
Articles

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Back to the Future: Recommendations and Predictions for Greener Tax Policy

*Don't throw the past away
You might need it some rainy day
Dreams can come true again
When everything old is new again¹*

For the last ten years, I have been considering how the tax system affects the sustainability of our planet and our economy. Businesses and consumers are subject to tax-imposed costs that affect decisions about activities and investments. In some cases, Congress shifts costs by lessening the tax burden on one activity or another. These cost shifts influence investment decisions. Congress can also influence decisions through direct action: by regulating activities or by directly funding activities through appropriations. In many cases, the tax system's incentives are not consistent with the government's

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¹ PETER ALLEN, EVERYTHING OLD IS NEW AGAIN (A&M Records 1982) (1977).

stated goals. In fact, the scheme itself creates contradictory incentives. For example, the tax system creates incentives for using energy as well as for conserving energy. While this result may seem perverse, it should not be unexpected. As the old saying goes, governments aren't good at picking winners, but losers are good at picking governments.² Producers of fossil fuel energy make every effort to retain their tax benefits even as the government provides new benefits for renewable energy.³

When I began writing this Article, a new presidential administration had just started its second hundred days.⁴ The Obama administration has a lot on its plate: an economic crisis, health care reform, a war (or two), and climate change. As this Article is about sustainability, it focuses on how the tax system can help with environmental issues.

Climate change has emerged as the preeminent environmental challenge of our generation; governments and business leaders throughout the world agree.⁵ In the Energy Improvement and

² See Richard E. Baldwin & Frederic Robert-Nicoud, *Entry and Asymmetric Lobbying: Why Governments Pick Losers* 1–2 (Ctr. for Econ. Performance, The London Sch. of Econ. & Political Sci., CEP Discussion Paper No. 791, 2007), available at <http://cep.lse.ac.uk/pubs/download/dp0791.pdf>.

³ Declining or sunset industries may benefit disproportionately from lobbying expenditures. *Id.*

⁴ See, e.g., Joe Garofoli, *How Obama's Milestone Stacks Up*, S.F. CHRON., Apr. 26, 2009, at A13, available at <http://www.sfgate.com/cgi-bin/article.cgi?f=c/a/2009/04/25/MN53178JV5.DT2> (discussing the opinions of, among others, a political science professor at the University of California, Davis who teaches a course on President Obama's first hundred days); Howard Kurtz, *For the Media, 100-Days Story Represents the Perfect Swarm*, WASH. POST, Apr. 28, 2009, at C01, available at http://www.washingtonpost.com/wp-dyn/content/article/2009/04/27/AR2009042703573_pf.html; Katie Rooney, *Barack Obama's First 100 Days: The Inauguration*, TIME.COM, Apr. 8, 2009, http://www.time.com/time/specials/packages/article/0,28804,1889908_1889909,00.html; *First 100 Days*, CHI. TRIB., <http://www.chicagotribune.com/news/politics/chi-090123-obama-first-100-days-photogallery,0,2761919.photogallery> (last visited Jan. 10, 2010); *Obama's First 100 Days*, WASH. POST, <http://www.washingtonpost.com/wp-dyn/content/gallery/2009/01/21/GA2009012102666.html> (last visited Jan. 10, 2010).

⁵ See, e.g., Abigail Curtis, *Collins Addresses Unity Graduates*, BANGOR DAILY NEWS, May 11, 2009, at B2 (“Climate change is the most significant environmental challenge facing our planet.” (quoting Senator Susan Collins, Graduation Address at Unity Coll. (May 9, 2009)); Gov't of Sask., Can., Environment: Climate Change, <http://www.environment.gov.sk.ca/Default.aspx?DN=9192f8e8-23fe-4077-ac7d-30b7b269bdf> (last visited Jan. 10, 2010) (“The single most significant environmental challenge facing the globe and citizens of the earth is the changes in our climate that are occurring as a result of greenhouse gas emissions.”); Nottingham City Council, U.K., Climate Change Facts, <http://www.nottinghamcity.gov.uk/index.aspx?articleid=8080> (last visited Jan. 10, 2010) (“Climate change is the most significant environmental challenge facing all of us.”);

Extension Act of 2008 (EIEA), Congress required the Secretary of the Treasury to undertake a carbon audit of the Internal Revenue Code (Code).⁶ Lawrence Zelenak both suggests that this may be the first step toward “greening” the Code and notes that Congress has not made consistent progress toward that goal.⁷ While Congress has used the Code to encourage conservation and renewable energy on and off since 1978, the Code has simultaneously provided tax incentives for energy use and fossil fuel consumption.⁸ The government provides more support for energy via tax incentives than through direct government expenditures,⁹ and, until 2007, the majority of those tax incentives were directed toward nonrenewable sources.¹⁰ For 2007, federal support for the energy sector totaled \$16.6 billion, \$10.4 billion from tax incentives.¹¹ The federal tax subsidy for fossil fuels dropped from over 60% of total tax subsidies for energy in 1997 to under 50% in 2007.¹² Having tax incentives for conservation and renewable energy overtake tax incentives for fossil fuels is a welcome

Press Release, Hewlett-Packard, HP and World Wildlife Fund Establish Climate Change Initiatives (May 23, 2007), <http://www.hp.com/hpinfo/newsroom/press/2007/070523c.html> (quoting World Wildlife Fund’s Vice President of Business and Industry, Suzanne Apple, as saying that “[c]limate change may be the most significant environmental challenge of our era”); The Pew Charitable Trusts, Global Warming, http://www.pewtrusts.org/our_work_category.aspx?id=112 (last visited Jan 10, 2010) (stating that global warming is “the most significant environmental challenge of our time”).

⁶ Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, sec. 117, 122 Stat. 3807, 3831. The Act requires the Secretary of the Treasury to “enter into an agreement with the National Academy of Sciences [NAS] to undertake a comprehensive review of the [Code] to identify the types of and specific tax provisions that have the largest effects on carbon and other greenhouse gas emissions.” *Id.*

⁷ Lawrence Zelenak, *Tax Expenditures and the Carbon Audit*, 122 TAX NOTES 1367, 1368 (2009) (“Unless Congress has become more serious since 2004 about the effects of tax provisions on global warming, the major environmental impact of the NAS study may be the loss of the trees supplying the paper on which the study is printed.”).

⁸ See Roberta F. Mann & Mona L. Hymel, *Getting Into the Act: Enticing the Consumer to Become “Green” Through Tax Incentives*, 36 ENVTL. L. REP. 10,419, 10,422–24 (2006) [hereinafter Mann & Hymel, *Getting Into the Act*].

⁹ U.S. ENERGY INFO. ADMIN., U.S. DEP’T OF ENERGY, FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY MARKETS 2007, at xi (2008) [hereinafter SUBSIDIES], available at <http://www.eia.doe.gov/oiaf/servicerpt/subsidy2/pdf/execsum.pdf>.

¹⁰ GILBERT E. METCALF, MANHATTAN INST., ENERGY POL’Y & THE ENV’T REP. NO. 13, TAXING ENERGY IN THE UNITED STATES: WHICH FUELS DOES THE TAX CODE FAVOR? 13 (2009) [hereinafter METCALF, TAX-FAVORED FUELS], available at http://www.manhattan-institute.org/html/eper_04.htm.

¹¹ SUBSIDIES, *supra* note 9, at xi.

¹² METCALF, TAX-FAVORED FUELS, *supra* note 10, at 13.

trend for those who advocate greening the Code.¹³ At the beginning of a new presidential administration, the time seems ripe for both examining how some past recommendations for greening the Code have fared and seeing how those recommendations may play in the future.

The congressionally mandated carbon audit of the Code is not limited to energy tax provisions. The provision, introduced by Congressman Earl Blumenauer (D-Or.), states:

The study will examine areas where the connection between the tax code and carbon emissions are obvious (e.g., energy taxation) and will consider areas where the connection between the tax code and carbon emissions may be less obvious (e.g., tax policies affecting urban development, which affect climate through travel demand and land-use change).¹⁴

This Article addresses both direct and indirect connections between tax policy and carbon emissions. Any discussion of tax policy's impact on the environment must begin with a review of how the Code can be used to encourage behavior. Accordingly, this Article begins with a brief discussion of tax expenditures. The Article then reviews tax policy recommendations in the following areas: (1) housing, (2) transportation, (3) energy and conservation incentives, and (4) carbon pricing, including carbon sequestration. For each area, I compare past recommendations to actual changes in tax policy and make predictions about coming changes to tax policy and how those changes may affect carbon emissions.

I

THE CONCEPT OF TAX EXPENDITURES

Many of the tax code provisions that affect the environment provide subsidies to certain industries or to taxpayers for engaging in certain behavior. A tax expenditure is a subsidy delivered through the tax system.¹⁵ Stanley Surrey, then Assistant Secretary of the

¹³ See Craig Hanson & David Sandalow, *Greening the Tax Code* 1 (Brookings Inst., Tax Reform, Energy and the Environment Policy Brief No. 1, 2006), available at http://pdf.wri.org/greening_the_tax_code.pdf (noting that tax policy has a significant and mostly unintentional impact on the environment).

¹⁴ Press Release, Rep. Earl Blumenauer, Reps. Blumenauer, McDermott, and Neal Highlight House Passage of New Direction Energy Policy (May 21, 2008), http://blumenauer.house.gov/index.php?option=com_content&task=view&id=1322.

¹⁵ STANLEY S. SURREY, *PATHWAYS TO TAX REFORM: THE CONCEPT OF TAX EXPENDITURES* 6 (1973).

Treasury for Tax Policy, was the first person to use the term “tax expenditures.”¹⁶ In Surrey’s view, tax expenditures created an end-run around the appropriations process. He hoped to shame Congress into reducing their use of tax expenditures by publishing an annual tax expenditure budget.¹⁷ However, his dream has not been realized. While the staff of the Joint Committee on Taxation (JCT) has published an annual tax expenditure budget since 1972, this transparency has not curbed Congress’s enthusiasm for distributing subsidies through the Code. In 1972, the tax expenditure budget described sixty tax expenditures.¹⁸ In 2007, the tax expenditure budget listed 170 tax expenditures.¹⁹ Moreover, in 2009, the size of the tax expenditure budget is anticipated to exceed 50% of the total nondefense discretionary spending.²⁰

The JCT recently revised its method of determining tax expenditures. From 1972 through 2007, the JCT determined the cost of tax expenditures by reference to a “normal income tax structure.”²¹ Under the Congressional Budget and Impoundment Control Act of 1974, tax expenditures are “revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability.”²² Thus, tax expenditures are an exception to the normal income tax structure. If a business would normally have to depreciate the cost of a solar electric panel over ten years, but instead receives an immediate tax credit for

¹⁶ U.S. DEP’T OF THE TREASURY, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30, 1968, at 322–23 (1969) (quoting Stanley S. Surrey, Assistant Sec’y, U.S. Dep’t of the Treasury, Remarks Before The Money Marketeers (Nov. 15, 1967)).

¹⁷ *See id.* at 312 (quoting Stanley S. Surrey, Assistant Sec’y, U.S. Dep’t of the Treasury, Speech Before the Boston Economic Club (May 15, 1968)).

¹⁸ STAFFS OF TREASURY DEP’T & JOINT COMM. ON INTERNAL REVENUE TAXATION, 92D CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES 4–5 tbl.1 (Comm. Print 1972) [hereinafter JCS-28-72].

¹⁹ STAFF OF JOINT COMM. ON TAXATION, 109TH CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2007–2011, at 24–35 tbl.1 (Comm. Print 2007) [hereinafter JCS-3-07].

²⁰ STAFF OF JOINT COMM. ON TAXATION, 110TH CONG., A RECONSIDERATION OF TAX EXPENDITURE ANALYSIS 4–5 (Comm. Print 2008) [hereinafter JCX-37-08] (estimating tax expenditure revenue at \$250 billion for 2009 and noting that nondefense discretionary spending constituted \$482 billion of the federal budget for the same year).

²¹ JCS-3-07, *supra* note 19, at 2.

²² Congressional Budget and Impoundment Control Act of 1974, Pub. L. No. 93-344, sec. 3(3), 88 Stat. 297, 299.

the cost of the solar electric panel, the difference between the tax the business would have paid if it had depreciated the cost and the tax paid if the company had taken the credit constitutes the tax subsidy received by the business.²³

After 2007, the JCT's new methodology divides tax expenditures into two categories: "Tax Subsidies" and "Tax-Induced Structural Distortions."²⁴ Rather than determining whether a provision properly belongs in a "normal income tax structure," the JCT will look at the Internal Revenue Code and determine if the provision is an exception to a general rule.²⁵ A tax subsidy is defined as "a specific tax provision that is deliberately inconsistent with an identifiable general rule of the present tax law (not a hypothetical 'normal' tax), and that collects less revenue than does the general rule."²⁶ The JCT's new methodology divides tax subsidies into three subcategories: tax transfers, social spending, and business synthetic spending.²⁷ Most of the tax subsidies discussed in this Article fall into either the business synthetic spending or the social spending subcategories. Finally, the JCT has updated the classic tax policy criteria of equity, efficiency, and ease of administration as those criteria are applied to tax expenditures. In addition to meeting those classic goals, a tax expenditure should also be transparent, targeted, and certain.²⁸

From a researcher's perspective, the JCT's tax expenditure analysis is invaluable in assessing the costs of tax subsidies. It should be noted that each provision stands alone in the JCT's tax expenditure budget. That is, items in the tax expenditure budget cannot be added together to get an accurate picture of the cost savings of repealing those provisions.²⁹ The estimates do, however, provide an indication of the relative magnitude of tax expenditures.³⁰

²³ See JCS-3-07, *supra* note 19, at 5–6 (indicating that the main benefit of some tax expenditures is timing).

²⁴ JCX-37-08, *supra* note 20, at 9.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at 12–13.

²⁸ See *id.* at 62–67.

²⁹ *Id.* at 5.

JCT Staff published tax expenditure calculations cannot be compared directly with . . . projected actual expenditures, because . . . tax expenditure figures calculate the nominal revenues forgone by the existence of the rule in question, not the revenues that would be raised by repealing the rule; the two are not the same because actual repeal would have behavioral consequences that would

II REVIEW OF RECOMMENDATIONS

A. Housing

As in the energy sector, the federal government provides a majority of its housing assistance through the Code.³¹ For 2009, the federal government provided a total of \$32 billion in direct assistance for public housing, including Indian and Native Hawaiian housing, and rental assistance payments.³² The tax subsidy provided through the mortgage interest deduction alone was estimated at \$80 billion for 2009.³³ In addition, the tax system subsidized property taxes (\$16 billion), eliminated gain on the sale of principal residences (\$16 billion), and encouraged first-time homebuyers (\$13.6 billion).³⁴ The income distributions for recipients of direct assistance and tax subsidies are strikingly different. Rental assistance vouchers go to “over two million households with extremely low incomes.”³⁵ Forty percent of families receiving rental assistance vouchers have incomes lower than half of the poverty line.³⁶ Over 90% of recipients of public housing are extremely low income.³⁷ In contrast, 73% of the total benefit of the home mortgage interest deduction accrued to households with incomes over \$100,000 in 2007.³⁸ For 2008, the federal poverty line for a family of four was \$21,200.³⁹ Less than 1% of the total benefit of the home mortgage interest deduction accrued

affect post-repeal revenue collections. Moreover, tax expenditures are not additive, due to behavioral and other issues.

Id.

³⁰ *Id.*

³¹ See STAFF OF JOINT COMM. ON TAXATION, 110TH CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2008–2012, at 51–52 tbl.2 (Comm. Print 2008) [hereinafter JCS-2-08]; U.S. DEP’T OF HOUS. & URBAN DEV., FY 2010 BUDGET: ROAD MAP FOR TRANSFORMATION 39 app. (2009) [hereinafter HUD, FY 2010 BUDGET], available at <http://www.hud.gov/budgetsummary2010/fy10budget.pdf>.

³² See HUD, FY 2010 BUDGET, *supra* note 31, at 39 app.

³³ JCS-2-08, *supra* note 31, at 51 tbl.2.

³⁴ *Id.* at 52 tbl.2.

³⁵ HUD, FY 2010 BUDGET, *supra* note 31, at 9.

³⁶ *Id.*

³⁷ *Id.* at 10.

³⁸ JCS-2-08, *supra* note 31, at 76 tbl.6.

³⁹ Annual Update of the HHS Poverty Guidelines, 73 Fed. Reg. 3971, 3971 (Jan. 23, 2008).

to households with incomes under \$30,000.⁴⁰ That the tax system disproportionately subsidizes the housing of wealthy citizens does not necessarily indicate that the mortgage interest deduction is a flawed policy instrument.⁴¹ It would be difficult to subsidize low-income housing through a tax provision, as extremely low-income Americans rarely pay taxes.⁴²

The structure of the home mortgage interest deduction has a consequence even less transparent than its distributional inequity: it encourages sprawl development and excessive energy use.⁴³ Like any deduction, the home mortgage interest deduction is an upside-down subsidy.⁴⁴ The home mortgage interest deduction allows a deduction for interest paid on acquisition debt on a principal residence and one other residence on a total loan amount of up to \$1 million.⁴⁵ The deduction benefits taxpayers in higher rate brackets more than others. If a taxpayer in the 15% rate bracket has a \$10,000 mortgage payment, the individual's tax liability will decrease by \$1500.⁴⁶ If a taxpayer in the 35% rate bracket has a \$10,000 mortgage payment, the individual's tax liability will decrease by \$3500. This increased benefit results from the relationship between tax deductions and tax liability. A tax deduction reduces taxable income. Taxable income multiplied by tax rate equals tax liability. Thus, the higher the tax bracket, the greater the benefit from a deduction. In contrast, a tax credit produces the same reduction in tax liability irrespective of the

⁴⁰ See JCS-2-08, *supra* note 31, at 76 tbl.6.

⁴¹ For further illustrations showing how the mortgage interest deduction favors the wealthy, see Roberta F. Mann, *The (Not So) Little House on the Prairie: The Hidden Costs of the Home Mortgage Interest Deduction*, 32 ARIZ. ST. L.J. 1347, 1358–64 (2000) [hereinafter Mann, *Prairie*].

⁴² A refundable credit could be used to subsidize homeownership by nontaxpayers, as in the use of the earned income tax credit. I.R.C. § 32 (West 2009); see also Lily L. Batchelder et al., *Efficiency and Tax Incentives: The Case for Refundable Tax Credits*, 59 STAN. L. REV. 23 (2006).

⁴³ See Mann, *Prairie*, *supra* note 41, at 1388–89 (discussing Richard Voith, *Does the Tax Treatment of Housing Create an Incentive for Exclusionary Zoning and Increased Decentralization?* (Fed. Reserve Bank of Phila., Working Paper No. 99-22, 1999)).

⁴⁴ Mann, *Prairie*, *supra* note 41, at 1361 (citing STANLEY S. SURREY & PAUL R. MCDANIEL, *TAX EXPENDITURES* 77 (1985)).

⁴⁵ See I.R.C. § 163(h)(3)(B) (West 2009). For a definition of “qualified residence,” see § 163(h)(4)(A). There is also an interest deduction for home equity debt up to \$100,000. § 163(h)(3)(C).

⁴⁶ This liability calculation assumes that the taxpayer itemizes his deductions. The mortgage interest deduction is only available to taxpayers who elect to itemize. I.R.C. §§ 63(e), 67(b)(1) (West 2009).

rate bracket of the taxpayer.⁴⁷ A tax credit directly reduces tax liability.

It is also likely that the higher-bracket (wealthier) taxpayer will have a larger mortgage payment than the lower-bracket (poorer) taxpayer. Thus, if the taxpayer in the 35% rate bracket pays \$30,000 of mortgage interest, the individual will get a reduction in tax liability of \$10,500. The wealthier taxpayer will have a higher payment due to the purchase of a more expensive house. It is also likely that the more expensive house is larger than the less expensive house. It is possible that the more expensive house is farther away from work, resulting in a longer commute. Harvard economist Edward Glaeser commented on the utility of the home mortgage interest deduction:

The tax subsidy does modestly encourage homeownership. But it specifically encourages borrowing to invest in expensive homes, which are risky assets that can crash as well as boom. We had housing bubbles long before the federal government got into the subsidy business, but encouraging homeowners to buy with borrowed money certainly did nothing to moderate extreme price swings. . . . [W]e are essentially spending federal money to encourage people to live in 3,000-square-foot houses instead of 2,500-square-foot houses.⁴⁸

In these hard economic times, even well-off homeowners are suffering from housing cost burden. The Harvard Joint Center for Housing Studies determined that “[f]or homeowners earning more than the median income, the likelihood of being housing cost burdened nearly doubled between 2001 and 2006.”⁴⁹ One newspaper article even posed the question: “Is suburbia turning into slumburbia?”⁵⁰

While some predicted that the fuel price increases experienced in the summer of 2008 would spell the death of suburbia, reports of its

⁴⁷ See THE PRESIDENT’S ADVISORY PANEL ON FED. TAX REFORM, SIMPLE, FAIR, AND PRO-GROWTH: PROPOSALS TO FIX AMERICA’S TAX SYSTEM 61 tbl.5.1 (2005), available at http://govinfo.library.unt.edu/taxreformpanel/final-report/TaxPanel_5-7.pdf (proposing to replace the home mortgage interest deduction with a 15% credit available to all taxpayers, limited to the average regional price of housing).

⁴⁸ Edward Glaeser, *This Old House Policy*, BOSTON GLOBE, Nov. 2, 2008, at C1, available at http://www.boston.com/bostonglobe/ideas/articles/2008/11/02/this_old_house_policy/.

⁴⁹ JOINT CTR. FOR HOUS. STUDIES OF HARVARD UNIV., THE STATE OF THE NATION’S HOUSING 2008, at 28 (2008), available at <http://www.jchs.harvard.edu/publications/markets/son2008/son2008.pdf>.

⁵⁰ Carol Lloyd, *Is Suburbia Turning Into Slumburbia?*, S.F. CHRON., Mar. 14, 2008, <http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2008/03/14/carollloyd.DTL>.

demise may have been premature.⁵¹ From 1985 to 2003, the United States experienced both a slight population shift to the suburbs and increased preferences for larger, single-family housing.⁵² The total number of single-family, owner-occupied homes in the suburbs has increased from 30.8 million in 1997⁵³ to 34.3 million in 2007.⁵⁴ Strikingly, the average lot size for suburban homes has increased from 0.39 acres in 1997⁵⁵ to 1.75 acres in 2007.⁵⁶ The larger the lot size, the lower the density. Low-density development outside the central city is the definition of sprawl.⁵⁷ Sprawl development results in automobile dependence because low-density development discourages walking and the use of public transportation.⁵⁸

New single-family homes continue to increase in size. In 1987, the average single-family home in the United States contained 1900

⁵¹ See Joel Kotkin, Op-Ed., *Suburbia's Not Dead Yet*, L.A. TIMES, July 6, 2008, at M6, available at <http://www.latimes.com/news/printedition/opinion/la-op-kotkin6-2008jul06.0,1038461.story> (noting that many jobs have migrated to the suburbs and less than 3% of regional jobs in Los Angeles are in the central city); Christopher B. Leinberger, *The Next Slum?*, ATLANTIC, Mar. 2008, available at <http://www.theatlantic.com/doc/200803/subprime> (describing the rise of the American dream of housing in the suburbs and predicting a demographic shift of the wealthy to the cities and the poor to the suburbs).

⁵² Office of Policy Dev. & Research, U.S. Dep't of Hous. & Urban Dev., *American Households and Their Housing: 1985 and 2003*, U.S. HOUSING MARKET CONDITIONS, Feb. 2005, at 7, 9, available at http://www.huduser.org/periodicals/ushmc/winter04/article_USHMC_04Q4.pdf; see also Les Christie, *The Rich: Still Bullish on Real Estate*, CNNMONEY.COM, June 18, 2007, http://money.cnn.com/2007/06/15/real_estate/the_wealthy_bullish_on_real_estate/index.htm ("The wealthy also appear to want more space; 61% of those moving this year plan to buy a bigger house.").

⁵³ U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, AMERICAN HOUSING SURVEY FOR THE UNITED STATES: 1997, at 22 tbl.1C-3 (2000) [hereinafter AMERICAN HOUSING SURVEY 1997], available at <http://www.census.gov/prod/99pubs/h150-97.pdf>.

⁵⁴ U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, AMERICAN HOUSING SURVEY FOR THE UNITED STATES: 2007, at 26 tbl.1C-3 (2008) [hereinafter AMERICAN HOUSING SURVEY 2007], available at <http://www.census.gov/prod/2008pubs/h150-07.pdf>. "Suburbs are defined . . . as the portion of each metropolitan area that is not in any central city." *Id.* app. A at A-28. "[A]ny city with at least 250,000 population or at least 100,000 people working within its corporate limits qualifie[s] as a central city." *Id.* app. A at A-2. "Metropolitan areas are composed of whole counties . . . that have significant levels of commuting and contiguous urban areas in common." *Id.* app. A at A-14.

⁵⁵ AMERICAN HOUSING SURVEY 1997, *supra* note 53, at 22 tbl.1C-3.

⁵⁶ AMERICAN HOUSING SURVEY 2007, *supra* note 54, at 26 tbl.1C-3.

⁵⁷ Mann, *Prairie*, *supra* note 41, at 1370; see also ANN BROWN ET AL., SIERRA CLUB, 1998 SPRAWL REPORT, <http://www.sierraclub.org/sprawl/report98/report.asp> (last visited Jan. 10, 2010).

⁵⁸ U.S. GEN. ACCOUNTING OFFICE, GAO/RCED-99-87, COMMUNITY DEVELOPMENT: EXTENT OF FEDERAL INFLUENCE ON "URBAN SPRAWL" IS UNCLEAR 1-2 (1999), available at <http://www.gao.gov/archive/1999/rc99087.pdf>.

square feet.⁵⁹ In 1997, the average single-family home contained 2140 square feet.⁶⁰ In 2007, the average single-family home contained 2479 square feet.⁶¹ While one might think that increasing home sizes would increase energy usage, the U.S. Department of Energy predicts that increases in energy efficiency will cancel out increases in home size.⁶² The National Association of Home Builders (NAHB) draws the same conclusion.⁶³ Various tax credits encourage energy efficiency in residential property.⁶⁴ However, as fewer people are living in those larger homes, energy usage per occupant is increasing.⁶⁵

Can the federal government encourage homeownership without encouraging sprawl and excessive energy use? In 2000, I recommended converting the home mortgage interest deduction into a shelter credit.⁶⁶ The shelter credit would apply to renters and homeowners alike. Renters would receive matching funds for saving for future home ownership. For homeowners, the credit would be determined by multiplying the median national home price by the annualized long-term, tax-exempt interest rate, and then multiplying that product by the lowest marginal tax rate. This structure would eliminate the upside-down nature of the subsidy provided by the home mortgage interest deduction, and would also reduce the incentive to buy a larger, more expensive home.

⁵⁹ NAT'L ASS'N OF HOME BUILDERS, SINGLE-FAMILY SQUARE FOOTAGE BY LOCATION (2009), available at http://www.nahb.org/fileUpload_details.aspx?contentID=80051.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² See U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, 2005 RESIDENTIAL ENERGY CONSUMPTION SURVEY: ENERGY CONSUMPTION AND EXPENDITURES TABLES tbl.US1 (2005), available at <http://www.eia.doe.gov/emeu/recs/recs2005/c&e/summary/pdf/tableus1part1.pdf> (showing that energy costs are lower for homes built between 2000 and 2005 than for homes built before 2000).

⁶³ See YINGCHUN LIU, NAT'L ASS'N OF HOME BUILDERS, HOME OPERATING COSTS (2005), <http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=35389> (noting that fuel costs per square foot are substantially lower for newer homes).

⁶⁴ See discussion *infra* Part II.C.2.

⁶⁵ See U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, AMERICA'S FAMILIES AND LIVING ARRANGEMENTS: 2003, at 4 (2004); see also Posting of Tommy Unger to Zillow Blog, Smaller Families Living in Larger Homes, <http://www.zillow.com/blog/smaller-families-living-in-larger-homes/2007/02/> (Feb. 20, 2007) (noting that the average household size has decreased from 3.7 to 2.6 people since 1940).

⁶⁶ See Mann, *Prairie*, *supra* note 41, at 1393–97.

In 2005, President George W. Bush's Tax Reform Advisory Panel recommended replacing the home mortgage interest deduction with a home credit.⁶⁷ The home credit, available to all taxpayers, would be equal to 15% of the mortgage interest paid, and the allowable mortgage amount would be limited to the average regional price of housing—limits ranging from about \$227,000 to \$412,000.⁶⁸ A 2007 report by the Congressional Budget Office suggested reducing the maximum mortgage on which interest can be deducted from \$1 million to \$400,000 or converting the mortgage interest deduction to a credit.⁶⁹ President Obama has proposed limiting the value of itemized deductions, including the home mortgage interest deduction, to no more than 28% starting in 2011.⁷⁰ The \$1 million principal amount limit would remain unchanged. Under the proposal, taxpayers now subject to 33% or 35% rates would be able to claim deductions only at a 28% rate. So, for every \$1000 in deductions, a top-bracket household would save \$280 in taxes, down from \$350. Even President Obama's modest proposal faces significant political opposition.⁷¹ To date, the sacred cow status of the home mortgage interest deduction remains unchanged.⁷²

B. Transportation

Transportation choices, and the resulting environmental effects, are linked to tax incentives.⁷³ As discussed above, tax subsidies for housing that encourage low-density development result in more driving and more road building. More driving results in more emissions, and more emissions change the climate and hurt human

⁶⁷ THE PRESIDENT'S ADVISORY PANEL ON FED. TAX REFORM, *supra* note 47, at 73.

⁶⁸ *Id.* at xvii, available at http://govinfo.library.unt.edu/taxreformpanel/final-report/TaxPanel_1_11-1.pdf.

⁶⁹ CONG. BUDGET OFFICE, BUDGET OPTIONS 267 (2007), available at <http://www.cbo.gov/doc.cfm?index=7821&type=1>.

⁷⁰ See ROSANNE ALTSHULER ET AL., URBAN-BROOKINGS TAX POLICY CTR., TAX PROPOSALS IN THE 2010 BUDGET 15 (2009), available at http://www.taxpolicycenter.org/UploadedPDF/411849_2010_budget.pdf.

⁷¹ See, e.g., Peter Y. Hong, *Homeownership: A Coveted Tax Break Is on the Table*, L.A. TIMES, Mar. 14, 2009, at B1, available at <http://articles.latimes.com/2009/mar/14/business/fi-deduct14>.

⁷² See Nick Timiraos, *The Obama Budget: Mortgage Deduction Looks Less Sacred*, WALL ST. J., Feb. 27, 2009, at A8, available at <http://online.wsj.com/article/SB123569898005989291.html>.

⁷³ See generally Roberta F. Mann, *On the Road Again: How Tax Policy Drives Transportation Choice*, 24 VA. TAX REV. 587 (2005) [hereinafter Mann, *Road*].

health. However, recent economic factors and legislative changes have had a positive effect on transportation policy.

The recent, record-high gasoline prices encouraged Americans to curtail driving and try public transportation.⁷⁴ Public transportation ridership increased 6.5% in the third quarter of 2008—the largest quarterly increase in the past twenty-five years.⁷⁵ According to the American Public Transportation Association, an industry group, “[p]ublic transportation use is one of the most effective actions individuals can take to conserve energy.”⁷⁶ It notes that public transportation use saves more than eleven million gallons of gasoline per day and reduces potential carbon dioxide emissions by thirty-seven million metric tons annually.⁷⁷

The federal income tax system recently became fairer with respect to public transportation. Following sensible recommendations, Congress gave parity to public transportation benefits⁷⁸ and added a benefit for employees who bicycle to work. Before February 17, 2009, employees who drove to work could receive up to \$230 per month for parking from their employers without being taxed, while the tax-free benefit for employees who used other transit was limited to \$120 per month.⁷⁹ Commentators criticized the disparity in treatment, noting that the cost of parking is a key factor in the decision to drive to work.⁸⁰ The American Recovery and Reinvestment Act of 2009 (ARRA) provided that the transit benefit would equal the parking benefit beginning in March 2009.⁸¹

⁷⁴ Clifford Krauss, *Rising Gas Prices Threaten to Slow a Recovery*, N.Y. TIMES, June 9, 2009, at B1, available at http://www.nytimes.com/2009/06/09/business/09gas.html?_r=1&ref=todayspaper (noting that consumers paid \$1.5 billion per day to fuel their vehicles in the summer of 2008, while in January 2009, they were spending only \$600 million per day).

⁷⁵ Michael Cooper, *Rider Paradox: Surge in Mass, Drop in Transit*, N.Y. TIMES, Feb. 4, 2009, at A1, available at <http://www.nytimes.com/2009/02/04/us/04transit.html>.

⁷⁶ AM. PUB. TRANSP. ASS'N, PUBLIC TRANSPORTATION SAVES ENERGY AND HELPS OUR ENVIRONMENT (2009), available at http://www.apta.com/gap/policyresearch/Documents/facts_environment_09.pdf.

⁷⁷ *Id.*

⁷⁸ In 2005, I recommended that “Congress should eliminate its tax bias towards car use. At the very least, the amount of the subsidy for transit passes should equal the subsidy for parking.” Mann, *Road*, *supra* note 73, at 639.

⁷⁹ Rev. Proc. 2008-66, 2008-45 I.R.B. 1107. The “transit” benefit also includes a benefit for employer-sponsored carpools.

⁸⁰ See Mann, *Road*, *supra* note 73, at 636.

⁸¹ See I.R.C. § 132(f)(2) (West 2009); American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1151(a), 123 Stat. 115, 333 (“In the case of any month

Bicycling to work provides significant economic, environmental, and health benefits. Car ownership is expensive.⁸² In 2007, Americans spent \$440.4 billion on motor vehicles and parts.⁸³ In the same year, transportation expenses consumed 17.6% of total consumer expenditures, second only to housing costs.⁸⁴ The American Automobile Association estimated the annual cost of operating a vehicle ranged from \$6320 for a small sedan to \$10,448 for a midsize SUV.⁸⁵ In contrast, the cost of operating a bicycle is only \$120 per year.⁸⁶ Walking and biking are the best transportation modes for short trips, as they require only simple facilities.⁸⁷ Bicycle transportation has minimal environmental impact and produces no harmful emissions. While cars burn fuel, bicycles burn calories. While automobile travel provides no physical activity, a 150-pound person riding a bicycle at twelve miles per hour burns forty calories per mile.⁸⁸ Physical activity is essential for maintaining health.⁸⁹

beginning on or after the date of the enactment of this sentence [enacted Feb. 17, 2009] and before January 1, 2011, subparagraph (A) shall be applied as if the dollar amount therein were the same as the dollar amount in effect for such month under subparagraph (B).”); *see also* Rev. Proc. 2009-12, 2009-19 I.R.B. 928.

⁸² *See* SCOTT BERNSTEIN ET AL., SURFACE TRANSP. POLICY PROJECT, DRIVEN TO SPEND: PUMPING DOLLARS OUT OF OUR HOUSEHOLDS AND COMMUNITIES 4 (2005) (citing a Bureau of Labor Statistics’s report stating that “transportation has been the number two expense for households, second only to housing”).

⁸³ EUGENE P. SESKIN & SHELLY SMITH, U.S. DEP’T OF COMMERCE, ANNUAL REVISION OF THE NATIONAL INCOME AND PRODUCT ACCOUNTS: ANNUAL ESTIMATES FOR 2005–2007 AND QUARTERLY ESTIMATES FOR THE FIRST QUARTER OF 2005 TO THE FIRST QUARTER OF 2008, at 64 tbl.2.3.5 (2008), *available at* http://www.bea.gov/scb/pdf/2008/08August/0808_nipa_annrev.pdf.

⁸⁴ *See* U.S. BUREAU OF LABOR STATISTICS, U.S. DEP’T OF LABOR, CONSUMER EXPENDITURES IN 2007, at 2 tbl.B (2009), *available at* <http://www.bls.gov/cex/csxann07.pdf>.

⁸⁵ AAA Reports that Cost of Owning & Operating a New Vehicle Is Now 54.1 Cents per Mile, REUTERS, Apr. 4, 2008, <http://www.reuters.com/article/pressRelease/idUS70206+04-Apr-2008+MW20080404>.

⁸⁶ Pedestrian & Bicycle Info. Ctr., Economic Benefits, http://www.bicyclinginfo.org/why/benefits_economic.cfm (last visited Jan. 11, 2010).

⁸⁷ *See* Bill Wilkinson, *Transport at the Millennium: Nonmotorized Transportation: The Forgotten Modes*, 553 ANNALS AM. ACAD. POL. & SOC. SCI. 87, 92 (1997).

⁸⁸ *See, e.g.*, Caloriesperhour.com, Calories Burned, BMI, BMR & RMR Calculator, http://www.caloriesperhour.com/index_burn.php (follow “Bicycling Calculator” hyperlink) (last visited Jan. 11, 2010).

⁸⁹ OFFICE OF THE SURGEON GEN., U.S. DEP’T OF HEALTH & HUMAN SERVS., THE SURGEON GENERAL’S CALL TO ACTION TO PREVENT AND DECREASE OVERWEIGHT AND OBESITY 2007, at 1 (2001), *available at* <http://www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf>.

In 2008, the EIEA added the bicycle commuter tax benefit.⁹⁰ Employees may receive tax-free reimbursement from their employers for “reasonable expenses incurred by the employee during such calendar year for the purchase of a bicycle and bicycle improvements, repair, and storage, if such bicycle is regularly used for travel between the employee’s residence and place of employment.”⁹¹ Employees may receive up to \$20 without tax for each “qualified bicycle commuting month.”⁹² For a month to qualify, the employee must regularly use “the bicycle for a substantial portion of the travel between the employee’s residence and place of employment,” and may not receive any of the other transportation tax benefits.⁹³ This restriction will limit the benefit of the provision for multimodal commuters. A commuter who rides a bike to a subway stop and takes the train for the rest of the way to work can either take the transit benefit of up to \$230 per month or settle for the bicycle benefit of \$20 per month. Representative Earl Blumenauer (D-Or.) recently introduced a bill allowing employees to receive both transit passes and bicycle commuting costs without tax consequences.⁹⁴ No action has yet been taken on the bill.

Congress has continued to add incentives for energy-efficient vehicles. There are seven or eight tax credits for alternative fuel vehicles, depending on how one counts. The EIEA added the newest tax credit, one for plug-in hybrid vehicles.⁹⁵ The credit applies to purchasers of “new qualified plug-in electric drive motor vehicle[s].”⁹⁶ The provision defines a “new qualified plug-in electric drive motor vehicle” as a four-wheeled vehicle propelled by a battery with at least four kilowatt-hours of electricity that can be charged from an external source.⁹⁷ The amount of the credit ranges from \$2500 to \$15,000, depending on the excess battery capacity and the

⁹⁰ Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 211(a)–(d), 122 Stat. 3807, 3840–41. Senator Ron Wyden (D-Or.) previously introduced similar legislation. *See* Bicycle Commuters Benefits Act of 2007, S. 858, 110th Cong. (2007).

⁹¹ I.R.C. § 132(f)(5)(F)(i) (West 2009).

⁹² I.R.C. § 132(f)(5)(F)(ii).

⁹³ I.R.C. § 132(f)(5)(F)(iii).

⁹⁴ H.R. 863, 111th Cong. (2009).

⁹⁵ I.R.C. § 30D (West 2009) (originated in the Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 205, 122 Stat. 3807, 3835–38).

⁹⁶ I.R.C. § 30D(a)(1).

⁹⁷ I.R.C. §§ 30(d), 30D(c).

weight of the vehicle.⁹⁸ The credit cap drops to \$7500 for years after 2009, and there is a 250,000 vehicle limitation per manufacturer.⁹⁹ Congress also added a credit for used vehicles that have been converted to plug-in electric drive vehicles.¹⁰⁰ The credit is 10% of the conversion costs, up to \$40,000.¹⁰¹ Taxpayers may obtain the credit until the end of 2011.¹⁰² A 10% credit of up to \$2500 is available for electric-drive, low-speed, motorcycle and three-wheeled vehicles.¹⁰³ Purchasers of new hybrid vehicles have enjoyed a tax credit since 2005.¹⁰⁴ The credit was capped at 60,000 units per manufacturer.¹⁰⁵ As such, the credits are no longer available for vehicles manufactured by Toyota.¹⁰⁶ The hybrid vehicle credits will expire for all manufacturers at the end of 2009.¹⁰⁷ Congress also provides tax credits for the purchase of fuel cell vehicles, lean burn vehicles, and alternative fuel vehicles.¹⁰⁸ These credits have complex requirements for fuel used, fuel efficiency, and weight classes, as well as varied expiration dates.¹⁰⁹

By providing tax benefits for purchasers of fuel-efficient vehicles, Congress is sending the following message to American consumers: we want you to buy these cars. But the dizzying array of tax credits combined with their computational complexity is enough to daunt any

⁹⁸ I.R.C. § 30D(a)–(b); *see also* I.R.S. Notice 2009-58, I.R.B. 2009-30, *available at* http://www.irs.gov/irb/2009-30_IRB/ar07.html. Some golf cart dealers have been promoting the incentive, with the blessing of the Internal Revenue Service. *See* Alice Gomstyn, *A Bailout . . . for Golf Carts?*, ABC NEWS, Oct. 21, 2009, <http://abcnews.go.com/Business/golf-car-sales-spike-08-bailout/story?id=8875161>.

Thanks to alert student Sara Kearsley for this article.

⁹⁹ I.R.C. § 30D(b).

¹⁰⁰ I.R.C. § 30B(i)(1) (West 2009).

¹⁰¹ *Id.*

¹⁰² I.R.C. § 30B(i)(4).

¹⁰³ I.R.C. § 30 (West 2009).

¹⁰⁴ Energy Policy Act of 2005, Pub. L. No. 109-58, sec. 1341, § 30B, 119 Stat. 594, 1038–49 (2005).

¹⁰⁵ I.R.C. § 30B(f)(2).

¹⁰⁶ I.R.S. News Release IR-2007-186 (Nov. 8, 2007), *available at* <http://www.irs.gov/newsroom/article/0,,id=175518,00.html> (noting that no credit is allowed for the purchase of Toyota or Lexus hybrid vehicles after September 30, 2007).

¹⁰⁷ I.R.C. § 30B(k)(3).

¹⁰⁸ I.R.C. § 30B(a)(1), (2), (4).

¹⁰⁹ *See* STAFF OF JOINT COMM. ON TAXATION, 111TH CONG., TAX EXPENDITURES FOR ENERGY PRODUCTION AND CONSERVATION 6–8 tbl.E (Comm. Print 2009), *available at* <http://www.jct.gov/publications.html?func=startdown&id=3554>.

consumer.¹¹⁰ In some cases, higher credits are provided for vehicles with worse fuel efficiency.¹¹¹ Commentator Martin Sullivan calculated that a Chevrolet Tahoe Hybrid SUV would receive a tax credit of \$5.59 per gallon of gasoline saved, while the Chevrolet Malibu Hybrid receives only \$1.13 per gallon of gasoline saved.¹¹² Credits are provided for vehicles that are not yet widely commercially available, such as fuel cell vehicles.¹¹³ Consumer surveys show that the most significant factor in the decision to purchase a fuel-efficient vehicle is gasoline prices.¹¹⁴ In a 2006 survey, 50% of “respondents said they would consider a hybrid vehicle for their next purchase.”¹¹⁵ Ninety-eight percent of those respondents cited better fuel economy as a very important factor in their decision; whereas only forty-six percent cited the availability of tax credits as a very important factor.¹¹⁶ If a tax credit does not influence behavior, it is simply a windfall to the purchaser and the manufacturer, at the taxpayers’ expense. If the credits for alternative fuel vehicles were simpler and more transparent, they might have a better chance at influencing consumer behavior.

President Obama recently approved Congress’s effort to get Americans into more fuel-efficient vehicles—the “cash for clunkers”

¹¹⁰ As a practical matter, the credits will be calculated by the car manufacturers, who have their own incentives for publicizing it to their customers. See Mann & Hymel, *Getting Into the Act*, *supra* note 8, at 10,426.

¹¹¹ The 2009 Cadillac Escalade Hybrid 2WD (20 combined highway/city miles per gallon) is eligible for a \$2200 tax credit while the 2009 Chevrolet Malibu Hybrid (30 combined highway/city) is eligible for a \$1550 tax credit. See Car MPG, 2009 Cadillac Escalade Hybrid MPG (Apr. 8, 2009), <http://www.carmpg.net/cadillac/2009-cadillac-escalade-hybrid-mpg> (showing miles per gallon rating for an Escalade Hybrid); Car MPG, 2009 Chevrolet Malibu Hybrid MPG (Apr. 8, 2009), <http://www.carmpg.net/chevrolet/2009-chevrolet-malibu-hybrid-mpg> (showing miles per gallon rating for a Malibu Hybrid); U.S. Dep’t of Energy, New Energy Tax Credits for Hybrids, http://www.fueleconomy.gov/Feg/tax_hybrid.shtml (last visited Jan. 11, 2010).

¹¹² Martin A. Sullivan, *Tech Neutrality, Tax Credits, and the Gas Tax*, 122 TAX NOTES 619, 621 tbl.1 (2009) [hereinafter Sullivan, *Tech*].

¹¹³ Honda plans to lease two hundred fuel cell vehicles to California drivers between 2008 and 2010. Honda, Drive FCX Clarity FCEV, <http://automobiles.honda.com/fcx-clarity/drive-fcx-clarity.aspx> (last visited Jan. 11, 2010). The first vehicle was delivered on June 25, 2008. *Id.*

¹¹⁴ A Consumer Reports survey shows that high gas prices are impacting drivers’ lifestyles and vehicle choices. Consumer Reports, Drivers Feel Pressure at the Pumps (May 2006), http://money.aol.com/consreports/smartshopping/babies_kids/_a/drivers-feel-pressure-at-the-pumps/20060601141309990001 (last visited Jan. 11, 2010).

¹¹⁵ *Id.*

¹¹⁶ *Id.*

program.¹¹⁷ Added to the supplemental appropriations bill for the Iraq and Afghanistan wars, the vigorously debated provision provides government vouchers for either \$3500 or \$4500 to car owners who trade in their older, less fuel-efficient vehicles for new vehicles that get better gas mileage.¹¹⁸ The “clunker” must have been manufactured in 1984 or later, must have a mileage rating of eighteen miles per gallon (mpg) or worse, and must have been registered to the owner for at least one year.¹¹⁹ To receive a \$3500 voucher, the new vehicle must get at least four miles per gallon more than the trade-in.¹²⁰ To receive \$4500, the new vehicle must get at least ten miles per gallon more than the trade-in.¹²¹ The trade-in vehicle must be destroyed.

As the average vehicle on the road in the United States is nine years old, a faster turnover of the vehicle fleet is necessary to rapidly increase efficiency.¹²² The cash for clunkers program was “wildly popular.”¹²³ The first billion dollars allocated to the program ran out before the end of July, about a month after the program started.¹²⁴ Congress added another two billion dollars, which was exhausted by August 24, 2009.¹²⁵ As of August 20, 2009, 457,000 clunkers had been turned in.¹²⁶ Critics of the plan argued that the criteria were so lax the government would be subsidizing trading in one gas hog for

¹¹⁷ Associated Press, *Obama Signs Bill Funding Wars*, ABC NEWS, June 24, 2009, <http://abcnews.go.com/Politics/wirestory?id=7921345>.

¹¹⁸ Consumer Assistance to Recycle and Save Act of 2009, Pub. L. No. 111-32, § 1302, 123 Stat. 1859, 1909–10. For a comparison of the House and Senate proposals, specifically H.R. 1550, 111th Cong. (2009), and S. 247, 111th Cong. (2009), see David Kiley, *Dueling ‘Clunker Car’ Bills*, BUSINESS WEEK, June 11, 2009, http://www.businessweek.com/bwdaily/dnflash/content/jun2009/db20090611_409752.htm?campaign_id=rss_daily.

¹¹⁹ Consumer Assistance to Recycle and Save Act of 2009, Pub. L. No. 111-32, § 1302, 123 Stat. 1859, 1914–15.

¹²⁰ *Id.* at 1909.

¹²¹ *Id.* at 1910.

¹²² FED. HIGHWAY ADMIN., U.S. DEP’T OF TRANSP., *THE CARBON FOOTPRINT OF DAILY TRAVEL 3* (2009) [hereinafter U.S. DEP’T OF TRANSP., CARBON FOOTPRINT], available at [http://nhts.oml.gov/briefs/Carbon Footprint of Travel.pdf](http://nhts.oml.gov/briefs/Carbon%20Footprint%20of%20Travel.pdf).

¹²³ See, e.g., Elisabeth Leamy & Mike Callahan, *‘Cash for Clunkers’ Suspended? Funds Already Running Out*, ABC NEWS, July 31, 2009, <http://abcnews.go.com/GMA/story?id=8218841&page=1>; Peter Valdes-Dapena, *Cash for Clunkers Ending*, CNNMONEY.COM, Aug. 21, 2009, http://money.cnn.com/2009/08/20/autos/cash_for_clunkers_end/index.htm?postversion=2009082016.

¹²⁴ See Valdes-Dapena, *supra* note 123.

¹²⁵ *Id.*

¹²⁶ *Id.*

another.¹²⁷ However, the average improvement in mileage was a respectable 9.6 mpg.¹²⁸ The top ten trade-in “clunkers” were all either sport utility vehicles, trucks, or vans.¹²⁹ Eight of the top ten new vehicles purchased under the program were cars.¹³⁰ A similar program in Europe also spurred new car sales.¹³¹ Princeton economist Alan Blinder earlier proposed a simpler cash for clunkers program.¹³² Under Blinder’s proposal, the cash received for the clunker could be spent on anything.¹³³

As fuel costs are the most significant factor in the choice of vehicle, how does tax policy address them? Congress provides tax incentives for using alternative fuels. Ethanol reaps the most benefit from the tax system. The excise tax credit for ethanol is the single largest energy tax expenditure.¹³⁴ Ethanol also enjoys a collection of income tax credits.¹³⁵ From an environmental standpoint, the tax incentives for ethanol are not an unalloyed blessing. Most of the fuel ethanol produced in the United States is made from corn, which is also a nutritional staple.¹³⁶ Using corn to produce fuel increases food prices worldwide at the expense of the poor and hungry.¹³⁷ Corn is a thirsty, hungry, and pest-prone crop, requiring water, fertilizer, and

¹²⁷ Janet Hook, *Car Trade-In Bill Is Called a Lemon*, L.A. TIMES, June 13, 2009, at A14, available at <http://articles.latimes.com/2009/jun/13/nation/na-clunkers13?pg=1>.

¹²⁸ See Matthew L. Wald, *Agreement on a Vote to Extend Car Program*, N.Y. TIMES, Aug. 6, 2009, at B4, available at <http://www.nytimes.com/2009/08/06/us/politics/06clunkers.html>

¹²⁹ See *id.* (citing the Transportation Department’s reported top ten “cash for clunker” new purchases and trade-ins).

¹³⁰ See *id.*

¹³¹ See, e.g., Nelson D. Schwartz, *‘Euros for Clunkers’ Drives Sales*, N.Y. TIMES, Apr. 1, 2009, at B1, available at <http://www.nytimes.com/2009/04/01/business/global/01refunds.html>.

¹³² Alan S. Blinder, *A Modest Proposal: Eco-Friendly Stimulus*, N.Y. TIMES, July 27, 2008, at BU5, available at <http://www.nytimes.com/2008/07/27/business/27view.html>.

¹³³ *Id.*

¹³⁴ See I.R.C. § 6426(a) (West 2009); Roberta F. Mann & Mona L. Hymel, *Moonshine to Motorfuel: Tax Incentives for Fuel Ethanol*, 19 DUKE ENVTL. L. & POL’Y F. 43, 50 n.47 (2008) [hereinafter Mann & Hymel, *Moonshine*].

¹³⁵ I.R.C. § 40(a) (West 2009); see Mann & Hymel, *Moonshine*, *supra* note 134, at 47–50.

¹³⁶ Alternative Fuels & Advanced Vehicles Data Ctr., U.S. Dep’t of Energy, *Starch- and Sugar-Based Ethanol Feedstocks*, http://www.afdc.energy.gov/afdc/ethanol/feedstocks_starch_sugar.html (last visited Jan. 12, 2010).

¹³⁷ See H. Josef Hebert, Associated Press, *With Food Costs Rising, Ethanol Benefits Now Questioned*, BOSTON GLOBE, May 6, 2008, http://www.boston.com/business/articles/2008/05/06/with_food_costs_rising_ethanol_benefits_now_questioned.

pesticides.¹³⁸ Finally, corn is not an efficient producer of fuel. According to studies, the net energy benefit of corn ethanol is only slightly positive.¹³⁹ Recent legislation has somewhat reduced the tax subsidies for corn ethanol, while increasing subsidies for cellulosic ethanol.¹⁴⁰ Cellulosic crops, such as switchgrass, offer promise of more efficient and less environmentally damaging production of ethanol. Cellulosic ethanol is not yet widely available.¹⁴¹ However, Congress's action to specify a higher tax credit for this ethanol is a step in the right direction.¹⁴²

Of course, governmental policy outside of tax policy also affects transportation choices. On May 19, 2009, President Obama announced stiffer Corporate Average Fuel Economy (CAFE) standards.¹⁴³ By 2016, new passenger cars sold in the United States will have to meet an average mileage requirement of thirty-nine miles

¹³⁸ Corn uses more fertilizers and pesticides per unit of land than any other biofuel feedstock. See NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., WATER IMPLICATIONS OF BIOFUELS PRODUCTION IN THE UNITED STATES 27 (2008).

¹³⁹ HOSEIN SHAPOURI ET AL., U.S. DEP'T OF AGRIC., THE ENERGY BALANCE OF CORN ETHANOL: AN UPDATE 9 (2002), available at http://www.heartland.org/custom/semod_policybot/pdf/16324.pdf.

¹⁴⁰ The formerly \$0.51 per gallon income or excise tax credit for ethanol will be reduced to \$0.45 per gallon if designated U.S. ethanol production thresholds are exceeded. I.R.C. § 40(h) (originally enacted as Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, § 15,331(a), 122 Stat. 1651, 2277). In tax years after December 31, 2000, if the alcohol is ethanol, then the excise tax amount is the blender amount for alcohol that is at least 190 proof and the low-proof blender amount for alcohol that is at least 150 proof but less than 190 proof. See *id.* § 40(d). The blender amount is \$0.51 for 2005 through 2008 and \$0.45 for 2009 through 2010. *Id.* § 40(h)(2). The low-proof blender amount is \$0.3778 for 2005 through 2008 and \$0.3333 for 2009 through 2010. *Id.* The rate for 2009 and 2010 will revert to \$0.51 if the Secretary of the Treasury determines, in consultation with the Environmental Protection Agency, that less than 7.5 million gallons of ethanol (including cellulosic ethanol) has been produced in, or imported into, the United States in such year. *Id.* § 40(h)(3). In 2008, Congress provided a \$1.01 per gallon tax credit for cellulosic ethanol. *Id.* § 40(b)(6).

¹⁴¹ See Matthew L. Wald & Alexei Barrionuevo, *Chasing a Dream Made of Waste*, N.Y. TIMES, Apr. 17, 2007, at C1, available at <http://www.nytimes.com/2007/04/17/business/17ethanol.html>; see also Posting of Ian Austen to Green Inc., *Shell's Cellulosic 'First' Is More of a Second*, N.Y. TIMES, June 13, 2009, <http://greeninc.blogs.nytimes.com/2009/06/13/shells-cellulosic-first-is-more-of-a-second/> (reporting that Shell announced the sale of the first gasohol-gasoline blended with cellulosic ethanol).

¹⁴² See Martin A. Sullivan, *A Better Way to Subsidize Ethanol*, 113 TAX NOTES 16 (2006).

¹⁴³ Press Release, Office of the Press Sec'y, President Obama Announces National Fuel Efficiency Policy (May 19, 2009), http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/.

per gallon, up from 27.5 mpg currently.¹⁴⁴ The *Wall Street Journal* reported that “[l]ight trucks would have to deliver an average of 30 mpg, compared with about 23 mpg today.”¹⁴⁵ The new standards are projected to save 1.8 billion barrels of oil and reduce greenhouse gas emissions by approximately 900 million metric tons.¹⁴⁶ This statistic is generally corroborated by a study that was based on a U.S. Department of Transportation survey, which found that, if fuel efficiency was twenty-nine miles per gallon for all vehicles, there would be a 31.7% reduction in CO₂ emissions from vehicle travel.¹⁴⁷ However, the environmental improvement expected from more stringent CAFE standards will be tempered by the effects of ethanol. Credits toward a manufacturer’s CAFE requirements are added for vehicles capable of running on higher blends of ethanol,¹⁴⁸ such as E85 (a blend consisting of 85% ethanol and 15% gasoline).¹⁴⁹ For example, a dual-fuel Chevrolet Impala that gets twenty-nine miles per gallon combined highway and city on gasoline is credited with a rating of forty-eight miles per gallon.¹⁵⁰

Other forms of alternative fuels receive support from tax subsidies. The biodiesel and renewable diesel producer credit was recently increased from \$0.50 to \$1 per gallon.¹⁵¹ Other alternative fuels eligible for an excise tax credit include liquefied petroleum gas, compressed or liquefied natural gas, liquefied hydrogen, liquid fuel from coal, and compressed or liquefied biomass.¹⁵² In particular, liquid fuel from coal, also known as synfuel, has been infamous as a

¹⁴⁴ Stephen Power & Christopher Conkey, *U.S. Orders Stricter Fuel Goals for Autos*, WALL ST. J., May 19, 2009, at A1, available at <http://online.wsj.com/article/SB124266939482331283.html>.

¹⁴⁵ *Id.*

¹⁴⁶ Press Release, *supra* note 143.

¹⁴⁷ U.S. DEP’T OF TRANSP., CARBON FOOTPRINT, *supra* note 122, at 3 Exhibit 3.

¹⁴⁸ See 49 U.S.C. § 32906 (2006).

¹⁴⁹ *E.g.*, Chuck Giametta, *E85 Distilled*, HOWSTUFFWORKS, <http://consumerguideauto.howstuffworks.com/fa-e85-distilled-cga.htm> (last visited Jan. 11, 2010) (explaining the components of E85).

¹⁵⁰ Union of Concerned Scientists, Clean Vehicles: The Dual-Fuel Vehicle Incentive Program, http://www.ucsusa.org/clean_vehicles/technologies_and_fuels/biofuels/the-dual-fuel-vehicle.html (last visited Jan. 11, 2010).

¹⁵¹ I.R.C. § 40A(b) (West 2009). The \$0.50 increase was added by the Emergency Economic Stabilization Act of 2008, Pub. L. No 110-343, Div. B, 122 Stat. 3765.

¹⁵² I.R.C. § 6426(d)(2) (West 2009).

political subsidy without any redeeming societal benefit.¹⁵³ Yet some scientists now believe that liquid fuel from coal may emit less CO₂ than oil, provided that the CO₂ emitted during the fuel's production is sequestered.¹⁵⁴ The EIEA ties the excise tax credit for liquid fuel derived from coal to carbon sequestration.¹⁵⁵ Beginning on October 1, 2009, liquid fuel derived from coal through the Fischer-Tropsch process must be produced at a facility that separates and sequesters at least 50% of its CO₂ emissions to qualify for the per-gallon alternative fuel incentives.¹⁵⁶ Then, starting on December 31, 2009, this requirement increases to 75% of emissions.¹⁵⁷ This provision represents another step in the right direction.

Finally, the tax system is still providing incentives for the production of fossil fuels for transportation. Maintaining subsidies for oil and gas production is clearly inconsistent with the goal of moving energy policy in the direction of renewable sources.¹⁵⁸ President Obama has proposed eliminating certain oil and gas tax subsidies.¹⁵⁹ This would certainly be a beneficial undertaking. By terminating tax preferences for oil and gas companies, the proposal would subject oil and gas corporations to the same tax treatment as other corporations engaging in similar activities.¹⁶⁰ Repealing these subsidies would raise about \$26 billion over the next decade, as well as help stimulate use of renewable energy sources.¹⁶¹

¹⁵³ See Eli Kintisch, *The Greening of Synfuels*, 320 SCI. 306, 306 (2008) (calling the synfuel program "a colossal flop . . . plagued by mismanagement, political wrangling, and falling oil prices").

¹⁵⁴ *Id.*

¹⁵⁵ See Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 204, 122 Stat. 3807, 3835 (codified at I.R.C. § 6426(d)).

¹⁵⁶ I.R.C. § 6426(d).

¹⁵⁷ I.R.C. § 6426(d)(4)(B).

¹⁵⁸ See Roberta Mann, *Waiting to Exhale?: Global Warming and Tax Policy*, 51 AM. U. L. REV. 1135, 1219–20 (2002) [hereinafter Mann, *Waiting*] ("It is hard to see what could be less economically efficient than paying for both incentives to use and incentives to stop using fossil fuels.").

¹⁵⁹ U.S. DEP'T OF THE TREASURY, GENERAL EXPLANATIONS OF THE ADMINISTRATION'S FISCAL YEAR 2010 REVENUE PROPOSALS 59–69 (2009) [hereinafter GREENBOOK].

¹⁶⁰ For a comparison of the tax treatment of oil companies to those in other industries, see Mann, *Waiting*, *supra* note 158, at 1164–68.

¹⁶¹ GREENBOOK, *supra* note 159, at 128 tbl.1 (calculating \$31.5 billion total less \$5.3 billion levy on offshore oil and gas production).

The oil and gas benefits the administration recommended repealing include:¹⁶²

- the enhanced oil recovery credit;¹⁶³
- the marginal well tax credit;¹⁶⁴
- the expensing of intangible drilling costs;¹⁶⁵
- the deduction of tertiary injectants;
- the passive loss exception for working interests in oil and gas properties;¹⁶⁶
- percentage depletion;¹⁶⁷
- the domestic manufacturing deduction for oil and gas production.¹⁶⁸

Twenty-six billion dollars over ten years may not sound like much in these days of trillion dollar bailouts. As I pointed out in a previous article, providing any subsidy to the fossil fuel industry “contradicts sound environmental policy and sends the wrong message to markets and consumers.”¹⁶⁹ However, between 1997 and 2007, the tax subsidy for natural gas and petroleum liquids decreased from 59% of the total energy tax subsidies to 20%.¹⁷⁰ The decrease in the share of tax subsidy does not represent a significant decline in the actual dollars given as tax subsidies to the oil and gas industry; rather, total tax expenditures for energy have more than tripled, rising from \$3.2 billion in 1999 to more than \$10.4 billion in 2007.¹⁷¹

To summarize, in the realm of transportation, the federal tax system still has some distance to cover. On the positive side, both equalizing the employee fringe benefit for parking and transit and adding a bicycling commuter benefit help the environment. Creating a higher tax credit for ethanol made from cellulose is better than continuing to encourage ethanol made from corn. If Congress actually acts on the President’s proposal and repeals the long-standing

¹⁶² *Id.* at 59–69 (referencing the administration’s proposed repeals).

¹⁶³ I.R.C. § 43 (West 2009).

¹⁶⁴ I.R.C. § 613A (West 2009).

¹⁶⁵ I.R.C. § 263(c) (West 2009).

¹⁶⁶ I.R.C. § 469(c)(3) (West 2009).

¹⁶⁷ I.R.C. §§ 611–613 (West 2009).

¹⁶⁸ I.R.C. § 199(d)(9) (West 2009).

¹⁶⁹ Mann, *Road*, *supra* note 73, at 652.

¹⁷⁰ METCALF, TAX-FAVORED FUELS, *supra* note 10, at 4 tbl.1.

¹⁷¹ SUBSIDIES, *supra* note 9, at xi.

subsidies for the oil and gas industry, the legislature would provide real as well as symbolic benefits.

One recommendation remains untouched by the hand of Congress—increasing the gas tax. In a perfect economic world, subsidies for alternative fuels would be equivalent to taxing gasoline because both policies change the relative price of conventional and alternative energy.¹⁷² However, as the current tax subsidies are not technology neutral, they result in a disparate benefit per gallon of gasoline saved.¹⁷³ Moreover, even technology-neutral subsidies are inefficient because they do not stimulate declines in the production of gasoline.¹⁷⁴ The economically efficient answer is to increase the gas tax.¹⁷⁵ The United States has significantly lower gas taxes than other developed nations.¹⁷⁶ A recent study found a strong link between higher gas prices and demand for smaller, more fuel-efficient vehicles.¹⁷⁷ U.S. gasoline prices increased by 100% between 2003 and 2007.¹⁷⁸ During that time, “[a]ll major car categories . . . gained market share[,] . . . with gains of between 4.5 percent and about 9

¹⁷² See Sullivan, *Tech*, *supra* note 112, at 619.

¹⁷³ See *id.* at 620.

¹⁷⁴ See *id.* at 622–23.

¹⁷⁵ *Id.* at 624; see also Donald B. Susswein, *Managing Our Energy Addiction: A Road Map*, 115 TAX NOTES 659 (2007).

¹⁷⁶ Vehicle Fuel Retail Price (2009 U.S. Dollars per Gallon):

Country	Retail Price	Wholesale Price	Taxes	Portion Tax
France	5.84	1.85	3.99	68.3%
Germany	6.12	1.87	4.25	69.4%
Italy	5.94	2.13	3.81	64.1%
Spain	4.74	2.05	2.69	56.8%
UK	5.13	1.54	3.59	69.8%
Japan	4.36	2.02	2.34	53.7%
Canada	2.74	1.78	0.96	35.0%
USA	2.05	1.65	0.40	19.5%

Data adapted from INT’L ENERGY AGENCY, OIL MARKET REPORT 21 tbl.14 (May 14, 2009), available at <http://omrpublic.iaea.org/omrarchive/14may09tab.pdf>. Author calculated the conversion from liters in the report to gallons in the above table using the following formula: 1 Liter = 0.264172 Gallons. See CalculateMe.com, Convert Liters to Gallons, <http://www.calculateme.com/Volume/Liters/ToGallons.htm> (last visited Jan.11, 2010).

¹⁷⁷ CONG. BUDGET OFFICE, EFFECTS OF GASOLINE PRICES ON DRIVING BEHAVIOR AND VEHICLE MARKETS, at xii (2008), available at <http://www.cbo.gov/doc.cfm?index=8893> [hereinafter CBO STUDY].

¹⁷⁸ *Id.*

percent for every 60 cent increase in the price of gasoline above \$2.30 per gallon . . . [while] the market shares of all types of light trucks . . . [fell] by 4 percent to 6 percent.”¹⁷⁹ Beleaguered U.S. automobile manufacturers, urged by the government to sell fuel-efficient vehicles, are begging for an increase in the gas tax.¹⁸⁰ Moreover, if subsidies for renewable fuels were replaced by an increase in the gas tax, the tax code could be substantially simplified.¹⁸¹ Of course, while “[n]othing comes more naturally to Congress than granting tax subsidies for a good cause[.]”¹⁸² almost nothing is more painful for a politician than suggesting an increase in taxes, particularly during an economic downturn.¹⁸³ Indeed, a recent poll shows that a majority of Americans favor suspending the gas tax.¹⁸⁴ Thus, while increasing the gas tax would be ideal from an economic and environmental standpoint, an increase seems unlikely to happen in this country.

C. Energy and Conservation

Limiting environmental damage from climate change needs a multidimensional approach that involves not only energy source switching but also conservation.¹⁸⁵ This Part of the Article first addresses how tax policy affects energy sources and then turns to tax policy’s impact on conservation and efficiency.

¹⁷⁹ *Id.* at 18.

¹⁸⁰ See, e.g., Sharon Silke Carty, *Electric Cars Rule at Auto Show*, USA TODAY, Jan. 12, 2009, at 7A, available at http://www.usatoday.com/money/autos/2009-01-12-gas-tax-automakers-small-car-sales_N.htm.

¹⁸¹ See Martin A. Sullivan, *The Losers in the Energy Subsidy Game*, 121 TAX NOTES 510, 511 (2008) [hereinafter Sullivan, *Losers*].

¹⁸² *Id.* at 510. In this article, Sullivan also suggests fifty additional ways to save motor fuel not subsidized by the Internal Revenue Code, from learning how to shift—manual transmissions save fuel—to properly inflating tires. *Id.* at 512–15.

¹⁸³ See, e.g., Clifford Krauss, *Rising Gas Prices Threaten to Slow Recovery*, N.Y. TIMES, June 9, 2009, at B1.

¹⁸⁴ Dennis Jacobe, *Majority of Americans Favor Suspending Federal Gas Tax*, GALLUP, May 13, 2008, <http://www.gallup.com/poll/107257/majority-americans-favor-suspending-federal-gas-tax.aspx>.

¹⁸⁵ See, e.g., John Dernbach et al., *Stabilizing and Then Reducing U.S. Energy Consumption: Legal and Policy Tools for Efficiency and Conservation*, 37 ENVTL. L. REP. 10,003, 10,006 (2007).

1. Energy

As discussed above, the majority of energy tax subsidies now go to nontraditional energy sources.¹⁸⁶ Transportation and electricity generation make up almost 70% of the energy used in the United States.¹⁸⁷ In 2007, transportation accounted for 29% of energy use.¹⁸⁸ The bulk of the remaining energy, 40%, was used to generate electricity.¹⁸⁹ Unsurprisingly, the bulk of the remaining subsidies for energy go to electricity generation. Subsidies and support for electricity generation are 41% of total energy subsidies.¹⁹⁰ In 2007, tax expenditures comprised about two-thirds of the total governmental subsidy for electricity generation.¹⁹¹

Electricity can be made from a number of fuel sources. In the United States, coal-fired generation produces the majority (51%) of electricity.¹⁹² The remaining electricity is produced from nuclear fission (21%), natural gas (17%), renewable energy (9%), and oil (2%).¹⁹³ This Part of the Article focuses on coal, nuclear fission, and renewable energy, as oil and natural gas receive a significantly lower level of governmental support for electricity production than these other fuel sources.¹⁹⁴

a. Coal

Coal is a favored fuel for electricity generation because it is relatively cheap and widely available. In 2007, the average price of generating a million British thermal units (Btus) of electricity from coal was \$1.78, as compared with \$7.02 for natural gas and \$14.77 for petroleum.¹⁹⁵ However, coal emits more CO₂ than most other fuels—

¹⁸⁶ See METCALF, TAX-FAVORED FUELS, *supra* note 10, at 4 tbl.1.

¹⁸⁷ U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, ANNUAL ENERGY REVIEW 2008, at 40 tbl.2.1a (2009), [hereinafter ANNUAL ENERGY REVIEW 2008], available at <http://www.eia.doe.gov/emeu/aer/pdf/aer.pdf>.

¹⁸⁸ *See id.*

¹⁸⁹ *See id.*

¹⁹⁰ SUBSIDIES, *supra* note 9, at xiv.

¹⁹¹ *Id.* at xv.

¹⁹² ANNUAL ENERGY REVIEW 2008, *supra* note 187, at 37 fig.2.0.

¹⁹³ *Id.*

¹⁹⁴ SUBSIDIES, *supra* note 9, at xv.

¹⁹⁵ U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, DOE/EIA-0383 (2009), ANNUAL ENERGY OUTLOOK 2009 app. at 114 tbl.A3 (2009) [hereinafter ANNUAL ENERGY OUTLOOK 2009], available at [http://www.eia.doe.gov/oiaf/aer/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aer/pdf/0383(2009).pdf).

between 205 and 227 pounds per million British thermal units.¹⁹⁶ In contrast, natural gas emits 117 pounds of CO₂ per million British thermal units.¹⁹⁷ Electricity generated from nuclear, wind, solar, or hydroelectric power has no direct CO₂ emissions.¹⁹⁸ In addition to greenhouse gas (GHG) emissions, coal's other adverse environmental consequences include environmental degradation of coal mining communities and the health effects caused by toxic emissions such as sulfur dioxide and mercury.¹⁹⁹

Under the friendly administration of former President George W. Bush, which had declared that there would be no cost for carbon emissions, coal producers planned to build many new coal plants.²⁰⁰ However, after the Supreme Court decided that carbon dioxide was a

¹⁹⁶ See U.S. Energy Info. Admin., U.S. Dep't of Energy, Environment FAQs, http://tonto.eia.doe.gov/ask/environment_faqs.asp#CO2_quantity (last visited Jan. 11, 2010).

¹⁹⁷ *Id.*

¹⁹⁸ See CONG. BUDGET OFFICE, NUCLEAR POWER'S ROLE IN GENERATING ELECTRICITY 21 & fig.2-2 (2008), available at <http://www.cbo.gov/ftpdocs/91xx/doc9133/05-02-Nuclear.pdf>. Uranium is the raw material for nuclear power. A study by Australian researchers Gavin Mudd and Mark Diesendorf finds potential for significant CO₂ emissions associated with uranium mining. See Gavin M. Mudd & Mark Diesendorf, *Sustainability of Uranium Mining and Milling: Toward Quantifying Resources and Eco-Efficiency*, 42 ENVTL. SCI. & TECH. 2624, 2629–30 (2008); see also Kurt Kleiner, *Nuclear Energy: Assessing the Emissions*, NATURE REP. CLIMATE CHANGE, Sept. 24, 2008, <http://www.nature.com/climate/2008/0810/full/climate.2008.99.html> (stating that plant and component manufacturing and transportation for nuclear, wind, solar, and hydro power may result in CO₂ emissions). For a discussion of the carbon emission risks of dam building, see David Biello, *The Dam Building Boom: Right Path to Clean Energy?*, YALE ENV'T 360, Feb. 23, 2009, <http://e360.yale.edu/content/feature.msp?id=2119>. For an analysis of carbon emissions of wind energy, see S.W. WHITE & G.L. KULCINSKI, UNIV. OF WIS., NET ENERGY PAYBACK AND CO₂ EMISSIONS FROM WIND-GENERATED ELECTRICITY IN THE MIDWEST 29 fig.9 (1998), available at <http://icf4.neep.wisc.edu/pdf/fdm1092.pdf>, stating that “[w]ind [f]arm CO₂ [e]missions are [d]ominated by [m]aterials [p]rocrement,” and EUR. WIND ENERGY ASS'N, WIND ENERGY-THE FACTS: EXECUTIVE SUMMARY 25 (2009), available at http://www.ewea.org/fileadmin/ewea_documents/documents/publications/WETF/1565_ExSum_ENG.pdf. For an analysis of carbon emissions from solar panel production, see KEIICHIRO ASAKURA ET AL., CO₂ EMISSION FROM SOLAR POWER SATELLITE THROUGH ITS LIFE CYCLE: COMPARISON OF POWER GENERATION SYSTEMS USING JAPANESE INPUT-OUTPUT TABLES (2000).

¹⁹⁹ See Roberta Mann, *Another Day Older and Deeper in Debt: How Tax Incentives Encourage Burning Coal and the Consequences for Global Warming*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 111, 119–21 (2007) [hereinafter Mann, *Coal*].

²⁰⁰ See Steven Mufson, *Midwest Has 'Coal Rush,' Seeing No Alternative*, WASH. POST, Mar. 10, 2007, at A1; Steven Mufson & Juliet Eilperin, *EPA May Reverse Bush, Limit Carbon Emissions From Coal-Fired Plants*, WASH. POST, Feb. 18, 2009, at A2.

pollutant subject to regulation under the Clean Air Act,²⁰¹ the Environmental Protection Agency issued a moratorium on the construction of new coal plants.²⁰² The chairman of the Federal Energy Regulatory Commission recently stated that no new nuclear or coal plants may ever be needed in the United States, and that renewables like wind, solar, and biomass will provide enough energy to meet future demand.²⁰³ Commentator Gregg Easterbrook notes that “[e]nvironmentalists who correctly point out there can never be absolutely ‘clean coal’ thus end up in the position of opposing coal that’s far cleaner than what we are using.”²⁰⁴ In Easterbrook’s opinion, “green power simply cannot grow quickly enough to eliminate the need for coal.”²⁰⁵

Whether new coal plants are needed or not, the tax system contains a number of incentives for using coal to produce electricity. Congress provided \$2.55 billion in tax credits for investments in clean coal facilities²⁰⁶ and \$600 million in tax credits for gasification projects, including coal gasification.²⁰⁷ Over the next five years, Congress will also provide \$100 million in production tax credits to refined coal production facilities²⁰⁸ and \$100 million in production tax credits to

²⁰¹ See *Massachusetts v. EPA*, 549 U.S. 497, 528–29 (2007); *Deseret Power Elec. Coop.*, PSD Appeal No. 07-03 (U.S. Env’tl. Prot. Agency Nov. 18, 2008).

²⁰² See Bryan Walsh, *Environmentalists Win Big EPA Ruling*, TIME, Nov. 13, 2008, <http://www.time.com/time/health/article/0,8599,1859049,00.html>.

²⁰³ Noelle Straub & Peter Behr, *Energy Regulatory Chief Says New Coal, Nuclear Plants May Be Unnecessary*, N.Y. TIMES, Apr. 22, 2009, <http://www.nytimes.com/gwire/2009/04/22/22greenwire-no-need-to-build-new-us-coal-or-nuclear-plants-10630.html>.

²⁰⁴ Gregg Easterbrook, Op-Ed, *The Dirty War Against Clean Coal*, N.Y. TIMES, June 29, 2009, at A21.

²⁰⁵ *Id.*

²⁰⁶ I.R.C. § 48A(d)(3)(A) (West 2009). For a description of the clean-coal tax credits, see Mann, *Coal*, *supra* note 199, at 131.

²⁰⁷ I.R.C. § 48B(d)(1) (West 2009).

²⁰⁸ STAFF OF JOINT COMM. ON TAXATION, 111TH CONG., TAX EXPENDITURES FOR ENERGY PRODUCTION AND CONSERVATION 110–12 tbl.9 (Comm. Print 2009) [hereinafter JCX-25-09R]. Section 45(d)(8) of the Code defines “refined coal production facility” as

(A) with respect to a facility producing steel industry fuel, any facility (or any modification to a facility) which is placed in service before January 1, 2010, and

(B) with respect to any other facility producing refined coal, any facility placed in service after the date of the enactment of the American Jobs Creation Act of 2004 [enacted Oct. 22, 2004] and before January 1, 2010.

I.R.C. § 45(d)(8) (West 2009).

Indian coal production facilities.²⁰⁹ In 2007, the Energy Information Administration (EIA) of the U.S. Department of Energy determined that refined coal received a higher level of government subsidy per unit of energy produced than any other electricity-generating fuel, \$29.81 per megawatt-hour (mwh).²¹⁰ Emerging renewable technologies such as solar (\$24.34 per mwh)²¹¹ and wind (\$23.37 per mwh)²¹² are not far behind but coal—even refined coal—is a mature technology that should not need subsidies. The EIA did not analyze subsidies for clean coal because clean coal has not produced energy in significant amounts.

Clean coal technologies include the integrated gasification combined cycle (IGCC), which provides a more efficient way of reducing GHG emissions.²¹³ There are currently only two commercially sized IGCC plants operating in the United States.²¹⁴ IGCC plants are significantly more expensive to build than conventional pulverized coal plants. While the capital cost to build a conventional coal plant ranges from \$1347 to \$1617 per kilowatt (kw), the capital cost to build an IGCC plant ranges from \$1670 to \$2350 per kw.²¹⁵ Although the projects eligible for first tranche (\$1.3 billion) of the clean coal credits need not remove GHG emissions, projects that have GHG capture capability received priority in credit allocation.²¹⁶ To be awarded credits from the second tranche (\$1.25 billion) of the clean coal credits, a project must include equipment that separates and sequesters at least 65% “of such project’s total

²⁰⁹ JCX-25-09R, *supra* note 208, at 110–12 tbl.9. Section 45(c)(9) of the Code defines “Indian coal” as “coal which is produced from coal reserves which, on June 14, 2005—

- (i) were owned by an Indian tribe, or
- (ii) were held in trust by the United States for the benefit of an Indian tribe or its members.”

I.R.C. § 45(c)(9). Section 45(d)(10) of the Code defines “Indian coal production facility” as “a facility that produces Indian coal, . . . which is placed in service before January 1, 2009.” I.R.C. § 45(d)(10).

²¹⁰ SUBSIDIES, *supra* note 9, at xvi tbl.ES5.

²¹¹ *Id.*

²¹² *Id.*

²¹³ *See Mann, Coal, supra* note 199, at 117.

²¹⁴ Clean-Energy.us, Facts About IGCC Electric Power, <http://www.clean-energy.us/facts/igcc.htm#projects> (last visited Jan. 11, 2010).

²¹⁵ U.S. ENVTL. PROT. AGENCY, EPA-430/R-06/006, FINAL REPORT: ENVIRONMENTAL FOOTPRINTS AND COSTS OF COAL-BASED INTEGRATED GASIFICATION COMBINED CYCLE AND PULVERIZED COAL TECHNOLOGIES app. A, at A-2 to A-3 (2006).

²¹⁶ I.R.C. § 48A(e)(3)(B) (West 2009).

carbon dioxide emissions.”²¹⁷ If all of the first tranche credits have not been allocated, those credits may be reallocated, and those projects receiving reallocated credits must include equipment that separates and sequesters at least 70% of such projects’ total CO₂ emissions.²¹⁸

The second tranche of credits and the reallocation rules were added by the Energy Improvement and Extension Act of 2008.²¹⁹ The Act also increased the incentive to sequester carbon dioxide in gasification projects (not IGCC) by requiring that \$250 million of the tax credits allocated to these projects must be awarded to ventures that separate and sequester 75% of the project’s total CO₂ emissions, and by directing that projects with the greatest separation and sequestration percentages receive priority in the award process.²²⁰ A recent study by the Massachusetts Institute of Technology concluded that there is no justification for government support of coal projects that do not include carbon capture and storage.²²¹ The clean coal credits seem to be moving in the right direction, but the tax system is clearly still providing a lot of subsidy to the coal industry without any real strings attached.

b. Nuclear

As noted above, nuclear power produces no direct carbon emissions. Nuclear power has been viewed with suspicion in the United States after the near meltdown of the Three Mile Island reactor in 1979.²²² In other countries, nuclear power is more accepted. For example, nuclear power provides over 75% of France’s electricity.²²³ After being left out of the energy tax subsidy party for many years, in 2005, the Energy and Investment Tax Act added a production tax credit of 1.8 cents per kilowatt-hour for energy produced from

²¹⁷ I.R.C. § 48A(e)(1)(G).

²¹⁸ *See id.*

²¹⁹ Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 111(a)–(d), 122 Stat. 3807, 3822–23.

²²⁰ I.R.C. § 48B(d)(4) (West 2009).

²²¹ MASS. INST. OF TECH., THE FUTURE OF COAL: OPTIONS FOR A CARBON-CONSTRAINED WORLD 99 (2007), available at http://web.mit.edu/coal/The_Future_of_Coal.pdf.

²²² *See, e.g.*, WORLD NUCLEAR ASS’N, THREE MILE ISLAND: 1979 (2001), <http://www.world-nuclear.org/info/inf36.html>.

²²³ WORLD NUCLEAR ASS’N, NUCLEAR POWER IN FRANCE 1 (2009), <http://www.world-nuclear.org/info/inf40.html>.

qualified “advanced nuclear facilities.”²²⁴ A taxpayer operating a qualified facility may claim no more than \$125 million in tax credits per 1000 megawatts of allocated capacity in any one year of the eight-year credit period.²²⁵ An advanced nuclear facility is any nuclear facility built for the production of electricity with a reactor design that was approved after 1993 by the Nuclear Regulatory Commission (NRC).²²⁶ To receive the credit, the facility must be placed in service after August 8, 2005, but before January 1, 2021.²²⁷ As of December 31, 2008, the last date for application for the credit, twenty-six facilities had filed construction/operating license applications with the NRC.²²⁸ Like clean coal, capital costs are “the single most important cost component for nuclear power.”²²⁹ A 2004 University of Chicago study found that an investment tax credit of \$18 per mwh (equivalent to 1.8 cents per kwh) would reduce the levelized cost of electricity (LCOE) generated from nuclear power from \$53 per mwh to \$38,²³⁰ which is competitive with coal and gas generation. The study also found that nuclear power is competitive with coal-fired generation if there is a price on GHG emissions.²³¹ Thus, the study illustrates that clean energy can be made cost-competitive by either subsidizing clean energy or making dirty energy more expensive. It remains to be seen whether nuclear energy can overcome its past and become a viable clean energy source.

c. Renewable Energy

Renewable energy consumption amounts to 7% of the total U.S. energy supply.²³² Renewable energy may be such a small part of our

²²⁴ I.R.C. § 45J (West 2009) (original version at Energy Policy Act of 2005, Pub. L. No. 109-58, § 1306, 119 Stat. 997).

²²⁵ I.R.C. § 45J(a)–(c).

²²⁶ I.R.C. § 45J(d).

²²⁷ See *id.* (clarifying in the statutory notes that August 8, 2005, was the date this provision was enacted).

²²⁸ Katarina Olivia Savino, *The Case for Nuclear Power Tax Incentives*, 123 TAX NOTES 329, 335–36 (2009).

²²⁹ UNIV. OF CHI., THE ECONOMIC FUTURE OF NUCLEAR POWER S-4 (2004), available at http://www.nei.org/filefolder/unichicago_economic_study_8-04.pdf.

²³⁰ *Id.* at S-14 to S-15. “The LCOE is the price at the busbar needed to cover operating costs plus annualized capital costs.” *Id.* at S-1.

²³¹ *Id.* at S-16.

²³² U.S. ENERGY INFO. ADMIN., U.S. DEP’T OF ENERGY, RENEWABLE ENERGY ANNUAL 2007, at 1 fig.1.1 (2009) [hereinafter REA 2007], available at http://www.eia.doe.gov/cneaf/solar.renewables/page/rea_data/rea.pdf.

energy supply because fossil energy got a head start, but the reason may also be that renewable power technologies are capital-intensive, usually with relatively high construction costs and low operating costs.²³³ The largest component of renewable energy is biomass (53%), followed by hydroelectric (36%), wind (5%), geothermal (5%), and solar (1%).²³⁴ In 2007, 54% of renewable energy was used for electricity generation.²³⁵ Within renewable energy electricity generation, hydropower generated 69%, biomass 12%, wind 10%, geothermal 9%, and solar less than 1%.²³⁶ Renewable energy enjoys federal tax benefits primarily through the production tax credit (PTC)²³⁷ and the investment tax credit (ITC).²³⁸ The ARRA allows ITC-eligible renewable power projects to receive a cash grant of equivalent value instead of the ITC.²³⁹

The ITC provides a tax credit of 30% of the project cost for “energy property.”²⁴⁰ Energy property includes property that generates electricity by solar, wind, closed-loop biomass,²⁴¹ open-loop biomass,²⁴² geothermal, landfill gas, trash, hydropower, or marine and hydrokinetic renewable energy.²⁴³ The depreciable basis of a project must be reduced by half the value of the ITC.²⁴⁴ As most business property may be fully depreciated (i.e., the owner may deduct the full cost of the property over time), this may reduce the

²³³ See MARK BOLINGER ET AL., LAWRENCE BERKELEY NAT’L LAB. REPORT, LBNL-1642E, PTC, ITC, OR CASH GRANT?: AN ANALYSIS OF THE CHOICE FACING RENEWABLE POWER PROJECTS IN THE UNITED STATES 1 (2009), available at <http://eetd.lbl.gov/ea/emp/reports/lbnl-1642e.pdf>.

²³⁴ REA 2007, *supra* note 232, at 1 fig.1.1.

²³⁵ *Id.* at 2.

²³⁶ See *id.* at 8 tbl.1.2.

²³⁷ I.R.C. § 45(a) (West 2009).

²³⁸ See I.R.C. § 48 (West 2009).

²³⁹ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1603, 123 Stat. 115, 364.

²⁴⁰ I.R.C. § 48(a)(2).

²⁴¹ I.R.C. § 45(c)(2) (defining “closed-loop biomass” as “organic material from a plant which is planted exclusively for purposes of being used . . . to produce electricity”).

²⁴² “Open-loop biomass” is almost any organic waste material, including agricultural livestock waste nutrients, wood by-products such as slash or brush, and crop residue. I.R.C. § 45(c)(3).

²⁴³ I.R.C. § 48(a)(3). Marine and hydrokinetic energy includes energy derived from: waves, tides, and currents; free-flowing water in rivers, lakes, and streams; free-flowing water in canals or man-made channels; or differentials in ocean temperature (ocean thermal energy conversion). I.R.C. § 45(c)(10).

²⁴⁴ I.R.C. § 50(c)(3) (West 2009).

overall tax benefit from the project.²⁴⁵ The ITC provides up-front tax benefits: all the tax benefits of the ITC occur as soon the project is placed in service.²⁴⁶ However, if the project is sold within five years, the ITC must be recaptured.²⁴⁷ Recapture means that the taxpayer's taxable income will increase in the amount of the ITC previously taken. In contrast, the PTC reduces tax liability over the ten-year period after the project begins producing electricity based on the amount of electricity produced, rather than on the cost of the property.²⁴⁸ Solar electric projects are no longer eligible for the PTC.²⁴⁹ Ultimately, the relative financial value of the tax incentive—whether it be the PTC or the ITC—depends on “two project-specific factors: installed project costs and expected capacity factor (i.e., production).”²⁵⁰ Projects with higher capacity factors and lower installed costs would prefer the PTC over the ITC because more capacity means more production, “while lower installed costs mean that the value of those PTCs will add up to a higher percentage of installed costs.”²⁵¹

The prevailing economic climate also affects the choice of subsidy. The ITC and the PTC created financing options for renewable energy projects via “tax equity investors,” investors who bought into the projects through complex partnership and lease transactions to reap the tax benefits.²⁵² With their own losses and few profits to be taxed, banks and corporate investors have no need for renewable energy tax benefits.²⁵³ Researchers at the National Renewable Energy Laboratory noted:

The number of tax equity investors active in the renewable power market has declined precipitously, however, as a result of the

²⁴⁵ See I.R.C. §§ 167–168 (West 2009).

²⁴⁶ I.R.C. § 48(a).

²⁴⁷ I.R.C. § 50; see also Treas. Reg. § 1.47-6(a)(2) (2009) (providing that recapture will apply if a partner in a partnership that owns the facility reduces its interest in the partnership by more than a third).

²⁴⁸ I.R.C. § 45(a) (West 2009).

²⁴⁹ See I.R.C. § 45(d)(4) (cross-referencing section 48(a)(3)).

²⁵⁰ BOLINGER ET AL., *supra* note 233, at 4.

²⁵¹ *Id.* at 6.

²⁵² See Posting of John Marciano to Project Finance News Blog, How the Final Stimulus Bill Will Affect Renewable Power Projects (Feb. 17, 2009), <http://renewableprojectfinance.blogspot.com/2009/02/how-final-stimulus-bill-will-affect.html>.

²⁵³ See Andy Stone, *Glory Days May Be Gone for Green Energy*, FORBES, June 9, 2009, <http://www.forbes.com/2009/06/08/solar-wind-green-business-energy-banks.html>.

financial crisis that began unfolding across the globe in the summer of 2008. The resulting shortage and increased cost of project financing has, in turn, slowed the development of new renewable power projects,²³⁴ leading to layoffs throughout the entire industry supply chain.

The cash grant option reduces the need for tax equity investors, but may not eliminate it. First, the cash grant is not paid until the project is placed in service.²⁵⁵ Developers typically need to line up financing before beginning the project. Second, most renewable energy projects are eligible for another tax benefit, accelerated depreciation deductions, and usually “generate tax losses during the first six or seven years of operation.”²⁵⁶ The government anticipates transferring more value through grants than through ITCs over the next five years: \$1.11 billion in grants²⁵⁷ and less than \$200 million in ITCs.²⁵⁸

If the public policy goal is to increase the supply of renewable energy, the PTC is better than the ITC because it provides continuing incentives to produce renewable energy, rather than providing an incentive to invest capital in a renewable project.²⁵⁹ The cash grant is economically equivalent to the ITC.²⁶⁰ The Tax Policy Center found that “the production credit for renewable energy may be relatively more cost-effective than [other energy incentives] because it subsidizes output of a broad range of technologies that displace fossil fuels in electricity generation, without biasing choice towards one energy solution or altering relative prices of capital and labor in production.”²⁶¹

However, even under the PTC, not all renewable energy sources are treated equally. The JCT found that per unit of energy, wind and geothermal receive the highest credit amount, \$6.15 per MMBtus,

²⁵⁴ BOLINGER ET AL., *supra* note 233, at 1.

²⁵⁵ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1603, 123 Stat. 115, 364.

²⁵⁶ JOHN GIMIGLIANO & KATHERINE BREAKS, WASH. NAT’L TAX, ENERGY PROVISIONS IN THE AMERICAN RECOVERY AND REINVESTMENT TAX ACT OF 2009, at 5 (2009).

²⁵⁷ See U.S. DEP’T OF THE TREASURY, AMERICAN RECOVERY AND REINVESTMENT ACT AGENCY PLAN 1 (2009), available at http://www.treas.gov/recovery/docs/ARRA%20Agency%20Plan%202005_15_2009%20Department%20of%20the%20Treasury.pdf.

²⁵⁸ JCX-25-09R, *supra* note 208, at 111 tbl.9.

²⁵⁹ TAX POLICY CTR., URBAN INST. & BROOKINGS INST., TAX STIMULUS REPORT CARD: RENEWABLE ENERGY INCENTIVES (2009), http://www.taxpolicycenter.org/taxtopics/conference_renewable_energy.cfm [hereinafter TPC, STIMULUS REPORT CARD].

²⁶⁰ BOLINGER ET AL., *supra* note 233, at 2.

²⁶¹ TPC, STIMULUS REPORT CARD, *supra* note 259.

while open-loop biomass only receives \$2.93 per MMBtus.²⁶² In terms of tons of CO₂ emissions avoided, the PTC delivers \$7.74 per ton to geothermal and \$12.28 per ton to wind.²⁶³ There is also considerable dispute about what should be considered “renewable.” Attracted by the tax benefits enjoyed by renewable energy, lobbyists at both the state and federal level seek to expand the definition to include nuclear energy and advanced coal.²⁶⁴ While federal assistance in moving to a more climate-friendly energy policy may seem welcome, using renewable energy tax incentives is, at best, a mixed blessing. Economist Eric Toder writes:

The [renewable energy] subsidies are beneficial to the extent that they reduce consumption of fossil fuels, with the benefit depending on the product of the displaced fossil fuel consumption and the difference between the market price of the displaced fuel and the hypothetical correct price that accounts for all social costs of fossil fuel consumption. But subsidies are in general a less cost-effective way of reducing oil vulnerability and greenhouse gas emissions than direct increases in fuel prices because their incentive effects are less complete. Subsidies can encourage firms and households to alter production methods and make investments in specified energy-saving technologies, but they do not reduce consumption of energy-intensive goods and services and do not encourage energy-saving changes in production methods²⁶⁵ and technology other than those specified in the tax provisions.

Renewable energy may also come with social costs. Wind turbines can harm birds and bats.²⁶⁶ Exploration for geothermal resources has

²⁶² JCX-25-09R, *supra* note 208, at 118 tbl.10.

²⁶³ Gilbert E. Metcalf, *Tax Policies for Low-Carbon Technologies* 12 tbl.3 (Nat’l Bureau of Econ. Research, Working Paper No. 15,054, 2009), available at <http://www.nber.org/papers/w15054>.

²⁶⁴ Felicity Barringer, *With Billions at Stake, Trying to Expand the Meaning of ‘Renewable Energy,’* N.Y. TIMES, May 25, 2009, at A9, available at <http://www.nytimes.com/2009/05/25/business/energy-environment/25renew.html>.

²⁶⁵ Eric Toder, *Energy Taxation: Principles and Interests*, TAX NOTES: 2006 ENERGY SUPPLEMENT, Nov. 27, 2006, at 95–96, available at http://www.urban.org/uploadedpdf/1001077_energy_taxation.pdf.

²⁶⁶ Joseph Caputo, *Can Wind Power Be Wildlife Friendly*, SMITHSONIAN MAG., Feb. 27, 2009, <http://www.smithsonianmag.com/specialsections/ecocenter/Can-Wind-Power-Be-Wildlife-Friendly.html>; see also Andrew Curry, *Deadly Flights*, 325 SCI. 386, 387 (2009) (reporting that migratory bats are killed by “barotrauma, fatal bubbles or ruptures in bats’ lungs and hearts caused by the low-pressure zones the massive [wind turbine] blades create in their wake”); Jeffrey S. Hinman, Note, *The Green Economic Recovery: Wind Energy Tax Policy After Financial Crisis and the American Recovery and Reinvestment Tax Act of 2009*, 24 J. ENVTL. L. & LITIG. 35, 45–46 (2009).

triggered earthquakes.²⁶⁷ The manufacture of solar panels uses toxic materials.²⁶⁸ Marine renewable energy may disrupt aquatic life.²⁶⁹ The uneven application of the PTC, the lobbying effort to expand the definition of “renewable,” and the possible social cost of renewable energy sources all show the danger of having the government pick winners. A rational energy tax policy would eliminate subsidies for fossil fuels, impose a carbon tax, and create incentives for conservation. In the next two sections of this Article, I discuss existing conservation incentives and consider carbon pricing alternatives.

2. Conservation

The good news is that American society can produce more wealth with less energy. The ratio of energy consumption per dollar of gross domestic product (GDP), also called the energy intensity of the economy, declined steadily from 19.57 in 1949 to 8.52 in 2008.²⁷⁰ The U.S. Department of Energy expects to see continued declines to 5.6 in 2030.²⁷¹ The carbon intensity of the economy has declined impressively since records were first kept in 1980, going from 917 metric tons of CO₂ per million dollars of GDP to only 520 metric tons in 2007.²⁷² Of course, GDP has continued to increase, going from approximately \$2.8 trillion in 1980 to about \$14.3 trillion in 2008.²⁷³ The bad news is GHG emissions in the United States have continued to increase as well, going from five billion tons in 1990 to 5.8 billion

²⁶⁷ James Glanz, *In Bedrock, Clean Energy and Quake Fears*, N.Y. TIMES, June 24, 2009, at A1, available at <http://www.nytimes.com/2009/06/24/business/energy-environment/24geotherm.html> (describing serious earthquakes triggered by a geothermal drilling project in Basel, Switzerland). A project in California, described as “the Obama administration’s first major test of geothermal energy as a significant alternative to fossil fuels,” was cancelled due to earthquake concerns. James Glanz, *Running Aground: Geothermal Project Is Shut Down*, N.Y. TIMES, Dec. 12, 2009, at A10.

²⁶⁸ SILICON VALLEY TOXICS COAL., TOWARDS A JUST AND SUSTAINABLE SOLAR ENERGY INDUSTRY 9–18 (2009), available at http://www.svtc.org/site/DocServer/Silicon_Valley_Toxics_Coalition_-_Toward_a_Just_and_Sust.pdf.

²⁶⁹ U.S. DEP’T OF ENERGY, ENERGY SAVERS: OCEAN TIDAL POWER, http://www.energysavers.gov/renewable_energy/ocean/index.cfm/mytopic=50008 (last visited Jan. 12, 2010).

²⁷⁰ ANNUAL ENERGY REVIEW 2008, *supra* note 187, at 13 tbl.1.5 (noting that the ratio is 1000 Btus per dollar as valued in 2000).

²⁷¹ ANNUAL ENERGY OUTLOOK 2009, *supra* note 195, at 59.

²⁷² ANNUAL ENERGY REVIEW 2008, *supra* note 187, at 13 tbl.1.5 (using dollar values in 2000).

²⁷³ *Id.*

tons in 2008.²⁷⁴ The bottom line is that we cannot consume our way out of climate change. We have to conserve.

Energy efficiency and conservation are the most attractive and necessary energy policy options for the United States.²⁷⁵ The unused gallon of gas or kilowatt of energy is the cleanest and cheapest of all energy sources. In 2004, scientists Stephen Pacala and Robert Socolow identified fifteen technologically mature options for stabilizing carbon emissions and heading off catastrophic climate change.²⁷⁶ According to Pacala and Socolow, improvements in efficiency and conservation likely offer the greatest potential to stabilize carbon emissions.²⁷⁷ If existing practices for heating and cooling spaces, heating water, lighting, and refrigeration were applied to residential and commercial buildings worldwide, a billion tons of carbon emissions could be avoided.²⁷⁸

By setting the criteria for tax savings through energy savings, encouraging conservation also avoids the problem of the government picking technological winners. Most of the federal tax credits for conservation are aimed at consumers.²⁷⁹ The conservation credits fall into three general categories: credits for homeowners, credits for vehicle owners, and credits for manufacturers. The credits for vehicle owners will not be addressed here, as they were discussed previously.²⁸⁰

There are two types of credits that apply to homeowners. One, the credit for residential energy-efficient property,²⁸¹ is the consumer counterpart to the ITC for renewable energy.²⁸² It provides a personal tax credit for 30% of the unlimited cost of qualified solar electric properties, solar water heating properties, geothermal heat pump properties, and small wind properties installed in the taxpayer's

²⁷⁴ U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, U.S. CARBON DIOXIDE EMISSIONS FROM ENERGY SOURCES 2008 FLASH ESTIMATE 14 (2009), available at <http://www.eia.doe.gov/oiaf/1605/flash/pdf/flash.pdf>.

²⁷⁵ Dernbach et al., *supra* note 185, at 10,003.

²⁷⁶ S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCI. 968, 969 (2004), available at <http://www.sciencemag.org/cgi/reprint/305/5686/968.pdf>.

²⁷⁷ *Id.*

²⁷⁸ *See id.* at 968 (noting that each option, or wedge, avoids one billion tons of carbon emissions per year by 2054).

²⁷⁹ *See Mann & Hymel, Getting Into the Act, supra* note 8, at 10,424–26.

²⁸⁰ *See supra* Part II.B.

²⁸¹ I.R.C. § 25D (West 2009).

²⁸² *See* I.R.C. § 45 (West 2009).

residence by the end of 2016.²⁸³ Like the ITC for renewable energy, the residential energy-efficient property credit picks winning technologies. Only the provisions describing qualified solar water heating and geothermal heat pump properties refer to efficiency ratings.²⁸⁴

The nonbusiness energy property credit is a 10% credit for the sum of the cost of qualified energy efficiency improvements and residential energy property expenditures.²⁸⁵ The nonbusiness energy property credit is more narrowly applied than the credit for residential energy-efficient property. The nonbusiness energy property credit applies only to amounts spent on the taxpayer's *principal* residence, which is more narrowly defined than "a residence of the taxpayer."²⁸⁶ These credits only apply to expenditures made in 2009 and 2010, and the aggregate amount of such credits is capped at \$1500.²⁸⁷

Each type of property eligible for the nonbusiness energy property credit must meet strict efficiency standards determined by efficiency experts. For example, the building envelope components (roofs, insulation, windows, doors) must meet the prescriptive criteria of the 2000 International Energy Conservation Code.²⁸⁸ Central air conditioners must achieve the "highest efficiency tier established by the Consortium for Energy Efficiency."²⁸⁹ Qualified natural gas furnaces must achieve an annual fuel utilization efficiency rate of not less than ninety-five.²⁹⁰

The tax system provides another benefit for energy conscious consumers. If a public utility gives a subsidy to a consumer for the purchase of any energy conservation measure, like a cash discount on a solar water heater,²⁹¹ the subsidy will be excluded from the consumer's gross income for federal income tax purposes.²⁹²

²⁸³ I.R.C. § 25D.

²⁸⁴ See I.R.C. § 25D(b)(2) (requiring that the solar water heating property be "certified for performance by the non-profit Solar Rating Certification Corporation or a comparable entity"); § 25D(d)(5)(B) (requiring the geothermal heat pump property to meet the requirements of the Energy Star program that are in effect at the time the equipment was purchased).

²⁸⁵ I.R.C. § 25C(a) (West 2009).

²⁸⁶ See I.R.C. § 121 (West 2009) (defining principal residence).

²⁸⁷ I.R.C. § 25C(b), (g).

²⁸⁸ I.R.C. § 25C(c)(1).

²⁸⁹ I.R.C. § 25C(d)(3)(C).

²⁹⁰ I.R.C. § 25C(d)(4).

²⁹¹ For example, the city of Eugene's Water and Electric Board provides a cash discount of up to \$600 on the purchase of a solar water heater. Eugene Water & Elec. Bd.,

The manufacturer's tax credits apply to builders of new energy-efficient homes²⁹³ and energy-efficient appliances.²⁹⁴ These credits encourage builders and manufacturers to produce energy-efficient products for consumers. To qualify for the new energy-efficient home credit, the residence must be certified to achieve either a 30% or 50% reduction in heating and cooling energy consumption compared to a comparable dwelling unit.²⁹⁵ To qualify for the energy-efficient appliance credit, the dishwasher, clothes washer, or refrigerator must meet strict efficiency criteria specified in the statute.²⁹⁶

Owners of commercial buildings can also receive tax savings by improving the energy efficiency of their buildings. The energy-efficient commercial buildings deduction allows an additional deduction of \$1.80 per square foot of commercial property that exceeds certain energy efficiency standards.²⁹⁷ The expenditures must be certified "as part of a plan designed to reduce the total annual energy and power costs" of the interior lighting, cooling, heating, ventilation, and hot water systems of the building by at least 50% in comparison to a reference building.²⁹⁸ The American Council for an Energy-Efficient Economy found that the tax incentive for energy-efficient commercial buildings had the best cost-benefit ratio of the energy tax incentives they studied.²⁹⁹

Requiring that eligibility for a tax credit depends on verifiable efficiency standards takes the government out of the business of picking winners. Consumers can buy whatever equipment meets the standards. Manufacturers can use whatever technology works to achieve the efficiency standards. Tax incentives for energy conservation are a key part of a rational energy policy. For Americans, the problem may be that energy conservation is not

Solar Water Heaters, <http://www.eweb.org/saveenergy/home/solarheating> (last visited Jan. 12, 2010).

²⁹² I.R.C. § 136(a) (West 2009).

²⁹³ I.R.C. § 45L(a) (West 2009).

²⁹⁴ I.R.C. § 45M(a) (West 2009).

²⁹⁵ I.R.C. § 45L(c).

²⁹⁶ I.R.C. § 45M(b).

²⁹⁷ I.R.C. § 179D (West 2009).

²⁹⁸ I.R.C. § 179D(c).

²⁹⁹ Am. Council for an Energy-Efficient Econ., Tax Incentives for Advanced Energy-Efficient Technologies: Costs, Benefits, and Legislative Recommendations, <http://www.aceee.org/energy/national/taxfaq2.htm> (last visited Jan. 12, 2010).

glamorous.³⁰⁰ When on the campaign trail, President Obama suggested that we should pump up our tires to save fuel, inspiring gleeful ridicule on the part of his opponent.³⁰¹ According to the U.S. Department of Energy, proper tire inflation can improve gas mileage by around 3.3%, but that fact did not stop the laughter.³⁰²

In an earlier article, Mona Hymel and I recommended that renewable energy incentives have a longer life span, as Congress was in the habit of renewing them for one or two years—not long enough to spur investment.³⁰³ Congress corrected that problem in 2008, giving an eight-year extension for investments in most renewable incentives.³⁰⁴ But Congress may have the timing slightly wrong, as the tax equity investor market will probably take a number of years to recover.

In sum, when influencing behavior, incentive design is important.³⁰⁵ Richard Thaler and Cass Sunstein have written an interesting book on choice architecture that can shed some light on the debate about energy incentives. They identified four questions to ask when determining the appropriateness of incentive design: (1) who uses; (2) who chooses; (3) who pays; and (4) who profits?³⁰⁶ While free markets may create the proper incentives to make good products and sell them at the right price, many markets are “replete with incentive conflicts.”³⁰⁷ As noted previously, the tax system contains many conflicting incentives for energy.³⁰⁸ Thaler and Sunstein note that “[t]he most important modification that must be

³⁰⁰ See Dernbach et al., *supra* note 185, at 10,004 (noting that “many [Americans] equate . . . affluence with energy use” and “thus see using less energy as inconsistent with the American lifestyle, and even as a form of martyrdom or impoverishment”).

³⁰¹ Dan Neil, *Gauging Furor Over Air in Tires*, L.A. TIMES, Aug. 8, 2008, at C1, available at <http://articles.latimes.com/2008/aug/08/business/fi-neil8?pg=1>.

³⁰² U.S. Dep’t of Energy, *Tips to Improve Your Gas Mileage: Keeping Your Car in Shape*, <http://www.fueleconomy.gov/feg/maintain.shtml> (last visited Jan. 12, 2010).

³⁰³ See Mann & Hymel, *Getting Into the Act*, *supra* note 8, at 10,422 (“[T]ax incentives should last long enough to overcome the market barriers and enable environmentally sound products to compete economically with older, less efficient products.”); see also BOLINGER ET AL., *supra* note 233, at 2–3 (detailing legislative history of the PTC).

³⁰⁴ Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 103(a), 122 Stat. 3807, 3811 (codified as amended at I.R.C. § 48(a), (c)(1) (West 2009)).

³⁰⁵ See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 252 (2008).

³⁰⁶ *Id.* at 97.

³⁰⁷ *Id.* at 98.

³⁰⁸ See *supra* notes 110–12, 157–70 and accompanying text.

made to a standard analysis of incentives is salience.”³⁰⁹ They suggest that a thermostat could be programmed to tell the homeowner the cost of lowering the air temperature from eighty to seventy-five degrees to make energy savings salient.³¹⁰ Thaler and Sunstein call those who influence choices “choice architects.”³¹¹ One example of how the federal tax system exercises its “choice architect” power is in the withholding provisions.³¹² Wage earners have taxes withheld from their wages as a default measure. Wage earners are, therefore, the most compliant of taxpayers because of the choice architecture of the system.³¹³

The tax system could increase the salience of saving energy by imposing increasingly steep costs on marginal usage. If consumers understood that turning down the thermostat would not only cost more in terms of energy usage, but more in terms of taxes, a behavioral shift might occur. One commentator suggests that “[t]o discourage consumers from using electricity beyond basic needs, they should be required to pay on a progressive . . . rate basis.”³¹⁴ Alternatively, consumers could be forced into a default choice of renewable energy, as with ethanol, which is blended into gasoline under state and federal renewable portfolio standards.³¹⁵ In the case of energy, increasing salience is preferable to default portfolio standards. Portfolio standards pick winning technologies, while a progressive tax on energy would reward efficiency and savings.

D. Carbon Pricing

After years of resistance, and aided by a change in administration, the United States has finally decided that it needs to act to reduce GHG emissions. GHG emissions could be controlled by regulation, by market mechanisms, or by some combination of the two. A market mechanism operates by imposing a price on GHG emissions, thereby discouraging the use of fossil fuel energy. The debate has

³⁰⁹ THALER & SUNSTEIN, *supra* note 305, at 98.

³¹⁰ *See id.* at 99.

³¹¹ *Id.* at 252.

³¹² *See* I.R.C. § 3402 (West 2009).

³¹³ The noncompliance rate for wage earners is 1%. JASON FURMAN, CTR. ON BUDGET & POLICY PRIORITIES, CLOSING THE TAX GAP 2 (2006), available at <http://www.cbpp.org/files/4-10-06tax3.pdf>.

³¹⁴ Stanley Veliotis, *A Call for Progressive Taxation of Home Energy Use*, 121 TAX NOTES 319, 319 (2008).

³¹⁵ *See* Mann & Hymel, *Moonshine*, *supra* note 134, at 56.

focused on two different designs of market mechanism: a cap-and-trade system and a carbon tax.

A classic cap-and-trade system imposes a marketwide quantity restriction while allowing emitters to choose between reducing their own output and purchasing allowances to emit. A classic carbon tax is a cost restriction: emitters both will pay a fixed amount for emissions and may choose between reducing emissions or paying a price. In an economically efficient market, a carbon tax and a cap-and-trade regime would have the same outcome, as one could predict the cost of a cap-and-trade system and the emissions reductions of a carbon tax.³¹⁶ In the real world, a carbon tax would create a stable price and fluctuating emissions. A cap-and-trade system would create stable emissions and fluctuating costs. Increasing numbers of scholars prefer the carbon tax system,³¹⁷ but the political system has so far spoken in favor of the cap-and-trade option.³¹⁸

I have written in favor of the carbon tax because of its simplicity, transparency, and ability to contain costs.³¹⁹ As I noted, “a federal cap-and-trade program could be structured to provide public benefits, a level playing field, and fairness and cost containment for all industries and consumers. The odds are just overwhelmingly against that result.”³²⁰ If the Waxman-Markey bill recently passed by the

³¹⁶ JONATHAN L. RAMSEUR & LARRY PARKER, CONG. RESEARCH SERV., CARBON TAX AND GREENHOUSE GAS CONTROL: OPTIONS AND CONSIDERATIONS FOR CONGRESS 3 (2009).

³¹⁷ *Hearing on Scientific Objectives for Climate Change Legislation Before The H. Comm. on Ways and Means*, 111th Cong. (2009) (statement of James Hansen, Adjunct Professor, The Earth Institute at Columbia University, and Director, NASA Goddard Institute for Space Studies), available at <http://waysandmeans.house.gov/Hearings/Testimony.aspx?TID=2084>; Reuven S. Avi-Yonah & David M. Uhlmann, *Combating Global Climate Change: Why a Carbon Tax Is a Better Response to Global Warming Than Cap and Trade*, 28 STAN. ENVTL. L.J. 3 (2009); Kenneth P. Green et al., *Climate Change: Caps vs. Taxes*, in ENVIRONMENTAL POLICY OUTLOOK (Am. Enter. Inst. for Pub. Policy, AEI Outlook Series No. 2, 2007), available at www.aei.org/docLib/20070601_EPOg.pdf; Roberta F. Mann, *The Case for the Carbon Tax: How to Overcome Politics and Find Our Green Destiny*, 39 ENVTL. L. REP. 10,118 (2009) [hereinafter Mann, *The Case for the Carbon Tax*]; Gilbert E. Metcalf & David Weisbach, *Will a New Administration Mean a New Policy on Climate Change?*, 122 TAX NOTES 625 (2009); Janet E. Milne, *Carbon Taxes in the United States: The Context for the Future*, 10 VT. J. ENVTL. L. 1 (2008).

³¹⁸ See John M. Broder, *House Backs Bill, 219–212, to Curb Global Warming*, N.Y. TIMES, June 27, 2009, at A1, available at <http://www.nytimes.com/2009/06/27/us/politics/27climate.html>.

³¹⁹ See Mann, *The Case for the Carbon Tax*, *supra* note 317, at 10,125.

³²⁰ *Id.* at 10,123 (footnote omitted).

House of Representatives (the American Clean Energy and Security Act of 2009 or ACES) is any guide, the odds have not lied in this case.³²¹

First, the ACES contains 1428 pages and cannot be described as simple or transparent. Any cap-and-trade system must contain three elements: the cap, which represents the maximum annual emissions; the allocation of permits, which can be auctioned or given away; and the trade, which involves setting up a market. In addition to the basic cap-and-trade structure,³²² the ACES contains provisions for banking and borrowing allowances,³²³ for carbon offsets,³²⁴ for regulating carbon and carbon derivative markets,³²⁵ and for exemptions from environmental regulation.³²⁶ Banking allows permit holders to save this year's permit for use in a future year. A fixed cap is the only way to ensure a fixed amount of emissions, so banking makes the emissions uncertain. Borrowing allows permit holders to borrow more than their allocation, again making emissions uncertain. Carbon offsets theoretically do not increase emissions as they absorb carbon, but it can be challenging to accurately measure offsets,³²⁷ which pose significant compliance issues.³²⁸ A firm quantity restriction is the primary benefit of a cap-and-trade system, so allowing banking, borrowing, and offsets reduces the environmental integrity of the program. This environmental integrity is further impaired by the provisions precluding regulation of GHG emissions by the Environmental Protection Agency (EPA), although that was probably a political necessity.³²⁹

³²¹ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (as passed by the House of Representatives, June 26, 2009).

³²² See *id.* sec. 311, §§ 721–724.

³²³ *Id.* sec. 311, § 725.

³²⁴ See *id.* sec. 311, §§ 731–743.

³²⁵ See *id.* §§ 351–360.

³²⁶ See *id.* sec. 311, §§ 831–835.

³²⁷ See Dan Mitchell, *How Clean Is Your Carbon Credit?*, N.Y. TIMES, May 5, 2007, at C5.

³²⁸ See Fiona Harvey, *Beware the Carbon Offsetting Cowboys*, FIN. TIMES (London), Apr. 26, 2007, at 8.

³²⁹ See Kassie Siegel et al., *No Reason to Wait: Reducing Greenhouse Gas Emissions Through the Clean Air Act 2* (Ctr. for Biological Diversity, Climate Law Institute Working Paper No. 1, 2009), available at http://www.biologicaldiversity.org/programs/climate_law_institute/legislating_for_a_new_climate/pdfs/NoReasonToWait.pdf (noting that the EPA could implement GHG regulations in a manner compatible with a cap-and-trade program). The paper reports that “[i]t is nonsensical to discard existing tools that can

One conception of a fair carbon cap-and-trade scheme would include the following: “(1) upstream coverage incorporating the entire economy; (2) 100% auction of carbon permits; (3) no offsets allowed; and (4) equal distribution of auction revenues on a per capita basis.”³³⁰ The ACES appears to have relatively complete upstream coverage, but only 15% of permits will be auctioned in 2012, the first year of the program, with the percentage auctioned to increase over time.³³¹ The EPA estimates the value of the 85% of permits to be given away at \$51 billion.³³² As noted above, the ACES includes offsets. The auction revenues would be distributed in part to offset increased energy costs for low- and moderate-income households, to prevent international deforestation, to help the United States adapt to climate change, and to support research and development of clean energy and energy-efficient technologies.³³³

Concern about the potential abuse of offsets and trading in carbon derivatives caused Representative Peter DeFazio (D-Or.) to vote against the ACES.³³⁴ A 2008 report found that between one-third and two-thirds of the carbon offsets allowed in the European Union carbon trading program did not produce actual carbon emissions reductions.³³⁵ A 2009 report details how an underregulated market of carbon derivatives could give rise to a new economic boom and bust.³³⁶

Despite the flaws in the ACES, the bill has garnered considerable support. Although I prefer the carbon tax approach, I hesitate to make

work today in favor of a new and untested system, leaving us no other options. Yet the ACESA [H.R. 2454] would do just that in many important regards.” *Id.* at 22.

³³⁰ Mann, *The Case for the Carbon Tax*, *supra* note 317, at 10,123 n.79.

³³¹ See Kate Sheppard, *Everything You Always Wanted to Know About the Waxman-Markey Energy/Climate Bill in Bullet Points*, GRIST, June 3, 2009, <http://www.grist.org/article/2009-06-03-waxman-markey-bill-breakdown/>.

³³² See *id.*

³³³ *Id.*

³³⁴ Representative Peter DeFazio, The Remarks of the Honorable Peter DeFazio at the Portland City Club (June 19, 2009) (transcript available at http://www.defazio.house.gov/index.php?option=com_content&task=view&id=492). For the roll call vote on the bill, see *House Vote 477-H.R. 2454: On Passage American Clean Energy and Security Act*, N.Y. TIMES, Sept. 19, 2009, <http://politics.nytimes.com/congress/votes/111/house/1/477>.

³³⁵ See John Vidal, *Billions Wasted on UN Climate Programme*, GUARDIAN (London), May 26, 2008, at 1, available at <http://www.guardian.co.uk/environment/2008/may/26/climatechange.greenpolitics/print>.

³³⁶ See FRIENDS OF THE EARTH, SUBPRIME CARBON?: RE-THINKING THE WORLD’S LARGEST NEW DERIVATIVES MARKET 4 (2009), available at <http://www.foe.org/pdf/SubprimeCarbonReport.pdf>.

the perfect enemy of the “good enough for now.” Nobel Prize-winning economist Paul Krugman supports the legislation, although he also prefers a carbon tax.³³⁷ Author Tom Friedman also supports the legislation, while noting its flaws.³³⁸ Nobel Prize winner and former Vice President Al Gore worked behind the scenes to ensure the bill’s success.³³⁹ House Republican leaders, including House Minority Leader John Boehner (who does not support the bill), call the cap-and-trade program a “national energy tax” and predict that it will cause large price increases for all forms of energy.³⁴⁰ However, the Congressional Budget Office determined that the average cost per household would be a modest \$175 per year with lower-income households receiving a net average decrease in costs of \$40 per year, while the highest income earners would have a net cost of \$245 per year.³⁴¹ The American Council for an Energy-Efficient Economy predicts \$29 billion in net annual consumer savings from the ACES, coming primarily through its non-cap-and-trade provisions for energy efficiency programs such as stricter building codes, new lighting standards, and smart grid appliances.³⁴²

In 2002, I recommended that the Internal Revenue Code contain credits for carbon sequestration.³⁴³ In 2008, Congress added a \$20 tax credit for each metric ton of carbon dioxide captured and secured in geological storage.³⁴⁴ Taxpayers using CO₂ “as a tertiary injectant in a qualified enhanced oil or natural gas recovery project” may get a \$10 tax credit for each metric ton.³⁴⁵ My recommendation focused on forest projects and carbon sinks rather than geological storage. The ACES, as part of its offset provisions, provides for supplemental

³³⁷ See Paul Krugman, *Betraying the Planet*, N.Y. TIMES, June 29, 2009, at A21 (calling climate change deniers treasonous).

³³⁸ Thomas L. Friedman, Op-Ed, *Just Do It*, N.Y. TIMES, July 1, 2009, at A33.

³³⁹ Broder, *supra* note 318, at A1; Paul Krugman, *The Perfect, the Good, the Planet*, N.Y. TIMES, May 18, 2009, at A23.

³⁴⁰ See John M. Broder, *Energy Bill Unfinished, but Vote Nears*, N.Y. TIMES, June 24, 2009, at A17.

³⁴¹ CONG. BUDGET OFFICE, THE ESTIMATED COSTS TO HOUSEHOLDS FROM THE CAP-AND-TRADE PROVISIONS OF H.R. 2454, at 2 (2009), available at http://energycommerce.house.gov/Press_111/20090620/cbowaxmanmarkey.pdf.

³⁴² AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., HR. 2454 ADDRESSES CLIMATE CHANGE THROUGH A WIDE VARIETY OF ENERGY EFFICIENCY MEASURES (2009), <http://www.aceee.org/energy/national/WMSavingsUpdate0624.pdf>.

³⁴³ See Mann, *Waiting*, *supra* note 158, at 1221.

³⁴⁴ I.R.C. § 45Q (West 2009) (original version at Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Div. B, § 115(a)–(d), 122 Stat. 3807, 3829–31).

³⁴⁵ I.R.C. § 45Q(a)(2).

emissions reductions through reduced deforestation.³⁴⁶ Although Congress has not adopted all of my recommendations on carbon pricing and sequestration, the body has made some progress.

III CONCLUSION

Early-twentieth-century economist Arthur Pigou theorized that only governments could solve the failure of the market to account for certain unintended social costs of market activity.³⁴⁷ In other words, “the market often fails to tell the ecological truth.”³⁴⁸ For maximum social utility, a pollution tax should be set at the marginal benefits of cleaning up the pollution.³⁴⁹ Modern economists still agree, as Gilbert Metcalf wrote, “[a] tax on pollution is a simple way to ensure that private firms use resources that take into account the full (social) cost of their behavior.”³⁵⁰ As using lots of energy is tied to the American idea of affluence, we need a cultural shift. Imposing consumption taxes, such as a carbon tax, on environmentally damaging goods would encourage efficiency and savings. If Americans paid the full price for using an electric clothes dryer, there would be more clotheslines. The United States has not embraced the idea of pollution taxes, preferring instead to create incentives for alternatives to traditional fossil fuel technologies. Tax incentives are an inefficient way of solving social problems but they are politically attractive. In 1967, Stanley Surrey hoped to stifle the growth of tax expenditures,³⁵¹ but tax expenditures have continued to expand, from

³⁴⁶ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 753 (as passed by the House of Representatives, June 26, 2009).

³⁴⁷ See generally A.C. PIGOU, *THE ECONOMICS OF WELFARE* (1920).

³⁴⁸ LESTER R. BROWN, *ECO-ECONOMY: BUILDING AN ECONOMY FOR THE EARTH* 22 (2001).

³⁴⁹ Robert N. Stavins, *Environmental Economics* 11 (Nat’l Bureau of Econ. Research, Working Paper No. 13,574, 2007), available at http://www.nber.org/papers/w13574.pdf?new_window=1.

³⁵⁰ Gilbert E. Metcalf, *A Green Employment Tax Swap: Using a Carbon Tax to Finance Payroll Tax Relief* 1 (Brookings Inst., Tax Reform, Energy, and the Environment Policy Brief, 2007), available at http://pdf.wri.org/Brookings-WRI_GreenTaxSwap.pdf.

³⁵¹ See generally Stanley S. Surrey, *Tax Incentives as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditures*, 83 HARV. L. REV. 705 (1970).

\$36.6 billion in 1967³⁵² to over \$1 trillion in 2007.³⁵³ In 2005, the U.S. Government Accountability Office (GAO) compared tax expenditures to direct government spending, concluding that tax expenditures should be reexamined.³⁵⁴

From a budgetary perspective, most tax expenditures are comparable to mandatory spending for entitlement programs, in that no further action is required to provide resources for tax expenditures. “Tax expenditures do not compete overtly in the annual budget process and, in effect, receive a higher funding priority than discretionary spending subject to the annual appropriations process.”³⁵⁵

Thus, not only is government picking winners through tax expenditures, it is also picking them without as much examination as would occur if those industries were directly funded. The stealth spending through tax expenditures results in less revenue for more transparent government spending, higher taxes, or higher deficits. In 2005, the GAO noted that “the long-term fiscal challenge makes it all the more important to ensure all major federal spending and tax programs and policies—including tax expenditures—are efficient, effective, and relevant.”³⁵⁶ In the current economic crisis, this is truer than ever. Ideally, the government would raise money through taxes and distribute it through a transparent and careful appropriations process. Until then, as long as we have tax incentives, we should use them to level the playing field, not to pick winners. We should use tax incentives to encourage innovation and efficiency.

Finally, the government must require an examination of the consequences of tax expenditures for energy. Pursuant to Stanley Surrey’s design, Congress requires that the Joint Committee on Taxation estimate the revenue effects of each tax provision, both

³⁵² CONG. BUDGET OFFICE, TAX EXPENDITURES: BUDGET CONTROL OPTIONS AND FIVE-YEAR BUDGET PROJECTIONS FOR FISCAL YEARS 1983–1987, at 12 tbl.3 (1982), available at <http://www.cbo.gov/doc.cfm?index=5940&type=1>.

³⁵³ JCS-3-07, *supra* note 19, at 24–35 (2007). The figures represent the author’s calculations and exclude items with a positive tax expenditure of less than \$50 million. See generally CHYE-CHING HUANG & HANNAH SHAW, CTR. ON BUDGET & POLICY PRIORITIES, NEW ANALYSIS SHOWS “TAX EXPENDITURES” OVERALL ARE COSTLY AND REGRESSIVE (2009), <http://www.cbpp.org/files/2-23-09tax2.pdf>.

³⁵⁴ See U.S. GOV’T ACCOUNTABILITY OFFICE, TAX EXPENDITURES REPRESENT A SUBSTANTIAL FEDERAL COMMITMENT AND NEED TO BE REEXAMINED 4–6 (2005), available at <http://www.gao.gov/new.items/d05690.pdf>.

³⁵⁵ *Id.* at 18.

³⁵⁶ *Id.* at 44.

when it is proposed and annually after it becomes law.³⁵⁷ Tracking the utilization of tax incentives may not necessarily illustrate their effectiveness in accomplishing the congressional intent of the provisions. Congress should first explicitly identify its goals in proposing the rule. For example, for the wind PTC, the congressional goal might be to increase the proportion of electricity generated by renewable energy. Once the goal is clearly identified, Congress should require a regularly scheduled ex post analysis to see whether the tax incentive effectively met the goal.³⁵⁸ If the goal has not been met, then taxpayers need to know the reasons why. Will the goal eventually be met if we stay the course? Does it need to be redesigned to be more effective? Or is the tax incentive being misused, like the synfuel credit?³⁵⁹

Congress has taken a step in the right direction with the recently passed Tax Extenders Act of 2009.³⁶⁰ The Act extended several tax provisions that expired at the end of 2009, including the PTC for open-loop biomass, the new energy-efficient home construction credit, and the alternative fuel mixture credit. The Act also required the JCT to publish a study on the extended tax credits by November 30, 2010.³⁶¹ The study is to include the following: (1) an explanation of the provision and the relevant economic or social context; (2) a description of the purpose of the provision; (3) an analysis of the success of the provision in achieving its purpose; (4) an analysis of the extent to which extending or making the provision permanent would contribute to achieving the purpose; (5) “a description of the direct and indirect beneficiaries” of the provision, including any unintended beneficiaries; (6) an analysis of whether the provision is the most cost-effective way of achieving the purpose; (7) an explanation of any unintended effects of the provision; (8) an analysis of how the provision “could be modified to better achieve its original purpose”; (9) a description of any interactions with other tax provisions or direct spending programs; and (10) a description of

³⁵⁷ See Congressional Budget and Impoundment Control Act of 1974, Pub. L. No. 93-344, § 308, 88 Stat. 297.

³⁵⁸ Zelenak opined that my call for study of the consequences of tax expenditures is “very much in the spirit of the carbon audit mandate of section 117 [of the Emergency Economic Stabilization Act of 2008].” Zelenak, *supra* note 7, at 1375.

³⁵⁹ See *supra* note 153 and accompanying text.

³⁶⁰ H.R. 4213, 111th Cong. The Act passed the Senate on March 10, 2010. 156 CONG. REC. S1533 (2010).

³⁶¹ *Id.* § 622.

unavailable information that may be necessary to complete a more thorough examination.³⁶² Although this sort of analysis should be applied to all energy tax provisions on a regular basis, not just on enactment or extension, this is a welcome start. The stakes are too high—both economically and environmentally—to throw taxpayer money away on technologies that are inefficient, ineffective, or environmentally damaging.

³⁶² *Id.*

