Mr. Samuel W. Bodman
Secretary of Energy
Office of the Secretary of Energy
1000 Independence Ave. S.W.
Washington D.C. 20585
Fax: 202-586-4403
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Re: A Petition for Rulemaking Pursuant to the Administrative Procedure Act: To Designate Plug-In Hybrid Electric Vehicles As Alternative Fuel or Dual-Fuel Vehicles under the Energy Policy Act of 1992

Dear Secretary Bodman:

Pursuant to the Right to Petition the Government Clause contained in the First Amendment of the United States Constitution and the Administrative Procedure Act, 5 U.S.C. § 553(e), which requires every federal agency to “give an interested person the right to petition for the issuance, amendment, or repeal of a rule,” Friends of the Earth and Center for Biological Diversity file this petition for Rulemaking and Collateral Relief and respectfully request, pursuant to Section 553(e) of the APA, that you promulgate a rule designating Plug-in Hybrid Electric Vehicles (PHEVs) as “Alternative Fuel” or “Dual Fuel” Vehicles under the Energy Policy Act of 1992, 42 U.S.C. §§ 13211(3), (8).

I. INTRODUCTION

A. PETITIONERS

Petitioner FRIENDS OF THE EARTH (FoE) is an environmental advocacy organization founded in 1969, with approximately 37,000 members across the nation. Friends of the Earth’s mission is to defend the environment and champion a healthy and just world, which includes encouraging better stewardship of natural resources, reduction in greenhouse gas emissions, and effective responses to climate change. Bluewater Network, a team of Friends of the Earth, works to confront the root causes of climate change, to combat environmental damage caused by cars, vessels, and motorized recreation industries, and to protect human health and the planet by reducing dependence on fossil fuels. Friends of the Earth has major ongoing legislative and advertising campaigns as well as litigation on energy, air pollution and climate change.
Petitioner CENTER FOR BIOLOGICAL DIVERSITY (The Center) is a non-profit organization with offices in San Francisco, Joshua Tree, and San Diego, California, Phoenix and Tucson, Arizona, Silver City, New Mexico, Portland, Oregon, and Washington, D.C. The Center is a national membership organization with over 30,000 members in the United States. The Center’s mission is to ensure the preservation, protection, and restoration of biodiversity, native species, ecosystems, public lands, and public health. Recognizing that global warming from society’s emission of greenhouse gases is one of the foremost threats to the Center’s members and their recreational, spiritual, vocational, aesthetic and other interests in the earth’s environment, biodiversity, and public health, the Center’s Climate, Air, and Energy Program works to reduce United States’ greenhouse gas emissions and promote sound conservation strategies in order to protect these interests. The Center’s work includes participating in rulemaking and project review procedures for activities that effect greenhouse gas emissions, such as the Department of Energy’s alternative fuel vehicle private and municipal fleet rule and the National Highway Traffic Safety Administration’s proposed corporate average fuel economy standards for light trucks, and petitioning for the protection of species threatened with extinction by global warming under the Endangered Species Act, such as the polar bear, penguins, and Caribbean corals.

Friends of the Earth and Center for Biological Diversity qualify as “interested persons” for purposes of the Administrative Procedure Act. 5 U.S.C. § 553(e). They submit this petition on behalf of themselves and their members.

B. THE ENERGY POLICY ACT


In passing EPAct, Congress was motivated by two principle concerns: (1) the dependency of the American economy, particularly the transportation system, on imported oil and (2) the direct link between the level and type of energy consumption and
environmental quality.\footnote{See e.g. H.R. Rep. No. 104-474(I), at 132-133, reprinted in 1992 U.S.C.C.A.N. 1954, 1955. (“Three energy price shocks in the past two decades, each followed by a serious recession, have demonstrated the importance of energy policy to the nation’s economic health. The latest shock, triggered by Iraq’s invasion of Kuwait in August 1990, and the subsequent embargo of Iraqi and Kuwaiti oil exports, reminded the American people that our dependence on the volatile Persian Gulf region for an increasing share of our daily oil consumption involves definite risks and costs. Administration economic spokesmen and others have pointed out that the doubling of oil prices during the embargo was a major cause of the 1990-1992 recession. Growing imports also contribute to the nation’s negative balance of trade.” … [and] … “Concurrent with this renewed focus on the importance of energy to the economy came a growing awareness of the direct link between the level and type of energy consumption and the quality of the environment. The Committee sought, in addition to improved energy efficiency, a commitment to develop renewable energy, to promote cleaner alternative automotive fuels ….”).}


As set forth below, a rule designating Plug-in Hybrid Electric vehicles (PHEVs) as “alternative fuel vehicles” or “dual fuel vehicles” under EPAct would advance EPAct’s twin goals of reducing American reliance on imported petroleum for transportation and improving environmental quality. Moreover PHEVs satisfy the specific requirements of EPAct to be considered as “alternative fuel” or “dual fuel” vehicles.

II. FACTS: Plug-In Hybrid Electric Vehicles

In general, a plug-in hybrid electric vehicle (PHEV) is a vehicle which uses a liquid fuel, including gasoline, diesel, or biofuels, to power an internal combustion engine (ICE) and electric batteries to power an electric motor. A PHEV’s electric batteries are recharged from an external electrical outlet. In addition, while in operation, the electric batteries are charged from an on-board rechargeable energy storage system. A PHEV can travel for a designated range without requiring the internal combustion engine component of the vehicle, thereby obviating the need for petroleum use while operating on the electric battery. The typical range for PHEVs is generally assumed to be 20 to 60 miles of all-electric travel (PHEV-20 to PHEV-60). In this mode of operation the vehicle
operates as a pure electric vehicle. The range and additional power of the ICE power train is available when needed for trips outside the range allowed by the electric battery. Depending on software configurations, PHEVs can also operate in a blended mode where both gas and external electricity are used simultaneously to substantially increase gas mileage for a particular range.

A Fact Sheet prepared by the Electric Power Research Institute (EPRI) in August 2004\(^2\) describes a plug-in hybrid electric vehicle as similar to today’s hybrid vehicles such as the Toyota Prius, which uses gasoline and electricity to power the car. However, unlike today’s hybrids, which have small batteries and no zero-emission range, plug-in hybrids have larger batteries that are fueled by an external source of electricity – generally a standard 110-volt household electrical outlet. Compared to non-plug-in hybrids, a plug-in hybrid offers a 25% to 55% reduction in some types of air pollution, a 35% to 65% reduction in greenhouse gases (depending on the electricity mix), and a 40% to 80% reduction in petroleum use. \(\text{Id.}\) (EPRI Fact Sheet)\(^3\)

PHEV’s are a relatively new technology that is still in a demonstration phase, but a strong interest and research effort has been evident over the past year, reaching up to the highest levels of government. For example, when President Bush announced in last year’s State of the Union Address that “America is addicted to oil,” it was front-page news across the country.\(^4\) Less widely reported were his comments a few weeks later, while visiting Colorado to promote the Advanced Energy Initiative. In remarks at the National Renewable Energy Laboratory in Golden, the President unequivocally endorsed hybrid vehicles, and specifically PHEVs.\(^5\)

As established below, Plug-in Hybrid Electric Vehicles satisfy all of the factors required to be considered alternative fuel vehicles under EPAct. For an average car trip, PHEVs can run entirely on electricity, an alternative fuel, or, when configured as a mixed-mode PHEV, will use the alternative fuel source at low speeds and intermittently based on computer-specified efficiencies. PHEVs enhance energy security by relying on a pre-existing domestic energy source, our electric grid, offering substantial environmental benefits over their petroleum-burning counterparts. At a minimum, they are dual fuel vehicles under EPAct, relying on electricity and petroleum. DOE should

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\(^3\) Available on DOE web page at http://www1.eere.energy.gov/vehiclesandfuels/epact/pdfs/plf_docket/eprphev_factsheet.pdf

\(^4\) http://www.whitehouse.gov/stateoftheunion/2006/index.html

\(^5\) http://www.whitehouse.gov/news/releases/2006/02/20060221.html
support PHEV’s, as does the President, by clearly designating them as qualifying alternative fuel vehicles under EPAct. Such a designation will provide a substantial market for this emerging technology. Indeed, prompt action by DOE will support ongoing efforts of diverse groups, such as those of the Environmental and Energy Study Institute’s Plug-in-Partners Campaign which is holding its one-year anniversary celebration early next week, and which states PHEVs “offer a promising opportunity to reduce dependence on foreign oil, decrease greenhouse gas and other transportation emissions, revitalize local economies, and lower fuel costs.”6 These are the very goals of EPAct. Your quick action, on this Petition will bring these goals closer to reality.

III. ARGUMENT

A. PHEVs Meet the Purposes of EPAct

1. PHEVs Enhance our Energy Security

U.S. energy security requires that we support near-term automotive technology to reduce this nation’s petroleum dependence, while working toward longer range technologies such as hydrogen fuel cells. Plug-in hybrids satisfy this near-term role. The EPRI study cited above concluded “a plug-in electric hybrid vehicle with even a 20-mile range battery (the lowest estimate) could reduce petroleum consumption by about 60%.”7

Plug-in hybrid demonstration vehicles on the road now are achieving gasoline equivalent mileages of over 100 miles per gallon, and require no infrastructure other than a standard 110 or 120 volt plug.8 PHEVs are built using a standard hybrid drive train, with a larger battery pack9 and certain software modifications. PHEVs have the further


7  Lucy Sanna, Driving the Solution: The Plug-In Hybrid Vehicle, EPRI JOURNAL, Fall 2005, 11.

8  See e.g., http://www.arb.ca.gov/msprog/zevprog/symposium/presentations/maccurdy.pdf (average mileage of 110 mpg for trips over 8 miles)

9  Tests currently being performed on lithium-ion energy batteries are demonstrating that battery technology for PHEVs is currently sufficiently advanced to support PHEV technology. Presentation, Bob Graham, Electric Power Research Institute, CAL-ETC 2006 Fall Roundtable Symposium.
benefit of relying on domestic electricity production, which is much less dependent upon petroleum: less than 2% of electricity in the U.S. is generated from oil.\textsuperscript{10}

As NREL’s own website summarizes, electric vehicles are “clean, quiet, largely independent of imported petroleum, and highly amenable to using wind or other renewable energy generation.”\textsuperscript{11} PHEVs provide these benefits while also satisfying consumer needs for a longer driving range, when necessary. Another advantage of the PHEV is the synergy it offers with biofuels. It has long been understood that crop production in most countries is not sufficient to supply all of the biofuel needs of society, especially when importance of food production is considered. However, PHEVs dramatically reduce the requirement for liquid fuel to as little as 20% of an equivalent standard hybrid electric vehicle. This produces a synergy between PHEVs and biofuels whereby extreme reductions in petroleum usage are possible. For example, E85 which is composed of 85% ethanol stretches petroleum by a factor of about 2.5 today. Combining E85 as the liquid fuel with a PHEV-70 results in a petroleum stretch factor of 10 (2.5 x 4). If a standard hybrid electric vehicle achieves 50 miles per gallon of gasoline, the similar PHEV-70 would achieve an equivalent of up to 500 mpg if fueled by E85.

The independent National Commission on Energy Policy concluded in a 2004 study that “[p]lug-in or grid-connectable hybrids may be the most promising AFV pathway… Unlike most AFVs, plug-ins hold the potential of being cost-competitive at current gasoline prices. They deserve at least as much attention from policymakers and car companies as hydrogen fuel cell vehicles have received.”\textsuperscript{12}

In sum, PHEV’s offer substantial energy security benefits and abundantly satisfy the petroleum reduction goals of EPAct.

2. **PHEVs Promise Substantial Environmental Benefits**

As DOE has noted in *Clean Cities Now*, “a plug-in hybrid traveling mostly on its electric motor has the potential to be cleaner than a vehicle running primarily on a gasoline engine.”\textsuperscript{13} Citing an EPRI study, it further noted that “carbon dioxide (CO2) emissions for a plug-in hybrid compact sedan would be less than 200 grams per mile

\begin{itemize}
  \item \textsuperscript{10} Institute for the Analysis of Global Security, “Plug-in Hybrid Vehicles,” \url{http://www.iags.org/pih.htm}.
  \item \textsuperscript{11} National Renewable Energy Laboratory, *Plug-in Hybrid Electric Vehicles*, at \url{http://www.nrel.gov/vehiclesandfuels/hev/plugins.html}.
  \item \textsuperscript{13} *Plugging in to the Next Stage in HEV Technology*, Clean Cities Now, February 2006, \url{http://www.eere.energy.gov/cleancites/ccn/progs/print_issue.cgi/A}.
\end{itemize}
compared to a conventional vehicle with CO2 emissions of approximately 320 grams per mile.”14 These gains would be offset by emissions from the power plants generating electricity to power PHEVs, but those emissions are (a) less than the lifecycle emissions associated with petroleum; (b) are more easily regulated due to their centralized nature; and (c) decreasing with time, as new plants and cleaner generating technologies come online. The California Air Resources Board has found that greenhouse gas emissions for a PHEV with a 20-mile range in California are 62% less than an equivalent gas-powered car.15

But even given current electric generating capacity, the environmental benefits of PHEVs are substantial. States with zero-emissions initiatives (such as California, Massachusetts, and New York) have collected years of data showing that electric vehicles are cleaner than gasoline vehicles even when taking into account emissions from power plants.16 Further, a recent study by the California Air Resources Board looked at the environmental impact of electric vehicles “from extraction of the fuel source all the way to the tailpipe and the wheel” and found that an electric vehicle generates only one-third of the greenhouse gases compared to its internal-combustion counterpart.

Even nationwide, where the electrical grid is 50-60% coal-fired, the environmental benefits of PHEVs are clear. Two government studies concluded that PHEVs would result in large reductions even on the nation’s existing “dirty grid.” In 2001, DOE’s Argonne National Lab estimated that PHEVs reduce greenhouse gas emissions by 36 percent. In July 2002, another Argonne researcher estimated that plug-in PHEVs using nighttime power would reduce greenhouse gases by 46 to 61 percent.17 Again, it is easy to conclude PHEVs offer substantial environmental benefits.

B. PHEVs Constitute Alternative Fuel Vehicles Under EPAct

EPAct defines an “alternative fueled vehicle” as a dedicated fuel vehicle, running on alternative fuel, or a dual fueled vehicle.18 EPAct defines “alternative fuels” to include electricity.19

14 Id.


16 CalCARS is a non-profit coalition advocating the adoption of plug-in hybrid vehicles. See http://www.calcars.org/vehicles.html#cleaner.

17 See http://www.calcars.org/vehicles.html#cleaner.

18 42 U.S.C. § 13211(3).

19 42 U.S.C. § 13211(2).
1. **Dedicated Fuel Vehicle**

PHEVs meet the Act’s definition of a dedicated vehicle for nearly half of all car trips. A “dedicated” fuel vehicle is defined by the Act as an automobile that operates only on alternative fuel.\(^{20}\) According to a study by the Electric Power Research Institute (EPRI), “half the cars on U.S. roads are driven 25 miles a day or less,” well within the range in which PHEVs run on electricity alone.\(^{21}\) This means that for half of all PHEV trips, the plug-in hybrid electric vehicle operates as a pure electric vehicle.

For the other half of all trips, PHEVs will operate as a dual fueled vehicle (discussed below) utilizing the electric motor for its specific all-electric range and then reverting to operate on its ICE engine. PHEVs should thus be considered alternative fuel vehicles under EPAct.

2. **PHEVs Constitute Dual Fuel Vehicles Under EPAct\(^ {22}\)**

EPAct provides that a qualifying alternative fuel vehicle can be a dual fuel vehicle.\(^ {23}\) The term “dual fueled vehicle” means a motor vehicle as defined in 49 U.S.C. §32901(a)(8),\(^ {24}\) that is, an automobile that: (A) is capable of operating on alternative fuel and on gasoline or diesel fuel; (B) provides equal or superior energy efficiency, as calculated for the applicable model year during fuel economy testing for the United States Government, when operating on alternative fuel as when operating on gasoline or diesel fuel; (C) (applicable only for model years 1993-1995); (D) for a passenger

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\(^{21}\) Lucy Sanna, *Driving the Solution: The Plug-In Hybrid Vehicle*, EPRI JOURNAL, Fall 2005, 11.

\(^{22}\) Currently, although electricity is listed as an alternative fuel, plug-in hybrid electric vehicles (“PHEVs”) may not be recognized as alternative or dual fuel vehicles under EPAct. Previous rulings have found that traditional hybrid electric vehicles, because they are not fueled by an external non-petroleum source, may not qualify as alternative or dual fuel vehicles. Dept. of Transportation, *Minimum Driving Range for Duel Fueled Electric Passenger Automobiles*, 49 C.F.R. Part 538 (denying petition to qualify HEVs as dual-fuel vehicles under EPACT). This logic does not hold in the case of PHEVs. DOE should clearly state that PHEVs will receive credit as alternative or dual-fuel vehicles under EPAct.

\(^{23}\) 42 U.S.C. § 13211(3).

automobile, meets or exceeds the minimum driving range prescribed by the Secretary.25 PHEVs meet these criteria.

As discussed above, PHEVs are capable of operating on electricity, an alternative fuel, for a designated range, generally between 20 to 60 miles. PHEVs achieve superior energy efficiency than a similar internal combustion engine-powered vehicle when operating on electricity. Electric engines are approximately 20-50 percent more efficient than internal combustion engines. Plus, recent on-road testing data demonstrates that PHEVs are more than twice as efficient as their hybrid counterparts.26 Finally, PHEVs with a minimum all-electric range of 10.2 miles will meet the minimum driving range of 7.5 miles on an urban cycle and 10.2 on a highway cycle. See 62 Fed.Reg. 357.

Accordingly, Petitioners request DOE to clarify that, at a minimum; PHEVs qualify for credit under EPAct as dual fuel vehicles.

III. Unlike Current Gas-Electric Hybrids, PHEVs Would Greatly Benefit from EPAct’s Market-forcing Effects

Finally, it should be noted that the promising future of PHEVs, a promise specifically cited by the President, would be enhanced by the designation of PHEVs as qualifying for EPAct alternative fuel vehicle credit. Plug-in hybrids are at a stage of development where the market-forcing mechanisms of EPAct can create a tipping point for which this advanced technology is viable for both producers and consumers.

As Clean Cities Now points out, prototype vehicles are “being demonstrated today:”

EPRI and DaimlerChrysler AG of Stuttgart, Germany, [have] developed [a] prototype van. According to Mark Duvall, manager of technology development for EPRI, DaimlerChrysler in Stuttgart is extensively testing the vans before they are brought into the United States for fleet testing and evaluation. The first U.S. vehicle was shipped to Los Angeles in November, and three more are scheduled to be delivered in 2006. The vans have a nickel-metal hydride or a lithium ion battery pack and are available with the option of either a gasoline or a diesel engine.27


27 Plugging into the Next Stage in HEV Technology, supra n.13.
While the technology is available, significant hurdles of cost remain before PHEVs can be brought to the mass market. A clear designation of PHEVs as alternative fuel vehicles under EPAct will help speed the process of bringing PHEVs to market. Knowing that an initial market for PHEVs exists, automakers are more likely to invest the resources necessary to develop these vehicles and bring them to market. This is exactly the pump-priming “chicken and egg” scenario that EPAct was designed to address.

For the last ten years, EPAct has mandated that an increasing percentage of each federal fleet’s vehicle acquisitions must be alternative fuel vehicles. For the most part, federal agencies have been unwilling or unable to comply with this requirement. Adding PHEVs to the list of vehicles for which fleet managers may receive EPAct credit will make it easier to purchase of alternative fuel vehicles, thus increasing compliance with the law. PHEVs require no additional fueling infrastructure other than an electrical outlet. Performance and range of the vehicle would be virtually identical to the gasoline-powered vehicles that they would replace. The suitability of PHEV technology for fleet vehicles is indicated by the fact (noted above) that the first prototypes to reach the market are fleet delivery vans. Hence, all the environmental and security benefits inherent in PHEVs would be multiplied by the greater likelihood (relative to existing approved vehicles) that federal fleets would actually use them.

CONCLUSION

Petitioners strongly believe that plug-in hybrid electric vehicles fulfill all the requirements necessary to be designated as alternative fuel vehicles under EPAct. PHEVs serve the goals of the Act. As the President himself has recognized, use of PHEVs will reduce oil imports, reduce greenhouse gas emissions, improve our economy, and enhance our domestic energy security. Moreover, PHEV technology will benefit from the market creating provisions of EPAct. The federal government, via the Energy Policy Act and the President’s energy initiative, has an important role to play in leading the way towards wider acceptance and adoption of these vehicles. We therefore request that DOE begin a rulemaking process to designate PHEVs as alternative fuel or dual fuel vehicles under EPAct.

If you have any questions concerning this Petition, or desire any further information, we are happy to provide it. We look forward to your prompt response.


Respectfully Submitted,

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