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Alternative Fuel and Advanced Vehicle Technology Incentives: A Summary of Federal Programs

Lynn J. Cunningham
Information Research Specialist

Beth A. Roberts
Information Research Specialist

Bill Canis
Specialist in Industrial Organization and Business

Brent D. Yacobucci
Section Research Manager

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Summary

A wide array of federal incentives supports the development and deployment of alternatives to conventional fuels and engines in transportation. These incentives include tax deductions and credits for vehicle purchases and the installation of refueling systems, federal grants for conversion of older vehicles to newer technologies, mandates for the use of biofuels, and incentives for manufacturers to produce alternative fuel vehicles. The current array of incentives for alternative fuels and related technologies does not reflect a single, comprehensive strategy, but rather an aggregative approach to a range of discreet public policy issues, including goals of reducing petroleum consumption and import dependence, improving environmental quality, expanding domestic manufacturing, and promoting agriculture and rural development.

Current federal programs are administered by five key agencies: Department of the Treasury, Department of Energy, Department of Transportation, Environmental Protection Agency, and the U.S. Department of Agriculture. The incentives and programs described in this report are organized by the responsible agency.

- Treasury (through the Internal Revenue Service, IRS) administers tax credits and deductions for alternative fuel and advanced technology vehicle purchases, expansion of alternative fuel refueling infrastructure, and incentives for the production and/or distribution of alternative fuels. Many of these incentives have expired in recent years although some were extended by the American Taxpayer Relief Act of 2012 (P.L. 112-240).
- DOE (mainly through the Office of Energy Efficiency and Renewable Energy, EERE) administers research and development (R&D) programs for advanced fuels and transportation technology, grant programs to deploy alternative fuels and vehicles, and a loan program to promote domestic manufacturing of high-efficiency vehicles.
- DOT (mainly through the Federal Highway Administration, FHWA, and Federal Transit Administration, FTA) administers grant programs to deploy "clean fuel" buses and other alternative fuel vehicles. DOT (through the National Highway Traffic Safety Administration, NHTSA) also administers federal Corporate Average Fuel Economy (CAFE) standards, which include incentives for production of alternative fuel vehicles.
- EPA (mainly through the Office of Transportation and Air Quality, OTAQ) administers the Renewable Fuel Standard, which mandates the use of biofuels in transportation. EPA also administers grant programs to replace older diesel engines with newer technology.
- USDA (mainly through the Rural Business-Cooperative Service, RBS) administers grant, loan, and loan guarantee programs to expand agricultural production of biofuel feedstocks, conduct R&D on biofuels and bioenergy, and establish and expand facilities to produce biofuels, bioenergy, and bioproducts.

Contents

Figures

Tables

Appendixes

Contacts

Introduction

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Many of the policy choices presented for alternative fuel and advanced vehicle technologies originated as a response to the nation's interest in reducing petroleum imports, a goal first articulated at the time of the two OPEC oil embargoes in the 1970s. While President Richard Nixon is often cited as the first President to call for "energy independence," successive Presidents and Congresses have made efforts to reduce petroleum imports as well.

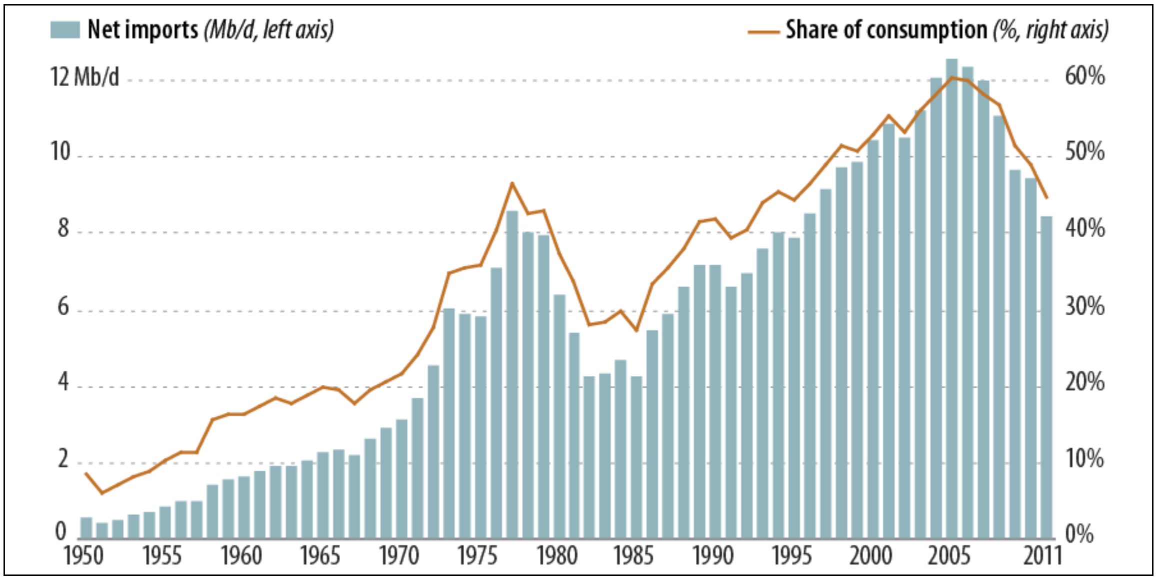
As shown in **Figure 1**, since peaking in 2005, net U.S. oil imports have fallen by one-third, and now represent 45% of domestic consumption, down from 60% in 2005.[1] Factors in this reversal have been the recent recession and the rise in petroleum prices in 2008, both of which reduced domestic demand, as well as a rise in the supply of U.S. oil and oil alternatives due to increased private sector investment and federal incentives, some of which are cited in this report. In addition, the United States has become a net exporter of petroleum products (while it remains a net importer of crude oil).

In addition to concerns over petroleum dependence, other factors have also driven policy on alternative fuels and advanced vehicle technologies. The current array of incentives does not reflect a single, comprehensive strategy but rather an aggregative approach to a range of discreet public policy issues, including improving environmental quality, expanding domestic manufacturing, and promoting agriculture and rural development.

[1] CRS Report R42465, *U.S. Oil Imports and Exports*, by Robert Pirog.

Figure 1. Net Oil Imports

In millions of barrels a day (Mb/d) and as share of U.S. consumption



Source: EIA, *Petroleum & Other Liquid Fuels*, February 28, 2012, http://www.eia.gov/petroleum/data.cfm.

Note: Net oil imports are gross imports minus exports.

Factors Behind Alternative Fuels and Technologies Incentives

While a reliance on foreign sources of petroleum has been an overriding concern for the past 40 years, other factors, such as rural development, promotion of domestic manufacturing, and environmental concerns, have also shaped congressional interest in alternative fuels and technologies. A variety of programs affecting alternative fuels and technologies have been proposed and enacted, each with its own benefits and drawbacks. (This report does not evaluate the effectiveness of alternative fuel programs and incentives.) Alternative fuels programs fall into one of the following six categories: expanding domestic ethanol production; establishing other alternative fuels; encouraging the purchase of non-petroleum vehicles; reducing fuel consumption and greenhouse gas emissions; supporting U.S. vehicle manufacturing; and funding U.S. highways.

Developing Domestic Ethanol Production

Ethanol has been seen as a homegrown alternative to imported oil, and a number of programs were put in place to encourage its domestic development (instead of importing from other ethanol producers, such as Brazil). To spur establishment of this domestic industry, Congress has enacted a number of laws, which are also beneficial to states that have a large concentration of corn growers (corn being the raw material feedstock in most U.S. ethanol). Until recently, the incentives for ethanol production have most often been included in farm-related legislation and appropriations and hence have been administered by the U.S. Department of Agriculture (USDA), or in tax provisions administered by the Internal Revenue Service (IRS). Notably, the volumetric ethanol excise tax credit (VEETC), which expired at the end of 2011, provided a tax credit to gasoline suppliers who blend ethanol with gasoline. The small ethanol producer tax credit provided a limited additional credit for small ethanol producers.

Establishing Other New Alternative Fuels

In addition to ethanol, Congress has sought to spur development of other alternative fuels, such as biodiesel, cellulosic biofuel, hydrogen, liquefied petroleum gas (LPG), compressed natural gas (CNG), and liquefied natural gas (LNG). Some of these fuels have been supported through tax credits[2] (such as the biodiesel tax credit), federal mandates (mainly the Renewable Fuel Standard (RFS)), and R&D programs (such as the Biomass Research and Development Initiative, which provides grants for new technologies leading to the commercialization of biofuels).

Encouraging the Purchase of Non-Petroleum Vehicles

Congress has enacted laws that seek to boost consumer interest by providing tax credits for the purchase of some vehicles that consume far less petroleum or do not consume petroleum at all. These tax credit programs are generally limited in duration as a way to encourage early adopters to take a risk on new kinds of vehicles. The assumption behind these laws is that once a significant number of such new cars enter the mainstream, more and more car buyers would be attracted to them, prices would fall, and the credits would no longer be needed. The credits have been available for plug-in vehicles (pure battery-electric and plug-in hybrid), hybrid vehicles, and those with fuel cells, advanced lean burn[3] technology, and certain alternative fuels technologies. Congress has also enacted tax credits to spur the expansion of infrastructure to fuel such vehicles.

Reducing Fuel Consumption and Vehicle Emissions

Several agencies have been mandated by Congress and by the Obama Administration to address concerns over fuel consumption and vehicle emissions through programs for alternative fuels, including the Environmental Protection Agency (EPA) and the Department of Transportation (DOT). The most significant and long-standing program to reduce vehicle fuel consumption is the Corporate Average Fuel Economy (CAFE) program administered by DOT.[4] Under CAFE, manufacturers can accrue credits for the production and sale of certain types of alternative fuel vehicles. A recent joint rulemaking process between DOT and EPA links future CAFE standards with greenhouse gas (GHG) standards under the Clean Air Act. DOT also established the Congestion Mitigation and Air Quality Improvement Program (CMAQ) to fund programs that will reduce emissions in urban areas that may exceed certain air quality standards. At EPA, the Diesel Emission Reduction Act (DERA) was implemented with a goal of reducing diesel emissions by funding and implementing new technologies. In addition, EPA's Renewable Fuel Standard (RFS) mandates the scalable use of renewable fuels in gasoline between 2006 and

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[2] Several alternative fuel tax credits were extended or reinstated in P.L. 112-240.

[3] In general these are advanced diesel vehicles.

[4] For more information, see CRS Report R42721, *Automobile and Truck Fuel Economy (CAFE) and Greenhouse Gas Standards*, by Brent D. Yacobucci, Bill Canis, and Richard K. Lattanzio.

2022.[5] Under the RFS, GHG emission reduction requirements apply to biofuels from newer refineries.

Supporting U.S. Motor Vehicle Manufacturing

The Department of Energy (DOE), in partnership with U.S. automakers and academic institutions, has overseen research and development programs on vehicle electrification for nearly 40 years, in particular research focused on how to produce economical batteries that extend electric vehicle range. These R&D programs were supplemented in the American Recovery and Reinvestment Act (ARRA; P.L. 111-5) to include grants to build lithium-ion battery manufacturing plants in a bid to boost the international competitiveness of this sector. The Advanced Technology Vehicles Manufacturing (ATVM) loan program at DOE supports manufacturing plant investments to enable the development of technologies to reduce petroleum consumption, including the manufacture of electric and hybrid vehicles.[6]

Highway Funding and Fuels Taxes

As described below (see "Motor Fuels Excise Taxes"), one of the earliest fuels-related federal programs is the motor vehicle fuels excise tax first passed in the Highway Revenue Act of 1956 to fund construction and then maintenance of the interstate highway system.[7] Originally, only gasoline and diesel were taxed, but as newer fuels became available (such as ethanol and compressed natural gas), they were added to the federal revenue program, but often at lower tax rates than gasoline or diesel. Lower tax burdens for some fuels or vehicles effectively incentivize those choices over conventional options. However, lower tax burdens for these vehicles and fuels could ultimately compromise federal highway revenue. The vehicles responsible for lower tax revenues include traditional internal combustion engine vehicles with higher mileage per gallon as well as new technology electric and hybrid cars.

Structure and Content of the Report

The federal tax incentives and programs discussed in this report aim to support the development and deployment of alternative fuels. There is no central coordination of how these incentives interact. In general, they are independently administered by separate federal agencies, including five key agencies: Treasury, DOE, DOT, EPA, and USDA.

This report focuses strictly on those programs that directly support alternative fuels or advanced vehicles, and does not address more general programs (e.g., general manufacturing loans, rural

[5] CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*, by Randy Schnepf and Brent D. Yacobucci.

[6] For more information, see CRS Report R42064, *The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program: Status and Issues*, by Brent D. Yacobucci and Bill Canis.

[7] The gasoline tax was originally enacted in 1932 and dedicated solely to reducing a federal budget deficit. It remained that way until the passage of the Federal Aid Highway Act of 1956 (P.L. 84-627) which established the Highway Trust Fund; the Highway Revenue Act was Title II of P.L. 84-627. For more details about the role of the fuels tax in funding the federal highway program, see CRS Report RL30304, *The Federal Excise Tax on Gasoline and the Highway Trust Fund: A Short History*, by James M. Bickley.

development loans.), or those that have been authorized but never funded. The programs are presented by agency, starting with those that generally address these issues, followed by those that are fuel- or technology-specific. Expired programs are included because there may be congressional interest in reinstating these programs (as was done for several provisions in P.L. 112-240) or establishing similar programs in the future.

The **Appendix** contains three tables:

1. A summary of the programs discussed in the body of the report, listed by agency (**Table A-1**);
2. A listing of programs and incentives for alternative fuels, by fuel type (**Table A-2**); and
3. A listing of programs and incentives for advanced technology vehicles, by vehicle type (**Table A-3**).

Department of the Treasury

Motor Fuels Excise Taxes

- Administered by: Internal Revenue Service (IRS)
- Original authorizing legislation and legislative history: Most motor fuels taxes (some of which were initially enacted in 1932) were included in the Highway Revenue Act of 1956 (P.L. 84-627) primarily to support the Highway Trust Fund, except for the tax on compressed natural gas, which was enacted in 1993 (Omnibus Budget Reconciliation Act of 1993; P.L. 103-66). Taxes that support the Highway Trust Fund have been extended numerous times, most recently by P.L. 112-141, which also extended spending authority out of the Highway Trust Fund through September 30, 2014.[8]
- Joint Committee on Taxation (JCT) estimated tax expenditure for FY2012: N/A.
- Scheduled termination: 4.3 cents per gallon of the gasoline/diesel fuel tax is permanent; the rest of the motor fuels taxes expire on September 30, 2016, when major highway-related taxes expire.
- Description: The motor fuels taxes that were included in the Highway Revenue Act of 1956 (P.L. 84-627) were dedicated to supporting the Highway Trust Fund, except for the tax on compressed natural gas, which was enacted in 1993. The federal excise tax on most of these fuels was last raised by Congress in 1993. Taxes vary by fuel: gasoline, 18.4 cents per gallon; diesel fuel, 24.4 cents per gallon; biodiesel, 24.4 cents per gallon; ethanol, 18.4 cents per gallon; hydrogen, 18.4 cents per gallon equivalent; liquefied petroleum gas (LPG), 18.3 cents per gallon; compressed natural gas (CNG), 18.3 cents per gallon equivalent; liquefied natural gas (LNG), 24.3 cents per gallon equivalent. Electricity for electric vehicles is untaxed. Similarly, until recently other fuels (e.g., ethanol-blended

[8] Taxes dedicated to the Highway Trust Fund (HTF), authority to place those taxes into the HTF and to spend funds out of the HTF all have expiration dates which must be extended by Congress periodically.

gasoline) were subject to exemptions from, or credits against, these taxes. These exemptions/credits effectively incentivize selected fuels/vehicles relative to conventional options.

- Qualified applicant/Covered entity: Manufacturers who produce applicable fuel types.[9]
- Applicable fuel/technology: Gasoline, diesel, hydrogen, liquefied petroleum gas, liquefied natural gas, compressed natural gas, ethanol and methanol (electricity is exempt).
- For more information: See IRS publication 510, *Excise Taxes* http://www.irs.gov/publications/p510/index.html; and Federal Highway Administration, Financing Federal-aid Highways, Appendix L http://www.fhwa.dot.gov/reports/financingfederalaid/appl.htm.
- Related CRS Reports: CRS Report RL30304, *The Federal Excise Tax on Gasoline and the Highway Trust Fund: A Short History*, by James M. Bickley, and CRS Report R42877, *Funding and Financing Highways and Public Transportation*, by Robert S. Kirk and William J. Mallett

Incentives for Alternative Fuel and Alternative Fuel Mixtures (other than Liquefied Hydrogen)

- Administered by: IRS
- Original authorizing legislation and legislative history: Established by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU; P.L. 109-59); Section 5 of the Tax Technical Corrections Act of 2007 (P.L. 110-172) modified the rules for filing excise tax refund claims for alternative fuel mixtures and the definition of alternative fuels relating to hydrogen and carbon resources. The Emergency Economic Stabilization Act (P.L. 110-343 §204) extended through 2009 the excise tax credit for alternative fuel and fuel mixtures. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (§704 of P.L. 111-312) extended through 2011 the excise tax credits and outlay payments for alternative fuel and alternative fuel mixtures; further extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §412).
- JCT estimated tax expenditure for FY2012:[10] $0
- Scheduled termination: December 31, 2013.
- Description: This provision established a 50-cents-per gallon excise tax credit for certain alternative fuels used as fuel in a motor vehicle, motor boat, or airplane and a 50-cents-per gallon credit for alternative fuels mixed with a traditional fuel (gasoline, diesel, or kerosene) for use as a fuel.

[9] The tax is imposed on the producer of such fuels.

[10] For JCT tax expenditure estimates, see U.S. Congress, Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 2011-2015*, 112th Cong., 1st sess., January 17, 2012, JCS-1-12 (Washington: GPO, 2012), pp. 33-35.

- Qualified applicant/Covered entity: Taxpayers who supplied or mixed qualifying fuel types.
- Applicable fuel/technology: Liquefied petroleum gas, P Series fuels, compressed or liquefied natural gas, any liquefied fuel derived from coal or peat, liquefied hydrocarbons derived from biomass. (Ethanol, methanol, and biodiesel do not qualify for the alternative fuel or alternative fuel mixture credit).
- For more information: See IRS Publication 510 and IRS Forms 637, 720, 4136, and 8849, on the IRS website at http://www.irs.gov.
- Related CRS Reports: CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*, by Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Alternative Motor Vehicle Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established by the Energy Policy Act of 2005 (P.L. 109-58 §1341(a)) American Recovery and Reinvestment Act of 2009 (P.L. 111-5, Div. B, §1141-1144).
- JCT Estimated Tax Expenditure for FY2012: Less than $50 million
- Scheduled termination: December 31, 2014, for fuel cell vehicles; expired December 31, 2010, or earlier for all other vehicles.
- Description: Enacted in the Energy Policy Act of 2005, the provision includes separate credits for four distinct types of vehicles: using fuel cells, advanced lean burn technologies, and qualified hybrid.
- Qualified applicant/Covered entity: Taxpayers purchasing a qualified fuel or technology.
- Applicable fuel/technology: Hybrid gasoline-electric; diesel; battery-electric; alternative fuel and fuel cell vehicles; and advanced lean-burn technology vehicles.
- For more information: See the IRS website for the Alternative Motor Vehicle Credit at http://www.irs.gov/businesses/corporations/article/0,,id=202341,00.html.
- Related CRS Reports: CRS Report R40913, *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*, by Lynn J. Cunningham and Beth A. Roberts, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Plug-in Electric Drive Vehicle Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established by the Energy Improvement and Extension Act of 2008, 26 U.S.C. 38(b)(35), 30D, P.L. 110-

343, Div. B, Title II, §205(a). The American Recovery and Reinvestment Act of 2009 (P.L. 111-5, §141) amended Section 30D effective for vehicles acquired after December 31, 2009.

- JCT estimated tax expenditure for FY2012: $200 million
- Scheduled termination: Phased out separate for each automaker when that automaker has sold a total of 200,000 qualified vehicles.
- Description: Purchasers of plug-in electric vehicles may file to obtain a tax credit of up to $7,500 per vehicle, depending on battery capacity. The vehicle must be acquired for use or lease and not for resale. Additionally, the original use of the vehicle must commence with the taxpayer and the vehicle must be used predominantly in the United States. For purposes of the 30D credit, a vehicle is not considered acquired prior to the time when title to the vehicle passes to the taxpayer under state law.
- Qualified applicant/Covered entity: Purchasers of qualified vehicles.
- Applicable fuel/technology: Plug-in electric vehicles.
- For more information: See the IRS website at http://www.irs.gov/businesses/article/0,,id=214841,00.html and The U.S. Department of Energy's Alternative Fuels & Advanced Vehicles Data Center website at http://www.afdc.energy.gov/afdc/laws/law/US/409.
- Related CRS Reports: CRS Report R41154, *The U.S. Motor Vehicle Industry: A Review of Recent Domestic and International Developments*, by Bill Canis and Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Plug-in Electric Vehicle Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: American Recovery and Reinvestment Act, P.L. 111-5, §1142; extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §403).
- JCT estimated tax expenditure for FY2012: Less than $50 million
- Scheduled termination: For Plug-in Electric Vehicles (IRC 30 and 30D) vehicles must have been acquired after February 17, 2009, and before January 1, 2014.
- Description: Internal Revenue Code Section 30 and 30D provide a tax credit for qualified plug-in electric vehicles. The credit is equal to 10% of the cost of a qualified plug-in electric vehicle and limited to $2,500. Qualified vehicles include low-speed vehicles or vehicles that have two or three wheels. The vehicle must have been acquired for use or lease and not for resale. The original use of the vehicle must commence with the taxpayer and the vehicle must be used predominantly in the United States.
- Qualified applicant/Covered entity: Taxpayers purchasing qualifying vehicles.
- Applicable fuel/technology: Two- or three-wheeled plug-in electric vehicles or certain low-speed vehicles.

- For more information: See the IRS website at http://www.irs.gov/businesses/article/0,,id=214841,00.html and http://www.irs.gov/irb/2009-30_IRB/ar07.html.
- Related CRS Reports: CRS Report R41154, *The U.S. Motor Vehicle Industry: A Review of Recent Domestic and International Developments*, by Bill Canis and Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Conversion Kits

- Administered by: IRS
- Original authorizing legislation and legislative history: American Recovery and Reinvestment Act (P.L. 111-5, §1143)
- JCT estimated tax expenditure for FY2012: $0
- Scheduled termination: Expired December 31, 2011.
- Description: The credit was equal to 10% of the cost of converting a vehicle to a qualified plug-in electric drive motor vehicle and placed in service after February 17, 2009. The maximum amount of the credit was $4,000. The credit does not apply to conversions made after December 31, 2011. A taxpayer was able to claim this credit even if the taxpayer claimed a hybrid vehicle credit for the same vehicle in an earlier year.
- Qualified applicant/Covered entity: Taxpayers who purchased the applicable technology.
- Applicable fuel/technology: Qualified plug-in electric vehicle kits.
- For more information: See the IRS website at http://www.irs.gov/newsroom/article/0,,id=206871,00.html/.
- Related CRS Reports: CRS Report R41154, *The U.S. Motor Vehicle Industry: A Review of Recent Domestic and International Developments*, by Bill Canis and Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Alternative Fuel Refueling Property Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established by the Energy Policy Act of 2005 (P.L. 109-58), Title XIII, §1342(a), extended by the American Recovery and Reinvestment Act (P.L. 111-5) and Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312). Amended by: P.L. 109-135, Title IV, §402(k), 412(d) and P.L. 110-172, §6(b); extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §402).
- JCT estimated tax expenditure for FY2012: Less than $50 million
- Scheduled termination: December 31, 2014, for hydrogen refueling property; December 31, 2013, for all other fuels.

- Description: Consumers who install qualified residential non-hydrogen fueling equipment receive a 30% tax credit of up to $1,000; businesses receive a credit up to $30,000. Special rules in place for 2009 and 2010 increased the credit rate to 50% for non-hydrogen property. Credit limits were also temporarily increased to $2,000 for non-business property, $50,000 for business property. The credit rate remained at 30% for hydrogen property in 2009 and 2010, but the maximum credit for businesses was increased to $200,000.
- Qualified applicant/Covered entity: Consumers or businesses who install qualifying equipment/property.
- Applicable fuel/technology: Natural gas, liquefied petroleum gas, hydrogen, electricity, E85, or diesel fuel blends containing a minimum of 20% biodiesel.
- For more information: See IRS Form 8911 at http://www.irs.gov/pub/irs-pdf/f8911.pdf.
- Related CRS Reports: CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*, by Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Volumetric Ethanol Excise Tax Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established in 2005 by the American Jobs Creation Act of 2004, §301 (P.L. 108-357); modified by the Food, Conservation, and Energy Act of 2008, §15331 (P.L. 110-246); further amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §203; extended by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §708.
- JCT estimated tax expenditure for FY2012: Foregone revenue of approximately $6 billion.[11]
- Scheduled termination: Expired December 31, 2011.
- Description: Gasoline suppliers who blend ethanol with gasoline were eligible for a tax credit of 45 cents per gallon of ethanol. This credit replaced a long-standing partial tax exemption for ethanol-blended gasoline.
- Qualified applicant/Covered entity: Blenders of gasohol (i.e., gasoline suppliers and marketers).
- Applicable fuel/technology: Ethanol and other alcohol fuels.
- For more information: see IRS Publication 510, Chapter 2: Fuel Tax Credits and Refunds at http://www.irs.gov/publications/p510/ch02.html; or DOE's web page for Volumetric Ethanol Excise Tax Credit (VEETC) at http://www.afdc.energy.gov/afdc/laws/law/US/399.

[11] Because of the nature of the credit, the actual tax expenditure is $0, although tax receipts are reduced by approximately $6 billion.

- Related CRS Reports: CRS Report R41227, *Energy Tax Policy: Historical Perspectives on and Current Status of Energy Tax Expenditures*, by Molly F. Sherlock, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Small Ethanol Producer Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established by the Omnibus Budget Reconciliation Act of 1990, §11502 (P.L. 101-508); extended by the American Jobs Creation Act of 2004, §301 (P.L. 108-357); expanded by the Energy Policy Act of 2005, §1347 (P.L. 109-58); amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §203; extended by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §708.
- JCT estimated tax expenditure for FY2012: $100 million.
- Scheduled termination: Expired December 31, 2011.
- Description: The small ethanol producer credit was valued at 10 cents per gallon of ethanol produced through the end of 2011. The credit was claimed on the first 15 million gallons of ethanol produced by a small producer in a given year.
- Qualified applicant/Covered entity: Any ethanol producer with production capacity below 60 million gallons per year.
- Applicable fuel/technology: Ethanol.
- For more information: see IRS Publication 510, Chapter 2: Fuel Tax Credits and Refunds http://www.irs.gov/publications/p510/ch02.html; and the Alternative Fuels and Advanced Vehicles Data Center's (AFDC's) web page for the Small Ethanol Producer Credit at http://www.afdc.energy.gov/afdc/laws/law/US/352.
- Related CRS Reports: CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*, by Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Biodiesel Tax Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established in 2005 by the American Jobs Creation Act of 2004, §302 (P.L. 108-357); extended by the Energy Policy Act of 2005, §1344 (P.L. 109-58); amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §202-203; extended by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §701; extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §405).
- JCT estimated tax expenditure for FY2012: $0
- Scheduled termination: December 31, 2013.

- Description: Biodiesel producers (or producers of diesel/biodiesel blends) may claim a per-gallon tax credit through the end of 2013. The credit is valued at $1.00 per gallon. Before amendment by P.L. 110-343, the credit was valued at $1.00 per gallon of "agri-biodiesel" (biodiesel produced from virgin agricultural products such as soybean oil or animal fats), or 50 cents per gallon of biodiesel produced from previously used agricultural products (e.g., recycled fryer grease). The tax credit expired at the end of 2009 and was not extended until the passage of P.L. 111-312, which retroactively applied the extension to fuel produced in 2010. The tax credit also expired at the end of 2011 and was extended through 2013 by P.L. 112-240, which retroactively applied the extension to fuel produced in 2012.
- Qualified applicant/Covered entity: Biodiesel producers and blenders.
- Applicable fuel/technology: Biodiesel.
- For more information: see IRS Publication 510, Chapter 2: Fuel Tax Credits and Refunds at http://www.irs.gov/publications/p510/ch02.html; and the Alternative Fuels and Advanced Vehicles Data Center's (AFDC's) web page for the Biodiesel Mixture Excise Tax Credit at http://www.afdc.energy.gov/afdc/laws/law/US/395.
- Related CRS Reports: CRS Report R41631, *The Market for Biomass-Based Diesel Fuel in the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Small Agri-Biodiesel Producer Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established in 2005 by the Energy Policy Act of 2005, §1345 (P.L. 109-58); amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §202-203; extended by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §701; extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §405).
- JCT estimated tax expenditure for FY2012: $0
- Scheduled termination: December 31, 2013.
- Description: The small agri-biodiesel producer credit is valued at 10 cents per gallon of "agri-biodiesel" (see Biodiesel Tax Credit, above) produced. The credit may be claimed on the first 15 million gallons of ethanol produced by a small producer in a given year through the end of 2013. The tax credit expired at the end of 2009 and was not extended until the passage of P.L. 111-312, which retroactively applied the extension to fuel produced in 2010. The credit also expired at the end of 2011 and was extended through 2013 by P.L. 112-240, which retroactively applied the extension to fuel produced in 2012.
- Qualified applicant/Covered entity: Any agri-biodiesel producers with production capacity less than 60 million gallons per year.
- Applicable fuel/technology: Biodiesel.

- For more information: see IRS Publication 510, Chapter 2: Fuel Tax Credits and Refunds at http://www.irs.gov/publications/p510/ch02.html; and the Alternative Fuels and Advanced Vehicles Data Center's (AFDC's) web page for the Biodiesel Mixture Excise Tax Credit at http://www.afdc.energy.gov/afdc/laws/law/US/342.
- Related CRS Reports: CRS Report R41631, *The Market for Biomass-Based Diesel Fuel in the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci, and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Renewable Diesel Tax Credit

- Administered by: IRS
- Original authorizing legislation and legislative history: Established in 2005 by the Energy Policy Act of 2005 (P.L. 109-58), §1346 ; amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §202-203; extended by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §701; extended through 2013 (retroactive for 2012) by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §405).
- JCT estimated tax expenditure for FY2012: $0
- Scheduled termination: December 31, 2013.
- Description: Producers of biomass-based diesel fuel (or producers of diesel/renewable biodiesel blends) may claim a $1.00 per gallon tax credit through the end of 2013. Renewable diesel is similar to biodiesel, but it is produced through different processes and thus was ineligible for the (above) biodiesel credits. The tax credit expired at the end of 2009 and was not extended until the passage of P.L. 111-312, which retroactively applied the extension to fuel produced in 2010. The credit also expired at the end of 2011 and was extended through 2013 by P.L. 112-240, which retroactively applied the extension to fuel produced in 2012.
- Qualified applicant/Covered entity: Renewable diesel producers and blenders.
- Applicable fuel/technology: Renewable diesel.
- For more information: see IRS Publication 510, Chapter 2: Fuel Tax Credits and Refunds at http://www.irs.gov/publications/p510/ch02.html; and the Alternative Fuels and Advanced Vehicles Data Center's (AFDC's) web page for the Biodiesel Mixture Excise Tax Credit at http://www.afdc.energy.gov/afdc/laws/law/US/342.
- Related CRS Reports: CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*, by Brent D. Yacobucci; CRS Report R41631, *The Market for Biomass-Based Diesel Fuel in the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci; and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Credit for Production of Cellulosic and Algae-Based Biofuel

- Administered by: IRS

- Original authorizing legislation and legislative history: Established on January 1, 2009, by the Food, Conservation, and Energy Act of 2008, §15321 (P.L. 110-246); amended by the Health Care and Education Reconciliation Act of 2010 (P.L. 111-152), §1408; amended by the Small Business Jobs Act of 2010 (P.L. 111-240), §2121; amended and extended through the end of 2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §404).
- JCT estimated tax expenditure for FY2012: $0
- Scheduled termination: December 31, 2013.
- Description: Producers of cellulosic biofuel may claim a tax credit of $1.01 per gallon. For cellulosic ethanol producers, the value of the production tax credit is reduced by the value of the volumetric ethanol excise tax credit and the small ethanol producer credit—the credit is currently valued at $1.01 cents per gallon (the offsetting tax credits have expired). P.L. 112-240 amended the credit to include non-cellulosic fuel produced from algae feedstocks.
- The credit applies to fuel produced after December 31, 2008.
- Qualified applicant/Covered entity: Cellulosic biofuel producers and algae-based biofuel producers.
- Applicable fuel/technology: Cellulosic biofuels and algae-based biofuels.
- For more information: see the Alternative Fuels and Advanced Vehicles Data Center's (AFDC's) web page for the Cellulosic Biofuel Producer Tax Credit at http://www.afdc.energy.gov/afdc/laws/law/US/413; and IRS Publication 510 and IRS Forms 637 and 6478, which are available via the IRS website (http://www.irs.gov/).
- Related CRS Reports: CRS Report RL34738, *Cellulosic Biofuels: Analysis of Policy Issues for Congress*, by Kelsi Bracmort et al.; CRS Report R41460, *Cellulosic Ethanol: Feedstocks, Conversion Technologies, Economics, and Policy Options*, by Randy Schnepf; CRS Report R42122, *Algae's Potential as a Transportation Biofuel*, by Kelsi Bracmort; and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Special Depreciation Allowance for Cellulosic and Algae-Based Biofuel Plant Property

- Administered by: IRS
- Original authorizing legislation and legislative history: Established in 2006 by the Tax Relief and Health Care Act of 2006 (P.L. 109-432), §209; amended by the Energy Improvement and Extension Act of 2008 (P.L. 110-343, Division B), §201; modified by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §401; amended and extended through the end of 2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §410).
- JCT estimated tax expenditure for FY2012: $0

- Scheduled termination: December 31, 2013.
- Description: A taxpayer may take a depreciation deduction of 50% of the adjusted basis of a new cellulosic or algae-based biofuel plant in the year it is put in service. Any portion of the cost financed through tax-exempt bonds is exempted from the depreciation allowance. Before amendment by P.L. 110-343 the accelerated depreciation applied only to cellulosic ethanol plants that break down cellulose through enzymatic processes—the amended provision applies to all cellulosic biofuel plants. Before amendment by P.L. 112-240 the provision did not apply to algae-based biofuel plants: the incentive for algae-based plants applies to property placed in service in 2013.
- Qualified applicant/Covered entity: Any cellulosic biofuel plant acquired after December 20, 2006, and placed in service before January 1, 2014, and any algae-based biofuel plant placed in service in 2013. Any plant that had a binding contract for acquisition before December 20, 2006, does not qualify.
- Applicable fuel/technology: Cellulosic and algae-based biofuels
- For more information: See Senate Finance Committee, Summary of House-Senate Agreement on Tax, Trade, Health, and Other Provisions, December 7, 2006, at http://www.finance.senate.gov/newsroom/ranking/release/?id=97221a88-8b93-4000-b51c-5b03bc06e6fb.
- Related CRS Reports: CRS Report RL34738, *Cellulosic Biofuels: Analysis of Policy Issues for Congress*, by Kelsi Bracmort et al.; CRS Report R42122, *Algae's Potential as a Transportation Biofuel*, by Kelsi Bracmort; and CRS Report R41769, *Energy Tax Policy: Issues in the 112th Congress*, by Molly F. Sherlock and Margot L. Crandall-Hollick

Department of Energy

Advanced Technology Vehicle Manufacturing Loan Program

- Administered by: Loan Programs Office (LPO)
- Original authorizing legislation and legislative history: Authorized by the Energy Independence and Security Act of 2007 §136 (P.L. 110-140), funded by the Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, P.L. 110-329).
- FY2012 appropriated funds: $6 million (for program administration)
- Scheduled termination: Facilities funded must be placed in service by the end of 2020.
- Description: Advanced Technology Vehicle Manufacturing (ATVM) was established in 2007 to help automakers meet mandated vehicle fuel economy standards and to encourage domestic production of more fuel-efficient cars and light trucks. It provides up to $25 billion in revolving loans to qualified automakers for investment in their manufacturing operations. In FY2008, $7.51 billion was appropriated for the direct loans—$7.5 billion for the loan subsidies (available until expended) and $10 million for administration. Although

appropriations are provided annually for administration, Congress only approved the program loan subsidy authority one time. Currently, loans have been made to five companies, using $8.4 billion of the $25 billion loan authority.

- Qualified applicant/Covered entity: an automotive manufacturer satisfying specified fuel economy requirements or a manufacturer of qualifying components. To be financially eligible for an ATVM loan, an applicant must be financially viable without the receipt of additional federal funding for the proposed project.
- Applicable fuel/technology: No limitations on specific technologies; rather, limits are stipulated for vehicle emissions and fuel consumption.
- For more information: DOE website, https://lpo.energy.gov/?page_id=43.
- Related CRS Reports: CRS Report R42064, *The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program: Status and Issues* by Brent D. Yacobucci and Bill Canis; and CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress* by Brent D. Yacobucci

Vehicle Technologies Program

- Administered by: Office of Energy Efficiency and Renewable Energy (EERE)
- Original authorizing legislation and legislative history: Department of Energy Organization Act of 1977 (P.L. 95-91); Energy Policy Act of 1992 (EPACT; P.L. 102-486); Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58); Energy Independence and Security Act of 2007 (EISA; P.L. 110-140); American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).
- FY2012 appropriated funds: $329 million—of that $118 million for Batteries and Electric Drive Technology
- Scheduled termination: None.
- Description: Through research and development, VTP supports partnerships with other public and private organizations that will enhance energy efficiency and productivity, bring clean and affordable technologies to market, and enhance advanced technology vehicle choices for consumers. VTP supports, and works through, two major government-industry endeavors: the US DRIVE Partnership and the 21st century Truck Partnership.
- Qualified applicant/Covered entity: universities, vehicle and engine manufacturers, material suppliers, nonprofit technology organizations, energy suppliers, and national laboratories.
- Applicable fuel/technology: Advanced batteries, power electronics and electric motors, advanced combustion, lightweight materials, vehicle-to-grid interaction, and fuel cell and hydrogen technologies.
- For more information: See EERE's Vehicle Technology Program website at http://www1.eere.energy.gov/vehiclesandfuels; and Vehicle Technologies Program Factsheet at http://www1.eere.energy.gov/vehiclesandfuels/pdfs/vehicles_fs.pdf.

- Related CRS Reports: CRS Report R42064, *The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program: Status and Issues*, by Brent D. Yacobucci and Bill Canis

Biomass and Biorefinery Systems Program

- Administered by: EERE
- Original authorizing legislation and legislative history: Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577); Energy Policy and Conservation Act of 1975 (EPCA; P.L. 94-163); Energy Conservation and Production Act of 1976 (ECPA; P.L. 94-385); Department of Energy Organization Act of 1977 (P.L. 95-91); Energy Tax Act (P.L. 95-618); National Energy Conservation Policy Act of 1978 (NECPA; P.L. 95-619); Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620); Energy Security Act of 1980 (P.L. 96-294); National Appliance Energy Conservation Act of 1987 (P.L. 100-12); Federal Energy Management Improvement Act of 1988 (P.L. 100-615); Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218); Clean Air Act Amendments of 1990 (P.L. 101-549); Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 (P.L. 101-575); Energy Policy Act of 1992 (EPACT; P.L. 102-486); Biomass Research and Development Act of 2000 (Title III of Agricultural Risk Protection Act of 2000; P.L. 106-224); Farm Security and Rural Investment Act of 2002 (P.L. 107-171); Healthy Forest Restoration Act of 2003 (P.L. 108-148); Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58); Energy Independence and Security Act of 2007 (EISA; P.L. 110-140); The Food, Conservation, and Energy Act of 2008 (P.L. 110-234); American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).
- FY2012 appropriated funds: $199 million
- Scheduled termination: None.
- Description: The Biomass Program primarily focuses on research, development, demonstration, and deployment (RDD&D) to ensure that cellulosic ethanol is commercially viable by 2012 and that biobased aviation fuel, diesel fuel, and gasoline are price competitive by 2017. However, other non-transportation applications for biomass and bioenergy systems are also studied under this program.
- Qualified applicant/Covered entity: universities and businesses.
- Applicable fuel/technology: Biofuels.
- For more information: See http://www1.eere.energy.gov/biomass/.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Hydrogen and Fuel Cell Technologies Program

- Administered by: EERE

- Original authorizing legislation and legislative history: Federal Energy Administration Act of 1974 (P.L. 93-275); Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577); Energy Policy and Conservation Act of 1975 (EPCA; P.L. 94-163); Electric and Hybrid Vehicle Research, Development and Demonstration Act (P.L. 94-413); Department of Energy Organization Act of 1977 (P.L. 95-91); Automotive Propulsion Research and Development Act of 1978 (Title III of Department of Energy Act of 1978-Civilian Applications; P.L. 95-238); Methane Transportation Research, Development and Demonstration Act of 1980 (P.L. 96-512); Energy Security Act of 1980 (P.L. 96-294); Alternative Motor Fuels Act of 1988 (P.L. 100-494); Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 (P.L. 101-566); Energy Policy Act of 1992 (EPACT; P.L. 102-486); Hydrogen Future Act of 1996 (P.L. 104-271); Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58); Energy Independence and Security Act of 2007 (EISA; P.L. 110-140); American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).
- FY2012 appropriated funds: $104 million
- Scheduled termination: None.
- Description: This program works with industry, national laboratories, universities, government agencies, and other partners to overcome barriers to the use of hydrogen and fuel cells. It includes a research and development (R&D) effort focused on advancing the performance and reducing the cost of these technologies. R&D applies to both transportation and stationary applications.
- Qualified applicant/Covered entity: Federal government; national laboratories; colleges and universities; and for-profit organizations.
- Applicable fuel/technology: Hydrogen, fuel cells.
- For more information: See EERE's Hydrogen and Fuel Cell Technologies website at http://www1.eere.energy.gov/hydrogenandfuelcells/.
- Related CRS Reports: CRS Report R40168, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*, by Brent D. Yacobucci

Clean Cities Program

- Administered by: EERE and sponsored by the Vehicle Technologies Program.
- Original authorizing legislation and legislative history: Established by the Alternative Motor Fuels Act of 1988 (P.L. 100-494), and amended by the Energy Policy Act of 1992 (P.L. 102-486).
- FY2012 appropriated funds: Approximately $30 million
- Scheduled termination: None.
- Description: Initially started in 1993 as a DOE program to promote alternative fuel vehicles among the states, it is now a broader program to reduce petroleum consumption in transportation, with 100 Clean Cities coalitions that focus on deployment of alternative and renewable fuels, idle-reduction measures, fuel

economy improvements, and emerging transportation technologies. Clean Cities provides technical, informational, and financial assistance to communities.

- Qualified applicant/Covered entity: Businesses, fuel providers, vehicle fleets, state and local government agencies, and community organizations, led by nearly 100 Vehicle Technologies Program Clean Cities coordinators.
- Applicable fuel/technology: Electricity, natural gas, propane, bio-methane, ethanol, biodiesel, hydrogen.
- For more information: See the DOE Clean Cities website at http://www1.eere.energy.gov/cleancities/.
- Related CRS Reports: N/A

Department of Transportation

Corporate Average Fuel Economy Program Alternative Fuel Vehicle Credits

- Administered by: National Highway Traffic Safety Administration (NHTSA)
- Original authorizing legislation and legislative history: Corporate Average Fuel Economy (CAFÉ) program established in the Energy Policy and Conservation Act (EPCA) of 1975 (P.L. 94-163); alternative fuels incentives established in the Alternative Motor Fuels Act (P.L. 100-494); amended multiple times, most recently by the Energy Independence and Security Act of 2007, §109 (P.L. 110-140), to extend the expiration date through model year 2019 for dual fueled vehicles.
- FY2012 appropriated funds: N/A
- Scheduled Termination: No expiration for dedicated vehicles; after model year 2019 for dual fueled vehicles.
- Description: Automakers that sell passenger cars and light trucks in the United States must comply with federal CAFE standards. Those standards set fuel economy targets that automakers must meet, averaged across their car and light truck fleets. Those targets vary by vehicle class and size. To promote the production and sale of alternative fuel vehicles and provide flexibility in compliance, automakers may accrue CAFE credits by selling alternative fuel vehicles. For dedicated vehicles (i.e., vehicles that run solely on alternative fuel) credits are unlimited. For dual fueled vehicles (i.e., that may run on conventional or alternative fuel) credits are limited: The maximum fuel economy increase allowed through the use of dual fueled vehicle credits is 1.2 miles per gallon through model year (MY) 2014. After 2014 the credits are phased down and completely eliminated after MY 2019.
- Covered entity: Automakers that produce vehicles for sale in the United States
- Applicable fuel/technology: Incentives apply to vehicles capable of operating on methanol (at least 85%), ethanol (at least 85%), natural gas, liquefied petroleum

gas, hydrogen, coal-derived liquid fuels, biologically-derived fuels, and electricity.

- For more information: See NHTSA's CAFE website at http://www.nhtsa.gov/fuel-economy
- Related CRS Reports: CRS Report R42721, *Automobile and Truck Fuel Economy (CAFE) and Greenhouse Gas Standards*, by Brent D. Yacobucci, Bill Canis, and Richard K. Lattanzio

Congestion Mitigation and Air Quality Improvement Program

- Administered by: Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)
- Original authorizing legislation and legislative history: Established by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 (P.L. 102-240); reauthorized multiple times, most recently by the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005 (P.L. 109-59); extended multiple times, most recently by the Moving Ahead for Progress in the 21st Century Act (MAP-21, P.L. 112-141).
- FY2012 appropriated funds (estimated): $1.35 billion
- Scheduled Termination: September 30, 2014.
- Description: Congestion Mitigation and Air Quality Improvement (CMAQ) provides funds to states for transportation projects designed to reduce traffic congestion and improve air quality, particularly in areas of the country that do not attain National Ambient Air Quality Standards. In particular, it authorizes funding for programs and projects intended to reduce carbon monoxide, particulate matter, and ozone. CMAQ funds are apportioned in accordance with a formula based largely on a state's population and pollution reduction needs.
- Qualified applicant/Covered entity: State departments of transportation and metropolitan planning organizations (MPOs).
- Applicable fuel/technology: Any transportation project or technology that can lead to reductions in congestion or help improve air quality.
- For more information: See FHWA's CMAQ website at http://www.fhwa.dot.gov/environment/air_quality/cmaq/
- Related CRS Reports: CRS Report R42445, *Surface Transportation Reauthorization Legislation in the 112th Congress: MAP-21, H.R. 7, and H.R. 4348—Major Provisions*, coordinated by Robert S. Kirk; and CRS Report R41512, *Surface Transportation Program Reauthorization Issues for the 112th Congress*

Clean Fuels Grant Program

- Administered by: Federal Transit Administration (FTA)

- Original authorizing legislation and legislative history: Established by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (P.L. 100-17) §313; reauthorized and amended multiple times, most recently by the Moving Ahead for Progress in the 21st Century Act (MAP-21, P.L. 112-141).
- FY2012 appropriated funds: $51.5 million
- Scheduled termination: September 30, 2014.
- Description: The program provides grants for the purchase of alternative fuel and advanced technology transit buses. Under conventional bus grants, FTA will fund up to 80% of the cost of a bus; under the Clean Fuels Grant Program, FTA funds 90% of the incremental cost of a "clean fuel" bus. The incremental cost is the difference between the cost of the clean fuel bus and a comparable conventional bus.
- Qualified applicant/Covered entity: Tribes, states, state departments of transportation, and metropolitan planning organizations.
- Applicable fuel/technology: buses run on compressed natural gas, liquefied natural gas, biodiesel, battery electric, ethanol, methanol, fuel cells, and clean diesel (clean diesel projects limited to 25% of total funding).
- For more information: See FTA, Clean Fuels Grant Program website at http://www.fta.dot.gov/grants/13094_3560.html.
- Related CRS Reports: CRS Report R42445, *Surface Transportation Reauthorization Legislation in the 112th Congress: MAP-21, H.R. 7, and H.R. 4348—Major Provisions*, coordinated by Robert S. Kirk

Environmental Protection Agency

National Clean Diesel Campaign

- Administered by: Office of Transportation and Air Quality (OTAQ)
- Original authorizing legislation and legislative history: Established in 2005 by the Energy Policy Act of 2005 (P.L. 109-58), §§791-797; amended in 2008 by P.L. 110-255, §3; and amended in 2011 by the Diesel Emissions Reduction Act of 2010 (P.L. 111-364), §2.
- FY2012 appropriated funds: $30 million
- Scheduled termination: September 30, 2016.
- Description: EPA's National Clean Diesel Campaign (NCDC) promotes clean air strategies by working with manufacturers, fleet operators, air quality professionals, environmental and community organizations, and state and local officials to reduce diesel emissions. States are allocated funds for their clean diesel programs through the Diesel Emission Reduction Act (DERA).
- Qualified applicant/Covered entity: Manufacturers, fleet operators, air quality professionals, environmental and community organizations, and state and local governments.

- Applicable fuel/technology: Technologies that significantly reduce emissions (EPA maintains a list of verified retrofit technologies and emerging technologies at http://www.epa.gov/cleandiesel/verification/verif-list.htm).
- For more information: See EPA's National Clean Diesel Campaign website at http://www.epa.gov/cleandiesel/.
- Related CRS Reports: CRS Report R42520, *Environmental Protection Agency (EPA): Appropriations for FY2013*, coordinated by Robert Esworthy.

Renewable Fuel Standard

- Administered by: Office of Transportation and Air Quality (OTAQ)
- Original authorizing legislation and legislative history: Established in 2005 by the Energy Policy Act of 2005, §1501 (P.L. 109-58); expanded by the Energy Independence and Security Act of 2007, §202 (P.L. 110-140)
- FY2012 appropriated funds: N/A
- Scheduled termination: None.
- Description: The Energy Policy Act of 2005 established a renewable fuel standard (RFS) for automotive fuels. The RFS was expanded by the Energy Independence and Security Act of 2007. The RFS requires the use of renewable fuels (including ethanol and biodiesel) in transportation fuel. In 2011, fuel suppliers were required to include 13.95 billion gallons of renewable fuels in the national transportation fuel supply; this requirement increases annually to 36 billion gallons in 2022. The expanded RFS also specifically mandates the use of "advanced biofuels"—fuels produced from non-corn feedstocks and with 50% lower lifecycle greenhouse gas emissions than petroleum fuel—starting in 2009. Of the 36 billion gallons required in 2022, at least 21 billion gallons must be advanced biofuels. There are also specific quotas for cellulosic biofuels and for biomass-based diesel fuel. On May 1, 2007, EPA issued a final rule on the original RFS program detailing compliance standards for fuel suppliers, as well as a system to trade renewable fuel credits between suppliers. On March 26, 2010, EPA issued final rules for the expanded program (RFS2), including lifecycle analysis methods necessary to categorize fuels as advanced biofuels, and new rules for credit verification and trading. While this program is not a direct subsidy for the construction of biofuels plants, the guaranteed market created by the RFS is expected to stimulate growth of the biofuels industry and to raise prices above where they would have been in the absence of the mandate.
- Covered entity: Gasoline and diesel fuel suppliers—generally refiners, but other entities may also be covered.
- Applicable fuel: All biofuels (conventional ethanol, biodiesel, renewable diesel, cellulosic biofuels, advanced biofuels).
- For more information: EPA website, Renewable Fuel Standard (RFS) http://www.epa.gov/otaq/fuels/renewablefuels/index.htm.
- Related CRS Reports: CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*, by Randy Schnepf and Brent D. Yacobucci; CRS Report

R41106, *Meeting the Renewable Fuel Standard (RFS) Mandate for Cellulosic Biofuels: Questions and Answers*, by Kelsi Bracmort; and CRS Report R41631, *The Market for Biomass-Based Diesel Fuel in the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci

Department of Agriculture[12]

Biorefinery Assistance

- Administered by: Rural Business-Cooperative Service (RBS)
- Original authorizing legislation and legislative history: Established by the Food, Conservation, and Energy Act of 2008, §9001 (P.L. 110-246); extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).
- FY2012 appropriated funds: Mandatory funding of $74 million in FY2009 and $245 million in FY2010 was authorized for loan guarantees; no discretionary funding has been appropriated through FY2012
- Scheduled termination: September 30, 2013.
- Description: Grants to biorefineries that use renewable biomass to reduce or eliminate fossil fuel use.
- Qualified applicant: Biorefineries in existence at the date of enactment.
- For more information: See RBS website at http://www.rurdev.usda.gov/rbs/busp/baplg9003.htm.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Repowering Assistance

- Administered by: RBS
- Original authorizing legislation and legislative history: Established by the Food, Conservation, and Energy Act of 2008, §9001 (P.L. 110-246); extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).
- FY2012 appropriated funds: Discretionary funding of $15 million was appropriated only in FY2010
- Scheduled termination: September 30, 2013.
- Description: Grants to biorefineries that use renewable biomass to reduce or eliminate fossil fuel use. RBS issued a Notice of Funding Availability June 12, 2009, at http://www.rurdev.usda.gov/rbs/busp/9004%20FR%20NOFA.pdf.
- Qualified applicant: Biorefineries in existence at the date of enactment.

[12] For program details, see CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf.

- For more information: See the RBS website at http://www.rurdev.usda.gov/BCP_RepoweringAssistance.html.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Bioenergy Program for Advanced Biofuels

- Administered by: RBS
- Original authorizing legislation and legislative history: Established by the Food, Conservation, and Energy Act of 2008, §9001 (P.L. 110-246).
- FY2012 appropriated funds: No discretionary funding has been appropriated through FY2012; mandatory funding for FY2012 of $65 million
- Scheduled termination: September 30, 2013; extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).
- Description: Provides payments to producers to support and expand production of advanced biofuels refined from sources other than corn kernal starch. RBS issued a Notice of Contract Proposal June 12, 2009, at http://www.rurdev.usda.gov/rbs/busp/NOCP%20FR%209005.pdf.
- Qualified applicant: Producers of advanced biofuels.
- For more information: See RBS website at http://www.rurdev.usda.gov/rbs/busp/9005Biofuels.htm.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Biomass Crop Assistance Program

- Administered by: Farm Service Agency (FSA)
- Original authorizing legislation and legislative history: Established by the Food, Conservation, and Energy Act of 2008, §9001 (P.L. 110-246); extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).
- FY2012 appropriated funds: Mandatory Commodity Credit Corporation (CCC) funds of such sums as necessary are made available for each of FY2008-FY2012. In FY2012, Biomass Crop Assistance Program (BCAP) mandatory spending was limited to $17 million
- Scheduled termination: September 30, 2013.
- Description: Two separate payment programs for the establishment and supply of advanced biofuel feedstocks: (1) Establishment and annual payments, including a one-time payment of up to 75% of the cost of establishment for perennial crops, and annual payments for up to five or 15 years depending on the type of crop; and (2) dollar-for-dollar matching payments for collection, harvesting, storage, and transportation (CHST) of biomass to qualified biofuel production facilities (as well as bioenergy or biobased products), up to $45 per ton.

- Qualified applicant: Individuals who establish and produce qualified perennial biomass feedstock crops; individuals who deliver eligible biomass to a qualified facility.
- For more information: See FSA website at http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Rural Energy for America Program

- Administered by: RBS
- Original authorizing legislation and legislative history: Established in 2002 by the Farm Security and Rural Investment Act of 2002 (P.L. 107-171), §9007; amended in 2008 by the Food Conservation, and Energy Act of 2008 (P.L. 110-246), §9007. The new §9007 converted the federal Renewable Energy Systems and Energy Efficiency Improvements Program into the Rural Energy for America Program (REAP). Extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).
- FY2012 appropriated funds: $25 million ($22 million in mandatory funds are available and $3 million in discretionary funds).
- Scheduled termination: September 30, 2013.
- Description: Provides grants and loans for a variety of rural energy projects, including efficiency improvements and renewable energy projects. Although REAP is not exclusively aimed at biofuels projects, the program could be a significant source of loan funds for such projects.
- Qualified applicant/Covered entity: Rural small businesses and agricultural producers.
- Applicable fuel/technology: Biofuels (see description above), among other technologies.
- For more information: See the program website at http://www.rurdev.usda.gov/rbs/farmbill/.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

Biomass Research and Development

- Administered by: National Institute of Food and Agriculture (NIFA)
- Original authorizing legislation and legislative history: Established by the Biomass Research and Development Act of 2000, §307 (P.L. 106-224); program extended and mandatory appropriations provided by the Farm Security and Rural Investment Act of 2002, §9008 (P.L. 107-171); program extended and funding authorization expanded by the Energy Policy Act of 2005, §941 (P.L. 109-58); significantly modified by the Food, Conservation and Energy Act of 2008, §9008

(P.L. 110-246); extended through FY2013 by the American Taxpayer Relief Act of 2012 (P.L. 112-240 §701(f)).

- FY2012 appropriated funds: $40 million in mandatory funding
- Scheduled termination: September 30, 2013.
- Description: Grants are provided for biomass research, development, and demonstration projects. Eligible projects include ethanol and biodiesel demonstration plants.
- Qualified applicant: Wide range of possible applicants.
- For more information: See http://www.brdisolutions.com/default.aspx.
- Related CRS Reports: CRS Report R41985, *Renewable Energy Programs and the Farm Bill: Status and Issues*, by Randy Schnepf

U.S. Customs and Border Protection—Import Duty on Fuel Ethanol

- Administered by: U.S. Customs and Border Protection
- Original authorizing legislation and legislative history: Established in 1980 by the Omnibus Reconciliation Act of 1980 (P.L. 96-499); amended by the Tax Reform Act of 1986, §423 (P.L. 99-514) extended by the Tax Relief and Health Care Act of 2006, §302 (P.L. 109-432); further extended by the Food, Conservation, and Energy Act of 2008, §15333 (P.L. 110-246), and the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312), §708.
- FY2012 appropriated funds: N/A
- Scheduled termination: Expired December 31, 2011.
- Description: A 2.5% ad valorem tariff and a most-favored-nation duty of $0.54 per gallon of ethanol (for fuel use) applied to imports into the United States from most countries through the end of 2011; most ethanol from Caribbean Basin Initiative (CBI) countries imported duty-free.
- Covered entities: Fuel ethanol importers.
- Applicable fuel: Ethanol (from all feedstocks).
- For more information: See Senate Finance Committee, Summary of House-Senate Agreement on Tax, Trade, Health, and Other Provisions, December 7, 2006, at http://www.finance.senate.gov/newsroom/ranking/release/?id=97221a88-8b93-4000-b51c-5b03bc06e6fb.
- Related CRS Reports: CRS Report RS21930, *Ethanol Imports and the Caribbean Basin Initiative (CBI)*, by Brent D. Yacobucci

Appendix. Summary Tables

This appendix contains three tables:

- **Table A-1** provides a summary of the programs discussed in the body of the report, listed by agency;
- **Table A-2** lists programs and incentives for alternative fuels, by fuel type; and
- **Table A-3** lists programs and incentives for advanced technology vehicles, by vehicle type.

Table A-1. Federal Programs by Agency

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
		Internal Revenue Service		
Motor Fuels Excise Taxes	Most motor fuels taxes were enacted in the Highway Revenue Act of 1956 primarily to support the Highway Trust Fund, except for the tax on compressed natural gas, which was enacted in 1993. The federal excise tax on most of these fuels was last raised by Congress in 1993. Taxes vary by fuel: gasoline, 18.4 cents per gallon; diesel fuel, 24.4 cents per gallon; biodiesel, 24.4 cents per gallon; ethanol, 18.4 cents per gallon; hydrogen, 18.4 cents per gallon equivalent; liquefied petroleum gas, 18.3 cents per gallon; compressed natural gas, 18.3 cents per gallon equivalent; liquefied natural gas, 24.3 cents per gallon equivalent. Electricity for electric vehicles is exempt from taxation, and exemptions for other fuels existed until recently. Differences between tax rates effectively incentivize certain options over others.	N/A	4.3 cents per gallon of the gasoline/ diesel fuel tax is permanent; the rest of the motor fuels taxes expire on 9/30/2016 when many current highway-related taxes expire	Gasoline, diesel, liquefied petroleum gas, liquefied natural gas, fuels with methanol from natural gas, and compressed natural gas.
Incentives for alternative fuel and alternative fuel mixtures (other than liquefied hydrogen)	This provision established a 50-cents-per gallon excise tax credit for certain alternative fuel used as fuel in a motor vehicle, motor boat, or airplane and a 50-cents-per gallon credit for alternative fuel mixed with a traditional fuel (gasoline, diesel or kerosene) for use as a fuel.	$0	12/31/2013	Liquefied petroleum gas, P Series fuels, compressed or liquefied natural gas, liquefied hydrogen, any liquefied fuel derived from coal or peat, liquefied hydrocarbons derived from biomass. (Does not include ethanol, methanol or biodiesel.)
Alternative Motor Vehicle Credit	This provision includes separate credits for four distinct types of vehicles: using fuel cells, advanced lean burn technologies, qualified hybrid technology or qualified alternative fuels technologies.	Less than $50 million	12/31/2014 for fuel cell vehicles, expired 12/31/2010 or earlier for all other vehicles	Compressed natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, any liquid that is at least 85% methanol or a mixture of one of these fuels with a petroleum fuel.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
Plug-in Electric Drive Vehicle Credit	Purchasers of plug-in electric vehicles may file to obtain a tax credit of up to $7,500 per vehicle, depending on battery capacity.	$200 million	The credit is phased out when an automaker has sold a total of 200,000 qualified vehicles	Plug-in electric vehicles.
Plug-in Electric Vehicle Credit	A maximum credit of $2,500 is allowed for certain types of new vehicles.	Less than $50 million	12/31/13	Two- or three-wheeled plug-in electric vehicles or certain low-speed vehicles.
Conversion Kits	A credit of up to $4,000 was allowed for purchasing a kit to convert a vehicle to a plug-in electric drive vehicle.	$0	Expired 12/31/11	Qualified plug-in electric vehicle kits.
Alternative Fuel Refueling Property Credit	Consumers who install qualified residential non-hydrogen fueling equipment receive a 30% tax credit of up to $1,000; businesses receive a credit up to $30,000 (maximum credits were increased for 2009 and 2010, except for hydrogen property). Hydrogen refueling property may receive respective credits of up to $1,000 and $200,000.	Less than $50 million	12/31/2014 for hydrogen refueling property; 12/31/13 for all other fuels	Natural gas, liquefied petroleum gas, hydrogen, electricity, E85, or diesel fuel blends containing a minimum of 20% biodiesel.
Volumetric Ethanol Excise Tax Credit	Gasoline suppliers who blend ethanol with gasoline were eligible for a tax credit of 45 cents per gallon of ethanol.	$6 billion in foregone tax receipts	Expired 12/31/2011	Ethanol (and other alcohol fuels).
Small Ethanol Producer Credit	An ethanol producer with less than 60 million gallons per year in production capacity could claim a credit of 10 cents per gallon on the first 15 million gallons produced each year.	$100 million	Expired 12/31/2011	Ethanol.
Biodiesel Tax Credit	Producers of biodiesel or diesel/biodiesel blends may claim a tax credit of $1.00 per gallon of biodiesel.	$0	12/31/2013	Biodiesel.
Small Agri-Biodiesel Producer Credit	An agri-biodiesel (produced from virgin agricultural products) producer with less than 60 million gallons per year in production capacity may claim a credit of 10 cents per gallon on the first 15 million gallons produced in a year.	$0	12/31/2013	Biodiesel.
Renewable Diesel Tax Credit	Producers of renewable diesel (similar to biodiesel, but produced through a different process) may claim a tax credit of $1.00 per gallon of renewable diesel.	$0	12/31/2013	Renewable diesel.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
Credit for Production of Cellulosic and Algae-Based Biofuel	Producers of cellulosic and algae-based biofuels may claim a tax credit of $1.01 per gallon. For ethanol producers, the value of the production tax credit is reduced by the value of the volumetric ethanol excise tax credit and the small ethanol producer credit. Since both offsetting credits have expired, the credit is currently valued at $1.01 per gallon. The credit applies to fuel produced after December 31, 2008.	$0	12/31/2013	Cellulosic and algae-based biofuels.
Special Depreciation Allowance for Cellulosic and Algae-Based Biofuel Plant Property	Plants producing cellulosic and algae-based biofuels may take a 50% depreciation allowance in the first year of operation, subject to certain restrictions.	$0	12/31/2013	Cellulosic and algae-based biofuels.
	Department of Energy			
Advanced Technology Vehicles Manufacturing (ATVM) Program	ATVM was established in 2007 to help automakers meet mandated vehicle fuel economy standards and to encourage domestic production of more fuel-efficient cars and light trucks. It was first funded in 2008 to provide $25 billion in revolving loans to qualified automakers for investment in their manufacturing operations. In FY2008, $7.51 billion was appropriated for the direct loans—$7.5 billion for the loan subsidies (available until expended) and $10 million for administration. Currently, loans have been made to five companies, using $8.4 billion of the $25 billion loan authority.	$6 million (for administration)	Facilities funded must be placed in service by 12/31/2020	No limitations on specific technologies; rather, limits are stipulated for vehicle emissions and fuel consumption.
Vehicle Technologies Program (VTP)	Through research and development, VTP supports partnerships with other public and private organizations that will enhance energy efficiency and productivity, bring clean and affordable technologies to market, and enhance advanced technology vehicle choices for consumers.	$329 million—of that $118 million for Batteries and Electric Drive Technology	None	Advanced batteries, power electronics and electric motors, advanced combustion, lightweight materials, vehicle-to-grid interaction, and fuel cell and hydrogen technologies.
Biomass and Biorefinery Systems Program	The Biomass Program primarily focuses on research, development, demonstration, and deployment (RDD&D) to ensure that cellulosic ethanol is commercially viable by 2012 and that biobased aviation fuel, diesel fuel, and gasoline are price competitive by 2017.	$199 million	None	Biofuels.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
Hydrogen and Fuel Cell Technologies Program	The DOE Hydrogen Program works with industry, national laboratories, universities, government agencies, and other partners to overcome the barriers to the use of hydrogen and fuel cells. It includes a research and development (R&D) effort focused on advancing the performance and reducing the cost of these technologies.	$104 million	None	Hydrogen, fuel cells.
Clean Cities Program	Initially started in 1993 as a DOE program to promote alternative fuel vehicles among the states, it is now a broader program to reduce petroleum consumption in transportation, with 100 Clean Cities coalitions that focus on deployment of alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and emerging transportation technologies. Clean Cities provides technical, informational, and financial assistance to communities.	Approximately $30 million	None	Electricity, natural gas, propane, bio-methane, ethanol, biodiesel, hydrogen.
	Department of Transportation			
Corporate Average Fuel Economy (CAFE) Incentives for Alternative Fuel Vehicles	Automakers subject to Corporate Average Fuel Economy (CAFE) standards may accrue credits under that program for the production and sale of alternative fuel vehicles. For dedicated vehicles (i.e., vehicles that run solely on alternative fuel) credits are unlimited. For dual fueled vehicles (i.e., that may run on conventional or alternative fuel) credits are limited: The maximum fuel economy increase allowed through the use of these credits is 1.2 miles per gallon through model year (MY) 2014. After 2014 the credits are phased down and completely eliminated after MY 2019.	N/A	No expiration for dedicated vehicles; after MY 2019 for dual fueled vehicles	Methanol (at least 85%), ethanol (at least 85%), natural gas, liquefied petroleum gas, hydrogen, coal-derived liquid fuels, biologically derived fuels, and electricity.
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Congress directed the DOT to establish the CMAQ program to provide funds for projects and programs that may reduce the emissions of transportation-related pollutants that may cause an area within a state to exceed certain air quality standards.	$1.35 billion	9/30/2014	Not limited to alternative fuels or advanced technologies.
Clean Fuels Grant Program	This program provides grants to state departments of transportation and metropolitan planning organizations (among others) to purchase "clean fuel" transit buses. Federal Transit Administration (FTA) grants for conventional buses cover 80% of the cost, while Clean Fuels grants cover 90% of the incremental cost of clean fuel buses over conventional buses. Alternative fuels and advanced technologies qualify, including advanced diesel: however, only 25% of funding may be used for advanced diesel projects.	$51.5 million	9/30/2014	Buses powered by compressed natural gas, liquefied natural gas, biodiesel, batteries, ethanol, methanol, fuel cells, and clean diesel.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
	Environmental Protection Agency			
National Clean Diesel Campaign	EPA's National Clean Diesel Campaign (NCDC) promotes clean air strategies by working with manufacturers, fleet operators, air quality professionals, environmental and community organizations, and state and local officials to reduce diesel emissions. States are allocated funds for their clean diesel programs through the Diesel Emission Reduction Act (DERA).	$30 million	9/30/2016	Primarily for technologies which significantly reduce emissions (EPA maintains a list of verified retrofit technologies and emerging technologies at http://www.epa.gov/cleandiesel/).
Renewable Fuel Standard (RFS)	Mandated use of renewable fuel in gasoline and diesel fuel: 4.0 billion gallons in 2006, increasing to 36 billion gallons in 2022. There are specific sub-mandates for advanced biofuels (fuels other than corn-based ethanol), cellulosic biofuels, and biomass-based diesel fuels. Greenhouse gas emission reduction requirements apply to all advanced biofuels and to conventional biofuels from refineries built after 2007.	N/A	None	Biofuels (specific requirements for advanced biofuels, cellulosic fuels, and biomass-based diesel fuels).
	U.S. Department of Agriculture			
Biorefinery Assistance	The Biorefinery Assistance Program (BAP) assists in the development of new and emerging technologies for advanced biofuels. BAP provides competitive grants and loan guarantees for construction and/or retrofitting of demonstration-scale biorefineries to demonstrate the commercial viability of one or more processes for converting renewable biomass to advanced biofuels. Biorefinery grants can provide for up to 30% of total project costs. Each loan guarantee is limited to $250 million or 80% of project cost.	No FY2012 appropriation, but any mandatory funding unspent from the FY2010 allocation of $245 million remains available in FY2012.	9/30/2013	Advanced biofuels.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
Repowering Assistance	The Repowering Assistance Program (RAP) makes payments to eligible biorefineries (those in existence on the date of enactment of the 2008 farm bill, June 18, 2008) to encourage the use of renewable biomass as a replacement for fossil fuels used to provide heat for processing or power in the operation of these eligible biorefineries. Not more than 5% of the funds shall be made available to eligible producers with a refining capacity exceeding 150 million gallons of advanced biofuel per year.	$15 million in FY2010 was appropriated through FY2012. Any mandatory funding unspent from the FY2009 allocation of $35 million remains available in FY2012.	9/30/2013	Renewable biomass.
Bioenergy Program for Advanced Biofuels	To support and ensure an expanding production of advanced biofuels by providing payments to eligible advanced biofuel producers	Mandatory Commodity Credit Corporation (CCC) funding of $105 million for FY2012 was authorized to remain available until expended. P.L. 112-55 limits mandatory spending to $65 million.	9/30/2013	Advanced biofuels.
Biomass Crop Assistance Program (BCAP)	The Biomass Crop Assistance Program (BCAP) provides financial assistance to owners and operators of agricultural land and non-industrial private forest land who wish to establish, produce, and deliver biomass feedstocks. BCAP provides two categories of assistance: 1. establishment and annual payments, including a one-time payment of up to 75% of the cost of establishment for perennial crops, and annual payments (i.e., rental rates based on a set of criteria) of up to 5 years for non-woody and 15 years for woody perennial biomass crops; and 2. matching payments, up to $45 per ton, which may be available to help eligible material owners with collection, harvest, storage, and transportation (CHST) of eligible material for use in a qualified biomass conversion facility.	In the FY2012 Agriculture appropriations act (P.L. 112-55), BCAP mandatory spending was limited to $17 million.	9/30/2013	Feedstocks for the production of advanced biofuels.

Program	Description	FY2012 Appropriation or JCT Estimated Expenditure	Expiration Date	Eligible Fuels or Technologies
Rural Energy for America Program (REAP)	Provides grants and loans for a variety of rural energy projects, including efficiency improvements and renewable energy projects.	$25 million ($22 million in mandatory funds, $3 million discretionary)	9/30/2013	Rural energy projects broadly.
Biomass Research and Development Initiative (BRDI)	Provides competitive funding in the form of grants, contracts, and financial assistance for research, development, and demonstration of technologies and processes leading to significant commercial production of biofuels, biobased energy innovations, development of biobased feedstocks, biobased products, and other such related processes, including development of cost-competitive cellulosic ethanol.	$40 million	9/30/2013	Biomass energy and biobased products (not limited to transportation applications).
	Customs and Border Protection			
Import Duty on Fuel Ethanol	A 2.5% ad valorem tariff and a most-favored nation duty of $0.54 per gallon of fuel ethanol applied to imports from most countries.	N/A	Expired 12/21/2011	Imported ethanol for fuel use.

Source: CRS Analysis

Notes: N/A = not applicable

Table A-2. Federal Taxes and Incentives for Alternative Fuels

Fuel	Excise Tax Rate (¢ per gallon)	Production Incentive	Incentive for Blending and/or Fuel Use	Federal R&D	Other Programs
Biofuels					
General				DOE Biomass R&D program - $199 million in FY2012,[a] USDA Biomass R&D - $40 million in FY2012.[b]	Renewable fuel standard (RFS) mandates biofuel use by gasoline and diesel fuel suppliers—mandate of 15.2 billion gallons in 2012. Tax credit for installation of refueling infrastructure for some biofuels.
Conventional Ethanol	18.4	None	*$0.54 per gallon [expired]*		Majority of RFS met through use of conventional (corn-based) ethanol.
Biodiesel and Renewable Diesel	24.4	$1.00 plus $0.10 for small producers	$1.00 per gallon (may not claim this and the producer credit)		Specific carve-out in RFS for biomass-based diesel—1.28 billion gallons in 2013.
Cellulosic and Algae-Based Biofuels	Varies	$1.01 per gallon, plus accelerated depreciation of plant property	*$0.54 per gallon for cellulosic and algae-based ethanol (producer credit reduced by this amount plus the small producer credit) [expired]*	DOE and USDA biomass programs focused on cellulosic biofuel development.	Specific carve-out in RFS for cellulosic biofuels—8.65 million gallons in 2012.
Advanced Biofuels[c]	Varies	Varies	Varies	DOE Biomass Program.	USDA Farm Bill programs, including Biorefinery Assistance, Repowering Assistance, Bioenergy Program, Biomass Crop Assistance Program (BCAP).
Hydrogen	18.4	None	$0.50 per gallon	DOE Hydrogen and Fuel Cell Technologies Program—$104 million in FY2012.[d]	Tax credit for installation of refueling infrastructure.
Liquefied Petroleum Gas (LPG)	18.3	None	$0.50 per gallon		Tax credit for installation of refueling infrastructure.
Natural Gas					
Compressed Natural Gas (CNG)	18.3	None	$0.50 per gallon		Tax credit for installation of refueling infrastructure.

Fuel	Excise Tax Rate (¢ per gallon)	Production Incentive	Incentive for Blending and/or Fuel Use	Federal R&D	Other Programs
Liquefied Natural Gas (LNG)	24.3	None	$0.50 per gallon		Tax credit for installation of refueling infrastructure.

Source: CRS Analysis.

Notes: For more details, see **Table 1**. Italics indicate expired provisions.

a. Program not exclusively for transportation biofuels—also covers bioenergy (i.e., stationary sources) and bioproducts.

b. Program not exclusively for transportation biofuels—also covers bioenergy (i.e., stationary sources) and bioproducts.

c. This category generally encompasses others, including cellulosic biofuels, algae-based biofuels, and biomass-based diesel fuels.

d. Program not exclusively focused on transportation.

Table A-3. Federal Incentives for Alternative Fuel and Advanced Technology Vehicles

Vehicle Technology or Fuel Type	Manufacturing Incentive	Purchase Incentive	Federal R&D	Other Programs
Electrified Vehicles				
General			$118 million in FY2012 under DOE's Vehicle Technologies Program covers hybrid, battery electric, and plug-in technologies.	National Clean Diesel Campaign (NCDC), Clean Cities.
Hybrid	ATVM loan program generally applies.	*Up to $3,400 for passenger vehicles [expired]*		
Battery Electric	Credits under CAFE program; ATVM loan program generally applies.	Up to $7,500 for passenger vehicles; Up to $2,500 for two- and three-wheeled and low-speed vehicles; *Up to $4,000 for conversion kits [expired]*		
Plug-in Hybrid	Credits under CAFE program; ATVM loan program generally applies.	Up to $7,500 for passenger vehicles; Up to $2,500 for two- and three-wheeled and low-speed vehicles; *Up to $4,000 for conversion kits; [expired]*		
Ethanol Flexible Fuel Vehicle (FFV)	Credits under CAFE program expire after 2019 model year.	None	Limited	National Clean Diesel Campaign (NCDC), Clean Cities.
Fuel Cell Vehicles	Credits under CAFE program; ATVM loan program generally applies.	Up to $8,000 for passenger vehicles	DOE Hydrogen and Fuel Cell Technologies Program—$104 million in FY2012.[a]	National Clean Diesel Campaign (NCDC), Clean Cities.
Natural Gas Vehicles			Limited	
Compressed Natural Gas (CNG)	Credits under CAFE program; ATVM loan program generally applies.	*Up to $4,000 for passenger vehicles [expired]*		National Clean Diesel Campaign (NCDC), Clean Cities.
Liquefied Natural Gas (LNG)	Credits under CAFE program; ATVM loan program generally applies.	*Up to $4,000 for passenger vehicles [expired]*		National Clean Diesel Campaign (NCDC), Clean Cities.

Source: CRS Analysis.

Notes: For more details, see **Table 1**. Italics indicate expired provisions.

a. Program not exclusively focused on transportation.

Author Contact Information

Lynn J. Cunningham
Information Research Specialist
lcunningham@crs.loc.gov, 7-8971

Beth A. Roberts
Information Research Specialist
eroberts@crs.loc.gov, 7-9090

Bill Canis
Specialist in Industrial Organization and Business
bcanis@crs.loc.gov, 7-1568

Brent D. Yacobucci
Section Research Manager
byacobucci@crs.loc.gov, 7-9662