THE INTERNATIONAL COUNCIL
ON CLEAN TRANSPORTATION

1225 I Street NW
Suite 900
Washington DC 20005
+1 202.534.1600
www.theicct.org

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RE: Energy and Commerce Committee White Paper Series on the Renewable Fuel Standard

The International Council on Clean Transportation welcomes the opportunity to provide comments on the Energy and Commerce Committee's deliberations on the Renewable Fuel Standard. The ICCT is an independent nonprofit organization founded to provide first-rate, unbiased research and technical analysis to environmental regulators. Our mission is to improve the environmental performance and energy efficiency of road, marine, and air transportation, as well as their fuels, in order to benefit public health and mitigate climate change.

The ICCT has long supported, and welcomes the opportunity to provide comments on, the Renewable Fuel Standard (RFS). We commend the House and US Environmental Protection Agency for their continuing efforts to promote a cleaner, lower-carbon transportation sector that uses less petroleum-based – and more renewable – fuels with the RFS program. We hope these comments can help in the dialogue to continue improving the performance of the program.

We would be glad to clarify or elaborate on any points made in the attached comments. If there are any questions, Committee staff can feel free to contact our fuels program director, Dr. Nicholas Lutsey (*nic@theicct.org*).

Fanta Kamakaté
Chief Program Officer
International Council on Clean Transportation

International Council on Clean Transportation comments on Energy & Commerce Committee White Paper Series on the Renewable Fuel Standard

The International Council on Clean Transportation (ICCT) has long supported the Renewable Fuel Standards (RFS). The ICCT has contributed a substantial body of research and public comments directly to the US Environmental Protection Agency regulatory development process on the areas of life-cycle emission analysis, indirect land use change provisions, and volumes of fuels within the various RFS biofuel categories.

These comments are narrower in scope, related only to question #6 "Could the RFS be modified to enhance energy security further? Should the range of qualifying fuels be expanded? If so, how? If not, why not?" More specifically, these comments relate to the provisions within the RFS for the inclusion of electricity as a qualifying fuel.

The use of electricity as an energy carrier in transportation is relatively small but growing.[1] The first commercial plug-in electric vehicles on now in the marketplace[2], and sales of these electric-drive vehicles will increase as battery technology achieves greater economies of scale. In addition, there are new electrification niches to power accessories of idled trucks and trailer refrigeration loads, as well as port electrification for ships. Each vehicle that is powered by electricity in the US would, on average –

- Reduce its oil use by nearly 99%, because only about 1% of grid power is fueled by petroleum-based fuels[3];
- Reduce its climate-related emissions by over half (even with US' current electricity average grid mix of about 37% coal) and by much more in less coal-intensive states[4];
- Increase its renewable energy content to about 12%, based on the average renewable electricity contribution to the overall US electricity grid mix[5];
- Increase its renewable energy content to over 20% in leading renewable electricity states, including Alaska, California, Idaho, Maine, Montana, New York, Oregon, South Dakota, Vermont, Washington[6]
- Increase its renewable energy content to about 33-37% for vehicles that are powered by the leading power utilities that have been more actively investing in renewable energy-sourced electricity grid generation[7,8].

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[1] Hydrogen is another feasible energy carrier, which can also be produced using renewable energy. While our comments are written specifically for electric vehicles, it is important that the RFS provisions also encourage renewable hydrogen.

[2] As of May 2013, cumulative electric vehicles sales, including plug-in hybrids, just reached 100,000 units, per EDTA (2013) Electric Drive Sales. *http://www.electricdrive.org/index.php?ht=d/sp/i/20952/pid/20952*.

[3] Energy Information Administration (2013) *http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3*

[4] See, e.g., Lutsey, N. and D. Sperling (2012). Regulatory adaptation: Accommodating electric vehicles in a petroleum world. *Energy Policy*. 45: 308-316. *http://dx.doi.org/10.1016/j.enpol.2012.02.038*

[5] Energy Information Administration (2013) *http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3;* Average 2012 US grid electricity content of 7% hydroelectric, 3.5 wind, 1.4% biomass, 0.4% geothermal, and 0.1% solar; 12% renewable electric compares to 7% renewable in the current gasoline mix (i.e., E10 with 10% by volume ethanol)

[6] Based on 2009 state-by-state electricity content from the EPA (2012) eGRID2012 Verson 1.0. *http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html*

[7] PG&E (2013). Clean Energy Solutions. *http://www.pge.com/en/about/environment/pge/cleanenergy/index.page.*

[8] Portland General Electric (2013) How We Generate Energy. *http://www.portlandgeneral.com/our_company/corporate_info/how_we_generate_energy.aspx*

The ICCT would like to encourage the House to consider revising the RFS program to better promote renewable electricity use within the transportation sector. The existing RFS2 electricity provisions are unduly restrictive regarding the use of renewable electricity for transportation. For example, the RFS provisions allow for fuel providers (e.g., primarily electric utilities in this case) to opt in and generate RFS Renewable Identification Number (RINs) credits by either supplying electricity from a non-commercial electricity grid or requiring EPA Administrator approval. The use of non-commercial electric grids are extremely rare, and requiring special Administrator approval does not give a clear path for utilities to make serious investment decisions about how to alter their operations to better accommodate increasing numbers of plug-in electric vehicles. Also the definition of renewable within the RFS program is restricted to biomass – whereas there are far more renewable sources that offer petroleum savings and carbon reductions that meet or exceed the benefits of biomass-derived energy. Examples of renewable electricity sources that do not currently qualify are wind, geothermal, hydroelectric, solar photovoltaic, and solar thermal. Biomass-derived grid power is only about 1% of current US grid power, whereas the state-by-state renewable electricity portfolio standards will increasingly bring the US electricity grid to 20-30% renewable power in the 2020-2030 timeframe.

If the RFS provisions were modified so as to be inclusive of all commercial grid renewable electricity, utilities would have a greater incentive to play their respective role in readying the grid, improving electric vehicle charging options, working on electric vehicle-specific electricity rate structures, etc. Providing the electric utilities with a clearer path to generate RIN credits by explicitly allowing commercial grid electricity would be an important revision. Including electricity from all renewable sources (i.e., not only biomass-derived) would be appropriate. Including a factor that appropriately accounts for the lower on-vehicle energy requirements of electric drive would also be appropriate, considering that a unit of energy on a electric vehicle would deliver about three times the distance traveled from a unit of fuel energy on a comparable gasoline vehicle.[9,10]

As a result, the ICCT makes the following recommendations to be considered by the House Energy and Commerce Committee for further analysis:

- Commercial grid transmission: Adopt use of commercial transmission-supplied electricity (i.e., without special Administrator approval)
- Utility-average renewable fraction: Allow utilities to opt in to generate RIN credits based on their average overall commercial renewable electricity generation fraction (e.g., if a utilities overall electric power generation is 30% renewable, then their transportation electricity use would multiplied by 0.3 to calculate a RIN credit)
- Qualifying renewable energy sources: Include a provision whereby renewable electricity includes electricity that is powered by wind, solar, hydroelectric, geothermal (along with biomass fired and biomass co-fired power that are already included)
- Electric vehicle efficiency: Utilize a standard electric vehicle efficiency conversion of about 3.0 for electricity-powered transportation sources to reflect how an electric vehicle delivers about three times more miles traveled per energy unit than a comparable conventional gasoline vehicle.

[9] See Energy Economy Ratio provisions in California Air Resources Board (2013) Initial Statement of Reasons. Low Carbon Fuel Standard. *www.arb.ca.gov/fuels/lcfs/030409lcfs_isor_vol1.pdf*

[10] Lutsey, N. and D. Sperling (2010). Toward integration of vehicle and fuel regulation: California case study. *Transportation Research Record.* 2191: 100-110. *http://trb.metapress.com/content/6g10747l4188n768/*….

These concepts would likely amount to relatively small changes in the overall compliance with the RFS program. For context, an ICCT analysis for a plausible year 2025 scenario where there are 4 million total electric vehicles powered on average by a 25% renewable grid, suggests that the total annual RIN generation could be on the order of 450 million gallons equivalent [11], or about 2% of the total 21 billion gallons for advanced biofuel requirements in RFS2 for 2022. For a rough sense of scale, based on the value of $0.62 per advanced biofuel RIN,[12] this amount of renewable electricity-based RINs would amount to $280 million per year in sustained revenue that could be dedicated to electric vehicle charging infrastructure projects.

We also note that analogous provisions to those itemized above for battery electric vehicles should be considered for electric-drive vehicles that are fueled by hydrogen. Similar to electricity, hydrogen is an energy carrier that can be derived from diverse fossil and renewable sources. Although hydrogen fuel cell vehicles are further from major commercial deployment than plug-in battery electric vehicles, their long-term potential is very promising. Policies to incentivize the increased use of a higher renewable content of hydrogen are underway in California[13], and the RFS should create similar incentives for renewable hydrogen.

Each of the above-suggested recommendations would be appropriate under the objectives of the Energy Independence and Security Act, and they would also adhere to best practices internationally in promoting the transition to electric-drive vehicles. Transportation fuel policies – including the RFS, the California Low Carbon Fuel Standard (LCFS), and the European Union's Fuel Quality Directive (FQD) – can play an important role in better facilitating a mix of all alternative fuels in the vehicle fleet. Currently the RFS artificially restricts some renewable energy sources, whereas the LCFS and EU FQD polices are broader and include electric-drive options alongside biofuels, including provisions as suggested above.

More broadly, a path toward greater electrification of the transportation sector would be long and require sustained policy efforts on many fronts to facilitate a decades-long transition.[14,15] Concepts like those discussed here would make a major relevant stakeholder (i.e., the electric utilities) more vested in the process and help them generate some RIN revenue to pay for electric vehicle charging infrastructure. Among the broader policies that would also help long-term viability of electric vehicles are support for automobile manufacturing and suppliers' research and development on pre-commercial technologies, progressive long-term efficiency and greenhouse gas emission standards for vehicles that help drive incremental and electric-drive vehicle technologies into the market place, and upstream fuel policies like the RFS. Sustained efforts in all of these areas will be needed by countries like the US that seek to lead in the transition to electric drive vehicles in the 2020-2050 timeframe.

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[11] Based on electricity use of 0.34 kWh/mile (similar to Nissan Leaf), a 3.0 energy economy ratio (as used on LCFS), 22.6 kWh per gallon of ethanol equivalent (per RFS2 final rule provisions), and 10,000 miles per year of driving

[12] Based on D5 Advanced biofuel RIN 2012 average price from EcoEngineers, 2013. Overview of RIN Program and Recent Trends. *http://www.energy.ca.gov/altfuels/notices/2013-01-11_workshop/presentations/04_Shashi_Menon-Ecoengineers.pdf*

[13] California Air Resources Board (2013). Environmental & Energy Standards for Hydrogen Production *http://www.arb.ca.gov/msprog/hydprod/hydprod.htm*

[14] Greene, D., Park, S., Liu, C (2013). *Analyzing the Transition to Electric Drive in California*. Prepared for the International Council on Clean Transportation. *http://bakercenter.utk.edu/wp-content/uploads/2013/06/Transition-to-Electric-Drive-2013-report.FINAL_.pdf.*

[15] National Academy of Sciences (2013). *Transitions to Alternative Vehicles and Fuels*. *http://books.nap.edu/catalog.php?record_id=18264*. National Academies Press. Washington DC.

With all transportation policies, it is important to strive for technology neutral, performance-based standards that drive alternative fuels based on their relative energy and carbon benefits. The suggestions laid forth above could help to ensure that the RFS program more equitably promotes renewable biofuels and renewable electricity. Such changes would offer an acknowledgement that the long-term future for vehicles in the US is likely to involve lower carbon biofuels and more renewable electricity use (among other alternative fuels).

The ICCT encourages the Committee to consider the above recommendations and to reach out to the ICCT with any questions or clarifications on these comments.