The Clean-Fuel Vehicle Tax Deduction: Will It Drive an Increase in Fuel Efficiency Standards

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THE CLEAN-FUEL VEHICLE TAX DEDUCTION: WILL IT DRIVE AN INCREASE IN FUEL EFFICIENCY STANDARDS?

I. INTRODUCTION

The United States' dependence on foreign oil sources is currently the highest in history.1 This dependency has harmed the American economy in the past: manipulation of oil supply and prices by the Organization of the Petroleum Exporting Countries (OPEC) during the last three decades has been followed by economic recession in the United States.2 The United States' transportation industry receives ninety-five percent of its energy from oil; accounts for two-thirds of total United States petroleum use; and represents nearly all of the United States' high value petroleum products, such as gasoline.3 Transportation fuel consumption also dominates oil use worldwide.4 And worldwide demand for transportation fuel continues to grow.5

Another concern is the environmental damage caused by automobiles that contribute to ground level ozone, or smog; smog damages human health and is a factor in global warming.6 Over the


2. See id. (discussing dangers of foreign oil dependency). "The vast majority of the world's oil reserves are concentrated in the Middle East (65% to 75%), and controlled by the members of the OPEC oil cartel." Id. "Oil price shocks and price manipulation by the OPEC cartel from 1979 to 1991 cost the U.S. economy about $4 trillion, almost as much as we spent on national defense over the same time period and more than the interest payments on the national debt." Id.

3. See id. (citing extent of U.S. transportation industry's dependence on oil and petroleum products).


5. See id. at 65 (describing growth trends in oil consumption for transportation).


Motor vehicle exhaust includes carbon monoxide (CO), nitrogen oxides (NO subx), volatile organic compounds (VOCs), and particulate matter (PM). NO subx and VOCs are the major contributors to smog, which can

(115)
past one hundred years, the earth’s surface temperature has been rising; and since the 1970s, the earth’s temperatures have risen sharply. Concentrations of carbon dioxide and other greenhouse gases, which contribute to the earth’s warming, have increased substantially since the industrial revolution of the nineteenth century, due largely to human activity. Energy-related activity is the primary source of the United States’ greenhouse gas emissions, accounting for roughly eighty-five percent of the United States’ total man-made carbon-equivalent emissions. According to one account, “[t]wenty percent of all U.S. carbon dioxide emissions and [sixty-one percent] of transportation sector carbon dioxide emissions come from motor gasoline, most of which is used by automobiles and light trucks.”

Domestic oil consumption is a concern for Americans, as they worry about high fuel prices, dependency on foreign oil and the environment. One method for addressing the need for greener transportation that decreases dependency on fuel is to increase the fuel efficiency of vehicles. Environmental groups, such as the Sierra Club, believe that hybrid electric vehicles (HEVs) and fuel cell vehicles are the best solutions to global warming and air pollution.

be hazardous to people with many common breathing disorders, as can PM. In the concentrations found in some traffic “hot spots,” CO can slow peoples’ reflexes and contribute to safety problems.


7. See U.S. DEPARTMENT OF ENERGY & USEPA, Protecting the America’s Environment: Global Warming, at http://www.fueleconomy.gov/feg/climate.html (last visited Mar. 24, 2003) (discussing rising temperatures and global warming). The earth’s temperature “has risen by .6 degrees Celsius over the past 100 years. There was a warming trend from the 1890s to the 1940s. Cooling from the 1940s to the 1970s. And then sharply rising temperatures from the 1970s to today.” Id.

8. See id. (noting recent increase in earth’s temperature).

9. See id. (citing energy-related activity as United States’ primary source of man-made greenhouse gases in 1998).


Fuel cell vehicles, however, are not a viable option in the immediate future. Further, fuel-efficient HEVs come with a price: an HEV is approximately one-third more than the cost of an already mainstream, fuel-efficient, gasoline-powered vehicle. While this extra cost appears minimal to environmentalists and celebrities sporting these new vehicles, it is not obvious whether the average new-vehicle consumer is willing to pay this price. Many consumers, while concerned about the environmental damage caused by their current vehicles, may be deterred from buying an HEV by its overall cost.

One approach to achieving increased fuel efficiency through the use of HEVs is a financial incentive to encourage consumers to purchase these efficient vehicles. The Internal Revenue Service (IRS) has implemented a tax deduction to promote this behavior among consumers. This deduction provides a one-time benefit to consumers who purchase one of three qualified hybrid electric vehicles.

Automobile producers view tax incentives as crucial to the growth of HEVs. New-vehicle consumers also cite a federal tax incentive as one of the main factors in deciding to purchase an HEV. The Sierra Club views the tax deduction as one of many other incentives for encouraging the purchase of HEVs.


15. For further discussion of fuel cell vehicles, see infra notes 56-76 and accompanying text.


17. See id. (describing improved consumer market for HEVs).

18. See id. (discussing HEV overall economical value).

19. For discussion of the automobile industry's use of incentives as a tool for increasing vehicles sales, see infra note 131 and accompanying text.


23. See J.D. POWER AND ASSOCIATES, supra note 12 (citing tax incentive as one of main reasons consumers consider purchasing HEVs).
policies necessary to achieve greater fuel efficiency.\textsuperscript{24} Prior to adoption of the deduction, it was estimated that annual HEV sales in the United States would total five hundred thousand HEVs after 2005.\textsuperscript{25} Despite support from consumers, manufacturers and environmentalists, it is unclear whether the Clean Fuel Vehicle Tax Deduction will actually increase the number of HEVs on the road and, in turn, be an effective tool for decreasing our nation’s reliance on oil and improving the quality of our environment.\textsuperscript{26}

This Comment examines the Clean-Fuel Vehicle Tax Deduction and the likelihood that it will induce individual taxpayers to purchase an HEV, instead of a conventional gasoline-powered vehicle. Section II addresses technological advances in vehicle fuel efficiency, the benefits of each type of vehicle and their feasibility in today’s automobile market.\textsuperscript{27} In particular, Section II examines electric vehicles, alternative fuel vehicles, fuel cell vehicles and HEVs.\textsuperscript{28} Section III discusses the history and the effectiveness of federal and state efforts to control air pollution.\textsuperscript{29} Section IV addresses the Clean-Fuel Vehicle Tax Deduction, a recent approach taken by the federal government to address air pollution caused by individual drivers.\textsuperscript{30} Section IV also addresses the potential impact of the tax deduction on the individual taxpayer’s decision whether to purchase an HEV.\textsuperscript{31} Finally, Section V evaluates the future of HEVs in light of the Clean-Fuel Tax Deduction and discusses current issues surrounding oil consumption.\textsuperscript{32}

\textsuperscript{24} See Sierra Club, 12 Key Benchmarks for Achieving a Sound Energy Plan, at http://www.sierraclub.org/energy/bush_plan/12pointsofenergy.PDF (last visited Mar. 5, 2003) (stating tax credit and increased CAFE Standards necessary to achieve improved fuel efficiency). For further discussion of CAFE Standards, see infra notes 96-104 and accompanying text.


\textsuperscript{26} For further discussion of the Clean-Fuel Vehicle Tax Deduction and its potential effectiveness in promoting HEV purchases, see infra notes 118-78 and accompanying text.

\textsuperscript{27} For further discussion of electric vehicles, alternative fuel vehicles, fuel cell vehicles, and HEVs, see infra notes 36-87 and accompanying text.

\textsuperscript{28} Id.

\textsuperscript{29} For further discussion of previous laws adopted to address air pollution concerns, see infra notes 90-113 and accompanying text.

\textsuperscript{30} For further discussion of the Clean-Fuel Vehicle Tax Deduction, see infra notes 132-49 and accompanying text.

\textsuperscript{31} For further discussion of the Clean-Fuel Vehicle Tax Deduction’s potential influence on individual taxpayers’ vehicle purchasing decisions, see infra notes 118-31, 150-87, and accompanying text.

\textsuperscript{32} For further discussion of the future of HEVs, see infra notes 188-199 and accompanying text.
II. TECHNOLOGICAL ADVANCES FOR IMPROVED AIR QUALITY AND FUEL DEPENDENCY

Technological advances have produced some low-emission and zero-emission vehicles to improve our air quality problems. While appearing to solve an enormous environmental concern, low-emission and zero-emission vehicles have many drawbacks that make their mainstream use in the foreseeable future unlikely. These vehicles are not necessarily practical at this time and the vehicle-driving public will simply not embrace them.

A. Electric Vehicles

As of March 2002, more than 4,000 electric vehicles (EVs) occupied the United States' roads and highways. EVs are zero-emissions vehicles that have low costs, are extremely quiet and provide a smooth ride. EVs meet the zero-emissions standards adopted in many northeastern states.

Unfortunately, EVs have many undesirable traits. For example, electric vehicles have "limited range (less than 100 miles, depending on outside temperatures and driving conditions), limited charging facilities, short battery life, excess weight, less power than a gasoline engine and a high purchase price." An EV battery requires four to fourteen hours to charge, depending on the battery...
type and voltage. EVs also present safety concerns. Consumers resist this cost and inconvenience.

Another concern regarding electric vehicles is that they require increased power plant emissions to satisfy the increased power production associated with the vehicles. "EVs do not produce tailpipe emission, but generators producing the electricity used to charge EV batteries do emit pollutants." When electric car emissions and associated power plant emissions are compared with current vehicle emissions and associated petroleum refinery emissions, the power plant emissions for the use of electric cars has been cited as reason alone to abandon the idea of their use, without even considering the emissions saved from decreased gasoline use. Despite conflicting views on the environmental value of electric vehicles, a tax credit similar to the tax deduction for qualified clean-fuel vehicles promotes their use.

41. See CLEAN ALTERNATIVE Fuels, supra note 36 (discussing EV maintenance requirements). Maintenance benefits of EVs include lack of tune-ups and oil changes, timing belts, water pumps, radiators, fuel injectors, and tailpipe replacements associated with gasoline-powered vehicles. Id.

42. See David Bennett, Zero Emission Vehicles: The Air Pollution Messiah? Northeastern States Mandate ZEVs without Considering the Alternatives or Consequences, 20 WM. & MARY ENVTL. L. & POL'Y REV. 333, 357-58 (Summer 1996) (discussing consumer concerns about EVs). Despite safety concerns, EPA notes that "EVs must meet the same safety standards as conventional vehicles. In some instances, research shows that EVs can be safer than gasoline-powered vehicles." CLEAN ALTERNATIVE Fuels, supra note 36, at 2.

43. See Bennett, supra note 42, at 357-58 (discussing inconvenience of EVs).

44. See David M. Dreisen, Sustainable Development and Air Quality: The Need to Replace Basic Technologies with Cleaner Alternatives, 32 ENVTL. L. REP. 10,277, at 11 (Mar. 2002) (noting critics "of the electrical vehicle idea point out that electric vehicles involve increased power production, which implies greater emissions from power plants").

45. See CLEAN ALTERNATIVE Fuels, supra note 36, at 1 (noting that while EVs themselves release no pollutants into atmosphere, pollutants are still produced through electricity generation). EV electricity is produced in power plants. Id.

46. See Dreisen, supra note 44, at 11-12 (discussing cost-benefit analysis of emissions from EVs compared to increased power plant emissions created by increased demand for electricity). In contrast, hybrid vehicles "offer very fine environmental performance, with less power plant emissions and more petroleum refinery emissions than electric cars." Id. at 12. For further discussion of the environmental benefits associated with hybrid electric vehicles, see infra notes 78-88 and accompanying text.

47. See 26 U.S.C. § 30 (2003) (providing one-time tax credit to individual taxpayers during taxable year of EV purchase). Tax exemptions, tax credits, and reduced registration and license fees are provided for electric vehicles in some states. See CLEAN ALTERNATIVE Fuels, supra note 36, at 2.
B. Alternative Fuels

Alternative fuels include ethanol, methanol, liquefied petroleum gas and compressed natural gas.48 These fuels are cleaner burning than gasoline.49 While gasoline emits compound mixtures leading to ground-level ozone formation, "[alternative] fuels have a number of inherent properties that make them cleaner than conventional gasoline."50 Vehicles using these fuels include those operating solely on alternative fuels or in combination with gasoline.51

While these fuels burn cleaner and are less expensive than gasoline, they also have drawbacks.52 For example, they require larger storage tanks.53 Also, an adequate distribution system does not currently exist.54 In order for vehicles using alternative fuels to be practical, both consumer acceptance of the vehicles and fuels and a government and business commitment to ensuring availability throughout the country are needed.55

C. Fuel Cell Vehicles

Hydrogen fuel cell technology "is the power source of the future: an innovation that will reduce U.S. consumers' reliance on overseas oil and replace the polluting internal combustion engine with a nonpolluting, battery-like fuel cell."56 Fuel cells use hydrogen for fuel, as opposed to conventional methods of burning oil, coal, or gas, and can be used for commercial and residential power,
as well as vehicle engines. While fuel cells are not currently available to consumers, they have been used in spacecraft for a long time. Currently, the United States Army is collaborating with General Motors Corporation (GM) to replace its truck fleet with hybrid trucks, which combine fuel cells with diesel-engine electric power. The United States military’s ability to fund new fuel cell technology and test it in harsh conditions may push fuel cell development and place hydrogen-powered vehicles at car dealerships sooner than anticipated. GM has promised to have fuel cell vehicles on the market by 2010 if it can be supported by a fuel supply system at that time.

Fuel cells act like batteries but they do not lose power or require recharging. A fuel cell generates power through electricity produced by a chemical reaction between hydrogen and oxygen. The electricity produced by this reaction provides power to the electric motors that propel the vehicle. The only byproduct from this reaction is water. “Fuel cells are an alternative to batteries and can be used as the sole power source in a hybrid.”

Fuel cell vehicles operate without harmful vehicle emissions and without the same increased power plant emissions associated with EVs. Although power plant emissions may not increase

57. See id. (discussing fuel cell utility).
60. See id. (predicting GM/U.S. Army collaboration to hasten fuel cell availability to consumers).
61. See John O’Dell, GM to Produce Hybrid SUVs, L.A. TIMES, Jan. 6, 2003 (citing GM’s plans for fuel cell technology development), available at LEXIS, News Group File.
62. See Debra L. Hart-Munchel, Hybrid Cars: How They Can Reduce American Air Pollution and Oil Consumption, but Why They Are Not Replacing Traditional Gas Guzzling Cars and Trucks Just Yet, 10 PENN ST. ENVT'L. L. REV. 35, 52 (Fall 2001) (discussing fuel cell function). A fuel cell “continues to produce energy in the form of electricity and heat as long as fuel is supplied.” Id.
63. See Heckman, supra note 37, at 276 (discussing operation of fuel cell vehicles). “A fuel cell system can use hydrogen from natural gas, methanol, and even gasoline.” Hart-Munchel, supra note 62, at 52.
65. See id. (identifying single fuel cell vehicle byproduct).
66. See id. (discussing operation of fuel cell vehicles).
67. See DEPARTMENT OF ENERGY, Why Are Hydrogen & Fuel Cells Important?, at http://www.eere.energy.gov/hydrogenandfuelcells/hydrogen/why.html (last up-
through the production of electrical energy necessary to produce hydrogen, some pollution will result.\textsuperscript{68} The Department of Energy (DOE) predicts that if fuel cell vehicles replace ten percent of American automobiles, one million tons of regulated air pollutants and sixty million tons of carbon dioxide would be eliminated per year.\textsuperscript{69} Additionally, DOE projects that a ten percent replacement with fuel cell technology would reduce daily oil imports by thirteen percent.\textsuperscript{70}

While fuel cells appear to address concerns with air pollutants emitted from automobiles, as well as the United States' dependency on foreign oil, they "are costly and large, and there is currently no infrastructure for producing, storing, or distributing hydrogen."\textsuperscript{71} Extracting hydrogen from fossil fuels is expensive and poses a significant obstacle to fuel cell use.\textsuperscript{72} Reductions in fuel cell size and cost have been made possible in recent years by automobile producers through testing and development, but storage and distribution systems remain problematic.\textsuperscript{73} While commercially viable vehicles may be available within the next two decades, automakers fear that necessary nationwide processing, delivery, and fueling systems will not be available.\textsuperscript{74} Establishing a nationwide hydrogen refueling system may cost an estimated five hundred billion dollars.\textsuperscript{75} Due to
these obstacles, the fuel cell vehicle cannot immediately address pollution and oil dependency concerns; environmentalists would prefer to focus on HEV development today and fuel cell development in the future.76

D. Qualified Hybrid Electric Vehicles

According to the Environmental Protection Agency (EPA) and DOE, the Honda Insight and Toyota Prius HEVs are the most fuel-efficient and cleanest vehicles available for the year 2003.77 HEVs offer reduced emission and higher fuel efficiency than traditional, gasoline-powered cars by combining an electric motor with a gasoline-powered, internal combustion engine.78 The HEV engine is powered at any given time by electricity and gasoline, or by electricity alone.79 "A hybrid's battery is recharged by the internal combustion engine and by collecting energy when the car brakes. The battery powers an electric motor that supplements, or takes over for, the gasoline-powered engine."80 The gas engine shuts off when the car stops.81

The HEV battery has an environmentally kind feature: it is recyclable.82 Additionally, the battery materials are valuable, so automobile and battery manufacturers have an incentive to reuse them.83 The length of time an HEV battery will last is unknown.84 These rechargeable batteries are currently covered under warran-

79. See Bennett, supra note 42, at 352 (discussing attributes of HEVs).
81. See id. (discussing HEV mechanical functions).
82. See Kathleen Pender, Hybrids Picking Up Steam, S.F. CHRONICLE, Mar. 6, 2003, at B1 (discussing HEV battery disposal).
83. See id. (discussing scrap value of nickel cadmium batteries used in HEVs).
84. See id. (noting life of HEV batteries are not known at this time). Industry representatives have different predictions regarding the life of an HEV battery, ranging from a few years to the life of the vehicle. Id. "Hybrids have been on the road for only a few years, and it will be at least a few more before we know how long the batteries will really last." Id.
ties ranging from eighty thousand miles to one hundred thousand miles, or eight years.85

The complexity of the HEV engine increases the sticker price and repair costs compared to traditional motor vehicles.86 Despite the increased costs of an HEV, however, Americans are warming up to the idea of purchasing these vehicles based on concerns of fuel prices, the United States’ dependency on foreign oil, concern over the environment, and the new Federal Clean-Fuel Vehicle Tax Deduction.87

III. GOVERNMENT EFFORTS TO REDUCE AIR POLLUTION

Since the 1950s, the federal government, as well as many state governments, has made efforts to improve our country’s air quality.88 To date, the California Low-Emission Vehicle Program (CLEV) and the Amendments to the Clean Air Act (CAA) are the most successful of these programs.89

A. The Clean Air Act

Congress originally passed the Clean Air Act of 1970 to allow the federal government to play an active role in controlling air pollution, while permitting the states to maintain their power over air pollution control.90 CAA grew out of public concern over air pollution and health problems possibly linked to vehicle emissions.91 CAA takes two approaches in regulating automobile emissions: (1) creating emissions standards for new vehicles set by the EPA, and (2) allowing states to create and implement plans to meet National

85. See id. (citing manufacturer warranties for rechargeable HEV batteries). Toyota’s battery warranty is eight years or one hundred thousand miles. Id. Honda’s battery warranty is eight years or eighty thousand miles. Id. The current estimated cost of replacing an HEV battery no longer under warranty is three thousand dollars. Id.

86. See Heckman, supra note 37, at 275 (comparing high cost of HEVs to cost of traditional cars).


88. See generally Bennett, supra note 42, at 335 (reviewing regulatory history of automobile emission control).

89. See Heckman, supra note 37, at 269 (discussing attempts to regulate automobile emissions in U.S.).

90. See Bennett, supra note 42, at 338 (discussing purpose of CAA of 1970). Previous federal efforts to control air pollution include the Air Pollution Control Act of 1955, the Motor Vehicle Air Pollution Control Act of 1965, and the Air Quality Act of 1967. See generally id. at 335-37.

Ambient Air Quality Standards (NAAQS) set by the federal government. Under the first approach, states are not allowed to set their own new vehicle emissions standards unless approved by EPA. The second approach requires attainment of a State Implementation Plan (SIP) and EPA approval of NAAQS maintenance; each state, however, bears the burden of maintaining its own air quality. In 1990, Congress amended the CAA to include the federal Clean Fuel Vehicle (CFV) Program, which requires automobiles to use clean alternative fuels and to burn their fuels in a cleaner manner.

B. Corporate Average Fuel Economy Standards

Congress adopted the Energy Policy and Conservation Act (EPCA) in 1975. The Energy Policy and Conservation Act established the Corporate Average Fuel Economy (CAFE) Standards to reduce domestic dependency on foreign oil sources and to promote energy conservation. Under CAFE Standards, automobile manufacturers must "achieve minimum fuel efficiency standards for their individual passenger vehicle fleets as wholes . . . for each model year." While automobile efficiency has improved under

92. See id. at 39-41 (describing federal approach to air quality management under 1970 CAA). "Ambient air is the outdoor air that is used by the general public." Id. at 40.

93. See id. at 39 (discussing EPA control of new vehicle emissions standards under CAA). EPA "may waive this prohibition if the state has adopted standards that are at least as protective of public health and welfare as the applicable federal standards." Id. California adopted vehicle emissions standards in 1966, exempting it from federal standards, and maintains its own emissions standards subject to EPA approval. Bennett, supra note 42, at 342. For further discussion of emissions standards under Cal-LEV, see infra notes 105-13 and accompanying text.

94. See Hart-Munchel, supra note 62, at 40-41 (discussing administration of NAAQS). If an SIP does not meet set requirements, EPA may create its own plan for that state's air quality management. Id.

95. See Heckman, supra note 37, at 271 (discussing 1990 CAA Amendments). CFV was "modeled in large part on the Cal-LEV Program . . . The CFV Program focuses on clean fuel vehicles that meet either federal standards under the CAA Amendments or California emission standards made applicable by waiver of federal preemption." Id. For further discussion of Cal-LEV, see infra notes 105-13 and accompanying text.


97. See id. (citing source and purpose of CAFE Standards).

98. J. Yost Conner, Jr., Comment, Revisiting CAFE: Market Incentives to Greater Automobile Efficiency, 16 VA. ENVTL. L.J. 429, 434 (Spring 1997) (discussing CAFE requirements). Light trucks, minivans, and SUVs are required to meet separate standards. Smart, supra note 96, at 162. "This distinction was originally drawn to accommodate the fact that light trucks were primarily used for commercial and
the CAFE Standards, some argue that much of this success is attributable to the market, and not increased standards. 99 CAFE Standards are focused on automobile manufacturers, who respond more to consumer demand. 100 Additionally, CAFE Standards do not create incentives for consumers to purchase efficient automobiles. 101

Environmental organizations, such as the Sierra Club, are arguing for increased CAFE Standards. 102 The Sierra Club predicts that an increase in CAFE Standards for new cars, SUVs, and other light trucks to forty miles per gallon over the next ten years, in conjunction with an effective tax deduction for consumers, would save "[three] million barrels of oil per day, or [fifty] billion barrels of oil over the next fifty years, and would save consumers billions of dollars per year." 103 In 2002, the United States Senate rejected legislation that would require automobile manufacturers to increase their fleet averages roughly fifty percent to thirty-six miles per gallon. 104

C. California Low-Emission Vehicle Program

Under CAA, cars sold in the United States must meet either federal or California standards. 105 Under the Cal-LEV Program, passenger cars and light-sized and medium-sized trucks must meet strict standards, which are being phased in over the next ten

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99. See generally Conner, supra note 98 (finding CAFE standards ineffective and results greatly due to outside forces).

100. See generally id. at 432-40 (discussing focus and operation of CAFE laws).

101. See id. at 439-40 (criticizing CAFE Standards for creating financial obstacles for consumers to purchase fuel-efficient cars).


103. Sierra Club Benchmarks, supra note 102 (citing projected impact of increased CAFE Standards when combined with effective tax deduction for HEVs).

104. See Squatriglia, supra note 102 (noting U.S. Senate's rejection of legislation to increase fuel efficiency standards).

105. See Bennett, supra note 42, at 342 (discussing California's exemption from federal automobile standards under CAA). By allowing manufacturers to qualify as either a "federal car" or a "California car," EPA avoids burdening the automobile industry "by prohibiting any states from creating a vehicle standard different from the federal or California emission standards." Id.
The CAL-LEV standards have four classifications based on vehicle weight: (1) transitional low-emission vehicles, (2) low-emission vehicles, (3) ultra-low emission vehicles, and (4) zero-emission vehicles. California's plan requires automobile manufacturers to have a combination of LEVs that meet annual average fleet emissions standards, while allowing the manufacturers flexibility in meeting the requirement.

The Cal-LEV standards have one mandatory requirement: a sales quota of zero-emissions vehicles, or purely electric vehicles, for the purposes of fleet averaging. In March 2003, however, the California Air Resources Board (CARB) proposed new rules which would remove the requirement. CARB released a report encouraging fuel cell vehicles, and relying on HEVs, to improve California air quality. While automakers resisted electric vehicles from the beginning, fuel cell vehicles and HEVs are not receiving the same opposition. The proposed rules require automakers (1) to produce two hundred fifty fuel cell vehicles by 2008, (2) have twenty-two thousand HEVs on the road by 2005, and (3) increase the number of HEVs on the road to 117,500 by 2009.

IV. A NEW APPROACH: TAX DEDUCTION FOR HEVs

HEVs are currently the most feasible and effective option for reducing environmental damage caused by oil consumption. While the actual impact of HEVs on carbon dioxide emissions remains to be seen, some project great benefits to air quality.
Before HEV technology can benefit the environment, however, HEVs must be purchased and replace the current, inefficient vehicles on the road. The Clean-Fuel Vehicle Tax Deduction appears to be the best available approach for promoting the purchase of HEVs.

A. Tax Code's Effect on Individual Behavior

The current tax code uses policy-driven tax incentive provisions to induce taxpayers to alter their individual behavior to conform with Congress's preferences, based on political or social reasons. Whether this approach is effective for accomplishing the goal of changing behavior has been the subject of extensive debate. Some suggest that the type of tax incentive provided is determinative of whether the incentive will be successful. For example, whether the tax incentive is a one-time or periodic subsidy may influence a taxpayer's decision whether to modify behavior in a socially desirable way. The taxpayer may feel more comfortable engaging in activity where a one-time tax credit is available, rather than a periodic tax credit, because the taxpayer fears a later change in the policy on which she previously relied.

A market-based approach is frequently applied when regulating energy usage. Tax incentives are often used to promote environmentally conscious energy use. While this approach has been cited as an ineffective method of changing corporate behavior, tax incentives are arguably useful when given to individual consum-

116. See O'Dell, GM to Produce Hybrid SUVs, supra note 61 (quoting GM's vice president for research, development and planning as saying "[n]one of these new technologies matter if they don't sell in high volumes").

117. For further discussion of the Clean-Fuel Vehicle Tax Deduction and its likely ability to promote HEV purchases, see infra notes 132-87 and accompanying text.

118. See generally Daniel S. Goldberg, Tax Subsidies: One-Time vs. Periodic: An Economic Analysis of the Tax Policy Alternatives, 49 TAX L. REV. 305 (Winter 1994) (discussing current use of tax incentives as political or social policy).

119. See generally id. (discussing appropriate framework for tax policy as incentive).

120. See generally id. (discussing merits of one-time tax credits over periodic tax credits).

121. See id. at 310 (citing taxpayer concerns with various types of tax credits).

122. See id. (noting benefit of one-time tax credits to taxpayer, as opposed to periodic tax credits).


124. See id. (discussing purpose of tax incentives related to energy use).
While the actual effect of tax incentives has been a source of debate in the tax world, automakers know that one-time incentives are a useful tool in encouraging consumers to purchase certain automobiles. While the overall price of a vehicle is the most important factor for consumers purchasing new vehicles. As such, manufacturer rebates have “[proven] to be an effective tool in influencing the decision-making process of new vehicle buyers.” During most of 2002, GM led the United States automobile industry in incentives. This “strategy allowed it to increase profits and [United States] market share even as it cut prices.”

B. Clean-Fuel Vehicle Tax Deduction

On March 9, 2002, Congress adopted the tax deduction for clean-fuel vehicles and certain refueling property (Clean-Fuel Vehicle Deduction). This tax deduction “allows [individuals] to claim a deduction for the incremental cost of permitting a motor vehicle to be propelled by a clean-burning fuel.”

125. See id. at 179 (assessing effectiveness of tax incentives for corporations and individuals).

126. Id.


129. See id. (crediting manufacturer-sponsored rebates and low-interest finance rates with strong automobile sales).

130. See GM Sticks By Incentives, supra note 127 (noting GM led U.S. industry in incentives for much of 2002).

131. See id. (citing GM’s use of incentives in the decision-making process for new vehicle buyers).

132. 26 U.S.C. § 179A (2002). Refueling properties are also considered under this section for the deduction, but will not be discussed in this Comment. Id.

The Clean-Fuel Vehicle Deduction applies to qualified clean-fuel vehicles, or hybrid electric vehicles (HEVs). A qualified clean-fuel vehicle property, as defined by the Internal Revenue Code (IRC), is (1) purchased by the taxpayer for use other than resale, (2) originally owned by the taxpayer, and (3) meets Federal or State emissions standards. While purchasing an original equipment manufacturer's vehicle is the most conventional method for acquiring a qualified clean-fuel vehicle, retrofit parts and components may also qualify if they meet certain environmental standards. Electric cars are not included in the definition of a qualified clean-fuel vehicle. A tax deduction is provided for electric vehicles elsewhere in the code.

The maximum deduction that may be taken by an individual who purchases a qualified clean-fuel vehicle is two thousand dollars in the year of purchase. As the deduction is an above-the-line write-off, it acts as a reduction of income subject to taxation on an individual federal tax return. Additionally, the deduction can be taken regardless of whether the individual taxpayer itemizes deduc-

135. See 26 U.S.C. § 179A(c)(1)-(2) (defining "qualified clean-fuel vehicle property"). Section 179A defines "qualified clean-fuel vehicle property" as "property which is acquired for use by the taxpayer and not for resale, the original use of which commences with the taxpayer, with respect to which the environmental standards . . . are met . . . ." 26 U.S.C. § 179A(c)(1). Environmental standards for qualified clean-fuel vehicles require "the motor vehicle of which it is a part [to meet] any applicable Federal or State emissions standards with respect to each fuel by which such vehicle is designed to be propelled . . . ." 26 U.S.C. § 179A(c)(2)(A).
136. See 26 U.S.C. § 179A(c)(1)(A)-(2)(B) (explaining requirements for retrofit parts and components to meet environmental standards for tax deduction). Retrofit parts and components installed on a motor vehicle, that allow an engine to be propelled by a clean-burning fuel and which satisfy federal and state emissions-related certification, testing, and warranty requirements, qualify as a clean-fuel vehicle. Id.
137. See 26 U.S.C. § 179A(c)(1)(B)(3) (excluding qualified electric vehicles from definition of qualified clean-fuel vehicle property). Qualified electric vehicles are allowed a tax deduction under IRC § 30. 26 U.S.C. § 30. For further discussion of electric vehicles, see supra notes 36-47 and accompanying text.
While the deduction must be taken during the vehicle’s year of purchase, those who purchased qualified vehicles during the two years preceding the 2002 tax year may still receive a benefit by filing an amended return.

The Clean-Fuel Vehicle Deduction is only temporary. The deduction will be reduced twenty-five percent for clean-fuel vehicles placed into service in 2004, fifty percent in 2005, and seventy-five percent in 2006. The deduction will terminate for vehicles placed in service after the 2006 calendar year. The federal government, however, is currently considering an extension of this termination date and a possible increase in the deduction amount.

The individual taxpayer must purchase the qualified clean-fuel vehicle for a purpose other than resale to take the deduction. To ensure that taxpayers meet this qualification, the IRC requires that owners not sell the HEV during the first three years of ownership. If sold before this date, the individual taxpayer must recapture the deduction by increasing her income by her previously claimed deduction, at a graduated rate, during the taxable year in which the vehicle is sold.

141. See id. (discussing logistics of clean-fuel vehicle deduction). Prior to adoption of the Clean-Fuel Vehicle Tax Deduction, proposals for a hybrid tax deduction were criticized for many reasons, including the inability of taxpayers who did not qualify for itemized deductions to take advantage of the benefit. See Conner, supra note 98, at 443-47.


144. See id. (discussing phase out limits on deductions per year).


147. See 26 U.S.C. § 179A(c)(1)-(2) (requiring clean fuel vehicle to be “property which is acquired for use by the taxpayer and not for resale”).

148. See Kristof, supra note 140 (discussing recapture provision of deduction).

149. See id. (discussing deduction recapture under IRC § 179A). If the vehicle is sold in the first year of ownership, the taxpayer’s income for that taxable year will increase by the amount of the deduction in order to recapture that deduction. Id. If the vehicle is sold in the third year of ownership, the taxpayer’s income will only increase by one-third of the deduction. Id.
C. Response to Clean-Fuel Vehicle Tax Deduction

1. Automakers Plan to Enter HEV Market

Currently, the IRS has only identified three vehicles as qualified clean-fuel vehicles for purposes of the Clean-Fuel Vehicle Tax Deduction. These include the Honda Civic for Model Year (MY) 2003, the Honda Insight (MY 2000-02), and the Toyota Prius (MY 2001-03). Each of these vehicles is an HEV.

Since the adoption of the Clean-Fuel Vehicle Tax Deduction, other automakers have stepped up to compete for HEV business. Automakers such as Ford, GM, and the Japanese automakers missed out on the minivan wave of the 1980s. GM was slow to catch on to the SUV and truck trends of the mid-1990s. Domestic automakers are behind in the race again, as Toyota and Honda have been marketing HEVs in the United States for two years. GM is gaining ground with plans to release 2004 hybrid models of the GMC Sierra and the Chevrolet Silverado by the end of 2003. Ford and DaimlerChrysler plan to release HEV models of the Escape SUV and Dodge Ram pickup, respectively, in 2005. To stay competitive, Toyota is likely to release the first luxury HEV and SUV combination, the Lexus RX 330, by the end of 2004.

151. See id. (discussing availability of tax deduction to individual taxpayers who own HEVs).
152. See id. (classifying currently qualified clean-fuel vehicles as HEVs).
153. See generally Hakim, S.U.V. From Toyota in 2004 to Use Hybrid Technology, supra note 22 (discussing Toyota’s plans to produce hybrid SUV); see generally O’Dell, GM to Produce Hybrid SUVs, supra note 61 (citing GM’s announcement to produce hybrid trucks and SUVs); see generally Hakim, Hybrid Cars Are Catching On, supra note 80 (discussing increased HEV interest in automakers and consumers).
155. See id. (discussing ability of automakers to balance product lines with consumer demand).
156. See O’Dell, GM to Produce Hybrid SUVs, supra note 61 (noting GM’s late entry into HEV market).
157. See id. (discussing GM’s plans to enter HEV market).
158. See id. (citing Ford and DaimlerChrysler’s intent to produce and sell HEVs).
159. See Hakim, Hybrid Cars Are Catching On, supra note 80 (citing Toyota’s announcement to sell hybrid SUV).
2. Consumer Interest Increases

Consumer response to both HEVs and the Clean-Fuel Vehicle Tax Deduction is improving.\(^{160}\) This appears to be based less on environmental concerns and more on economic concerns and concerns prior to the war with Iraq.\(^{161}\) Dealers are seeing an increase in HEV inquiries, especially with rising gas prices.\(^{162}\) Purchases have not increased as a result of high gasoline prices, however, which is likely due to the current state of the economy.\(^{163}\)

Despite a poor economy, HEV demand has increased since the implementation of the Clean-Fuel Vehicle Tax Deduction.\(^{164}\) As of March 2003, Toyota and Honda HEV sales increased fifty percent from 2002.\(^{165}\) While Toyota and Honda had combined HEV sales of 36,000 HEVs in 2002, the two automakers predict combined sales of at least 45,000 HEVs in 2003.\(^{166}\) Honda and Toyota also saw sales increase from January to February 2003.\(^{167}\) It is estimated, however, that gas prices must remain at high levels to cause an increase in HEV sales.\(^{168}\)

The option to rent first is available to consumers who are unsure about HEVs and prefer to test drive before buying.\(^{169}\) Many car rental companies are offering HEVs and other alternative vehicles as options for those on vacation, business travel, or for those

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\(^{160}\) See Pender, supra note 16 (noting increase in HEV interest).

\(^{161}\) See id. (discussing motivation of consumers considering HEVs).

\(^{162}\) See id. (citing factors driving consumer interest in HEVs).

\(^{163}\) See id. (noting HEV sales have not increased despite consumer interest).


\(^{165}\) See id. (citing sale increases for Toyota Prius, Honda Civic Hybrid and Honda Insight in 2003).

\(^{166}\) See id. (stating Toyota and Honda 2003 sales predictions). "Toyota has said it may sell as many as 21,000 Prius sedans in 2003, compared with 20,119 [in 2002]." Id. Honda expects to sell up to 24,000 Civic Hybrids in 2003, of which less than 15,000 sold in 2002. Id. Honda does not expect Insight sales to increase in 2003. Id.

\(^{167}\) See Pender, supra note 82 (noting sale increases for Honda and Toyota in 2003). In February 2003, Honda sold 168 Insights, while only selling 111 Insights in January 2003. Id. Honda Civic Hybrids sales increased 35 percent from January to February 2003. Id. Toyota Prius sales increased 33 percent from January to February 2003. Id.

\(^{168}\) See supra note 164 (citing J.D. Power and Associates, which stated that "[retail] gasoline prices, which remain at record highs in California and near a two-year high elsewhere in the country, might have to stay at current levels or higher for at least four more months before larger numbers of consumers would consider buying such [HEVs]").

\(^{169}\) See Amy Cortese, Renting Cars for a Cleaner World, N.Y. TIMES, Jan. 24, 2003 at F9 (discussing availability of rental HEVs in certain markets), available at LEXIS, News Group File.
who want to "try-before-you-buy." These options, however, are limited at this time.171

Consumer ratings of HEVs are low when compared to combustion engines considered to be fuel-efficient.172 Additionally, it is estimated that HEVs will cost more to own over the life of a vehicle than similar gas engines.173 Even with the tax deduction, it will take several years of high gasoline prices to equalize the cost of an HEV with a traditional, gas-powered automobile.174 For example, if a vehicle owner achieves thirty-five miles per gallon on a currently owned vehicle, and upgrades to an HEV achieving fifty miles per gallon, the taxpayer will likely save roughly seven hundred dollars over the course of four years.175 The Clean-Fuel Vehicle Tax Deduction could save taxpayers in the highest tax bracket $772.176 The two figures combined do not offset the increased initial purchase price of an HEV, which is roughly $6000 for a Honda Civic Hybrid.177 Unfortunately, lack of ability to recover initial HEV costs through fuel savings may prevent consumers from justifying the expense.178

170. See id. (discussing availability of rental HEVs in certain markets).
171. See generally id. (discussing availability of rental HEVs in certain markets).
172. See Pender, supra note 16 (citing J.D. Power and Associates study on consumer satisfaction with gas mileage).
173. See id. (comparing cost of HEVs and gas engine vehicles).
174. See id. (noting tax deduction may not close gap between cost of HEV and conventional cars, even when combined with high gasoline prices).
175. See U.S. DEPT. OF ENERGY & USEPA, FUEL ECONOMY GUIDE: FUEL COST CALCULATOR, at http://www.fueleconomy.gov/feg/savemoney.shtml (last visited Mar. 23, 2003) (comparing costs of vehicles based on miles per gallon, miles driven annually, average cost of fuel, and number of years vehicle is owned). Where Car 1 achieves 35 mpg and Car 2 achieves 50 mpg, both are driven roughly 12,000 miles per year, and fuel is priced at an average of $1.70 per gallon, a vehicle owner would only save $699 over the course of 4 years driving Car 2. Id. If Car 1 achieved 25 mpg and Car 2 achieved 40 mpg, which is the predicted mpg on the promised hybrid SUVs, a vehicle owner would save $1224 over the course of 4 years, assuming fuel costs and miles driven remain the same. Id.
178. See Hybrid Vehicle Demand Expected to Exceed Supply, supra note 164 (citing AutoPacific Inc. analyst regarding suppression of consumer interest in HEVs).
3. Some State Tax Deductions Available

In addition to the Clean-Fuel Vehicle Tax Deduction offered by the federal government, "[some] states offer incentives, rebates, or grant programs to encourage people to purchase or lease hybrid and low or zero emission vehicles." \(^{179}\) Colorado, for example, offers a one-time tax credit for HEVs purchased in 2001 or later.\(^ {180}\) Maryland offers a fifteen hundred dollar tax credit.\(^ {181}\) States are also adding other incentives, such as permitted use of the carpool lane by solo HEV drivers.\(^ {182}\)

Though the Clean-Fuel Vehicle Tax Deduction helps consumers to be environmentally conscious when purchasing a vehicle, some consumers are being adversely affected by a tax increase for owning an HEV.\(^ {183}\) In Oregon, registering an HEV costs twice as much as registering an average gas engine vehicle.\(^ {184}\) The purpose of this additional cost is to compensate for tax dollars not spent at gas pumps, which fund Oregon's highway systems.\(^ {185}\) Oregon is concerned that HEV owners will not be paying their fair share of the highway expenses.\(^ {186}\) Despite this concern, Oregon still supports HEV use and is offering its own tax deduction for the purchase of an HEV.\(^ {187}\)


\(^{180}\) See Department of Energy Tax Incentives Fact Sheet, at http://www.ott.doe.gov/hev/ (last visited Jan. 2003) (discussing Colorado's alternative fuel vehicle credit). Colorado's tax credit is available for the Honda Civic Hybrid, Honda Insight, and Toyota Prius, as well as alternative fuel vehicles. Id. The tax credit varies according to the vehicle purchased, ranging from $1815 to $3929. Id. "If the allowable credit exceeds your state tax liability, you may carry the excess forward for as long as five years." Id.

\(^{181}\) See Sandra Block, Hybrid Vehicles Are Good for Environment and Your Wallet, USA Today, June 24, 2002, at 3B (noting state efforts to increase HEV use through tax incentives).

\(^{182}\) See id. (noting state efforts to increase HEV use through driving privileges).

\(^{183}\) See Pender, supra note 82 (citing taxpayer frustration with increased registration costs of HEVs, compared with gas engines, in Oregon).

\(^{184}\) See id. (noting Oregon's increased registration fees for HEVs). Oregon charges thirty dollars per year to register an HEV, while charging only fifteen dollars per year for an average gas-engine automobile. Id.

\(^{185}\) See id. (citing purpose of Oregon's increased registration fees for HEVs).

\(^{186}\) See id. (noting Oregon's concern that HEV owners and combustion engine owners should contribute equally to cost of maintaining highways).

\(^{187}\) See id. (noting Oregon's dollar-for-dollar tax incentive of up to $1500 for purchase of HEVs).
V. Conclusion

The impact of the Clean-Fuel Vehicle Tax Deduction on HEVs remains to be seen. Many economic factors other than a tax deduction could influence consumer purchases of HEVs, including gasoline prices. Fuel prices are reported as the top concern for consumers when considering whether to purchase an HEV. With increases in fuel prices, consumer interest in HEVs has also risen. It is argued, however, that two events must occur before gasoline prices will increase HEV sales: gasoline shortages similar to those in the 1970s and high gasoline prices for several months. Unless these two events occur, it is unlikely that we will see a large increase in demand for more fuel-efficient vehicles.

Gasoline prices recently increased as a result of a general strike in Venezuela, a leading oil supplier of the United States, and insecurity over the previously anticipated war with Iraq. An extremely cold winter in the Northeastern United States drove an increase in energy demand and is cited for increased gasoline prices. Despite concerns over the fate of the Iraqi oil fields during the recent war, oil prices fell immediately after the United States began the war. Though the future of politics and oil de-

188. For further discussion of the Clean-Fuel Tax Deduction and its effectiveness in influencing individuals to purchase HEVs, see supra notes 114-87 and accompanying text.


191. See id. (noting correlation between fuel price and consumer HEV interest).

192. See generally LeBeau, supra note 189 (citing automobile industry's belief that certain requirements must be met before gasoline prices will cause change in HEV sales).

193. See generally id. (predicting little change in fuel-efficiency demand without gasoline shortages and increased prices).


195. See John W. Schoen, No Relief in Sight for Gas Prices, MSNBC News, Feb. 27, 2003, at http://www.msnbc.com/news/878211.asp (citing cold weather as factor of increased gasoline prices). "One big reason is that refineries are switching much more slowly from making heating oil to gasoline, thanks to an unusually cold winter that has sent heating oil demand soaring." Id.

mand remain uncertain, gasoline prices are not expected to fall in the near future.\textsuperscript{197}

While it is difficult to predict the future price of gasoline, it is equally as difficult to predict the effect the price of gasoline will have on a consumer's decision to purchase an HEV, especially when combined with the Clean-Fuel Vehicle Tax Deduction and other economic and environmental concerns.\textsuperscript{198} It is certain, however, that the United States can address its oil dependency problem through use of advanced vehicle technology that allows us to use our energy resources at a higher level of efficiency.\textsuperscript{199}

\textit{Heather Munoz}


\textsuperscript{198} For further discussion of consumer concerns when deciding whether to purchase an HEV, see supra notes 12-26 and accompanying text.

\textsuperscript{199} See U.S. DEPARTMENT OF ENERGY & USEPA, supra note 1 (citing advanced vehicle technology as solution to U.S. oil dependence problem).