

## ARTICLES

### Getting Into the Act: Enticing the Consumer to Become “Green” Through Tax Incentives

by Roberta F. Mann and Mona L. Hymel

*Editors' Summary: Surveys show that the public will choose green alternatives if given the chance, yet average consumers are not making environmentally friendly choices in their everyday lives. In this Article, Profs. Roberta Mann and Mona Hymel examine this conundrum in the context of energy use and argue that well-designed tax incentives can encourage green behavior. After examining the elements necessary to create market demand, Mann and Hymel set forth the basic principles of a successful tax incentive program. The authors then look at the myriad of tax incentives available to promote consumer investment in alternative and fuel-efficient technologies. They conclude that although existing tax incentives encourage consumers to make green choices, the programs are poorly coordinated and fall short of their fullest potential. Federal, state, and local governments must therefore work together to achieve the common goal of preserving our environment.*

#### I. Introduction

*People are the source of power. As citizens, workers, investors, consumers, and innovators, people make things happen.*<sup>1</sup>

Energy tax incentives have historically focused on the supply of energy sources. The U.S. government spends billions of dollars each year propping up the petroleum industry through tax incentives. For example, oil and gas incentives encourage production and enhance oil recovery strategies. Furthermore, most of the tax incentives directed toward “environmentally friendly” technologies focus on creating new technology or increasing alternative fuel supplies. Meanwhile, federal policymakers have largely neglected the demand side of the energy equation. Properly designed tax incentives can effectively encourage energy consumers to conserve energy and use different energy sources. On the federal level, the clean fuel vehicle deduction has encouraged consumers to acquire hybrid gas/electric vehicles. Several states have also employed tax incentives to encourage consumers to use “green” energy sources. This Article explores the value of the consumer in promoting the environment. The untapped consumer needs a little prodding to become a larger part of the environmental reform

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1. Betsy Taylor, *How Do We Get From Here to There?*, in SUSTAINABLE PLANET: SOLUTIONS FOR THE TWENTY-FIRST CENTURY 236 (2002).

movement.<sup>2</sup> Well-designed tax incentives can provide such a nudge.

As 71% of consumers believe that a strong economy can co-exist with a clean environment, odds are that the public will choose green power, if given the chance.<sup>3</sup> Most individuals, however, are not making environmentally friendly choices in their everyday lives.<sup>4</sup> Our homes are not energy efficient. Our cars guzzle gas. We drive long distances to and from work. We do not recycle. Part II of the Article explores this mystery. If studies indicate that people are concerned about the environment, then determining the rea-

2. Several recent articles consider the environmental problems caused by individual practices and consumer decisions. See generally Daniel A. Farber, *Controlling Pollution by Individuals and Other Dispersed Sources*, 35 ELR 10745 (Nov. 2005); Michael P. Vandenberg, *The Individual as Polluter*, 35 ELR 10723 (Nov. 2005); Mark A. Cohen, *Individual and Household Environmental Behavior: What Does Economics Contribute to the Discussion?*, 35 ELR 10754 (Nov. 2005); Trip Pollard, *Driving Change: Public Policies, Individual Choices, and Environmental Damage*, 35 ELR 10791 (Nov. 2005); Paul C. Stern, *Understanding Individuals' Environmentally Significant Behavior*, 35 ELR 10785 (Nov. 2005); Ann E. Carlson, *Social Norms and Individual Environmental Behavior*, 35 ELR 10763 (Nov. 2005); Michael P. Vandenberg, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Laws*, 57 VAND. L. REV. 515 (2004).

3. GREENBERG QUINLAN RESEARCH INC., TOP TIER VOTING ISSUE 4 (2000), available at [http://www.greenbergresearch.com/articles/1604/1327\\_Environment%20Top%20Tier%20Voting%20Issue\\_analysis.pdf](http://www.greenbergresearch.com/articles/1604/1327_Environment%20Top%20Tier%20Voting%20Issue_analysis.pdf) (last visited Apr. 10, 2006).

4. One recent article estimates that individuals are the largest source of dioxin emissions, contribute approximately one-third of ozone precursor emissions, and surpass large industrial sources in emitting several other air toxics. See Vandenberg, *The Individual as Polluter*, *supra* note 2, at 10723.

sons that consumers are not participating in protecting the environment is critical.<sup>5</sup> Some individuals simply do not understand environmental problems. Many still fail to grasp the relationship between driving a large vehicle and global warming. In addition, even if they do have some understanding of the problem, many people live in denial about their responsibilities. The U.S. government does its part to reinforce this denial. For example, current political leaders continue to deny that global warming even exists. The consumer sector is vital in changing demand for environmental goods; therefore, the Article explores the root causes for their lack of participation.

Part III sets forth the basic principles of a successful tax incentive program. Part IV then discusses federal incentives used to stimulate consumers to invest in green technology. Federal tax credits are available for the purchase of certain hybrid vehicles, electric vehicles, and solar energy equipment. Part IV also discusses state initiatives to promote environmental stewardship and incentives designed for consumers. Finally, the Article discusses a comprehensive approach to marshalling the power of the consumer in creating a sustainable society.

In sum, consumers must “get into the act.” Characteristics of tax incentives should include sufficient funding and stability. Credits enacted for only a short time create uncertainty, yet consumers are unwilling to risk investments without certainty. The amount of the incentive needs to be large enough to stimulate interest and significant new investment, particularly in the early years. In addition, the public must be educated about energy efficiency technologies and the availability of the tax incentives. Consumers are concerned about the environment and are motivated to purchase renewable energy technologies. When these attitudes are supported by renewable energy policies, implementation of energy-efficient and renewable energy projects is successful.

## II. Affecting Demand for Energy Usage: Need, Desire, Cost, and Availability

*It's not easy being green.*<sup>6</sup>

This Article urges government policymakers to address the demand side of the energy equation. Why aren't consumers using more energy-efficient products? Consumers are willing to pay more for “green power,”<sup>7</sup> they put renewable en-

ergy and conservation high on a list of surveyed priorities, and yet renewable energy sources made up only 9% of energy usage in 2004.<sup>8</sup> Market demand is made up of four elements: need, desire, cost, and availability. Each of these elements must therefore be present to create more demand for green products.

Environmentalists consider that society needs to reduce its dependence on nonrenewable resources. But does the average consumer recognize that environmental problems exist, that the consumer may play a role in causing environmental problems, and that the consumer may play a role in solving environmental problems? The answers to these questions are clearly “yes.” A survey by Yale University found that 92% of Americans believe that dependence on imported oil is a serious problem.<sup>9</sup> Ninety percent of the more than 1,000 Americans surveyed believed that one of the best solutions to the problem of imported oil is to build more solar facilities. Eighty-eight percent thought that more wind-turbine farms should be built. Eighty-three percent believed that the government should enact tax credits for energy-efficient appliances. Seventy percent believed that tax credits for high-mileage hybrid vehicles were a good idea. In contrast, 67% of Americans surveyed thought that building more coal-fired plants was a bad idea. Sixty-four percent thought that building more nuclear-powered plants was a bad idea. Other studies showed that the more consumers learned about green resources, the more likely they are to choose them.<sup>10</sup> Accordingly, consumer education can supply the “need” for green power.

A consistent message from community leaders would also be helpful in convincing consumers of the need to move away from energy dependence on fossil fuels. While some regions of the United States have shown consistent interest in conservation and renewable energy, the federal government could use some work on its message. When the government provides consumer incentives to conserve nonrenewable resources and use renewable resources, it sends the message that environmental problems are real and that the consumer can help.<sup>11</sup> Unfortunately, the government sends consumers mixed messages. The Energy Tax Incentives Act (ETI Act)

5. Unfortunately, most of the research studying the response to environmental policies (financial and command and control) has focused on decisionmaking by firms. Very little research has focused on household responses to environmental policies. See HADI DOWLATABADI ET AL., MODEL, MODEL ON THE SCREEN, WHAT'S THE COST OF GOING GREEN? 15 (Resources for the Future, Discussion Paper 04-17, 2004), available at <http://www.rff.org/rff/Documents/RFF-DP-04-17.pdf> (last visited Apr. 10, 2006). This study notes that if energy expenditures are too low a fraction of household income, there is little response to efficiency information. If energy expenditures are a significant part of household income, individuals want to save energy, but often have no freedom to respond, perhaps due to agency or capital constraints. *Id.* at 16-17. These results suggest several possibilities: significant barriers to entry; landlord/tenant constraints; and potential free-rider issues.

6. Kermit the Frog, one of the Muppets created by Jim Henson. The quote is from the song “Bein’ Green,” written by Joe Raposo, that first debuted on *Sesame Street* on March 10, 1970.

7. EDWARD G. FERGUSON, REPORT ON CONSUMER ATTITUDES ABOUT CONSERVATION AND RENEWABLE RESOURCES (1999), available at [http://www.bpa.gov/Energy/N/Reports/what\\_consumers\\_want/](http://www.bpa.gov/Energy/N/Reports/what_consumers_want/) (last visited Mar. 23, 2006).

8. ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY (DOE), ELECTRICITY FORECAST, ANNUAL ENERGY OUTLOOK 2006, available at <http://www.eia.doe.gov/oiat/aeo/index.html> (last visited Mar. 23, 2006).

9. YALE UNIVERSITY SCHOOL OF FORESTRY AND ENVIRONMENTAL STUDIES, SURVEY OF AMERICAN ATTITUDES ON THE ENVIRONMENT (May 2005), available at <http://www.yale.edu/envirocenter/poll2key.prn.pdf>. Consistent data emerged from several other polls. See PEW RESEARCH CENTER FOR THE PEOPLE AND THE PRESS, BEYOND RED VS. BLUE (May 10, 2005), available at <http://peoplepress.org/reports/pdf/242.pdf> (finding that more than three-quarters (77%) believe the country should do whatever it takes to protect the environment and 63% subscribe to that view strongly); Polling-Report.com, *Environment—The Gallup Poll* (Mar. 13-16, 2006), at <http://www.pollingreport.com/enviro.htm> (last visited Apr. 10, 2006).

10. See FERGUSON, *supra* note 7 (citing three studies in Texas using a “Deliberative Polling™” technique, which involved polling consumers before and after an informative “town meeting.” The education provided by the meeting shifted consumer attitudes from a preference for renewable energy to a preference for conservation).

11. See generally Sharon C. Nantell, *Symposium: Federal Tax Policy in the New Millennium: A Cultural Perspective on American Tax Policy*, 2 CHAP. L. REV. 33 (1999); Alice G. Abreu, *Taxes, Power, and Personal Autonomy*, 33 SAN DIEGO L. REV. 1 (1996). Both articles discuss the power of the messages and impact of the federal tax system on the lives of individuals.

of 2005 provides greater assistance to production of non-renewable resources than it does to reducing demand and providing alternatives to nonrenewable energy sources.<sup>12</sup> The government does not consistently send the message that using nonrenewable resources is directly linked to environmental ills such as air pollution and global warming.<sup>13</sup> Accordingly, consumers feel justified in continuing consumption as usual. However, recent history shows that even ingrained societal behaviors can change. When credible science and a vigorous education campaign aimed at the general public convinced consumers of the health issues of smoking, local governments followed public opinion and now smoking is banned in most public buildings nationwide. Cigarette tax increases are now politically palatable. Perhaps if consumers can be convinced of the link between environmental disaster and nonrenewable energy sources, drivers of sport utility vehicles (SUVs) will be shunned and gas taxes will be viewed as acceptable “sin” taxes. But for now, Americans consider cheap gas to be their “constitutional” right, whatever the ultimate cost.<sup>14</sup>

Creating desire for products, needed or not, is the focus of marketing. Malcolm Gladwell, in his book *The Tipping Point*, notes that products and behaviors become popular in a manner similar to the spread of an epidemic. Advertising may help, but influential early adopters may have more effect. Actual users have more credibility than paid advertisers. Celebrity recommendations can have tremendous effect—witness the effect of popular talk show hostess Oprah Winfrey’s book club.<sup>15</sup> Celebrity owners of hybrid vehicles helped increase publicity and sales volume.<sup>16</sup> Perhaps if the reality television show “Extreme Home Makeover” focused on insulating homes, adding energy-efficient windows and appliances, solar heating, and low water use landscaping rather than adding immense hot tubs, theater rooms, and five-car garages, reducing home energy use would become fashionable.<sup>17</sup> One commentator noted that

[it] is truly ironic that one of those on the cutting edge of consumer conservation is [President George W. Bush] himself, whose ranch in Crawford, Texas, has been described as “an environmentally sensitive showplace” designed with “state-of-the-art energy efficiency.” The house is filled with energy-saving devices, while the

ranch’s lawn and fruit orchard are irrigated with recycled water.<sup>18</sup>

Once “green” becomes trendy, consumers must be educated on how to obtain green alternatives. The information must be presented in a way that captures and holds the customer’s attention: it must be “sticky,” in Gladwell’s terminology. Tax incentives alone won’t make green power trendy. President Bush’s “celebrity endorsement” of green building techniques can’t overcome his public and loyal support for the fossil fuel industry.<sup>19</sup> But government can help in educating the public by providing funds for implementation and streamlining the process of obtaining tax benefits.

Cost and availability are related issues. Many consumers are concerned about pollution, global warming, and the declining supply of oil. These concerned consumers would welcome an opportunity to purchase products that solve these environmental problems. However, energy-efficient alternatives are not always readily available or are available only at an entry cost significantly higher than energy intensive conventional products. For example, point-of-use hot water heaters are more efficient because they only heat water on demand. Traditional tank style hot water heaters use fuel constantly to maintain the heat of the water stored in the tank. An informal survey reveals that the purchase cost of a 50-gallon electric tank hot water heater averages about \$300, while the purchase cost of a tankless water heater averages about \$900. At an average annual energy cost savings of \$150 per year (which would increase as energy prices rise), it would take four years to recover the additional cost of the tankless unit. Thus, a consumer who does not plan to stay in her home for four years would not choose a tankless hot water heater. Likewise, a landlord who charges tenants for power usage would not choose a tankless hot water heater. Thus, environmentally friendly products frequently save the consumer money over time but are more expensive to purchase initially. As the U.S. Department of Energy (DOE) noted in its Annual Report, while “the most efficient technologies can provide significant long run savings in energy bills, their higher purchase costs tend to restrict their market penetration.”<sup>20</sup>

When market entry barriers cause consumers to make environmentally unsound decisions, tax incentives can help overcome the market barriers. Entry costs may be higher because environmentally friendly products do not have as high volume sales as conventional products. Low market volume makes manufacturing environmentally friendly products more expensive and also results in limited availability. If the market for the environmentally sound product becomes larger, the product can be produced more efficiently. Also, if demand is successfully stimulated and supply cannot catch up, “green” momentum may be lost. How many potential Toyota Prius owners gave up on the waiting list and purchased a conventionally powered vehicle? Tax incentives

12. Energy Policy Act of 2005, H.R. 6, 109th Cong., Pub. L. No. 109-58 (2005). The tax incentives portion of the Energy Policy Act, set forth in title XIII, is officially known as the “Energy Tax Incentives Act of 2005,” the focus of this Article.

13. See Roberta F. Mann, *Waiting to Exhale: Global Warming and Tax Policy*, 51 AM. U. L. REV. 1135, 1148-52 (2002) (discussing the federal government’s position on global warming).

14. See, e.g., Gernot Wagner, *NPR Commentary on the Kyoto Protocol* (July 13, 2001), at <http://www.gwagner.net/writing/2001/07/npr-commentary-on-kyoto-protocol.html> (last visited Mar. 24, 2006).

15. “A recommendation by [Oprah] Winfrey can be worth hundreds of thousands of copies in sales.” CNN.com, *Oprah’s Book Club Enters New Chapter by Cutting Back* (Apr. 5, 2002), at <http://archives.cnn.com/2002/SHOWBIZ/books/04/05/oprah.book.club/> (last visited Mar. 24, 2006).

16. Actors Leonardo DiCaprio and Cameron Diaz reportedly own hybrid vehicles. See Roberta F. Mann, *On the Road Again, How Tax Policy Drives Transportation Choices*, 24 VA. TAX REV. 587, 632 (2005) (citing Sandra Block, *Hybrid Vehicles: Easy on Gas and Your Wallet*, USA TODAY, June 24, 2002, at 3B, available at <http://www.usatoday.com/money/perfi/columnist/block/2002-06-25-hybrid-cars.htm> (last visited Apr. 10, 2006)).

17. See Sears.com, *Extreme Makeover: Home Edition*, at <http://abc.go.com/primetime/xtremehome/> (last visited Mar. 24, 2006).

18. Arianna Huffington, *Energy Efficiency: Our Leaders Fiddle While the Public Turns* (July 9, 2001), at [http://healthandenergy.com/energy\\_efficiency\\_strategy.htm](http://healthandenergy.com/energy_efficiency_strategy.htm) (last visited Mar. 24, 2006).

19. Former fossil fuel energy lobbyists, such as Deputy Secretary of the Interior J. Steven Giles, hold powerful positions in the Bush Administration. See Mann, *supra* note 13, at 1157.

20. ENERGY INFORMATION ADMINISTRATION, U.S. DOE, ANNUAL ENERGY OUTLOOK 2005, available at <http://www.eia.doe.gov/oiia/archive/aeo05/index.html> (last visited Mar. 24, 2006).

can increase sales volume and make products more available. So tax incentives should last long enough to overcome the market barriers and enable environmentally sound products to compete economically with older, less efficient products. Finally, operating costs for conventional products may be artificially low because of government subsidies for production of nonrenewable energy sources. Even aside from government subsidies, fossil fuel use produces high external costs that are borne by the public rather than by the fossil fuel industry. Government should stop subsidizing nonrenewable, polluting sources of energy and let the market operate to reduce demand for such products.

### III. Principles for Energy-Efficient Tax Incentives

Tax incentives are paid for by the entire taxpaying public. When a tax incentive is used to correct a market failure and provide a level playing field for an energy-efficient product, all taxpayers benefit from cleaner air and water and from the stability of a less oil dependent economy. Sen. Charles Grassley (R.-Iowa), chairman of the U.S. Senate Finance Committee acknowledged the government's role in providing access to energy-efficient products and technologies, stating that "[a]s consumer demand for alternative energy products increases, it's important for [the U.S.] Congress to help deliver those products. I hope this bill [the ETI Act] is just the beginning of creative ways to improve our environment, economy, and energy independence."<sup>21</sup>

A 2001 study by the American Council for an Energy-Efficient Economy (ACEEE) outlined eight principles for energy efficiency tax incentives, noting that tax incentives should:

- Stimulate commercialization of advanced technologies;
- Establish performance criteria and pay for results;
- Pay substantial incentives;
- Choose technologies where first cost is a major barrier;
- Be flexible in terms of who receives the credit (whether manufacturer or consumer);
- Complement other policy initiatives;
- Select priorities but offer incentives in a variety of areas to increase the likelihood of success; and
- Allow adequate time before phasing out the incentives.<sup>22</sup>

The results of the Yale survey discussed above indicate something about the psychology of American consumers: they want to help the environment but they don't want to change their lives to do so. Only 39% of those surveyed thought that reducing the national speed limit to 55 miles per hour was a good idea, which was only slightly more popular than building new nuclear power plants. Only 15% thought that increasing the gas tax would be a good idea. Accordingly, tax incentives designed for consumers should be easy to understand, easy to obtain, and ideally not require a radical change in the consumer's lifestyle.

The remainder of this Article will describe historical, current, and new federal and state energy tax incentives, comparing the incentives to the principles above, as appropriate.

21. *Grassley Highlights Consumer Tax Benefits in New Energy Bill*, 2005 TAX NOTES TODAY 146-57 (July 29, 2005). See also Press Release, U.S. Senate Committee on Finance, *Grassley Highlights Consumer Tax Benefits in New Energy Bill* (July 29, 2005), available at <http://www.senate.gov/~finance/press/Gpress/2005/prg072905a.pdf> (last visited Apr. 13, 2006).
22. PATRICK QUINLAN ET AL., *TAX INCENTIVES FOR INNOVATIVE ENERGY-EFFICIENT TECHNOLOGIES 2* (ACEEE Rep. No. E013) (2001).

### IV. Tax Incentives to Promote Consumer Investment in Alternative and Fuel-Efficient Technologies

#### A. History of Federal Incentives

As a result of the first U.S. oil crisis in 1973, declines in oil production, increases in oil demand, oil embargoes, oil price and supply shocks, wide petroleum price variations and price spikes, rising oil import dependence, and increased evidence of the seriousness of environmental problems associated with fossil fuels, Congress necessarily began to consider new energy policy options including alternative energy tax incentives and subsidies.<sup>23</sup> For the first time, in the Energy Tax Act of 1978, Congress enacted several tax provisions designed to encourage energy conservation and develop alternative fuels.<sup>24</sup> This section describes these and later tax provisions used to encourage consumers to make environmentally friendly choices.

Despite comprehensive non-tax environmental legislation enacted during the 1970s and increased governmental regulation of pollutants, the overwhelming majority of energy tax subsidies and incentives belong to businesses that extract, produce, and transport nonrenewable resources. The handful of tax incentives described as "alternative fuel tax provisions" fail to provide industries involved in developing renewable energy (not to mention the lowly consumer) even a small fraction of the government assistance and commitment that the fossil fuel industries have received. These "environmentally friendly" tax incentives dwarf the federal investment in exploitation of fossil fuels. Furthermore, tax incentives that target consumers have been and continue to be minimally utilized.

Despite the government's continued denial of the seriousness of environmental problems in the United States, Congress has experimented with several consumer-oriented tax incentives. Under the Energy Act of 1978, Congress enacted tax credits for investing in energy conservation products (insulation and other energy conservation components) and solar and wind energy equipment installed in a home or business.<sup>25</sup> Studies show that between 1978 and 1985, when the credit expired, about 30 million taxpayers had taken advantage of these credits.<sup>26</sup> Unfortunately, these credits were probably not responsible for the consumer behavior. One survey conducted in 1983 indicated that 85% of households implementing energy-efficient equipment did not even claim the tax credits, and those that did stated that they would have made the improvements even without the credit.<sup>27</sup> The study concluded that the small size of the credit, lack of promotion, and administrative burdens did little to motivate those not already motivated to make changes. More recent studies, however, contradict these early findings.<sup>28</sup> Several studies have found that tax credits play a sta-

23. SALVATORE LAZZARI, *ENERGY TAX POLICY* (Cong. Res. Serv. Rep. No. IB100054 1) (2001).

24. Energy Tax Act of 1978, Pub. L. No. 95-618, §301(a)(1) (1978).

25. See I.R.C. §46 (2004); LAZZARI, *supra* note 23, at 4.

26. PATRICK QUINLAN ET AL., *TAX INCENTIVES FOR INNOVATIVE ENERGY-EFFICIENT TECHNOLOGIES (UPDATED)*, (ACEEE Rep. No. E013 2) (2001).

27. *Id.*

28. KENNETH GILLINGHAM ET AL., *RETROSPECTIVE EXAMINATION OF DEMAND-SIDE ENERGY EFFICIENCY POLICIES 34-35* (Resources for the Future June 2004, Discussion Paper 04-19 rev, revised Sept.

tistically significant role in increased energy conservation activity. Moreover, these studies indicate that substantial cost-effective energy savings can be achieved through energy conservation products.<sup>29</sup> The residential energy income tax credit allowed taxpayers a 30% credit for the first \$2,000 spent on solar and wind energy equipment costs and a 20% credit for the next \$8,000.<sup>30</sup> Businesses enjoyed a 10% energy tax credit for investments in conservation or alternative fuel technologies such as solar, wind, geothermal, and ocean thermal technologies.<sup>31</sup> In 1980, Congress increased the residential energy tax credit to 40% of the first \$10,000 of equipment expenses. Congress also increased the business energy tax credit to 15% for solar, wind, geothermal, and ocean thermal technologies and added biomass to the list of technologies eligible for the credit.<sup>32</sup> Except for the business tax credit for solar property, these credits expired by December 31, 1985. Between 1992 and 2006, a 10% investment tax credit for business use of solar and geothermal energy was all that remained from these early energy tax credits.<sup>33</sup> Through 2005, federal tax laws did not include any consumer tax incentives for exclusively renewable technologies.

Returning to 1978, Congress enacted the “Gas Guzzler Tax,” a federal excise tax that applies to the sale of cars with a fuel economy rating below statutorily set standards, to encourage gasoline conservation.<sup>34</sup> While not an incentive promoting alternative fuel technologies, this excise tax encourages conservation of fossil fuels through technological innovations on existing gasoline-powered engines, thus, it is considered in this section. Likewise, the gas guzzler tax operates as an indirect consumer incentive. The tax provides two incentive effects readily apparent to consumers. First, vehicles subject to the tax are more expensive because the tax is passed on to the consumer, and the amount of the tax is identified on the vehicle pricing information. Second, fuel efficiency ratings are displayed on every vehicle creating consumer awareness of the importance of considering fuel

consumption in the purchasing decision.<sup>35</sup> Under the statute, both the tax and the fuel economy standards increased for each model year from 1980 through 1986. After 1986, however, Congress did not adjust either the fuel efficiency or the fuel economy standards until 1990.<sup>36</sup> For cars that do not meet the minimum fuel economy standard set by the U.S. Environmental Protection Agency (EPA), the amount of tax imposed depends on how far the fuel efficiency falls below EPA standards.<sup>37</sup> For vehicles with fuel economy of at least 22.5 miles per gallon (mpg), no excise tax is imposed. For vehicles with a fuel economy of less than 22.5 mpg, the excise tax begins at \$1,000 increases to \$7,700 for cars with a fuel economy of less than 12.5 mpg.<sup>38</sup> Unfortunately, vehicles that weigh over 6,000 pounds, the biggest polluters, are exempt from the gas-guzzler tax. Currently, over 55 different models of luxury automobiles (and SUVs) are exempt from this excise tax.<sup>39</sup>

Since the early 1970s, policymakers have introduced a number of measures to encourage the use of electric or alternative fuel vehicles.<sup>40</sup> Reacting to the 1973 to 1974 oil price shocks, Congress considered a 25% tax credit for individuals purchasing a qualified electric highway vehicle costing less than \$3,000.<sup>41</sup> After the 1979 oil price increases, the Senate passed a provision authorizing a 10% tax credit for the purchase of a qualifying electric vehicle or for the costs of converting an internal combustion engine to an electric-powered engine.<sup>42</sup> Both the 1975 and the 1979 efforts languished in Congress and died. Finally in 1992, following the Persian Gulf War and Operation Desert Storm, Congress enacted a wide range of tax and non-tax provisions to prop up domestic oil production, develop alternative fuel technologies, and encourage conservation.<sup>43</sup> The new tax incentives included both the tax credit for electric-powered vehicles drawing current from either rechargeable batteries or fuel cells and immediate expensing of a portion of the costs of “qualified clean-fuel vehicle property.”

Prior to enacting the ETI Act, both electric and fuel-cell vehicles could qualify for a 10% tax credit, up to a maximum of \$4,000.<sup>44</sup> A qualified electric vehicle is a motor vehicle that is powered primarily by an electric motor drawing current from rechargeable batteries, fuel cells, or other portable sources of electrical current.<sup>45</sup> Originally scheduled to

2004), available at <http://www.rff.org/rff/Documents/RFF-DP-04-19REV.pdf> (discussing several studies that find tax credits have a positive effect on conservation investment).

29. See, e.g., ENERGY STAR 2003 ANNUAL REPORT 3, available at <http://www.energystar.gov> (last visited Apr. 13, 2006); REDIRECTING AMERICA'S ENERGY: THE ECONOMIC AND CONSUMER BENEFITS OF CLEAN ENERGY POLICIES 14 (U.S. PIRG 2005), available at <http://newenergyfuture.com/newenergy.asp?id2=15905&id3=energy&> (last visited Apr. 13, 2006); STEVEN NADEL, THE FEDERAL ENERGY POLICY ACT OF 2005 AND ITS IMPLICATIONS FOR ENERGY EFFICIENCY PROGRAM EFFORTS (ACEEE Rep. No. E053) (2005); QUINLAN ET AL., *supra* note 26, at 27.

30. Energy Tax Act of 1978, Pub. L. No. 95-618, §101(a) (1978); Energy Information Administration, *Legislation Affecting the Renewable Energy Marketplace*, at <http://www.eia.doe.gov/cneaf/solar.renewables/page/legislation/impact.html> (last visited Mar. 24, 2006); LAZZARI, *supra* note 23, at 4.

31. Energy Tax Act of 1978, §301(a)(2)(B); Energy Information Administration, *supra* note 30; LAZZARI, *supra* note 23, at 4.

32. See Crude Oil Windfall Profits Tax Act of 1980, Pub. L. No. 96-223 (1980); LAZZARI, *supra* note 23, at 4; Energy Information Administration, *supra* note 30.

33. See I.R.C. §48 (2004). 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, but only, in the case of electricity generated by geothermal power, up to the electric transmission stage. See I.R.C. §48(a)(3)(A)(i) (2005).

34. See I.R.C. §4064 (2004).

35. 49 U.S.C. §32908(b)(1)(A) (2005).

36. See JOINT COMMITTEE ON TAXATION, PRESENT LAW AND BACKGROUND RELATING TO FEDERAL ENVIRONMENTAL TAX POLICY 11 (1990).

37. See *id.* at 10.

38. I.R.C. §4064(a) (2004).

39. See GREEN SCISSORS, GREEN SCISSORS 2004: CUTTING WASTEFUL & ENVIRONMENTALLY HARMFUL SPENDING 13 (2004), available at <http://www.greenscissors.org/publications/gss2004.pdf> (last visited Apr. 13, 2006). These models include the Lincoln Navigator, the Cadillac Escalade, and the Hummer H2.

40. 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.

41. *Id.* at 1246; Energy Policy and Conservation Act, Pub. L. No. 94-163, 89 Stat. 871 (1975).

42. Sullivan, *supra* note 40, at 1246.

43. Energy Security Act of 1992, Pub. L. No. 102-486, §1913(b)(1) (1992).

44. See I.R.C. §§30(a), 30(b) (2004).

45. See *id.* §30(c).

phase out in 2004, but extended in 2001, the credit is reduced by 25% in 2004, 50% in 2005, 75% in 2006, and then completely phased out by 2007.<sup>46</sup> Although enacted in 1992, the Internal Revenue Service (IRS) took three years to write regulations elaborating on the applicability of the credit.<sup>47</sup> The regulations primarily address issues of credit recapture, and despite the efforts of several groups, the IRS did not extend the credit to existing cars retrofitted with electric engines.<sup>48</sup> In addition, the IRS refused to include hybrid vehicles as eligible for the credit.<sup>49</sup>

Certain clean-fuel vehicles and clean-fuel refueling property are eligible for a limited amount of expensing in the year the property is placed in service.<sup>50</sup> Qualified clean-fuel vehicles include motor vehicles that use certain clean-burning fuels such as natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, electricity, and any other fuel containing at least 85% methanol, ethanol, any other alcohol, or ether.<sup>51</sup> The maximum amount of the deduction is \$50,000 for a truck or van with a gross vehicle weight over 26,000 pounds or a bus with at least a 20-person seating capacity.<sup>52</sup> For a truck or van with a gross vehicle weight between 10,000 and 26,000 pounds, the maximum deduction is \$5,000.<sup>53</sup> And for any other motor vehicle, the maximum deduction is \$2,000.<sup>54</sup> Up to \$100,000 of the costs of clean-fuel vehicle refueling property may also be expensed in the year it is placed in service.<sup>55</sup> Clean-fuel vehicle refueling property includes property for the storage or dispensing of a clean-burning fuel if the storage or dispensing occurs where the fuel is delivered into the vehicle fuel tank.<sup>56</sup> Eligible property also includes property for the on-site recharging of electric vehicles.<sup>57</sup> The deduction is phased down between 2004 and 2006, in the same manner as the electric vehicle credit, and is unavailable after December 31, 2005.<sup>58</sup>

The Energy Policy Act of 1992 included a provision that allowed consumers who purchased or installed an energy conservation measure to exclude the value of any subsidy provided by a public utility.<sup>59</sup> An energy conservation measure includes any installation or modification to a dwelling that reduces consumption of electricity or natural gas or improves the management of energy demand.<sup>60</sup> Although the IRS does not publish statistics showing how many taxpayers took advantage of this provision, the Joint Committee on Taxation (JCT) estimates that the provision reduces govern-

ment revenues by less than \$50 million per year, making this a very small benefit indeed.<sup>61</sup>

Since the 1980s, all of the energy tax legislation enacted by Congress, while including tax incentives for conservation and alternative fuels, continued to provide tax relief for the oil and gas industry.<sup>62</sup> For example, in the 2003 Energy Tax Act legislation, fossil fuels subsidies accounted for 56% of the total tax expenditure provisions for energy.<sup>63</sup> In the ETI Act, energy infrastructure incentives and fossil fuel incentives accounted for over 64% of the total tax expenditure provisions for energy.<sup>64</sup> Tax incentives currently available for conservation and renewable technologies are insignificant when compared with the enormous U.S. investment in the fossil fuel industry and its infrastructure. Furthermore, consumers are by and large left out of the picture. Federal tax incentives have largely failed to tap into Americans' desire to protect the environment and their willingness to use alternative technologies if they were readily available and affordable. In particular, tax incentives can be very effective in helping consumers overcome initial cost barriers. Consumer tax incentives would complement available business tax incentives, as well.

### B. New Federal Tax Incentives

The federal tax incentives added by the ETI Act are anticipated to cost \$14.5 billion, plus an additional \$6 million for the nuclear power industry. Of the total \$20 billion, more than \$12.8 billion, about 64%, benefit the fossil fuel or nuclear power industry. The bill contains \$5.3 billion, about 26%, for renewables, efficiency, and alternative fuel vehicles.<sup>65</sup> The new legislation continues the federal government's mixed message about energy: continuing to provide substantial subsidies for fossil fuel production while paying lip service to energy efficiency and renewable fuels. The legislation is consistent with DOE's 2005 outlook, published before the bill was passed. DOE publishes an annual energy outlook that projects U.S. energy trends for the next 20 years. The picture on the cover of the 2005 to 2025 report is an oil pump in front of the setting sun. The setting sun is appropriate because by 2025 the world will be 15 years past the peak of oil production.<sup>66</sup> DOE predicts that renewable energy sources will continue to be a minor player in the United States, stating that while electricity generation from renewable sources is expected to increase by 36% from 2003 to 2025, its share of total electricity supply is projected to decline from 9% in 2003 to 8% in 2025. DOE further predicts that per capita energy consumption will rise, with growth in demand for energy services only partially offset

46. See *id.* I.R.C. §30(b); Sullivan, *supra* note 40, at 1246.

47. See T.D. 8606, 1995-2 C.B. 3 (Aug. 2, 1995); Treas. Reg. §1.30-1 (2004) (defining qualified electric vehicles and providing recapture rules).

48. Sullivan, *supra* note 40, at 1246.

49. *Id.*

50. See I.R.C. §179A (2004).

51. See *id.* §179A(c).

52. *Id.* §179A(b)(1)(A).

53. *Id.*

54. *Id.*

55. See *id.* §179A(b)(2).

56. See *id.* §179A(d).

57. See *id.*

58. See *id.* §179A(f).

59. See *id.* §136 (2005); Energy Policy Act of 1992, Pub. L. No. 102-486, §1912(a) (1992).

60. See I.R.C. §136(c) (2005).

61. JCT, ESTIMATE OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2005-2009, at 31 (Doc. No. JCS-1-05) (2005). In comparison, the tax expenditures associated with the parking fringe benefit are estimated to average over \$4 billion over the five-year study period. *Id.* at 34.

62. See LAZZARI, *supra* note 23, at 8.

63. See *id.* at 16.

64. See JCT, ESTIMATED BUDGET EFFECTS OF ENERGY TAX INCENTIVES ACT OF 2005, TITLE XIII OF ENERGY POLICY ACT OF 2005 (H.R. 6) (2005).

65. JCT, ESTIMATED BUDGET EFFECTS OF THE CONFERENCE AGREEMENT FOR TITLE XIII OF H.R. 6, THE "ENERGY TAX INCENTIVES ACT OF 2005" (JCX-59-05) (2005) [hereinafter JCT 2005 ESTIMATED EFFECTS].

66. See Colin L. Campbell & Jean H. Laherrarere, *The End of Cheap Oil*, *Sci. Am.*, Mar. 1998, at 61, 63.

by efficiency gains. Residential energy use is expected to climb due to the growth of population in the West and the Southeast, where almost all new homes have central air conditioning. The trend toward the increasing size of homes and the increasing purchase of consumer electronics adds to the energy demand. The new energy bill is unlikely to change this forecast.

### 1. Credit for Residential Energy-Efficient Property<sup>67</sup>

Current tax law permits a taxpayer to exclude from income the value of any subsidy provided by a public utility for the purchase or installation of an energy conservation measure.<sup>68</sup> Under the ETI Act (new §25D of the Internal Revenue Code), a taxpayer may get a credit for certain residential energy-efficient property installed in her home after December 31, 2005, and before January 1, 2008. The tax credit is the sum of three components:

- (1) 30% of qualifying expenditures up to a maximum credit of \$2,000 to purchase qualified photovoltaic property;
- (2) 30% of qualifying expenditures up to a maximum credit of \$2,000 to purchase qualified solar water heating property; and
- (3) 30% of qualifying purchases up to \$500 per 0.5 kilowatt for the purchase of qualified fuel-cell power plants. The fuel-cell power plant must be used in a principal residence, it must convert a fuel into electricity using electrochemical means, it must have an electricity-only generation efficiency of greater than 30%, and it must generate at least 0.5 kilowatts of electricity.

A fuel-cell power plant makes energy without combustion by an electro-chemical process.<sup>69</sup> A variety of different fuels may be used, including hydrogen. Fuel-cell technology is still in the experimental stages. Although use of fuel-cell technology produces little to no pollution, manufacturing hydrogen fuel is energy intensive and requires significant amounts of electricity, which in the United States is primarily derived from the combustion of coal.<sup>70</sup>

67. The JCT estimates the cost of the residential energy-efficiency property tax credit at \$31 million through its sunset in 2007. See JCT 2005 ESTIMATED EFFECTS, *supra* note 65.

68. I.R.C. §136 (2005).

69. The National Fuel Cell Research Center explains that

[f]uel cells are electrochemical devices that convert a fuel's chemical energy directly to electrical energy with high efficiency. . . .

Fuel cells electrochemically combine a fuel (typically hydrogen) and an oxidant without burning, thereby dispensing with the inefficiencies and pollution of traditional energy conversion systems. Fuel cells function on the principal of electrolytic charge exchange between a positively charged anode plate and a negatively charged cathode plate. When hydrogen is used as the basic fuel, "reverse hydrolysis" occurs, yielding only water and heat as byproducts while converting chemical energy into electricity. . . . Pollutant emissions are practically zero.

National Fuel Cell Research Center, *What Is a Fuel Cell and How Does It Work*, at [http://www.nfrcr.uci.edu/fcreources/FCexplained/FC\\_howItWorks.htm](http://www.nfrcr.uci.edu/fcreources/FCexplained/FC_howItWorks.htm) (last visited Apr. 13, 2006).

70. TONY DUTZIK & ROB SARGENT, ACHIEVING A NEW ENERGY FUTURE: HOW STATES CAN LEAD AMERICA TO A CLEAN, SUSTAINABLE ECONOMY 16 (Nat'l Ass'n of State PIRGs 2005), available at <http://newenergyfuture.com/reports/newenergyfuture.pdf> (last visited Mar. 24, 2006).

The solar water credit only applies to a dwelling unit in the United States that is used as a residence. At least one-half of the energy used by the property must be derived from the sun. The photovoltaic credit applies to a device that generates electricity from solar power for use in a dwelling unit. One newspaper article noted that the solar hot water credit is disallowed "if the main purpose of the solar heater is to warm the swimming pool."<sup>71</sup> If she was correct, it would be a better provision than it is. In fact, the legislative history plainly states that the solar hot water heater must be used "exclusively for purposes other than heating a swimming pool or hot tub."<sup>72</sup> Accordingly, the provision may be encouraging people to use the solar hot water heater to heat their homes but to heat their swimming pools with nonrenewable energy sources. It makes sense not to incentivize a luxury item like a pool heater, but it seems to be going a bit far to penalize taxpayers who heat their residential hot water as well as their pool.<sup>73</sup>

The credit is nonrefundable, and the depreciable basis of the property is reduced by the amount of the property. Labor costs for on-site preparation, assembly, or original installation of the equipment are eligible expenditures.

### 2. Alternative Technology Vehicle Credits<sup>74</sup>

Prior tax law provided a deduction for the purchase of a qualified clean-fuel vehicle.<sup>75</sup> Hybrid passenger vehicles like the Toyota Prius qualify for the deduction, as well as other models specifically certified by the IRS. The clean-fuel vehicle deduction will expire in 2007. Purchasers of IRS-certified cars will be able to claim a deduction of \$2,000 if the vehicle was placed in service on or before December 31, 2005. In 2006, the deduction is reduced by 75% to \$500. No deduction will be allowed for vehicles placed in service after December 31, 2006. The one-time deduction must be taken in the year the vehicle was originally used, and the taxpayer must be the original owner. The JCT estimated that \$200 million worth of clean-fuel deductions would be taken in 2004.

A new tax law provision added by the ETI Act replaces the clean-fuel deduction with four credits that may apply to vehicles that save fuel based on four different technologies.<sup>76</sup> The total credit available for a hybrid motor vehicle or an advanced lean-burn vehicle is the sum of the fuel economy credit and the conservation credit.<sup>77</sup> The fuel economy credit varies according to how much the fuel economy of the qualifying vehicle exceeds the base fuel economy of a comparable 2002 model year non-alternate fuel vehicle. The

71. Kathy Kristof, *Tax Breaks for Saving Energy Tricky*, WILM. NEWS J., Aug. 21, 2005, at C3.

72. JCT, DESCRIPTION AND TECHNICAL EXPLANATION OF THE CONFERENCE AGREEMENT OF H.R. 6, TITLE XIII, THE "ENERGY TAX INCENTIVES ACT OF 2005," 49 (JCX-60-05) (2005). See I.R.C. §25D(e).

73. The solar energy property tax exemption in Louisiana, in contrast, applies to solar energy equipment attached to an owner-occupied residence or a swimming pool. LA. REV. STAT. ANN. §42:1706 (2005).

74. The JCT estimates the cost of the alternative motor vehicle credit of the ETI Act at \$807 million through 2010. See JCT 2005 ESTIMATED EFFECTS, *supra* note 65.

75. I.R.C. §179A (2005). This provision expired on December 31, 2005.

76. I.R.C. §30B (2005).

77. I.R.C. §§30B(c) and (d).

conservation credit is based on estimated lifetime fuel savings over a comparable 2002 model year non-alternate fuel vehicle, assuming a 120,000 mile vehicle life. The comparison is based on the weight of the vehicle.

A fuel-cell motor vehicle must be propelled by power derived from one or more cells that convert chemical energy directly into electricity by combining oxygen with hydrogen fuel that is stored on board the vehicle. An advanced lean-burn technology motor vehicle must be powered by an internal combustion engine that is designed to operate primarily using more air than is necessary for complete combustion of the fuel and incorporates direct injection. A hybrid motor vehicle draws propulsion energy from onboard sources of stored energy providing both an internal combustion or heat engine using consumable fuel and a rechargeable energy storage system. This type of vehicle's rechargeable energy system must meet a maximum available power standard.<sup>78</sup>

The alternative fuel motor vehicle credit only applies to vehicles that operate on compressed natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, and any liquid at least 85% of the volume of which consists of methanol. A reduced credit applies to vehicles that use those fuels mixed with petroleum-based fuels, but only if the fuel mixture is at least 75% nonpetroleum-based. The alternative fuel motor vehicle credit is based on the incremental cost of such vehicle over a comparable conventional fueled vehicle.

To qualify for any of the above credits, vehicles must be certified as meeting certain emission standards (which differ depending on the technology used and the size of the vehicle) and must be purchased new from a manufacturer. Section 30B(f) of the ETI Act limits the availability of the credit to the first 60,000 qualified vehicles sold by each manufacturer after December 31, 2005, with declining credits available for a brief grace period after the 60,000th vehicle is sold. The qualified fuel-cell motor vehicle credit expires in 2014. The other credits expire in 2010, except for medium and heavy hybrid trucks, which expire in 2009.

These credits are targeted to benefit only those purchasing vehicles that meet certain standards of fuel economy and emissions. The provision contains a strong whiff of protectionism: from recent sales trends, it appears clear that certain auto manufacturers will exhaust their share of vehicles eligible for the credit long before the credit expires in 2010. Toyota estimates that it will sell 145,000 hybrid vehicles in 2005.<sup>79</sup> They sold over 20,000 Priuses in the first quarter of 2005. At that pace, the maximum tax credit for the Prius will run out in the second or third quarter of 2006.

A tax incentive should overcome market barriers, not produce a windfall for consumers or manufacturers to continue their planned behavior. As hybrid car sales doubled in the first quarter of 2005 (over the first quarter of 2004), is this incentive really going to assist the market, or will it be a windfall? While the credit appears dauntingly complex to calculate, as a practical matter, the credit amount will be determined by the car manufacturers, who have their own in-

centives for publicizing it to their customers. The ACEEE has already estimated the hybrid vehicle tax credit amounts.<sup>80</sup> The Toyota Prius (60 mpg—city) would receive the largest credit of the popular hybrids at \$3,150. The four-wheel drive Ford Escape Hybrid (33mpg—city), would receive a \$1,060 credit.<sup>81</sup> Hybrid gas-electric technology can be used to create any combination of reduced gas consumption or increased performance. Early hybrids focused on fuel economy. As some newer hybrids increase performance without changing fuel economy, the provision's complexity seems justified. Purchasers' benefits will be tied to fuel economy, consistent with the energy saving purpose of the provision.

### 3. Credit for Electric Vehicles

The Senate version of the energy bill proposed modifying the current credit to make it permanent. The conference bill did not include that provision. Accordingly, the credit for electric vehicles will be reduced by 75% in 2006 and will expire as scheduled in 2007.

### 4. Credit for Nonbusiness Energy Property<sup>82</sup>

The new nonbusiness energy property credit added by the ETI Act provides a nonrefundable personal income tax credit for the sum of: (1) 10% of the cost of qualified energy efficiency improvements; and (2) residential energy property expenditures.<sup>83</sup> Qualified energy efficiency improvements include insulation, exterior windows and doors, and metal roofs with energy conserving coatings. Residential energy property expenditures include whole house fans, qualified natural gas, propane, or oil furnaces, and air conditioners that meet certain efficiency standards. The improvements must be made to the taxpayer's principal residence and must be installed after December 31, 2005, and before January 1, 2008. The maximum aggregate credit is \$500 per taxpayer over all taxable years, of which no more than \$200 may be attributable to the cost of windows.

This provision, while it encourages homeowners to conserve energy, does nothing to encourage new technologies. The products that are included in this credit do not face significant market barriers. However, the credit may give consumers a reason to buy more efficient products.

The energy bill also includes incentives for manufacturers to produce energy-efficient homes and appliances.<sup>84</sup> While these provisions will not affect the demand characteristics of consumers, they may assist in making energy-efficient products available. Senator Grassley noted that "new tax breaks for the manufacturers of this appliance are expected to increase the items' availability and drive down

78. Vehicles weighing 8,500 pounds or less must have a maximum available power from the rechargeable energy system of at least 5%.

79. Alan Ohnsman, *Toyota Leads U.S. Sales Gains for Gasoline-Electric Cars, SUVs* (Apr. 19, 2005), at [http://www.bloomberg.com/apps/news?pid=email\\_us&refer=japan&sid=aRcRjOfqg7uw](http://www.bloomberg.com/apps/news?pid=email_us&refer=japan&sid=aRcRjOfqg7uw) (last visited Apr. 10, 2006).

80. See American Council for an Energy-Efficient Economy, *Light-Duty Hybrid and Diesel Vehicle Tax Credits in the Energy Bill*, at <http://www.aceee.org/transportation/hybtaxcred.htm#table> (last visited Mar. 24, 2006).

81. See IRS News Release IR-2006-57 (Apr. 7, 2006) (stating that the Toyota Prius is eligible for a \$3,150 credit; IRS News Release IR-2006-56 (Apr. 7, 2006) (stating that the Ford Escape Hybrid is eligible for a \$1,950 credit).

82. The JCT estimates the cost of the credit for energy efficiency improvements to existing homes at \$556 million through 2007. See JCT 2005 ESTIMATED EFFECTS, *supra* note 65.

83. I.R.C. §25C.

84. New §§45L and 45M of the Internal Revenue Code.



their costs for consumers.”<sup>85</sup> This provision will be a good complement to the government’s Energy Star Program, which is a voluntary program under which manufacturers that produce products that meet federal energy efficiency guidelines can market those products under the “Energy Star” label. By the end of 2003, more than 1,400 manufacturers were Energy Star partners, producing 28,000 product models under the Energy Star label. Americans have purchased more than \$1 billion Energy Star products since the program began in 1992. Energy Star appliances have significant market share: nationwide, Energy Star clothes washers enjoyed a 23% market share in 2003.

### C. State and Local Tax Incentives

A number of U.S. states have enacted their own environmentally friendly incentive programs, many with consumer-oriented components, leading the federal government’s more anemic efforts. For example, Oregon offers a residential energy tax credit for a wide range of energy-efficient technologies including hybrid and alternative fuel vehicles, appliances, solar water heating systems, wind systems, and fuel cells. Between 1978 and 2001, over 84,000 residential energy tax credits were awarded; of

those, over 20,000 involved renewable energy technologies.<sup>86</sup> Most of the claims were for energy-efficient appliances such as solar water heaters. The energy savings generated from these technologies is significant. Participants surveyed indicated that the tax credit was critical in the development of the residential renewable energy market and that many consumers knew about the program. Programs such as Oregon’s can offer much insight into the development of consumer-oriented tax incentives that deliver results.

State and local tax incentives vary widely across the nation. The following chart shows the states that provide benefits and categorizes those benefits by the type of product and the type of tax reduced.<sup>87</sup> The home heating/cooling/power-generation category generally relates to benefits provided for alternative power sources used in the home. The alternative vehicle category is self-explanatory. The conservation measure category relates to benefits provided for the purchase and/or installation of energy conservation measures designed to increase the energy efficiency of the consumer’s home. The four “tax” categories relate to income tax benefits, local or state sales tax benefits, local or state property tax benefits, and state authorization for localities to provide their own property tax benefits.

Product	Income Tax Credit or Deduction	Sales Tax Exemption	Property Tax Exemption	Authorizes Local Property Tax Exemption
Home heating/cooling/ Power-generation	Alabama,* Arizona, California, Hawaii, Idaho, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New York, North Carolina, North Dakota, Oregon, Rhode Island, Utah	Arizona, Florida, Idaho, Iowa,* Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, Vermont, Washington	California, Illinois, Indiana, Iowa, Louisiana,* Maryland, Massachusetts, Michigan, Nevada, New York, North Carolina, North Dakota, Oregon, Rhode Island, South Dakota, Texas, Wisconsin	Connecticut, Maryland, New Hampshire, New York, Virginia
Alternative fuel vehicle	Colorado, Kansas, Louisiana, New York, Oregon	New York		
Conservation measures (insulation, windows, efficient appliances)	Arizona, California, Connecticut, Idaho, Maine, Montana, Oklahoma, Oregon, South Carolina**	Georgia,** Minnesota		
Notes	*Wood-burning stoves only **Mobile homes only	*Wind-only **Appliances purchased between Oct. 7, 2005, and Oct. 9, 2005 (three days only)	*Includes solar-heated swimming pools	

85. 2005 TAX NOTES TODAY 146-57 (July 29, 2005).

86. S. GOUCHOE ET AL., CASE STUDIES ON THE EFFECTIVENESS OF STATE FINANCIAL INCENTIVES FOR RENEWABLE ENERGY 58 (Nat’l Renewable Energy Lab. NREL/SR-620-32819) (2002), available at <http://www.nrel.gov/docs/fy02osti/32819.pdf> (last visited Apr. 13, 2006).

87. The information contained in the chart was derived from the Database of State Incentives for Renewable Energy, at <http://www.dsireusa.org/> (last visited Mar. 24, 2006).

Thirty-six of the 50 states provide some sort of tax incentive to encourage consumers to either save energy or use renewable energy sources. The tax incentive may be in the form of an income tax credit or deduction, a sales tax exemption, or a property tax exemption. Some states specifically authorize counties and municipalities to provide a property tax exemption for the added value of a renewable energy heating or cooling system.

Twenty-three states provide income tax incentives for energy conservation or use of renewable energy sources. Fifteen states provide income tax incentives for installation of renewable energy systems to provide home heating, cooling, or power-generation. Five states provide income tax incentives for the purchase or lease of alternative fuel vehicles. Nine states provide income tax incentives for home energy conservation measures such as adding insulation or energy-efficient appliances.

To date, state and local support for renewable energy has surpassed federal support by a large margin.<sup>88</sup> Tax benefits for renewable energy systems vary widely, from a low of \$500 in Montana<sup>89</sup> to a high of \$20,000 (spread over four years of tax returns) in neighboring Idaho.<sup>90</sup> Oregon's deduction of \$1,500 is about average,<sup>91</sup> with California,<sup>92</sup> Hawaii,<sup>93</sup> New York,<sup>94</sup> North Carolina,<sup>95</sup> and North Dakota<sup>96</sup> offering tax benefits as a percentage of the total cost of the energy system, with maximum credit amounts capped based on the type of system installed. For example, New York's income tax credit allows homeowners to recoup up to 25% of the cost of renewable electric-generating equipment costs, but the maximum amount is capped at \$3,750 for solar systems and at \$1,500 for fuel-cell systems.<sup>97</sup>

Income tax incentives can effectively motivate consumers to make investments in renewable energy, but both the benefit and the way to obtain the benefit must be clearly communicated. Unfortunately, many state programs lack funding for implementation and program evaluation. Without implementation funding, consumers will not be educated about the potential benefits. Without evaluation funding, it is difficult to obtain information about the number of taxpayers applying for benefits or the amount of benefits received by taxpayers, and it is practically impossible to assess the effectiveness of these provisions.<sup>98</sup>

Fourteen states exempt renewable or conservation energy products from state sales and use taxes. Most states offering such an exemption do so without limits or restrictions, removing 100% of the sales tax from the price of renewable equipment purchased from a retailer. Some states do specify the production capacity of eligible systems, and Arizona (which allows building contractors as well as retailers to avoid charging sales tax) imposes a \$5,000 cap per contractor per project.<sup>99</sup> Sales tax incentives have an immediate impact on consumers' purchasing decisions, as they are reflected in the price at the point of purchase. Some sales tax incentives are so briefly available as to be ineffective. The most extreme example is Georgia's state sales tax exemption for energy-efficient products.<sup>100</sup> It applies to dishwashers, clothes washers, ceiling fans, refrigerators, and a wide range of other household appliances that meet or exceed Energy Star requirements, but it only applies between October 6, 2005, and October 9, 2005. On the other hand, reasonable limits on the availability of tax benefits encourage prompt investment.<sup>101</sup>

Seventeen states provide a property tax exemption for the added value of a renewable energy heating or cooling system. Three additional states authorize their local governments to provide a property tax exemption. For most jurisdictions, this means that renewable energy equipment cannot be valued at a higher rate than conventional equipment (no matter what its actual cost) when the property is assessed for tax purposes. In some states, like Indiana<sup>102</sup> and Louisiana,<sup>103</sup> the value of a renewable energy system is not included at all in the assessment of buildings, swimming pools, or other structures to which they might be attached, i.e., adding a \$7,000 renewable energy system to property valued at \$100,000 would have no effect on the \$100,000 assessed value of that property. In other states, like Illinois<sup>104</sup> and Iowa,<sup>105</sup> special property tax assessments are offered on a case-by-case basis, with an assessor determining the exemption based on the type of equipment installed.

Whether a property tax exemption provides real incentives to consumers depends on how property tax is calculated in the applicable jurisdiction. It is doubtful whether consumers would base their energy system decision based on its potential property tax impact. Homebuyers certainly consider property taxes when making the decision to buy a home, but their impact is rarely considered when improvements are planned because property taxes are not an immediate consequence of the purchase decision. Property tax assessments usually are not made every year and may not be affected anyway by a minor improvement like a new hot water heater.

Last, coordination between federal and state tax incentives is difficult and rarely even attempted by the federal government. Federal income tax deductions for state income, property, and sales taxes reduce the value of the state tax benefits, at least for taxpayers who itemize deductions.

88. In 2001, \$66 million federal funds out of a total \$470 million in governmental support for solar energy. AMULF JAGER-WALDAU, PV STATUS REPORT 2003: RESEARCH, SOLAR CELL PRODUCTION, AND MARKET IMPLEMENTATION IN JAPAN, USA AND THE EUROPEAN UNION 31 (2003).

89. MONT. CODE ANN. §15-32-201 (2005).

90. IDAHO CODE §63-3022C (2005).

91. OR. REV. STAT. §316.116 (2005).

92. CAL. REV. & TAX CODE §17053.84 (2005).

93. HAW. REV. STAT. §235-12.5 (2005).

94. N.Y. TAX LAW §606(g-1) (Consol. 2005).

95. N.C. GEN. STAT. §§105-129.15 and 105.129.16A-19 (2006). North Carolina's tax credit is subject to various ceilings depending on the sector and the type of renewable energy system. The credits expire in 2006.

96. N.D. CENT. CODE §57-38-01.8 (2005).

97. *Id.*

98. ELIZABETH BROWN ET AL., TAX CREDITS FOR ENERGY EFFICIENCY AND GREEN BUILDINGS: OPPORTUNITIES FOR STATE ACTION 33 (2002), available at <http://www.aceee.org/pubs/e021full.pdf> (last visited Apr. 13, 2006).

99. ARIZ. REV. STAT. §42-5061 (2005).

100. GA. CODE ANN. §48-8-3 (2005).

101. BROWN ET AL., *supra* note 94, at ix.

102. IND. CODE §6-1.1-12 (2005).

103. LA. REV. STAT. §42:1706 (2005).

104. ILL. COMP. STAT. §200/10-10 (2005).

105. IOWA CODE §441.21 (2005).

## V. Conclusion

Existing tax incentives are helping consumers to “get into the act,” but the federal, state, and local tax incentives are poorly coordinated and fall short of their potential benefits. Tax incentives frequently expire after a short period of time, thus creating uncertainty for consumers considering making a long-term commitment to green energy. In states where the citizens have been educated about energy efficiency technologies and the availability of the tax incentives, programs have been successful.<sup>106</sup> It is appropriate

that each state offers a different array of tax benefits, targeting its own particular needs. However, without funding for program evaluation, it is nearly impossible to assess whether the programs have been effective. This problem is not unique to state tax incentives: while the projected cost of each tax proposal is carefully estimated, measurement of benefits after enactment is strictly ad hoc. The federal benefits should complement the state tax benefits, as the federal and state government should be working for a common goal: preserving the environment, and prosperity, for our posterity.

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106. Oregon awarded over 20,000 of tax credits for renewable energy technologies between 1978 and 2001. *GOUCHE ET AL.*, *supra* note 82.