Equity Act for the 21st Century, 3 Rutgers J. L. & Urb. Pol'y 520, 527 (2006).

[FN197]. Id. at 535.

[FN198]. Id. at 526-27.

[FN199]. See generally Binder, supra note 194.

[FN200]. NRDC, Guide to Location Efficient Mortgages, July 2, 2003, http:// www.nrdc.org/cities/smartGrowth/qlem.asp (The Location Efficient Mortgage® project is a joint effort of the Natural Resources Defense Council, the Surface Transportation Policy Project and the Center for Neighborhood Technology.).

[FN201]. Id.

[FN202]. Id.

[FN203]. Transit Coop. Research Program, Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, 48-51 (2004), available at http://www.tcrponline.org/bin/doc-distr.cgi/TCRP_RPT_102.pdf (login required).

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