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"[I]mposing a tax - any tax - is both powerful and manipulative."[1]

Economists, lawyers, environmentalists, other policy makers and scholars have written extensively about the use and benefits of economic instruments, such as taxes, to affect behavior that harms the environment. Tax incentives and subsidies have long played a key role in the development of fossil fuels,[2] and more recently, the development of alternative energy technologies.[3] Many scholars have also observed the social and cultural transformation that the United States (and the world) has experienced as a result of the technologies that energy has afforded us. One incredible, amazing technology – the car – gobbles tax-subsidized energy as it takes us to our distant homes or jobs or malls exhaling noxious gases along the way. And yet, while more evidence stacks up pointing to the car as a key contributor to environmental decline the present tax structure in the United States drives our ever-increasing dependence on the car.[4] With abundant examples of alternative energy and technological efficiency, the United States seems unwilling to set an example for the world by decreasing its dependence on fossil fuel technologies. This article draws on economic and social research to advocate for the development of tax policies that address the destructive environmental realities of continued and increasing fossil fuel usage. New policies, however, must take into account who Americans are, both socially and culturally, and how they expect to live and travel. The automobile, in particular, symbolizes to Americans individual freedom and democracy.[5] Thus, in developing environmentally friendly tax laws that will be accepted by the businesses and individuals affected, policy makers need to consider not only the economic impact, but also the social impact of tax structures and other laws that influence behavior.[6]

Formulating a plan for a transition from the current environmentally damaging (and contradictory) tax policy regime to one that eventually supports only renewable technologies will

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[1] Sharon C. Nantell, Federal Tax Policy in the New Millennium: A Cultural Perspective on American Tax Policy, 2 CHAP. L. REV. 33, 35 (1999).

[2] Early studies analyzing the effectiveness of the tax incentives for oil and gas indicated that they have increased the investment in petroleum in the United States. *See* James C. Cox & Arthur W. Wright, *The Cost-effectiveness of Federal Tax Subsidies for Petroleum: Some Empirical Results and Their Implications*, *in* STUDIES IN ENERGY TAX POLICY 188, 192 (Brannon, ed. 1975).

[3] This article focuses on fiscal subsidies, tax preferences and general agency support for energy. *See* Gerald M. Brannon, *Existing Tax Differentials and Subsidies Relating to the Energy Industries*, *in* STUDIES IN ENERGY TAX POLICY**,** at 3(Brannon, ed. 1975).

[4] The EPA estimates that fossil fuel combustion contributes more than 90 percent of greenhouse gas emissions in the United States (mostly for electricity and to power our cars). OFFICE OF POLICY, U.S. E.P.A., EPA 236-R-00-001, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-1998 (2000), http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2000.html (last visited Jun. 23, 2004)

[5] *See* Converge: Where Transportation and the Environment Meet, *The Automobile and The Environment*, *at* http://www.converge.ncsu.edu/topics/topics_display.asp?topic_ref=2 (last visited Apr. 12, 2005).

[6] *See* Alice G. Abreu, Taxes, Power, and Personal Autonomy, 33 SAN DIEGO L. REV. 1, 16 (1996); Nantell, *supra* note 1, at 33; Sheldon D. Pollack, Tax Reform: The 1980s in Perspective, 46 TAX L. REV. 489, 496 (1991).

require combining short-term and long-term strategies. This approach advocates for tax law reforms that can effectuate changes in society, and ultimately, culture. This article sets out tax law strategies for such a transformation that will enable the United States to free itself from dependence on fossil fuels and provide its citizens with a sustainable energy plan for the future. While the proposals address the legal aspects of changing tax laws, they also recognize that long-term environmental sustainability necessarily involves many other factors, including the transformation of environmental laws and changes in attitudes and lifestyles that are not addressed in this article.

I. Introduction

This article compares the United States' investment in non-renewable energy technologies (specifically fossil fuels) with its investment in renewable energy technologies. Through an historical analysis of federal tax incentives and subsidies to the energy industry, the article demonstrates the need to provide significant additional investment incentives in renewable energy technology if the United States is ever to achieve a sustainable mobile society. This historical analysis chronicles not only the development of tax laws, but also the attendant social changes created by the mobility afforded by cars. Americans' obsession with technology and mobility began long before the implementation of the federal tax laws, but the dramatic advances in the engineering of mobility coincide with substantial increases in federal subsidies to the burgeoning energy industry.

Tax incentives/subsidies for fossil fuels date back to the beginning of the federal income tax and have sparked controversy since inception.[7] With the implementation of the federal income tax in 1913, Congress included a deduction for oil depletion in the tax code.[8] Since 1913, Congress has added and expanded fossil fuel tax incentives. Yet despite decades of attempts to curtail these benefits, fossil fuel subsidies have remained amazingly resilient.[9] Along with the analysis of tax incentives, Part II. analyzes the history of fossil fuel development and explores the values and beliefs entrenched in fossil fuel incentives. Combining a legal, economic, and social history of our romance with fossil fuels (here, through our love of cars) provides a richer understanding of the problems associated with our dependence on fossil fuels and deeper insight into how the U.S. might successfully move toward change.

In contrast to the story of fossil fuel subsidies, history of tax incentives for alternative fuel sources begins much later. Not until 1978 did Congress enact the first energy tax credits targeted toward energy conservation.[10] The enactment of these energy-conscious provisions converged with the environmental awakening that took place in the 1970s. During this period, Congress enacted landmark laws regulating all forms of pollution. Despite the measurable

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[7] *See* STEPHEN L. MCDONALD, FEDERAL TAX TREATMENT OF INCOME FROM OIL AND GAS 11 (1963); Charles O. Galvin, *The "Ought" and "Is" of Oil-And-Gas Taxation*, 73 HARV. L. REV. 1441 (1960) (noting that for more than 40 years policy makers had been "grappling" with the proper tax policy for the petroleum industry).

[8] GEN. ACCOUNTING OFFICE, GAO/RCED-00-301R, TAX INCENTIVES FOR PETROLEUM AND ETHANOL FUELS: DESCRIPTIONS, LEGISLATIVE HISTORIES, AND REVENUE LOSS ESTIMATES 6 (Sept. 25, 2000) [hereinafter GAO, TAX INCENTIVES]; JOHN F. WITTE, THE POLITICS AND DEVELOPMENT OF THE FEDERAL INCOME TAX 81 (1985).

[9] *See* WITTE, *supra* note 8, at 81, 115, 116, 121, 137-38, 140, 147.

[10] The Energy Tax Act of 1978 included tax incentives for alternative energy. The cost of these new credits for 1979 was estimated at $935 million. *See* WITTE, *supra* note 8, at 214. *See infra* Part III for detailed discussion of tax incentives for alternatives.

success of these legislative efforts, environmental problems continue to grow as demand for polluting technologies has not abated.

Along with the extensive command and control regulations, Congress addressed the energy crisis of the late 1970s through tax policy. Unlike the tax incentives enacted during the oil boom and transportation awakening in the early 1900s, Americans' initiation to the environmental consequences of fossil fuel use has not resulted in the same magnitude of tax incentives encouraging the development of alternatives. This is so despite studies showing that energy conservation measures implemented since the 1970s have saved the United States approximately $1 trillion in energy waste costs.[11] Moreover, if the U.S. became as energy efficient as the Japanese, for example, energy waste costs would be reduced by over $200 billion per year. Yet, fossil fuels still receive approximately 85 percent of federal subsidies for energy.[12]

While continuing to incrementally, yet minimally, foster tax benefits for alternative energy technologies, Congress has developed no coherent strategy for moving away from fossil fuels. The tax laws continue to provide far greater subsidies to fossil fuel industries and their attendant infrastructure than to the development of alternative fuel sources. The subsidy ratio for renewables (including alternative technologies that are not renewable but reduce fossil fuel use) versus non-renewables (fossil fuels) is estimated as high as 1:35.[13] This article concludes by offering several approaches to changing the tax laws that address both legal and societal concerns. For example, on an industry-wide level, the article calls for current tax incentives for the fossil fuel industry to be gradually eliminated using the revenue recovered from these reforms to encourage the development of alternative and renewable fuels. Additionally, and equally important, tax incentives designed to encourage individuals to reconfigure their conception of mobility must be developed. Tax incentives for alternative transportation and incentives designed to decrease our dependence on travel must be seriously considered. Legal changes, in this instance, changes in tax laws, can be very powerful in influencing social changes that, in turn, provide momentum for more legal change. Any plan for tax policy transition should work toward achieving larger societal goals - in this case, sustainable mobility. In conclusion, the U.S. government has failed to move the United States economy and Americans' lifestyles away from non-renewable technologies. In addition to huge environmental issues presented by this failure, the safety and security of the U.S. and the global community are in serious peril, as oil-rich states exploit the political and economic weaknesses that fossil fuel dependence creates.[14] Engaging in tax reform is a critical part of improving the environment, as many European countries' well-developed tax programs illustrate. Acknowledging the environmental devastation resulting from U.S. fossil fuel use and freeing U.S. citizens from lifestyles dependent on non-renewable energy must be a top priority for the U.S. government over the next decade.

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[11] *See* NORMAN MYERS & JENNIFER KENT, REVERSE SUBSIDIES: HOW TAX DOLLARS CAN UNDERCUT THE ENVIRONMENT AND THE ECONOMY 70, n. 13 (2001).

[12] *See id.*

[13] *See id.*

[14] More than fifty-three percent of the U.S. daily consumption of oil and gas comes from foreign sources as compared with only thirty-five percent in 1973. *See* Donald L. Bartlett & James B. Steele, *The U.S. is Running Out of Energy,* TIME MAGAZINE, July 21, 2003, at 36.

II. Background: Federal Subsidies and Tax Incentives for Non-Renewable Fuels

The History of Oil and Gas Tax Incentives and Life around the Car: Even though fossil fuels provide energy for many uses, the tale of the automobile dominates and is illustrative of the fossil fuel powered economy.[15] This section traces the development of the energy industry through the history of the car. Throughout the twentieth century, as cars became the dominant means of travel, tax incentives and subsidies to the energy industry became entrenched. The "development of the automobile as the primary mode of personal transportation required a parallel development of the fuels that would power the automobiles."[16] The U.S. government realized early on the importance of developing both roads and inexpensive fuels to facilitate the revolution of mobility.

Federal energy incentives have been justified on two grounds: 1) to promote a new technology during the early developmental stages and 2) to pay the difference between the value of an activity to the private sector and its value to the public sector.[17] Both rationales have been employed to justify oil and gas incentives over the last century. At the turn of the twentieth century, the automobile and its attendant fuel source were burgeoning technologies. Federal incentives to develop a national transportation system fueled the federal incentives for oil and gas.[18] As Americans grew more and more dependent on the car, our fuel demands spurred continued incentives for the exploration and development of oil and gas. By the early 1970s, however, the rationale for oil and gas incentives had moved from one of support of a fledgling industry to price support for the American oil habit.[19] Given the problems created by heavy reliance on fossil fuels, existing incentives are unjustified and should, ultimately, be eliminated. Conversely, given the success of early tax incentives in stimulating fossil fuel development, this same strategy should be employed for the development of renewable energy technologies – so that Americans can drive those cars.

The Automobile: At the turn of the twentieth century, the automobile began its rise to prominence. In 1893, shortly after the automobile was invented, the U.S. government started advising state and local officials on road improvement.[20] In the early 1900s, Congress also

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[15] The EPA estimates that fossil fuel combustion contributes more than 90 percent of greenhouse gas emissions in the United States. *See* Doug Koplow & John Dernbach, *Federal Fossil Fuel Subsidies and Greenhouse Gas Emissions: A Case Study of Increasing Transparency for Fiscal Policy*, 26 ANNUAL REV. ENERGY ENVIRONMENT 361, 362 (2001). The transportation sector consumes about two thirds of the total petroleum use and accounts for about a quarter of total energy consumption. *See* GEN. ACCOUNTING OFFICE, GAO-01-957T, ALTERNATIVE MOTOR FUELS AND VEHICLES: IMPACT ON THE TRANSPORTATION SECTOR 1 (July 10, 2001)[hereinafter GAO IMPACT]. Because U.S. transportation needs, met mostly by cars, use the bulk of non-renewable energy, this article will use the car as a proxy for all energy uses in tracing the history of fossil fuel use in the United States.

[16] *See* Mary Bellis, *History of Gasoline, at* http://inventors.about.com/library/inventors/blgasoline.htm (last visited April 12, 2005).

[17] BRUCE W. CONE & ALEX G. FASSBENDER, AN ANALYSIS OF FEDERAL INCENTIVES USED TO STIMULATE ENERGY PRODUCTION, at EXECUTIVE SUMMARY 7 (1978).

[18] Even though this article follows the fossil fuel use of the car, petroleum uses go far beyond gasoline-powered vehicles. Likewise, policy decisions to encourage the exploration and development of petroleum resources have extended far beyond the car and transportation.

[19] *See* CONE, *supra* note 18, at EXECUTIVE SUMMARY 7 (citing a 1978 study stating that conclusion).

[20] *See* Richard F. Weingroff, Milestones for U.S. Highway Transportation and the Federal Highway Administration, 59 PUBLIC ROADS __ (Summer 1996), www.thfrc.gov/pubrds/spring96/p96sp44.htm (discussing the Office of Road Inquiry).

considered a number of bills to provide federal aid to road development.[21] Particularly after 1908, when Ford's low-priced Model T became affordable to the average person, the pressure for federal aid for roads mounted. In 1911, the invention of the electric starter eliminated the need for hand-cranking making automobile travel even more convenient.[22] In 1912, Congress appropriated $500,000 for state and local road improvement projects. By 1916, Congress appropriated $75 million to be matched by the states for road projects and establishing state highway agencies to implement the federal aid projects.[23] By 1919, nearly 7.6 million registered motor vehicles were driving on the 351,000 miles of surfaced roads.[24] In that same year, American car and truck owners consumed approximately 85 percent of domestic gasoline.[25] Shortly after World War I, Congress provided funding to states for construction of an interstate highway system.[26] In 1920, refiners added lead to gasoline to prevent engine knock and to allow for a smooth ride. In 1923, to encourage car sales, General Motors introduced "planned obsolescence," making minor changes to their cars each year.[27] By 1927, open-air cars became obsolete. Finally, the last ingredient, air conditioning, became cost effective enough to install in cars by the mid-1950s. In 1956, Congress "authorized the construction of one of the most significant engineering feats of the 20th century: the Interstate Highway System, which would ultimately involve the taking of 1.5 million miles of land to build 42,500 miles of highways over the next three decades."[28] By 1960, Americans could afford new comfortable cars, and the growing road system allowed travel virtually anywhere in the U.S. in any kind of weather. As the automobile made its journey into the lives of Americans, the federal government provided oil and gas producers two very important tax incentives for exploration and production of oil and gas: (1) the percentage depletion allowance and (2) the deduction for intangible drilling costs.

The Percentage Depletion Allowance and Intangible Drilling Costs Overview: In general, the depletion allowance provides for cost recovery of an owner's mineral investment similar to depreciation of a tangible asset.[29] Typically, the capital costs of a mineral investment include the purchase price of the property, discovery costs and development costs. As with depreciation, the taxpayer recovers these investment costs as the asset is expended to produce income. Two methods of calculating the depletion deduction are permitted – cost depletion and percentage depletion. As described above, a taxpayer using cost depletion recovers the actual costs of the mineral investment over its producing life based on the number units produced each year.[30] Cumulatively, cost depletion deductions can not exceed the original capital investment.

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[21] *See* Richard F. Weingroff, Federal Aid Road Act of 1916: Building the Foundation, 60 PUB. ROADS __ (Summer 1996), www.thfrc.gov/pubrds/summer96/p96su2.htm [hereinafter Weingroff, 1916 Road Act].
[22] *See* Converge, *supra* note 5, at 3.
[23] *See* Weingroff, 1916 Road Act, *supra* note 22 (discussing the Federal-Aid Road Act of 1916).
[24] *See* HAROLD F. WILLIAMSON, ARNOLD R. DAUM, & GILBERT C. KLOSE, THE AMERICAN PETROLEUM INDUSTRY: THE AGE OF ENERGY 1899-1950, at 190, 192 (1963).
[25] *See id.* at 195.
[26] *See* Mary Bellis, *How the Wheels Got Turning: A Historical Perspective on American Roads at,* http://inventors.about.com/library/inventors/blcar3.htm (providing funds for states to construct a paved system of two lane interstate highways).
[27] *See* Converge, *supra* note 5, at 3.
[28] *See id.* (discussing the Federal Aid Highway Act).
[29] *See* GEN. ACCOUNTING OFFICE, PETROLEUM AND ETHANOL FUELS: TAX INCENTIVES AND RELATED GAO WORK 5 (Sept. 25, 2000) [hereinafter GAO REPORT 2000].
[30] *See id.*; MCDONALD, *supra* note 7, at 9.

In contrast, Congress adopted percentage depletion to provide a special incentive for exploration and production activities by allowing the taxpayer to deduct a fixed percentage of the gross value of annual production.[31] Under percentage depletion, if the value of the mineral deposit exceeds the original cost of the investment, the investor receives a bigger tax deduction and, thus, a significantly reduced tax rate, based on successful production.[32] Because percentage depletion is computed without regard to the taxpayer's actual investment in the property, cumulative percentage depletion deductions can exceed the original investment costs. Furthermore, the use of percentage depletion does not preclude additional deductions from gross income of nearly all of the actual exploration and development costs.[33]

Taxpayers investing in oil and gas are also allowed to deduct immediately, and not required to capitalize, their intangible drilling and development costs (IDCs).[34] IDCs typically include labor, fuel, hauling, power, materials, supplies, tool rental, repairs of drilling equipment and other items incident to and necessary for the drilling and equipping productive wells.[35] In addition, the costs associated with a nonproductive well or "dry hole" may also be deducted as incurred.[36] If IDCs are not expensed, but instead capitalized, the costs are recovered through depletion or depreciation deductions.[37] The percentage depletion and IDC deductions have been part of the federal tax code almost since its inception.

The History of Percentage Depletion from 1913 to Present: In 1913, Congress instituted a tax deduction for a "reasonable allowance for depletion" up to 5 percent of the value of output.[38] In that same year, the U.S. Patent Office granted a patent on the cracking process converting oil to gasoline, significantly increasing the commercial uses of oil.[39] In 1918, Congress expanded the deduction allowing the total depletion deductions to exceed the original capital investment in the mineral property.[40] By allowing tax deductions that exceeded the original capital investment, oil and gas producers enjoyed an effective tax rate reduction not afforded to other industries.[41] Between 1918 and 1926, depletion deductions were calculated using the market value of newly discovered deposits, not the original capital investment.[42] In using the value of newly discovered wells as the basis for the deduction, the purpose for the deduction shifted from one of cost recovery to one of encouraging exploration. In 1926, Congress replaced discovery value depletion with the simpler percentage depletion allowing 27.5

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[31] Treas. Reg. § 1.612-1. All references to the IRC or regulations are to the current law unless otherwise noted.
[32] *See* MCDONALD, *supra* note 7, at 12-13.
[33] *See* MCDONALD, *supra* note 7, at 15.
[34] *See* I.R.C. § 263(a); MCDONALD, *supra* note 7, at 15.
[35] Treas. Reg. § 1.612-4(a).
[36] Treas. Reg. § 1.612-4(b)(4).
[37] *See* Treas. Reg. § 1.612-4(b); GAO REPORT 2000, *supra* note 29, at 8; MCDONALD, *supra* note 7, at 10.
[38] GAO, TAX INCENTIVES, *supra* note 8, at 6.
[39] *See* Bellis, *History of Gasoline*, *supra* note 16.
[40] JOINT COMMITTEE ON INTERNAL REVENUE TAXATION, PRELIMINARY REPORT ON DEPLETION 4 (1929), *reprinted in* INTERNAL REVENUE ACTS OF THE UNITED STATES 1909-1950, LEGISLATIVE HISTORIES, LAW, AND ADMINISTRATIVE DOCUMENTS (ed. Bernard Reams, 1979) [hereinafter PRELIMINARY REPORT ON DEPLETION 1929].
[41] One estimate concluded that the percentage depletion deduction effectively cut the tax rate for oil companies by more than half when the percentage depletion rate was 27 ½ percent. *See* MCDONALD, *supra* note 7, at 22.
[42] Discovery value depletion applied to mines and oil and gas wells discovered after March 1, 1913 and not acquired by purchase. *See* MCDONALD, *supra* note 7, at 12.

percent of the property's gross income to be deducted.[43] As with discovery value depletion, deductions were not limited to the original capital investment, although they could not exceed 50 percent of the net income from the property.[44] Prior to 1932, taxpayers using percentage depletion were not required to reduce their basis in the mineral investment to reflect the deductions, effectively allowing a double recovery of the investment when the taxpayer later sold the property.[45] Congress did not change the percentage depletion deduction again until 1969.

A New Era for Percentage Depletion: The high-water mark for percentage depletion had ended. In 1969, over sixty years after it had enacted discovery value depletion, Congress reduced the top depletion rate from 27.5 percent to 22 percent and also made percentage depletion subject to the add-on minimum tax.[46] Although not driven by any environmental conscience, these changes corresponded with the realization in the late 1960s of the environmental damage caused by emissions from burning fossil fuels.[47] Up to this point, the crucial issues affecting U.S. energy policy centered on national security, the constantly increasing domestic demand, and the limits to U.S. oil supplies.[48]

The U.S. government realized very early that petroleum was a "critical" war material. Federal policies reflected concern over (1) the creation and maintenance of reserve capacity to produce enough oil to rebuild after a potential nuclear war and (2) the creation and maintenance of enough domestic production so that in times of war large volumes of oil could be diverted to support military needs.[49] Furthermore, Americans consumed increasing amounts of oil and gas, U.S. oil production peaked, and demand required the U.S. to import oil from foreign countries. Both the increase in U.S. consumption and the increase in foreign oil imports heightened national

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[43] Determining discovery value proved very difficult. In many instances, controversies over fair market value resulted in litigation. Congress intended the percentage depletion rate to approximate the relation of discovery value deductions to gross income as estimated from previous years. *See* PRELIMINARY REPORT ON DEPLETION 1929, *supra* note 40, at 4. *See also* GAO, TAX INCENTIVES, *supra* note 8, at 6. JOINT COMMITTEE ON INTERNAL REVENUE TAXATION, DIVISION OF INVESTIGATION, VOL. 1 - PART 1, TENTATIVE PLAN OF PROCEDURE 4 (1927), *reprinted in* INTERNAL REVENUE ACTS OF THE UNITED STATES 1909-1950, LEGISLATIVE HISTORIES, LAW, AND ADMINISTRATIVE DOCUMENTS (ed. Bernard Reams, 1979) (noting that this change was made with insufficient data).

[44] Originally enacted with no limitation, in 1921, Congress limited percentage depletion to 100 percent of the property's net income to prevent losses on oil and gas properties from being deducted against other taxable income. *See* MCDONALD, *supra* note 7, at 13. The 50 percent net income limitation was added in 1924. *See* PRELIMINARY REPORT ON DEPLETION 1929, *supra* note 40**,** at 4. An early Joint Committee Report believed that the change from discovery value depletion to percentage depletion would significantly reduce the depletion allowed to the oil industry. The report concluded, however, that the change resulted in only a slight reduction in depletion and that, if the price of oil went up, depletion deductions would be higher than under prior law. *See id.*, at 30-31.

[45] The Revenue Act of 1932 required that the property's basis be adjusted for depletion allowed. *See* MCDONALD, *supra* note 7, at 14.

[46] The add-on minimum tax, the predecessor to the current alternative minimum tax (AMT), operated as a surcharge on certain tax preference items. Items excluded from taxable income under the regular tax were "added back on" to calculate the minimum tax. The current AMT operates as a separate tax system having its own definitions of income subject to tax and its own tax rates. The AMT, like the minimum tax, limits the deductibility of certain tax incentives that are otherwise deductible under the regular tax. *See* GAO, TAX INCENTIVES, *supra* note 8, at 6.

[47] The legislative history stated that if percentage depletion was viewed as a needed stimulant to oil and gas production, that the current 27 ½ percent rate was "higher than needed to achieve the desired increase in reserves." JOINT COMMITTEE ON INTERNAL REVENUE TAXATION, GENERAL EXPLANATION OF THE TAX REFORM ACT OF 1969 (December 3, 1970).

[48] *See* MCDONALD, *supra* note 7, at 73-83, 84-91.

[49] *See id.* at 85.

security concerns. In dealing with these issues, the U.S. government steered towards a policy of increasing domestic exploration and production. As *environmental* concerns emerged, however, exploration and production policies conflicted with the emerging need to reduce pollution created by burning fossil fuels. Because no viable alternative energy source was (or is) readily available, eliminating fossil fuel use was (and is) not a forseeable option.

Since the first U.S. oil crisis in 1973, when oil prices shot up as a result of political problems in the Middle East, the issues surrounding U.S. dependence on oil have become increasingly complex.[50] Throughout the 1970s and 1980s, Congress curtailed oil and gas incentives, and enacted modest tax incentives to spur development of alternatives.[51] For example, in 1975, Congress again reduced the rate of percentage depletion (phased down over a number of years) and eliminated its use for certain oil and gas producers. Major integrated oil producers could no longer take percentage depletion deductions, leaving only independent producers and royalty owners eligible to claim percentage depletion.[52] By 1984, the percentage depletion rate had been phased down to 15 percent, where it stands today, for most independent producers or royalty owners.

In the 1990s, as the U. S. struggled to develop solutions to its energy supply problems, Congress reverted back to its old philosophy and turned again to tax incentives to spur domestic oil and gas exploration and production. Reacting to events leading to the first Gulf War, in 1990, Congress increased the percentage depletion rate for oil and gas production from marginal properties held by independent producers and royalty owners.[53] In addition, Congress raised the net income limitation from 50 percent to 100 percent[54] and made percentage depletion available to transferred properties.[55] In 1992, Congress repealed the application of the Alternative Minimum Tax (AMT) to percentage depletion for oil and gas.[56] Later, Congress suspended the 100 percent net income limitation for producers and royalty owners from marginal wells through December 31, 2005.[57]

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[50] *See* Jeff Strand, *Taxes and Non-renewable Resources: The Impact on Exploration and Development*, 55 SMU L. REV. 1683, 1684 (2002).

[51] *See infra* Part III.

[52] *See* TAX REDUCTION ACT OF 1975, Pub. L. No. 94-12, 89 Stat. 26 (1975); JOINT COMMITTEE ON TAXATION, JCX-84-00, PRESENT LAW AND DESCRIPTION OF PROPOSALS RELATING TO FEDERAL INCOME TAX PROVISIONS THAT IMPACT ENERGY, FUEL, AND LAND USE CONSERVATION AND PRESERVATION 3 (July 24, 2000).

[53] *See* JOINT COMMITTEE ON TAXATION, JCX-84-00, *supra* note 52, at 4; I.R.C. § 613A(c)(6) .

[54] *See* IRC § 613 (a). *See also* JENNY B. WAHL, OIL SLICKERS: HOW PETROLEUM BENEFITS AT THE TAXPAYER'S EXPENSE 4 (Institute for Local Self-Reliance 1996), http://www.ilsr.org.

[55] REVENUE RECONCILIATION ACT OF 1990, Pub. L. No. 101-508, § 11521(a) (codified as amended at I.R.C. § 613A). Because it was intended to encourage production, the percentage depletion had not been available to transferred properties. Since the owners of transferred property had not undertaken the risks associated with production, they were not allowed to take percentage depletion. GAO, TAX INCENTIVES, *supra* note 8, at 6; GEN. ACCOUNTING OFFICE, GAO/GGD-90-75, TAX POLICY: ADDITIONAL PETROLEUM PRODUCTION TAX INCENTIVES ARE OF QUESTIONABLE MERIT 42 (1990) [hereinafter GAO, QUESTIONABLE MERIT]; JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS AFFECTING THE TAX TREATMENT OF DOMESTIC OIL AND GAS PRODUCERS 5 (April 28, 1983)(citing Reg. No. 45, Art. 223 (1919)).

[56] GAO, TAX INCENTIVES, *supra* note 8**,** at 6.

[57] *See* IRC § 613A (c)(6)(H). The Working Families Tax Relief Act of 2004 extended the relief from the net income limitation through December 31, 2005. THE WORKING FAMILIES TAX RELIEF ACT OF 2004, H.R. 1308, § 314(a) (Sept. 23, 2004) [hereinafter WORKING FAMILIES TAX ACT] (amending Code § 613A (c)(6)(H)). Congress recently enacted I.R.C. § 45I, a new tax credit for producing oil and gas from marginal wells. *See* AMERICAN JOBS CREATION ACT OF 2004, P.L. 108-357, § 341 (a) (October 22, 2004).

Intangible Drilling Costs Deduction: The deduction for intangible drilling and development costs has been much more significant than percentage depletion in attracting venture capital to the oil and gas industry. In an early article, one commentator stated "Pressed by high income-tax rates since World War II, investors have been lured by the opportunity of expensing against current income most of the costs of acquisitions of valuable reserves which can be accumulated as part of an individual's estate or disposed of at capital-gains rates."[58] Unlike percentage depletion, created by statute, the intangible drilling costs (IDCs) deduction evolved through administrative decisions and regulations. In 1917, the Treasury ruled that incidental expenses of drilling wells, including costs that "do not necessarily enter into and form a part of the capital invested or property account," could be deducted as an operating expense.[59] In 1918, Treasury further provided that the costs of "physical property" could be recovered through depreciation and that the cost of drilling unproductive wells (or dry holes) could be deducted as an ordinary operating expense.[60] Subsequent rulings and regulations gradually expanded the definition of "incidental expenses of drilling wells" to include all expenses for intangible items.[61] In 1945, after a court invalidated the regulations allowing IDCs to be expensed,[62] Congress quickly passed a resolution reinstating the Treasury's position.[63] In 1951, Congress authorized the current deduction of development costs incurred in the development of minerals *other* than oil and gas.[64] The legislative history indicates that Congress saw no need to enact a similar provision for oil and gas because IDCs were already currently deductible under existing law.[65] By 1954, Congress codified the deduction for intangible drilling costs in Internal Code Section 263(c).

As with percentage depletion, Congress limited the expensing of IDCs during the 1970s and 1980s. In 1976, Congress restricted the IDC deduction under the minimum tax, and later the AMT.[66] In 1982, Congress gave taxpayers the option to avoid tax preference treatment of IDCs by electing amortization over a 10 year period.[67] Congress also limited the expensing of IDCs for integrated oil companies to 85 percent of costs incurred.[68] In 1986, Congress repealed the IDC deduction for foreign properties, and further restricted IDC deductions for integrated

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[58] Galvin, *supra* note 7, at 1465.

[59] *See* T. D. 2447, 19 Treas. Dec. Int. Rev. 31, 35 (1917); Galvin, *supra* note 7, at 1465-69. Intangible drilling costs (IDCs) include the costs of labor, fuel, services, and nonsalvageable materials associated with preparing sites and drilling wells. GAO, QUESTIONABLE MERIT, *supra* note 55, at 24.

[60] *See* JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS, *supra* note 55, at 5. By 1933, Treasury had firmly established that any intangible drilling and development costs not deducted (i.e., capitalized) could be recovered through depletion and not depreciation. United States v. Dakota-Montana Oil Co., 288 U.S. 459 (1933); Galvin, *supra* note 7, at 1466.

[61] *See* Galvin, *supra* note 7, at 1465-69.

[62] F.H.E. Oil Co. v. Comm'r, 147 F. 2d 1002, 1005-06 (5th Cir. 1945) (holding that the administrative interpretations had liberalized the interpretation of deductibility beyond their statutory authority).

[63] H.R. Con. Res. 50, 79th Cong., 1945 Cum. Bull. 545 (1945); Galvin, *supra* note 7, at 1467.

[64] JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS, *supra* note 55, at 5.

[65] *See* S. REP.. NO.82-781(1951) [to accompany H.R. 82-4473 (1951)], *reprinted in* 1951 U.S.C.C.A.S., 2014.

[66] JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS, *supra* note 55, at 5. The excess of expensed IDCs over what would be allowable if the costs had been capitalized and amortized over 10 years became a tax preference item.

[67] I.R.C. § 59(e)(1). TAX EQUITY AND FISCAL RESPONSIBILITY ACT OF 1982, Pub. L. No. 97-248, 96 Stat. 324 (1982) (codified in scattered sections of 26 U.S.C.).

[68] JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS, *supra* note 55**,** at 6. The remaining amount of such costs could be amortized over 3 years.

companies to 70 percent of such costs.[69] In 1992, Congress lifted some of these restrictions by removing IDCs from the AMT base for taxpayers other than integrated companies, and including only 70 percent of IDCs in the AMT base for integrated oil companies.[70]

Other Tax Incentives for the Oil and Gas Industry: Since the 1970s, Congress has enacted a number of additional tax incentives to encourage exploration and development of the United States oil resources. The two provisions discussed in this section illustrate Congress' attempt to increase oil and gas production at the margins. While the effect of these provisions has been more limited, they demonstrate the federal government's continued policy promoting fossil fuels. As the U.S. oil reserves decline, fossil fuel incentives necessarily target technologies developed to extract petroleum under harsher conditions.

In 1980, Congress enacted a tax credit equal $3 (in 1978 dollars) per barrel or Btu oil barrel equivalent for taxpayers that produce certain qualifying fuels from nonconventional sources, including some oil and gas.[71] Fuels that qualify for the credit include (1) oil produced from shale and tar sands; (2) gas produced from goepressured brine, Devonian shale, coal seams, a tight formation, or biomass;[72] and (3) liquid, gaseous, or solid synthetic fuels produced from coal.[73] Qualifying fuels must be produced domestically from wells, mines or plants placed in service prior to July 1, 1998 (for coal and biomass) and December 31, 1992 (for all other facilities and wells). Adjusted for inflation, this credit was over $6.00 per barrel of liquid fuels in 1999.[74] The credit must be offset by benefits from government grants, subsidized or tax-exempt financing, energy credits, and the enhanced oil recovery credit.[75] According to the Joint Committee, this credit has cost the government over $10 billion (in 2000 dollars) since enacted.[76]

In 1990, Congress enacted a credit for qualified tertiary oil recovery costs incurred in the production of oil and gas on domestic projects.[77] This credit is designed to extend the lives of older wells with higher marginal production costs. Taxpayers are allowed to claim a credit equal to 15 percent of costs attributable to enhanced oil recovery (EOR) projects.[78] Qualified costs include tertiary injectant expenses, IDCs on a qualified EOR project, and amounts incurred for tangible depreciable property.[79] The credit amount phases out by the ratio that the reference price of oil for the preceding year exceeds $28 (adjusted for inflation) over $6.[80] A qualified EOR project must be located in the United States and involve the application of tertiary recovery

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[69] TAX REFORM ACT OF 1986, Pub. L. No. 99-514, 100 Stat. 2085 (codified as amended at I.R.C. § 291(b)(a)(A) (2004)); GAO REPORT 2000, *supra* note 29**,** at 8 (authorizing the remaining 30 percent capitalized and amortized over 5 years).

[70] *See* GAO REPORT 2000, *supra* note 29, at 8.

[71] *See id.* at 10 (enacting, as part of the Crude Oil Windfall Profit Tax Act of 1980, I.R.C. section 29).

[72] *See id.* at 10. Biomass is any organic material other than oil, natural gas, or coal, or any product these fuels. *Id.*

[73] I.R.C. § 29(c).

[74] *See* Salvatore Lazzari, *CRS Issue Brief for Congress*, ENERGY TAX POL'Y, August 20, 2003, at 1.

[75] The credit is scheduled to expire on December 31, 2007. *See* I.R.C. § 29(g)(1).

[76] *See* GAO REPORT 2000, *supra* note 29, at 11.

[77] I.R.C. § 43. Congress expanded the credit in 2004 to include the costs of constructing gas treatment plants located in Alaska. *See* I.R.C. § 43(c)(1)(D) as added by the American Jobs Creation Act of 2004, § 707.

[78] I.R.C. § 43(a). To the extent that a credit is allowed for such costs, the taxpayer must reduce the amount of otherwise deductible or capitalizable and recoverable costs. *See* I.R.C. § 43(d).

[79] *See* GAO REPORT 2000, *supra* note 29, at 13; I.R.C.§ 43(c).

[80] I.R.C. § 43(b). Currently, there is no phase out since the reference price is less than $28 adjusted for inflation.

methods that will likely result in "more than an insignificant increase" in the amount of recoverable oil.[81] According to the Joint Committee, this credit has cost the government approximately $482 million (in 2000 dollars) since enacted.[82]

Tax Advantage: Summing It All Up: For over 90 years, the combination of percentage depletion and the deduction for intangible drilling costs (along with more recently enacted tax incentives) has served to significantly lower the effective tax rate for companies in the oil and gas industry attracting substantial resources to the petroleum industry and thus, ensuring inexpensive supplies of gasoline to fuel our cars. For the petroleum industry, unlike other businesses, deductions for the costs of exploration and production are super-accelerated as compared to other types of capital investments – first, amounts in excess of original cost are deducted; second, most other costs associated with the investment are not only recoverable, but deductible immediately.[83] Over the years, various studies have assessed the economic impact of tax incentives on the oil and gas industry.[84] For much of the petroleum industry's history, oil and gas companies have paid little or no income tax as a result of the combination of percentage depletion and intangible drilling costs deductions.[85]

An early Treasury Department study indicated that percentage depletion reduced the taxable gross income of the petroleum industry by about 25.3 percent.[86] Furthermore, percentage depletion exceeded cost depletion by approximately 95.7 percent of the total depletion deductions allowable.[87] In evaluating IDCs, a nationwide survey taken between 1948 and 1955 indicated that IDCs averaged slightly less than 70 percent of total gross income from production.[88] While other studies concluded that IDCs accounted for 75 to 90 percent of the costs of drilling.[89] The IDC deduction alone appears to have had the effect of reducing the marginal tax rate by more than half. Analyzing tax return data between 1938 and 1961, another report compared after-tax rates of return on net assets of integrated petroleum companies, manufacturing companies, mining companies and all industry.[90] Except for 4 of the 23 years, oil and gas producers earned higher rates of return than integrated petroleum companies, manufacturing companies, mining companies and all industry.[91] Between 1949 and 1956, oil

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[81] *See* JOINT COMMITTEE ON TAXATION, DESCRIPTION OF THE STATUTORY PROVISIONS, *supra* note 55, at 13.
[82] *See* GAO REPORT 2000, *supra* note 29, at 13.
[83] *See* MCDONALD, *supra* note 7, at 16.
[84] *See* GAO REPORT 2000, *supra* note 29, at 5. Since the early 1970s, many federal agencies, congressional committees and other groups have regularly estimated the cost of such tax expenditures. The cost of the tax incentive is not the same as the measure of revenue increase if the provision were repealed.
[85] *See id.* at 26; GAO, QUESTIONABLE MERIT, *supra* note 55, at 51.
[86] The study even accounted for the 50 percent net income limitation in place prior to 1990. *See* MCDONALD, *supra* note 7, at 17; U.S. TREAS. DEP'T , OFFICE OF TAX ANALYSIS, STATISTICS OF CORPORATION MINERAL DEPLETION DEDUCTIONS AND RELATED ALLOWANCES, 1950, 1951, 1952 29, 37-40 (1955).
[87] *See* MCDONALD, *supra* note 7, at 17; U.S. TREAS. DEP'T, *supra* note 86, at 29, 37-40.
[88] *See id.* at 18 (citing data from Mid-Continent Oil and Gas Association, Percentage Depletion, Economic Progress, and National Security 34 (1961)).
[89] GAO, QUESTIONABLE MERIT, *supra* note 55, at 24; ANDREW KIMBRELL, ET. AL, THE REAL PRICE OF GASOLINE: ANALYSIS OF THE HIDDEN EXTERNAL COSTS CONSUMERS PAY TO FUEL THEIR AUTOMOBILES 11 (1998).
[90] *See id.* at 142 (citing data compiled by the First National City Bank of New York that used samples from leading corporations in selected industries for the period).
[91] *See id.* (citing a rate of return for oil and gas producers ranging from 3% to 22% higher than other companies).

and gas producers averaged a rate of return on stockholder's equity of 24.2 percent versus 12 percent for manufacturing corporations.[92]

After 1969, the percentage depletion rate dropped to 22 percent, and yet the percentage depletion deduction resulted in an exemption of about 15 percent of gross income or the equivalent of 33 percent tax reduction.[93] The IDC deduction shaved off another 15-18 percent of the total tax liability. The combination of the two deductions reduced the total tax liability for petroleum and oil producers by approximately 46 percent, 6 1/2 times higher than the maximum rate applicable to the general business credit available at the time.[94] Another study analyzing resource allocation, covering 1959 to 1971, concluded that federal tax policies significantly affected investment in crude petroleum reserves.[95] In the mid-1980s, the GAO reported that the marginal tax rate for independent oil and gas producers ranged from 8 to 9 percent and for integrated oil and gas companies from 7 to 24 percent. For most other industries the marginal tax rate ranged from 31-32 percent.[96]

More recent data, from 1994, indicates that this tax rate differential persists despite reductions in percentage depletion and, in some cases, IDCs.[97] The effective tax rate on oil and gas extraction income was 11 percent, as compared to the corporate statutory rate of 35 percent.[98] In a 1995 report, the Union of Concerned Scientists also calculated the effective tax rate for the oil and gas industry at 11 percent as compared to an effective rate for non-oil industry companies of 18 percent.[99] Several recent reports have quantified the tax benefits to the petroleum industry as reflected through lower gasoline prices to consumers. These studies indicate that tax subsidies reduce the price of gasoline by 1½ cents per gallon (on the low range) to 7 cents per gallon (on the high range).[100] In sum, the federal government's investment in the production of cheap fuel and roads, along with Henry Ford's assembly line production of the car, catapulted Americans on to the highways - where we remain today.

III. The Economic and Social History of Alternative Fuels

Life Behind the Wheel: The advent of the affordable car and its affordable fuel revolutionized life in the United States. In the late 1800s and early 1900s, a twenty-mile journey by horse or by foot could easily take the better part of a day. Today, that same twenty miles might only take 20-30 minutes – barring traffic nightmares.[101] Life behind the wheel has not only changed how quickly we travel, but it has also changed where and how we work, where and how we live, and where and how we socialize. Today, we drive through restaurants, banks,

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[92] *See* Stephen L. McDonald, *Percentage Depletion and the Allocation of Resources: The Case of Oil and Gas*, 15 NATIONAL TAX JOURNAL 323, at 333-336 (December 1961).
[93] *See* Brannon, *supra* note 3**,** at 8-11.
[94] *See id.*
[95] *See* Cox, *supra* note 3, at 186, 192. The study also indicated that the percentage depletion allowance was not cost-effective in increasing reserves when compared to the alternative policy of having the government purchase additional oil reserves directly. *See id.* at 192.
[96] *See* GAO, QUESTIONABLE MERIT, *supra* note 55**,** at 56.
[97] *See* WAHL, *supra* note 54, at 1.
[98] *See See* JANE GRAVELLE, ECONOMIC EFFECTS OF TAXING CAPITAL INCOME 54 (MIT Press 1994).
[99] *See* KIMBRELL, *supra* note 89, at 10; ROLAND HWANG, MONEY DOWN THE PIPELINE: UNCOVERING THE HIDDEN SUBSIDIES TO THE OIL INDUSTRY, at Executive Summary 1 (Union of Concerned Scientists 1995).
[100] *See* WAHL, *supra* note 54, at 1; KIMBRELL, *supra* note 89, at 10-14.
[101] *See* Converge, *supra* note 5, at 1.

pharmacies, and more. We live in suburbs and drive to the city center to work. We drive across the country for vacations and family visits. It is hard to imagine life without the car. The freedom we enjoy as a result of the car has changed virtually every aspect of life in the United States and most of the World.

By the 1960s, however, long after Americans had integrated the car into their lives, it became evident that the automobile was contributing to the emergence of other problems. Long before the U.S. worried about climate change, our gasoline-powered cars fueled air pollution, water pollution, urban blight, urban sprawl, traffic fatalities, and congestion. Up to this point in history, only two problems concerned policy makers about fossil fuel production: (1) keeping up supply (to meet increasing demand); and (2) national security. Keeping up with the demand for gasoline meant increasing the U.S. supply of oil and gas. The U.S. increased supply in two ways: (1) by increasing domestic production; and (2) by importing foreign oil. Importing foreign oil, however, contributed to the second problem, national security concerns. The government employed the most obvious solutions to these problems by drilling for more domestic reserves and instituting conservation measures to reduce the need for imports. Until the environmental awakening of the 1960s, no one proposed developing alternative fuel sources as a solution to the problems associated with dependence on fossil fuels.

Environmental Awakening: During the late 1950s and early1960s, the United States and its industrious work force led the world in commercial growth and innovation. Americans felt prosperous and our national love affair with the automobile continued. Congress displayed only mild concerns about the environmental side effects of automobile use and fossil fuel consumption when it authorized an early study on automobile air pollution.[102] But overall, Americans were content to drive their cars without regard to the impacts on the environment. The mid-1960s, however, ushered in a catalytic era of public discontent and civic unrest. Into this political and social climate came Rachel Carson's *Silent Spring*, a book that is credited with introducing the concept of an "environmental movement" to the forefront of mainstream America.[103] The American public and Congress took note. Congress began to investigate the impact of industrial growth on the environment. Responding to a growing awareness of air quality effects, Congress authorized studies to identify and measure motor vehicle emissions and their potentially detrimental effects on human health.[104] By 1965, the Secretary of Public Health began to establish auto emissions standards.[105] Ironically, Congress also created the Department of Transportation to deal with Americans' growing dependence on the automobile.[106]

By 1970, Americans drove 80 million cars close to 1 trillion miles, burned 5.25 million barrels of fuel and emitted 193 million tons of carbon per day.[107] Crude oil production from the

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[102] *See* Schenk Act of 1960, Pub. L. No. 86-493, 74 Stat. 162 (1960); *see also* Converge, *supra* note 5.

[103] *See* RACHEL CARSON, SILENT SPRING (1962). The book focused on the effects of chemical and pesticide use on human health and the environment, but came to represent the need to reevaluate the potentially disastrous impacts of human intervention on the earth's ecosystems. *See also* Al Gore, *Introduction* to RACHEL CARSON, SILENT SPRING, at xviii (1994). Although Rachel Carson, a scientist, thoroughly and scrupulously researched her book, she suffered painful criticism and professional stigmatism from chemists and chemical companies. *Id.* at xvi.

[104] Ashley Morris Bale, *The Newest Frontier in Motor Vehicle Emission Control: The Clean Fuel Vehicle*, 15 VA. ENVTL. L.J. 213, 219 (1995-1996) (citing Act of Oct. 9, 1962, Pub. L. No. 87-761, 76 Stat. 760).

[105] *See* Converge, *supra* note 5, at 1.

[106] *See* U.S. DEP'T OF TRANSP., OFFICE OF THE HISTORIAN, A CHRONOLOGY OF SIGNIFICANT DOT DATES, *at* http://isweb.tasc.dot.gov/Historian/ chronology.htm (last visited May 30, 2004) [hereinafter CHRONOLOGY OF DOT].

[107] THE WORLDWATCH INSTITUTE, VITAL SIGNS 2003, at 56 (2003).

lower 48 states also peaked in 1970 when oil and gas accounted for 71.1 percent of total energy production in the United States.[108] In that same year, Congress created the Environmental Protection Agency, instituted the first national Earth Day and enacted major environmental legislation.[109] Unfortunately, the harsh reality of oil dependence and U.S.'s growing dependence on foreign oil sources precipitated a national security crisis -- the oil embargo of 1973 and 1974. At this point, the United States imported nearly 35 percent of America's daily petroleum consumption.[110] The energy crisis spurred a veritable slough of federal legislation designed to deal with emergency petroleum situations.[111] By 1974, gasoline consumption had climbed to 6.5 million barrels per day, a 48 percent increase over the previous decade.[112] The U.S. Secretary of Transportation announced a new nationwide effort to promote carpooling.[113] Congress authorized the first federal subsidies for mass transit,[114] approved the creation of state energy conservation programs, and granted presidential authorization to lift oil price controls.[115] The Energy Policy and Conservation Act of 1975, in particular, required automobile manufacturers to meet corporate average fuel economy (CAFÉ) standards imposing stringent mile per gallon (mpg) requirements on automakers – an average of 27.5 mpg on passenger cars by model year 1985 – a goal that has never been reached.[116] Congress also strengthened the Secretary of Transportation's ability to impose civil penalties for automobile fuel inefficiency.[117] President Carter created the Department of Energy with expansive responsibilities that included: 1) creation and implementation of coordinated national energy policy; 2) development of renewable resources; and 3) assurance of adequate and reliable supply of energy at lowest reasonable cost.[118] The first tax incentives to promote conservation and develop renewable energy were enacted in the Energy Tax Act of 1978 almost twenty years after the government first began to

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[108] *See* ENERGY INFO. ADMIN., ENERGY IN THE UNITED STATES: 1635-2000, at 2, http://www.eia.doe.gov/emeu/aer/eh/petro.html.

[109] *See* CHRONOLOGY OF DOT, *supra* note 106; NATIONAL ENVIRONMENTAL POLICY ACT OF 1970, 42 U.S.C. § 4321 et seq. (1970); CLEAN AIR ACT OF 1970, 42 U.S.C. § 7401 et seq. (1970).

[110] *See* Bartlett, *supra* note 14, at 36 (importing 6 million barrels of crude oil and petroleum products daily).

[111] *See* EMERGENCY PETROLEUM ALLOCATION ACT OF 1973, 15 U.S.C. §§ 751- 760 (h) (1976); FEDERAL ENERGY ADMINISTRATION ACT OF 1974, 15 U.S.C. §§ 761-790 (h) (1976); ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT OF 1974, 15 U.S.C. §§ 792-798 (1976); EMERGENCY PETROLEUM ALLOCATION ACT 0F 1975, 15 U.S.C. §§ 751-760 (h) (1976).

[112] *See* Bartlett, *supra* note 14, at 36.

[113] *See* CHRONOLOGY OF DOT, *supra* note 106.

[114] *See id.*(appropriating $11.9 billion for capital and operating expenses for the nation's mass transit systems).

[115] ENERGY POLICY AND CONSERVATION ACT OF 1975, Pub. L. No. 94-163, 89 Stat. 871 (1975). ENERGY CONSERVATION AND PRODUCTION ACT OF 1976, Pub. L. No. 94-385, 90 Stat. 1125 (1976). Michael W. Grainey, *Recent Federal Energy Legislation: Toward a National Energy Policy at Last?*, 12 ENVTL. 29, at 41 (1981).

[116] *See* Converge, *supra* note 5; Bartlett, *supra* note 14, at 36.

[117] *See* NATIONAL ENERGY CONSERVATION ACT, Pub. L. No 95-619, 92 Stat. 3206 (1978). For example, the statute authorized the secretary to charge $10 for each tenth of a mile per gallon in excess of fuel economy standards beginning with model year 1982. *See id*. at 3239.

[118] *See* Grainey, *supra* note 115, at 31. Congress ultimately passed the National Energy Act consisting of: NATURAL GAS POLICY ACT OF 1978, 15 U.S.C. §§ 3301-3432 (Supp. II 1978); POWERPLANT AND INDUSTRIAL FUEL USE ACT OF 1978, 42 U.S.C. §§ 8301-8483 (Supp. II 1978); PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978, Pub. L. No. 95-617, 92 Stat. 3117; NATIONAL ENERGY CONSERVATION POLICY ACT, Pub. L. No. 95-619, 92 Stat. 3206 (1978); ENERGY TAX ACT OF 1978, Pub. L. No. 95-618, 92 Stat. 3174.

regulate pollution.[119] The tax incentives included in this bill provided more money for tax incentives than any legislation since and most of these provisions have been repealed.[120]

By the late 1980s, these legislative efforts appeared to be making an impact as fuel economy standards for passenger cars hit an all-time high averaging 22.1 miles per gallon.[121] Unfortunately, U.S. domestic oil production declined after 1988 when Alaska's oil production peaked,[122] despite continued legislative efforts, U.S. fuel demands continued to increase.[123] With foreign oil imports nearly equal to domestic oil supplies, the U.S. interests in preserving relations with oil producing countries became increasingly important. Moreover, the U.S. strategic petroleum reserve stock dropped steadily in the number of days it would last if foreign imports were suddenly stopped.[124] These issues reached a crisis level in early 1991 when the U.N. Coalition forces launched Operation Desert Storm.[125] Hoping to decrease U.S. Oil imports, Congress responded with more legislation promoting alternative fuels for motor vehicles.[126] Although alternative fuel vehicles in the national fleet have increased, Congress' original goals have never been realized. By 2000, alternative fuels accounted for 354 million gallons, only 0.2 percent of total vehicle fuels consumed.[127] And yet, in that same year, 128 million cars (a 60 percent increase from 1970) traveled 2.3 trillion miles (a 146 percent increase) consuming 8.2 millions gallons of gasoline (up 56 percent) and emitting 302 million tons of carbon (up 56 percent) with foreign imports still rising.[128]

As the millennium dawned, America's leadership has waned on reducing our fossil fuel consumption. By 2001, the transportation sector accounted for the bulk of petroleum consumption in U.S., representing two-thirds of total petroleum use and roughly a quarter of total energy consumption. By 2002, the fuel economy standards for passenger cars and SUVs had declined to an average of 20.4 mpg.[129] Sizes and weights of vehicles are growing steadily,

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[119] Pub. L. No. 95-618, 92 Stat. 3175 (1978). The "Gas Guzzler Tax," a federal excise tax that applies to the sale of cars with a fuel economy rating below statutorily set standards, was part of this legislation. *See* I.R.C. § 4064. *See* JOINT COMMITTEE ON TAXATION, PRESENT LAW AND BACKGROUND RELATING TO FEDERAL ENVIRONMENTAL TAX POLICY 11 (March 1, 1990). For vehicles with fuel economy of at least 22.5 miles per gallon, no excise tax is imposed. For vehicles with a fuel economy of less than 22.5 percent, the excise tax begins at $1,000 increasing to $7,700 for cars with a fuel economy of less than 12.5 miles per gallon. *See* I.R.C. § 4064 (a). Unfortunately, a very big loophole exists. Vehicles that weigh over 6,000 pounds, the biggest polluters, are exempt from the tax. Over 55 different models of luxury automobiles (and SUVs) are exempt. *See* I.R.C. § 4064 (b)(1).

[120] *See* Appendix, Chart II (graph depicting the investment through tax incentives in alternative technologies).

[121] *See* Bartlett, *supra* note 14, at 36.

[122] *See* ENERGY INFO. ADMIN., ENERGY IN THE UNITED STATES: 1635-2000, at 2, http://www.eia.doe.gov/emeu/aer/eh/petro.html.

[123] U.S. gasoline consumption was now at 7.2 million barrels per day. *See* Bartlett, *supra* note 14, at 36.

[124] The SPR stocks as Day of Net Imports reached a high of 115 days in 1985, and had dropped to 86 days when the U.S. entered Kuwait. *See* ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW 158 (2002) [hereinafter 2002 ANNUAL ENERGY REVIEW].

[125] CHRONOLOGY OF DOT, *supra* note 106. The assault took place one day after a U.N. deadline for Iraq to leave Kuwait.

[126] CHRONOLOGY OF DOT, *supra* note 106. Congress hoped to replace 10 percent of the petroleum fuels consumed by Light Duty Vehicles in 2000 and 30 percent in 2010 with alternative fuels such as ethanol, methanol, liquefied petroleum gas, compressed natural gas, liquefied natural gas, and electricity. *See* GAO IMPACT, *supra* note 15.

[127] *Id.*

[128] *See* WORLDWATCH INSTITUTE, VITAL SIGNS, *supra* note 107, at 56.

[129] Gasoline consumption rose another 1.5 million gallons per day over the previous decade to a total of 8.8 million per day. And in fact, by 2003, a full fifty-three percent of America's daily consumption of oil and petroleum products came from foreign sources. Bartlett, *supra* note 14, at 36.

wiping out decades of efforts to increase fuel economy and decrease pollution.[130] Despite a decade of significant environmental legislation in the 1970s and increased governmental regulation of pollutants, the overwhelming majority of energy tax incentives belong to businesses that extract, produce, and transport non-renewable resources. The handful of tax incentives discussed as "alternative fuel tax provisions" fail to provide businesses that are developing renewable energy with enough assistance and commitment to survive along side the fossil fuel industries. These "environmentally-friendly" tax incentives dwarf the federal investment in the exploitation of fossil fuels.

Tax Incentives for Alternative Fuel Technologies: Since the 1970s, the combination of declines in oil production, increases in demand, oil embargoes, petroleum price variations and price spikes, foreign oil dependence, and the seriousness of environmental problems associated with fossil fuels finally motivated reluctant policymakers to consider energy conservation tax incentives.[131] As discussed in Part II, between 1970 and 1990, Congress scaled back the petroleum industry's tax preferences.[132] And in 1978, Congress created several tax incentives encouraging energy conservation and the development of alternative fuels.[133]

Initially, Congress authorized tax credits for investing in energy conservation products and solar and wind energy equipment installed in a home or business.[134] The residential energy income tax credit provided a credit of 30 percent of the first $2,000 and 20 percent of the next $8,000 spent on solar and wind energy equipment.[135] Businesses could take a ten percent tax credit for investments in conservation or alternative fuel technologies, such as solar, wind, geothermal, and ocean thermal technologies.[136] In addition, Congress expanded the percentage depletion deduction to include geothermal deposits.[137] In 1980, Congress increased the residential energy tax credit to 40 percent of the first $10,000 of equipment expenses. Congress also increased the business energy tax credit to 15 percent for solar, wind, geothermal and ocean thermal technologies, and added biomass to the list of technologies eligible for the credit.[138] Except for the tax credit for solar and geothermal property, these credits expired on December 31, 1985. Since 1992, a 10 percent investment tax credit for business use of solar and geothermal energy is all that remains from these early energy tax credits.[139] This credit applies to the cost of new equipment (1) that uses solar energy to generate electricity, to heat or cool a structure, or to provide solar process heat, or (2) that is used to produce, distribute, or use energy derived from a geothermal deposit.[140]

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130 Each household in the U.S. has increased their trips by 46% since the early 1980s. *See id.*

131 *See* Lazzari, *supra* note 74, at 1.

132 *See supra* notes 45 to 56 and accompanying text.

133 *See* ENERGY TAX ACT, *supra* note 118, at § 301(a)(1).

134 *See* Lazzari, *supra* note 74, at 4 (including insulation and other energy conservation components).

135 *See* ENERGY INFO. ADMIN., LEGISLATION AFFECTING THE RENEWABLE ENERGY MARKETPLACE, *at* http://www.eia.doe.gov/cneaf/solar.renewables/page/legislation/impact.html (last visited Jun. 30, 2004).

136 *See* ENERGY TAX ACT, *supra* note 118, at § 301(a)(2)(B); LEGISLATION AFFECTING THE RENEWABLE ENERGY MARKETPLACE, *supra* note 135; Lazzari, *supra* note 74, at 4.

137 *See id.* The rate began at 22 percent and was phased down to 15 percent by 1983. *See* I.R.C. § 613(e).

138 *See* CRUDE OIL WINDFALL PROFITS TAX ACT OF 1980, Pub. L. No. 96-223; Lazzari, *supra* note 74, at 4.

139 *See* I.R.C. § 48(a)(3).

140 *See* I.R.C. §§ 48(a)(3)(A)(i) and 48(a)(3)(A)(ii).

In 1992, Congress also enacted the renewable electricity production credit for electricity generated from qualified energy resources ("QER").[141] QERs originally included wind energy, "closed-loop" biomass, or poultry waste facilities.[142] In 2004, Congress expanded QERs to include five new types: (1) geothermal energy, (2) solar energy, (3) small irrigation power, (4) municipal solid waste, and (5) refined coal.[143] QERs must also be produced at qualified facilities.[144] For certain QERs, taxpayers may take the credit during the first 10 years of production at a rate of 1.8 cents per kilowatt-hour.[145] For other QERs, the credit is reduced by half to 9 cents per kilowatt-hour and the credit period is reduced to 5 years.[146] To be eligible to claim the credit, the property must be placed in service prior to January 1, 2006.[147] Currently, no other tax provisions provide incentives for exclusively renewable technologies.

In 1978 Congress also enacted two tax incentives for ethanol and methane derived from renewable sources. The "alcohol fuels credits" included: (1) a partial exemption from the federal excise tax on motor fuels[148] and (2) three income tax credits for renewable alcohol-based motor fuels.[149] Proponents of these measures contended that tax incentives for alcohol fuels would reduce the U.S. dependence on imported fuel and provide much-needed support for farm incomes by finding another market the agricultural products, such as corn, from which alcohol can be produced.[150] Using alcohol fuels as additives to fossil-based fuels to reduce urban air pollution also attracted Congress to these initiatives. Of the two tax incentives, the partial exemption from the excise tax had been the most significant based on benefits claimed.[151] In 2004, however, Congress repealed the excise tax exemption, replacing it with two excise tax credits.[152]

The two new excise taxes credits are (1) the alcohol fuel mixture credit and (2) the biodiesel mixture credit. These credits can be claimed against the excise tax imposed on certain removals, entries and sales of taxable fuels.[153] An alcohol fuel mixture is any mixture of alcohol and a taxable fuel that is used by the producer or sold by the producer to any person for use as a

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[141] *See* I.R.C. § 45(a).

[142] *See* I.R.C. § 45(c). Closed-loop biomass is plant matter, where the plants are grown for the sole purpose of being used to generate electricity. It does not include waste materials. Poultry waste means poultry manure and litter, including wood shavings, straw, rice hulls, and other bedding materials for the disposition of manure. *Id.*

[143] *See* I.R.C. § 45(c). Poultry waste is now included in a category called "open-loop biomass" which broadened the category to include other agricultural livestock waste. I.R.C. § 45 (c)(3).

[144] *See* I.R.C. § 45 (d) (describing the facilities, as expanded in 2004, that qualify for the purposes of the tax credit).

[145] *See* Notice 2004-29, I.R.B. 2004-17, 828; I.R.C. § 45(a). The credit is reduced for grants, tax-exempt bonds, subsidized energy financing, and other credits. I.R.C. § 45(b)(3).

[146] Open-loop biomass facilities, small irrigation power facilities, landfill gas facilities and trash combustion facilities are only eligible for the 9 cent credit. *See* I.R.C. § 45(b)(4)(A). These same facilities plus the geothermal or solar energy facilities may only claim the credit for the first five years of production. *See* I.R.C. § 45(b)(4)(B).

[147] *See* I.R.C. § 45(c)(3) as amended by the WORKING FAMILIES TAX ACT, *supra* note 57, at § 313(a) (2004).

[148] This tax is earmarked for the Highway Trust Fund. *See* GAO REPORT 2000, *supra* note 29, at 16.

[149] *See* I.R.C. §§ 38, 40, 87; GAO REPORT 2000, *supra* note 29, at 17-18.

[150] *See* GEN. ACCOUNTING OFFICE, GAO/GGD-97-41, TAX POLICY: EFFECTS OF THE ALCOHOL FUELS TAX INCENTIVES 1 (March 6, 1997)[hereinafter GAO, ALCOHOL FUELS TAX].

[151] *See id.* at 2. Through 2000, Treasury estimated the revenue loss for the excise tax exemption to be $11,183,000,000 and the Joint Committee estimated it to be $7,523,000,000. While the revenue loss associated with the three income tax credits amounted to $478,000,000 (Treasury) and $198,000,000 (Joint Committee). *See* GAO REPORT 2000, *supra* note 29, at 15, 17.

[152] *See* I.R.C. § 6426, added by the AMERICAN JOBS CREATION ACT OF 2004, Section 301(a).

[153] *See* I.R.C. § § 6426(b) and (c).

fuel.[154] The credit amount varies depending on how much and what type of alcohol is contained in each gallon of fuel. For most fuel blends, the credit equates to 51 cents per gallon of alcohol used. A credit of 60 cents per gallon of alcohol is available for alcohol fuel blends that do not contain ethanol.[155] Alcohol derived from fossil fuels does not qualify for the exemption, and the alcohol must be at least 190-proof.[156] The biodiesel mixture is any blend of a biodiesel and diesel fuel (determined without regard to any use of kerosene) that is used by the producer or sold by the producer to any person for use as a fuel.[157] The credit amount varies depending on how much and what type of biodiesel is contained in each gallon of fuel. The credit for all of the biodiesel blends equates to 50 cents per gallon of biodiesel used. A credit of $1.00 per gallon of biodiesel is available for fuel blends that are considered agri-biodiesel.[158] These credits are to be coordinated with the income tax credits described below.

The three income tax credits: the alcohol mixtures credit, the pure alcohol fuel credit, and the small ethanol producers' credit are aimed at distinct lines of business.[159] The alcohol mixtures –or blender's- credit is 52 cents per gallon of ethanol. The alcohol contained in any of these blends, referred to as gasohol, must be at least 190 proof.[160] The alcohol blender's credit is primarily available to petroleum refiner, distributor, or marketer who mixes ethanol with gasoline. Retail fuel sellers that sell pure ethanol as vehicle fuel or to use themselves in their business may take the pure alcohol fuel credit[161] also at a rate of 52 cents per gallon of ethanol.[162] The credit increases to 60 cents per gallon for alcohol fuel blends that contain biomass methanol or other biomass alcohols, instead of ethanol. A 10 cents-per-gallon credit is available for small producers whose production does not exceed 15 million gallons per year and whose production capacity does not exceed 30 million gallons per year.[163] These credits are scheduled to expire after December 31, 2010 and must be coordinated with the alcohol fuel mixture excise tax credit.

In 2004, Congress added another income tax credit – the biodiesel fuels credit, which consists of two combined credits: (1) the biodiesel mixture credit and (2) the biodiesel credit.[164] The biodiesel mixture credit is 50 cents per gallon of biodiesel used to produce a qualified biodiesel mixture as decribed under the excise tax credit.[165] The biodiesel credit is a 50 cents for each gallon of biodiesel that is *not* mixed with diesel fuel and is used by the producer or sold by the producer at retail to any person for use as a fuel.[166] Both credits increase to $1.00 if agri-

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[154] *See* I.R.C. § 6426(b)(3).
[155] *See* I.R.C. § 6426(b)(2). The credit is available until December 31, 2010.
[156] *See* I.R.C. § 6426(b)(4).
[157] *See* I.R.C. § 6426(c)(3). This credit is only available until December 31, 2006. Biodiesel refers to a fuel blend made from vegetable oils and animal fats, combined with diesel.
[158] *See* I.R.C. § 6426(c)(2). Agri-biodiesel is derived solely from virgin oils, including esters derived from virgin vegetable oils, from corn, soybeans, sunflower seeds, cottonseeds, canola, crambe, rapeseeds, safflowers, flaxseeds, rice bran and mustard seeds and from animal fats. I.R.C. § 40A(d)(2).
[159] *See* I.R.C. §§ 38(b)(3), 40(a), and 87; GAO REPORT 2000, *supra* note 29, at 18.
[160] *See* GAO, ALCOHOL FUELS TAX, *supra* note 150, at 35.
[161] *See* I.R.C. § 40(b)(2). If the alcohol proof is less than 190 but greater than 150, a reduced credit of 45 cents applies. I.R.C. § 40(b)(3).
[162] *See* I.R.C. § 40(b).
[163] *See* I.R.C. § 40(b)(4).
[164] *See* I.R.C. § 40A (added by the AMERICAN JOBS CREATION ACT OF 2004, Section 302 (a)).
[165] *See* I.R.C. § 40A(b)(1). The biodiesel mixture is any blend of a biodiesel and diesel fuel (determined without regard to any use of kerosene) that is used by the producer or sold by the producer to any person for use as a fuel.
[166] *See* I.R.C. § 40A(b)(2).

biodiesel is used. Biodiesel has gained popularity in recent years as less polluting than regular diesel fuels.

Tax Credits for Electric and Clean-Fuel Vehicles: Since the early 1970s, policy makers have introduced several measures to encourage the use of electric or alternative fuel vehicles.[167] For example, reacting to the 1973–1974 oil price shocks, Congress considered a 25 percent tax credit for purchasing a qualified electric highway vehicle.[168] Responding to the 1979 oil price spikes, the Senate passed a proposal authorizing a 10 percent tax credit for the purchase of a qualifying electric vehicle or the conversion of an internal combustion engine to the use of electric power.[169] Both the 1975 and the 1979 efforts failed. Thirteen years later, in response Operation Desert Storm, Congress enacted a wide range of tax and nontax provisions to encourage domestic oil production, develop alternative fuels and promote conservation.[170] The legislation included both the tax credit for electric or fuel cell powered vehicles and a deduction for a portion of the costs of "qualified clean-fuel vehicle property."

Under current law, both electric and fuel cell vehicles are eligible for a 10 percent tax credit, up to a maximum of $4,000.[171] A qualified electric vehicle must be powered primarily by an electric motor drawing current from rechargeable batteries, fuels cells, or other portable sources of electrical current.[172] The credit is reduced by 75 percent in 2006, and completely eliminated by 2007.[173] Taxpayers can also deduct the costs of certain clean-fuel vehicles and clean-fuel refueling property.[174] Qualified clean-fuel vehicles include motor vehicles that use certain clean-burning fuels.[175] The maximum deduction is $50,000 for large trucks, vans or buses.[176] For mid-size vehicles, the maximum deduction is $5,000.[177] And for any other motor vehicle, the maximum deduction is $2,000. The deduction is reduced by 75 percent in 2006, and eliminated after December 31, 2006.[178] Purchasers of clean-fuel vehicle refueling property may also deduct up to $100,000 of the costs.[179] Clean-fuel vehicle refueling property includes property for the storage or dispensing of a clean-burning fuel or property for the on-site recharging of electric vehicles.[180]

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[167] Between 1996 and 2002, alone, at least 27 different tax proposals were introduced in Congress to subsidize alternative vehicles. *See* Martin A. Sullivan, *The Car Credit: How a Tax break for Engineering Got Engineered*, TAX NOTES, Mar. 11, 2002, at 1248.

[168] *Id.* at 1246; ENERGY POLICY AND CONSERVATION ACT, Pub. L. No. 94-163, 89 Stat. 871 (1975).

[169] Sullivan, *supra* note 167, at 1246.

[170] ENERGY SECURITY ACT OF 1992, Pub. L. No. 102-486, § 1913(b)(1) (1992).

[171] *See* I.R.C. §§ 30(a), 30(b). The credit is only available to the original property owner.

[172] *See* I.R.C. § 30(c).

[173] *See* I.R.C. § 30(b)(2); WORKING FAMILIES TAX ACT, *supra* note 57, at § 318(b); Sullivan, *supra* note 167, at 1246. Originally scheduled to phase out in 2004, the Working Families Tax Relief Act of 2004 again extended the provision through 2006. Despite the efforts of several groups, the IRS refused to extend the credit to include hybrid vehicles or existing cars retrofitted with electric engines. Sullivan, *supra* note 167, at 1246.

[174] *See* I.R.C. § 179A. The deduction is available for the year the property is placed in service. *Id.*

[175] *See* I.R.C. § 179A(c). Clean-burning fuels include natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, electricity and any other fuel containing at least 85 percent methanol, ethanol, any other alcohol or ether.

[176] I.R.C. § 179A(b)(1)(A). Trucks or vans with a gross vehicle weight over 26,000 and buses with at least a 20-person seating capacity.

[177] *Id.* A truck or van with a gross vehicle weight between 10,000 and 26,000 pounds.

[178] *See* I.R.C. § 179A(b)(1)(B), as amended by the Working Families Tax Act, § 319(b) (2004).

[179] *See* I.R.C. § 179A(b)(2). The deduction is available for the year the property is placed in service. *Id.*

[180] *See* I.R.C. § 179A(d). The storage or dispensing must occur where the fuel is delivered into the vehicle fuel tank.

Since the Reagan era, all of the energy tax legislation has included some tax incentives for conservation and alternative fuels, but the majority of tax relief continues to go to the petroleum industry.[181] For example, in the most recent 2003 Energy Tax Act legislation, fossil fuels subsidies accounted for 56 percent of the total tax expenditures provisions for energy.[182] The various tax incentives available for conservation and renewable technologies are just a drop in the bucket when compared with the U.S.'s enormous investment in fossil fuels and its infrastructure. This next section compares the U.S. investment in the petroleum industry with its investment in alternative fuels to build the case for eliminating fossil fuels subsidies and making a substantial investment in alternative/renewable fuels and technologies.

IV. Weaving the Tapestry: Analysis of Government Subsidies to Energy.

In the face of serious problems created by fossil fuel use and the inescapable reality that domestic supplies are insufficient to meet our needs, the national response remains virtually unchanged in the last 50 years. Early on, America's leaders agreed on two sobering realities that stem from our reliance on fossil fuels: (1) that domestic supplies are insufficient to keep up with domestic demand; and (2) that such reliance compromises our national security, both as a result of our inability to keep sufficient oil reserves to defend ourselves in time of war and because relying on foreign sources of oil leaves the U.S. at the mercy of foreign governments.[183] The U.S. has poured billions – trillions – into increasing domestic oil supplies. Yet despite modest fuel efficiency gains, oil consumption continues to rise. Furthermore, America's inability to control relationships with countries in the Middle East (our chief foreign oil source),[184] and our inability to maintain the Strategic Petroleum Reserve are extremely serious problems. During the 1970s, the United States awakened to the third sobering reality created by our reliance on fossil fuels: degradation of the environment along with related problems concerning health effects and social costs. Congressional action over the last 35 years reveals, however, contradictory responses to the fossil fuel dilemma: strong environmental legislation and continued investment in fossil fuel use. The message is confusing – stop polluting, but keep driving your gas-powered cars.

Despite rhetoric regarding the development, implementation and commitment to overcoming our devastating oil habit, Americans have only dabbled in alternatives. Tax and other incentives enacted to encourage alternative fuels are too small. On the other hand, the same tax incentives that subsidized fossil fuels fifty years ago still do so today. Moreover, these tax incentive provisions, by and large, have been ineffective in solving any of the problems associated with fossil fuel dependence. While Congress has reduced fossil fuel subsidies somewhat over the years and enacted a few "environmentally-friendly" tax subsidies since the 1970s, policymakers have no real plan for dealing with fossil fuel dependence – not through tax policy or elsewhere.

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[181] *See* Lazzari, *supra* note 74**,** at 8.
[182] *See* Lazzari, *supra* note 74**,** at 16.
[183] *See* GEN. ACCOUNTING OFFICE, GAO/RCED-97-6, ENERGY SECURITY: EVALUATING U.S. VULNERABILITY TO OIL SUPPLY DISRUPTIONS AND OPTIONS FOR MITIGATING THEIR EFFECTS 2 (1996)[hereinafter GAO, U.S. VULNERABILITY].
[184] *See* 2002 ANNUAL ENERGY REVIEW, *supra* note 124, at 164.

The U.S. has been investing in fossil fuels for almost 100 years. Historic justifications, themselves contested from the start,[185] no longer suffice. Data regarding the U.S. tax expenditures for fossil fuels and alternative/renewable fuels presents a dramatic picture.[186] Since the inception of the percentage depletion allowance and the IDC deduction, the United States has spent between $370 and $391 billion (in 2004 dollars) through tax incentives to subsidize fossil fuels.[187] This results in an average expenditure of approximately $4.5 billion every year for the last 87 years.[188] Furthermore, these figures only represent tax expenditures, and do not include subsidies that directly and indirectly benefit the oil and gas industry or other externalities that are difficult to measure. For example, the government subsidizes the transportation infrastructure, energy security costs, research and development subsidies, and costs associated with maintaining the Strategic Petroleum Reserve. Externalities that flow from fossil fuel use and the car, like localized pollution such as air pollution, agricultural crop losses and loss of visibility, planet-wide environmental costs such as global warming, water pollution costs such as oil spills, noise pollution, the environmental impact of sprawl, travel delays, and subsidized parking, just to name a few, cost Americans in both money and the quality of life.[189] When the economic models measuring subsidy reform consider other programs conferring benefits to fossil fuels, the cost of any reform is substantially increased.[190] All the while, environmental concerns are multiplying by geometric proportions.

Paradoxically, the "environmentally-friendly" tax subsidies that purport to encourage alternatives further encourage dependence on the car and fossil fuels. The most significant alternative fuel tax provision, the credits for alcohol fuels and now, the biodiesel fuels, grant a subsidy to fossil fuels mixed with an alternative fuel.[191] Thus, while the incentive may encourage more efficient fossil-fuel consumption, alternative fuel use has not resulted in lower fossil fuel consumption or reduced our dependence on the car.[192] In fact, both consumption and car use have increased despite these provisions. Since 1978, the United States has invested

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[185] *See* John H. Shows, *The Oil and Gas Industry and Its Present Tax Treatment*, 45 MISS. L. REV. 1125, 1128 (1974).

[186] *See* Charts I, II, and III in Appendix.

[187] *See* Chart I in Appendix. Detailed data and method of calculation are on file with the author.

[188] A number of other studies have come up with similar results for the annual amount, but no other study has estimated the cumulative investment amount. *See* Koplow & Dernbach, *supra* note 15, at 366. All of the reports are stated in 1999 dollars. EIA Report (1999-2000) estimated $2.6-2.9 billion per year. MISI Report estimated $6.81 billion per year. ICTA estimated $8.4-$15.8 billion per year. Koplow/Martin estimated $3.9-$6.8 billion per year. Wahl report estimated $3.5-$11.4 billion per year. Hwang Report estimated $3.6-4.1 billion per year. Koplow Report estimated $14.3-23.8 billion per year. EIA Report (1992) estimated $3.7-$4.3 billion per year. Heede Report estimated $38.8 billion per year. Pacific Northwest Laboratories (for Department of Energy) estimated $8.0 billion per year. *See id.* The estimates for the tables in this article come from the Joint Committee Report, the General Accounting Office estimates, and the Pacific Northwest Laboratories Report and from figures derived using the methodology established in the PNL report for fossil fuel incentives from 1918-1949.

[189] *See* KIMBRELL, *supra* note 89, at 6-7.

[190] *See* Koplow & Dernbach, *supra* note 15, at 373. One report states that these other programs contributed nearly 30 percent of the total subsidy-related reductions. (These programs include tax exempt municipal bonds, subsidies to federal power marketing administrations, Rural Utility subsidies, energy share of full user fee financing of water infrastructure, and user fee financing for the Strategic Petroleum Reserve.) *See id.*

[191] *See supra* text accompanying notes 131 to 166 for a detailed explanation the various tax provisions. These credits, in particular the excise tax exemption, which was recently repealed, constitute over 94% of alternative energy tax incentives. This figure is based on the Joint Committee on Taxation's Tax Expenditure Analysis.

[192] *See* GAO, ALCOHOL FUELS TAX, *supra* note 150, at 2, 6.

between $30 and $33 billion dollars in alternative energy through tax subsidies.[193] During this same period, the United States invested approximately $106 billion in fossil fuels – three times what was spent on alternatives fuels.[194] This kind of differential, not surprisingly, undercuts the likelihood of achieving successful results for alternatives fuel technologies.

Entering into the energy industry with its deeply entrenched gasoline fuel infrastructure presents significant barriers to potential investors. Very large investments are required in both the fuel and vehicle industries. The federal tax incentives were instrumental in overcoming the risk factors and establishing this industry.[195] In fact, without the federal tax incentives to keep its price competitive with conventional fuels, no market would exist for alcohol fuels, and thus, no capital.[196] Thus, tax incentives (and other incentives) are necessary to the development of alternatives. The reason is basically the same as it was 100 years ago for using incentives to stimulate the petroleum industry: (1) to overcome the high initial start-up costs; (2) to minimize the high risk associated with new industries; and (3) to send a message of support for this new technology.

Conversely, neither percentage depletion nor the IDC deduction have encouraged conservation of the oil and gas reserve, nor have they decreased U.S. security concerns associated with foreign imports.[197] The GAO concluded that "developing alternatives, increasing fuel efficiency in transportation, and continuing the development of the Strategic Petroleum Reserve" would likely increase U.S. energy security more than additional oil and gas tax incentives.[198] To date, alternative technologies are not used enough to have much impact on increasing the supply of oil reserves or reducing dependence on foreign imports.[199] The tax subsidies for alternative fuels are too small and fail to target the real problem - automobile and fossil fuel dependence. Despite continued car use, alternative fuels *do* have the potential to reduce petroleum consumption and reduce greenhouse gas emissions. Unfortunately, several recent studies indicate that even with increasing purchases of alternative fuel vehicles by federal agencies, state governments, and private consumers, "alternative fuel use in the transportation sector remains very small."[200]

These reports conclude that several critical factors hinder the public's acquisition of alternative fuel vehicles and the use of alternative fuels. First, gasoline prices are not high enough to convince Americans to give up their conventional fuel vehicles in favor of alternatives.[201] In addition, the U.S. has developed a massive refueling infrastructure and car-manufacturing system dedicated to gasoline-powered autos.[202] As a result, even if the price of gasoline rises substantially, many car owners will be reluctant to switch technologies. The

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[193] *See* Chart II in Appendix.
[194] *See* Chart I in Appendix for total CPI adjusted fossil fuel expenditures. This figure is the sum for 1979 to 2004.
[195] *See* DAVID L. GREENE AND ANDREAS SCHAFER, REDUCING GREENHOUSE GAS EMISSIONS FROM U.S. TRANSPORTATION 48 (PEW CENTER ON GLOBAL CLIMATE CHANGE, May 2003).
[196] *See* GAO IMPACT, *supra* note 15, at 12.
[197] *See* GAO, QUESTIONABLE MERIT, *supra* note 55, at 39.
[198] *See id.* at 4.
[199] *See* GAO, ALCOHOL FUELS TAX, *supra* note 150, at 6.
[200] *See* GAO IMPACT, *supra* note 15, at 1.
[201] The price of crude oil is approximately $50.00 per barrel and the average price of gasoline is $2.30. *See* MarketWatch, *Gas Price May Be Peaking - Lundberg*, CBS Market Watch (April 10, 2005). The price of gasoline remains low compared to historical prices that are adjusted for inflation. For example, the price of gasoline in 1981 was $1.35 per gallon. Adjusted for inflation, today's equivalent would be $2.94 in 2004.
[202] *See* GAO IMPACT, *supra* note 15, at 4.

limited number of refueling stations for alternative fuels makes their use extremely inconvenient for the average consumer. In 2004, a little over 6,000 refueling stations provided alternative fuels compared with over 180,000 conventional gas stations. One report states the "lack of adequate refueling infrastructure represents the biggest impediment to using alternative fuel vehicles."[203] Finally, alternative fuel vehicles are, on average, more expensive than conventional cars. For example, the price of an electric powered vehicle ranges from the low $30,000s to the mid-$40,000.[204] The GAO determined that very large tax incentives would be needed to result in any significant increase in alternative fuel vehicle use.[205]

Notwithstanding the environmental legislation, fuel conservation measures, and the development of some alternative fuel options over the last forty years, the United States still faces diminishing domestic oil supplies, increasing national security risks associated with imported oil, and continued environmental degradation from the use of fossil fuels. Options for increasing its domestic oil supply are limited. Therefore, Americans must conserve oil and develop alternative fuel technologies and infrastructures. Moving away from fossil fuels also remediates environmental concerns. Controversy over such significant changes to national policies is to be expected. Strong leadership is the key to staying the course.

V. Where Do We Go From Here? A Plan for Transition of Minds and Money

Reducing environmental fall out and energy security problems that result from dependence on oil is going to be challenging. Demand for mobility of both goods and people show no sign of slowing. Unless Americans increase energy efficiency, develop alternative energy sources, and find ways to improve land use and transportation systems such that accessibility is improved with fewer cars, transportation will continue to be the biggest polluting sector in the U.S. economy.[206] This section sketches out a four-part plan. Parts I through III of the plan should occur simultaneously and provide transition mechanisms for Part IV. Part I requires the phase out and elimination of fossil fuels and fossil fuel subsidies. Part II considers conservation measures that will be integral to any energy strategy. Part III discusses the development of hybrid fuels and renewable fuels. Finally, Part IV discusses possibilities for societal transformation as we move away from fossil fuel use and trade our old cars in for "renewable" ones.

Part I: Phase-out Fossil Fuels: Phasing out fossil fuel subsidies along with strategies for reducing fossil fuel use must begin immediately. Even if the U.S. adopted a serious plan for fossil fuel reduction today, the economy would remain vulnerable to oil price shocks for at least 10 more years because demand for oil is still increasing.[207] Additionally, the United States will remain vulnerable to oil price shocks in the long term unless significant improvements in energy efficiency and alternative fuels are made. Nonetheless, Congress has continued to consider and enact fossil fuel subsidies. A recent GAO report concluded that additional petroleum production

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[203] *Id.*

[204] *See id.* at 5. The three commercially available hybrids: the Toyota Prius, the Honda Insight, and the hybrid version of the Honda Civic have 30 to 40 percent higher fuel efficiency, but cost $3,000 to $4,000 more than comparable conventional vehicles. *See* GREENE, *supra* note 195, at 17.

[205] *See* GAO IMPACT, *supra* note 15, at 4.

[206] *See* GREENE, *supra* note 195, at 55.

[207] *See* GAO, VULNERABILITY, *supra* note 183, at 3.

tax incentives are not merited. This 1990 report stated that the "favorable tax treatments received by the industry as a whole and by certain activities within the industry both provide incentives for relatively inefficient investments within the industry."[208] Moreover, the Department of Energy's model estimating the impact of new subsidies reveal that its predictions considerably overestimate the effect of federal subsidies on oil production.

Many proponents of eliminating fossil fuel use believe that the government should tax fossil fuels to externalize some of oils hidden costs. Proponents of energy taxes should begin by making a dispassionate and objective assessment of the economic and distributional impacts of imposing such taxes.[209] Proponents of energy taxes should also be aware of historic pitfalls to past efforts. Because energy is vital to manufacturing processes and private households, the initial reaction to increasing the cost of energy will be received with skepticism and hostility. Likewise, energy taxes can stimulate intense regional political warfare as states compete to attract new industries and maintain existing ones [and the accompanying jobs]. Despite the potential for opposition, many experts agree that raising taxes on domestic gasoline consumption to increase the price would lower demand and increase the cost-competitiveness of alternative fuels.[210] Taxing activities that pollute and waste resources is a response adopted by many European countries with success.[211] Ideally, such strategies would work in tandem with other conservation measures.

Part II: Increase Conservation: Conservation strategies must be developed to reduce our dependence on fossil fuels. Tax policies can be used to provide incentives to individuals and businesses to increase conservation.[212] One study evaluating recent proposed tax incentives concluded that, based on non-environmental benefits and local environmental benefits alone (i.e., not global benefits), the benefit/cost ratio was significantly positive.[213] Moreover, to the extent that fuel prices increase in response to decreased federal assistance, fuel efficiency improvements can help to offset such price increases. In addition, carbon emissions can be significantly reduced by boosting vehicle fuel efficiency. After substantial improvements during the 1970s and 1980s, however, fuel economy has remained flat since 1990. Recent efforts to raise fuel economy have failed. Carmakers exploit exemptions and loopholes in existing standards.[214] In 2002, less than 6 percent of new model cars, vans and trucks (out of 865 models available) got better than 30 mpg. While more than a third of all cars, vans and trucks – 330

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[208] *See* GAO, QUESTIONABLE MERIT, *supra* note 55, at 3.

[209] See Henry Lee, *The Political Economy of Energy Taxes: An Assessment of the Opportunities and Obstacles*, 12 PACE ENVTL. L.REV. 81 (1994). (i.e. energy taxes not only increase the cost of fuels [gas, coal, electricity, natural gas] but also plastics, petro-chemicals, food and cars, etc – the trickle-down effect).

[210] *See* GAO, VULNERABILITY, *supra* note 183, at 4.

[211] *See* OECD, ENVIRONMENTAL TAXES AND GREEN TAX REFORM (1998); *See* MYERS AND KENT, *supra* note 11, at 203-04.

[212] Congress continues to consider tax incentives designed to reward conservation through energy efficiency improvements. *See* ENERGY TAX INCENTIVES ACT OF 2003, 108 S. Rpt. 54, S. 1149 (2003).

[213] *See* J. Andrew Hoerner and Avery P. Gilbert, *Assessing Tax Incentives for Clean Energy Technologies: A Survey of Experts Approach*, CENTER FOR A SUSTAINABLE ECONOMY (November 12, 1999, revised April 2000); www.sustainableeconomy.org. The study surveyed 81 experts on the impact of the tax incentive portion of the Climate Change Technology Initiative (CCTI) proposed by the Administration in 2000.

[214] *See* WORLDWATCH INSTITUTE, VITAL SIGNS, *supra* note 107, at 56.

models – got 20 mpg or less.[215] An increase in fuel economy of just *three miles per gallon* could reduce CO2 emissions by 140 million tons.[216]

In addition, more steps must be taken to reduce vehicle travel. Programs such as ridesharing, transit improvements, HOV lanes, bicycle and pedestrian facilities, flexible work hours, telecommuting and land-use planning are gradually becoming a more visible part of everyday society. Currently, the tax code provides employees with a tax-free fringe benefit for transportation in a commuter highway vehicle and any transit pass.[217] Unfortunately, Congress essentially gutted these two transit benefits by also allowing employers to provide employees $195 per month in free parking. Of the $2.62 billion this tax subsidy costs the federal government, over 85 percent is attributable to the free parking.[218] In sum, Americans must develop programs, both locally and nationally, to change social and cultural impediments to conserving energy and reducing travel.

Part III: Develop Alternatives: Renewable energy technology is underutilized and under funded. Of the tax credits available to alternative technologies, a miniscule amount is allocated to renewable technologies. Of the current tax credits for conservation, only a few provision specifically reward investment in renewable (or mostly renewable) energy.[219] Since enacted, the government has invested between $1 and $3.7 million (in 2003 dollars) to encourage taxpayers to develop renewable technology.[220] This equates to between three and eleven percent of the total amount the government subsidized alternative technologies.

Alternative fuels have the potential to reduce greenhouse gas emissions from 10 to 100 percent.[221] As the industry exists currently, these vehicles typically cost more, have limited driving ranges, and limited refueling and supply infrastructure. Fuels that can be blended with petroleum fuels do not suffer the same constraints, but the potential to reduce greenhouse gas emissions is estimated at only about 20 percent. Currently, four basic types of alternative motor vehicles are available in the consumer market.[222] As of 2001 only about 400,000 alternative fuel vehicles traveled the U.S. highways as compared to over 128 million gas-powered cars. New

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[215] ALEXANDER'S GAS AND OIL CONNECTIONS, 6 NEWS & TRENDS: NORTH AMERICA (Nov. 21, 2001). According to EPA fuel economy statistics, this is slightly less than 2001. Only 48 car models – led by two hybrids – get combined 30mpg or better.

[216] *See id.* In August 2001, Congress' ambivalence toward adopting a national conservation policy was apparent when it rejected fuel economy regulations for SUVs by a 269-160 vote.

[217] I.R.C. § 132 (f). For 2004, taxpayers could receive $100 in transit benefits tax-free.

[218] *See* Roberta F. Mann, *On the Road Again: How Tax Policy Drives Transportation Choice*, 24 VA. TAX. REV. 587, 637 (2005).

[219] *See infra* text accompanying notes 134 to 147 for discussion of tax provisions.

[220] These figures are based on the low and high estimates of federal tax expenditures for alternative fuels presented in the appendix.

[221] *See* GREENE, *supra* note 195, at 24.

[222] *See* Sullivan, *supra* note 167, at 1245. Electric Battery Vehicles have electric motors and batteries that need to be plugged in and recharged. Electric vehicles offer the highest end-use energy efficiencies of any type of alternative vehicle. *See* GREENE, *supra* note 195, at 28. Fuel Cell Vehicles also have electric motors but are not recharged by generated electricity, but by hydrogen-based fuel. The fuel is added to cells where reactions convert chemical energy into electrical energy. Hybrid Vehicles combine the internal combustion engine of a conventional vehicle with the battery and electric motor of an electric vehicle. Honda became first to market a hybrid in U.S. with the two-seater Insight that can get up to 70 miles per gallon. Toyota followed closely with the five-seater Prius in 2000. Alternative Fuel Vehicles uses only the traditional internal combustion engine but with different types of fuels (no gasoline or diesel). These types of vehicles currently receive the most significant tax incentives.

vehicle technology and alternative fuels are but a small part of the kind of retooling America needs to do to free itself from oil.

Part IV. The New Society: Any plan that meaningfully reduces the U.S. dependence on fossil fuels will encounter cultural impediments to change. If Americans want to continue driving their cars (and perhaps, better ways to travel can be developed), then following the steps outlined in Parts I, II, and III are imperatives. The bottom line, however is that no plan will work without: (1) government leadership, (2) participation by businesses, and (3) consumer acceptance. The innovations implemented in Portland, Oregon provide a good example of redevelopment that has effectively freed many of its citizens from car dependence. Portland's plan includes the following features. The city implemented mixed-use, transit-oriented development to reduce dependence on the automobile and protect livability.[223] Pursuant to a statewide land use law, Portland established urban growth boundaries around the city, forcing city planners to incorporate well-developed high-density projects. Portland's inner city is now a revitalized, thriving downtown area. Much of the new development downtown consists of 3 to 4 story multifamily dwellings built over street-level shops.[224] People can walk to shop and work.

Planners replaced a segment of downtown roadway with an urban park, limited downtown parking spaces and used road construction funds to create public transportation lines. Forty percent of commuters to downtown now use public transportation. The city transportation network includes a light rail line and, in the city center, bus transportation is free. Between 1980 and 1990, metropolitan Portland benefited from slower growth in vehicle traffic, and saw jobs and income levels go up.[225] City leaders and the community continue working cooperatively to improve, not only the environment, but the overall quality of life. For Americans who discovered the freedom that cars can provide, what is perhaps most surprising, is that Portland's plan is discovering ways to free its citizens from their cars.

V. Conclusion

The automobile along with cheap fuel and miles of roads revolutionized our lives at the turn of the twentieth century. National policies drove that revolution. This same kind of revolution must take place again, and the same magnitude of national investment will be needed for long term solutions to take hold. The deleterious side effects of the existing structure, built around fossil fuels and inefficient transportation modes, are undeniable. Even those who would deny the existence of global warming cannot ignore the magnitude of the security threat posed by the fossil fuel lifestyle. Tax incentives given to the fossil fuel industry over the last 90 years have played a major role in this investment. Percentage depletion and the IDC deduction encouraged drilling, extraction and development of oil and gas fuels. To date, the United States has not made this kind of financial commitment to alternative fuel technologies. As gasoline prices continue to rise, perhaps consumers will pressure their government officials at the federal, state and local levels to legislate for a sustainable future.

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[223] *See* WORLD RESOURCES INSTITUTE, TRANSPORTATION AND LAND USE: PORTLAND, OREGON, http://www.wri.org/wro/enved/suscom-portland.html.

[224] *Id.*

[225] *Id.*

The answer is obvious, but it will not be easy to implement. The United States must shift its investment away from fossil fuels and move resources into renewable energy and its infrastructure. This article describes a plan for the new mobile society. The plan has to allow time for transition – resource shifts and societal shifts – that can truly drive sustainable mobility. Environmental tax reform should be an integral part of this plan. Financing reforms through higher taxes on environmentally destructive activities can ultimately lower taxes on wages, capital formation and clean energy technologies.[226] A portion of these "green taxes" can provide transition assistance for energy-intensive companies; support to low-income households; and incentives for energy efficiency and clean technologies. Until the United States is willing to invest in tomorrow's revolution in the same order of magnitude that it invested in the revolution of the automobile, sustainable mobility will remain a mirage on the horizon at the end of the highway.

[226] *See* The Center for a Sustainable Economy, *Environmental Tax Reform: A Market-Based Solution* (Redefining Progress; www.rprogress.org/programs/sustainableeconomy/ETR.htm).