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to the

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Committee on Science, Space and Technology
Subcommittee on Energy and Environment

Hitting the Ethanol Blend Wall: Examining the Science on E15

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Chairman Harris, Ranking Member Miller and distinguished members of the committee: My name is Heather White. I am chief of staff and general counsel at the Environmental Working Group, a nonprofit research and advocacy organization based in Washington, DC, with offices in Ames, Iowa, and Oakland, California. I thank the members of the committee for holding this important hearing and for the opportunity to testify.

For almost two decades, our organization has advocated protection of vulnerable people from toxic contaminants, ending subsidies that encourage environmental harm and investing instead in conservation and sustainable development.

This nation's biofuels policy is on the wrong path. Environmental Working Group believes that the Environmental Protection Agency should not have waived the federal Clean Air Act to allow the percentage of ethanol blended with gasoline to increase by 50 percent, to 15 percent ethanol. Until this decision, gasoline's ethanol content was generally capped at 10 percent. We are nearing the "blend wall," the maximum amount of ethanol that can legally be blended into fuel. This blend wall is potentially at odds with the production mandate of 36 billion gallons of biofuels set forth in the Renewable Fuels Standard of the 2007 energy bill. Because of the lack of enforceable environmental safeguards surrounding biofuels policy, we opposed expansion of the energy bill's RFS mandate.

As this subcommittee examines mid-level ethanol blends and ethanol policy from a scientific perspective, we urge you to support efforts to:

- (1) Allow the ethanol tax credit to expire in 2011 and eliminate other oil subsidies and tax breaks.
- (2) Reject corn ethanol industry proposals to fund grants and back loan guarantees to support conventional biofuels infrastructure such as blender pumps, corn ethanol pipelines and mandates for flex-fuel vehicles.
- (3) Invest in focused research on advanced biofuels, including those recommended by the Interagency Biofuels Task Force, that significantly reduce greenhouse gases, do not compete with or displace food crops and are environmentally sustainable over both the short and long-term.
- (4) Reform the Renewable Fuels Standard by freezing and phasing out conventional biofuels mandates and adding significant and enforceable environmental safeguards to the advanced biofuels

mandate.

(5) Focus on policies that would cut gasoline consumption, among them, encouraging drivers to make fewer trips, to carpool and to invest in vehicles or forms of transportation that actually reduce dependence on fossil fuels.

No matter which path Congress takes on biofuels policy, it is clear that the latest science on the health risks of mid-level ethanol blends raises red flags. Our comprehensive review of the available scientific data indicates that E15 and higher ethanol blends could have significant adverse impacts on human and environmental health. (Appendix A). The data simply do not support a decision to approve fuel blends above E10 in the U.S.

Furthermore, E15-blended gasoline will likely result in a consumer nightmare for small engine owners, boaters and owners of older vehicles, who may find their engines destroyed or damaged and their warranties void. Until these data are adequately generated and assessed, consumer safety, public health, and environmental protection are at risk from mid-level ethanol blends.

Hitting the blend wall is symptomatic of our backwards biofuels policy, but, in fact, for the last 30 years, federal subsidies and other supports for biofuels have been misguided. Federal supports for corn ethanol, an environmentally destructive biofuel, are numerous and duplicative.

The ethanol industry benefits from corn subsidies since corn is its main feedstock. The industry also receives ethanol blender's tax credit, import tariff and mandated production through the Renewable Fuel Standard. These taxpayer-backed subsidies for corn ethanol are crowding out the market for more promising advanced biofuels. It is time we stopped subsidizing corn ethanol and artificially stimulating demand for ethanol blends that are not compatible with many vehicles and engines.

Some recent actions by the Environmental Protection Agency are cases in point.

- In March 2009, Growth Energy, representing 54 ethanol manufacturers, applied for a federal Clean Air Act waiver to increase the percentage of ethanol that can be blended into gasoline from 10 percent to 15 percent.
- On October 13, 2010, EPA approved a partial waiver, permitting E15 to be introduced into the fuel supply, with the caveat that it was approved only for vehicles manufactured after 2006. EPA proposed a rule to avert misfueling, meaning, using E15 in pre-2006 vehicles. It contemplated labeling gasoline pumps to deter consumers from fueling incompatible engines with E15.
- On January 21, EPA extended the E15 waiver to vehicles manufactured as early as 2001, effectively approving the higher ethanol blend for use in about two-thirds of the U.S. vehicle fleet.
- On June 28, EPA published its final misfueling rule, with label language intended to warn consumers if their vehicle or engine could be damaged by E15.¹

¹ U.S. Environmental Protection Agency. "E15 (a blend of gasoline and up to 15% ethanol)" 23 June 2011. Accessed 4 July 2011 at <http://www.epa.gov/otaq/regs/fuels/additive/e15/>.

Problems with higher blends of ethanol

The Environmental Protection Agency's decision to approve E15 is bad for consumers, the environment and public health. The decision is counterproductive to the national goal of reducing gasoline consumption and strengthening energy independence. Expanding gasoline's ethanol content by 50 percent will result in numerous short-term and long-term problems, among them:

- Consumer confusion at the pump
- Damage to older cars and trucks²
- Damage to small and off-road engines³
- Safety issues⁴
- Voided engine warranties
- More air pollutants like nitrous oxide and formaldehyde⁵
- Lower gas mileage
- More leaks from underground storage tanks⁶
- Greater potential for drinking water contamination

Preventing misfueling

EPA approved introduction of E15 into the fuel supply with conditions that aimed to help consumers avoid using it in older vehicles and small engines. The agency:

- Prohibited blends between E10 and E15 in unapproved vehicles and engines.
- Require all fuel dispensers to have a label if a retail station chooses to sell E15.
- Required a national survey of retail stations to ensure compliance with the labeling provisions.⁷

² U.S. Environmental Protection Agency. 2009. Written Statement by Margo T. Oge, Director, Office of Transportation And Air Quality, Office Of Air And Radiation, U.S. Environmental Protection Agency to the Committee on Environment and Public Works, Subcommittee On Clean Air And Nuclear Safety, United States Senate. Accessed online 1 April 2009 at http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=3fdd18ff-802a-23ad-4378-d21b6beb4d5a.

³ Knoll, K., West, B.H., Clark, W., Graves, R.L., Orban, J., Przesmitzki, S., Theiss, T.J. Knoll, K., West, B.H., Clark, W., Graves, R.L., Orban, J., Przesmitzki, S., and Theiss, T.J. "Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1 – Updated." Department of Energy. 2009. Accessed online 6 March 2009 at http://feerc.ornl.gov/publications/Int_blends_Rpt1_Updated.pdf.

⁴ Naidenko, Olga. "Ethanol-Gasoline Fuel Blends May Cause Human Health Risks and Engine Issues." May 2009. Accessed online 4 July 2011 at <http://www.ewg.org/biofuels/report/Ethanol-Health-Risks-and-Engine-Damage>.

⁵ U.S. Environmental Protection Agency. "National Air Quality - Status and Trends through 2007 EPA-454/R-08-006." 2008. Accessed online May 2009 at <http://www.epa.gov/airtrends/2008/index.html>.

⁶ Tiemann, Mary. "Leaking Underground Storage Tanks: Prevention and Cleanup." 18 May 2010. Congressional Research Service. Accessed online 4 July 2011 at <http://ncseonline.org/nle/crs/abstract.cfm?NLEid=1457>.

⁷ U.S. Environmental Protection Agency. "EPA Announces E15 Partial Waiver Decision and Fuel Pump Labeling Proposal." 2 December 2010. Accessed online 4 July 2011 at <http://www.epa.gov/otaq/regs/fuels/additive/e15/420f10054.htm>.

EWG recommended that the EPA require gasoline station owners to put clear, detailed labels on pumps in order to alert consumers to the dangers of E15.⁸ EPA incorporated a few of our recommendations but watered down the language at key points. For instance, we suggested the label bear the word “Warning.” EPA opted for the weaker word “Attention.” We recommended that the label display an 800 number and website address or that it advise the consumer to consult the owner’s manual if uncertain whether E15 could be used in a particular vehicle or small engine. EPA ignored these suggestions, among many others, that would help prevent harm to older vehicles and ethanol-related pollution.

EPA’s final rule minimized safety issues. It did not adequately inform consumers that small engines can stall or fail if fueled wrongly with E15.

Taken together, these EPA decisions do not adequately protect consumers, public health or the environment.

EPA decisions endanger older and smaller engines

Adding small, well-tested amounts of oxygenated additives like ethanol to engine fuel to reduce air pollution in targeted nonattainment areas makes sense. But the misguided effort to treat ethanol as an alternative transportation fuel has become a well-founded source of concern for consumers, environmental groups, livestock farmers, automobile makers and the food industry. Most gasoline sold in the U.S. contains 10 percent ethanol. Most engines can tolerate that much ethanol. But engines run hotter on a gasoline-ethanol blend than on pure gasoline. As a result, many gasoline engines cannot run on E15 without risking major internal damage and increased tailpipe emissions. Newer vehicles can accommodate increased exhaust and catalyst temperatures, but many older vehicles cannot. For that reason, EPA has approved E15 only for automobiles made in 2001 and thereafter. Yet the ethanol industry, thirsting for bigger markets and more sales, has pressed hard to add E15 to the entire automobile fuel supply, arguing without basis that increased ethanol content in gasoline would somehow foster American energy independence. Well-known compatibility problems suffered by older vehicles and small or off-road engines were pushed to the side.

Growth Energy has contended that tests show that no problems exist with using the E15 fuel mix. It has urged the agency to extend the waiver to older vehicles.⁹

In fact, the Department of Energy’s vehicle emissions data for 2001 to 2006 model vehicles found that four of eight vehicles failed to meet at least one of three emissions standards, for nitrous oxide, carbon monoxide and non-methane organic gases.¹⁰ Vehicles newer than 2006 fared slightly better. Still, fully

⁸ Environmental Working Group. “Comments on EPA’s E15 Misfueling Rule (40 CFR Part 80 on November 4, 2010).” Accessed online 4 July 2011 at http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=b33e540b-d305-4ba6-be45-81a0d701ed2b.

⁹ Growth Energy. “In Landmark Move, EPA Approves Higher Ethanol Blend for Vehicles Built in Last Decade.” 21 January 2011. Accessed online 4 July 2011 at <http://www.growthenergy.org/news-media-center/releases/-in-landmark-move-epa-approves-higher-ethanol-blend-for-vehicles-built-in-last-decade/>.

¹⁰ Environmental Working Group. “When It Comes to E15, Never Mind the Data.” 5 May 2011. Accessed online 4 July 2011 at <http://www.ewg.org/agmag/2011/05/when-it-comes-to-e15-never-mind-the-data/>.

one-fifth of vehicles manufactured in 2007 or later failed to meet at least one emissions standard when using E15.

The E15 waiver is based on Section 211(c)(1), a provision in the federal Clean Air Act that allows the EPA to issue regulations to “control or prohibit the manufacture, introduction into commerce, offering for sale, or sale of any fuel or fuel additive for use in a motor vehicle, motor vehicle engine, or nonroad engine or nonroad vehicle (A) if, in the judgment of the Administrator, any fuel or fuel additive or any emission product of such fuel or fuel additive causes, or contributes, to air pollution or water pollution (including any degradation in the quality of groundwater) that may reasonably be anticipated to endanger the public health or welfare, or (B) if emission products of such fuel or fuel additive will impair to a significant degree the performance of any emission control device or system which is in general use, or which the Administrator finds has been developed to a point where in a reasonable time it would be in general use were such regulation to be promulgated.”¹¹

It appears that EPA considered only option B when approving the E15 waiver. It seems to have ignored the act’s first principle -- to protect public health and welfare. The agency approved a fuel known to damage vehicle engines made before 2001 and with some chance of causing newer vehicles to emit excessive pollutants. In its final misfueling rule, EPA admitted that E15 use “could lead to extremely elevated exhaust and evaporative emissions.”¹² EPA issued the waiver despite evidence of increased emissions with use of higher ethanol blends. The waiver directly conflicts with testing by the Department of Energy, the National Renewable Energy Laboratory, the Oak Ridge National Laboratory and the Coordinating Research Council, a non-profit organization that conducts engineering and environmental studies on the engines and petroleum products.¹³

Health hazards of E15 emissions

EPA’s E15 decision presents a clear risk to human health.¹⁴ The more a vehicle burns higher ethanol blends, the more it emits the toxic pollutants acetaldehyde, formaldehyde and nitrous oxide.

Last month, the Department of Health and Human Services officially classified formaldehyde as a “known human carcinogen.”¹⁵ The International Agency For Research on Cancer, an arm of the World Health Organization, also uses that designation. As well, formaldehyde causes severe respiratory tract irritation, chronic bronchitis and airway inflammation.¹⁶

¹¹ U.S. Environmental Protection Agency. “Regulation To Mitigate the Misfueling of Vehicles and Engines With Gasoline Containing Greater Than Ten Volume Percent Ethanol and Modifications to the Reformulated and Conventional Gasoline Programs.” 23 June 2011. Accessed online 4 July 2007 at <http://www.epa.gov/otaq/regs/fuels/additive/e15/mitigate-misfuel-e15.pdf>.

¹² Ibid.

¹³ Coordinating Research Council, Inc. “About CRC.” Accessed online 4 July 2011 at <http://www.crao.com/about/index.html>.

¹⁴ U.S. Environmental Protection Agency. “Health Effects Notebook for Hazardous Air Pollutants.” 2007. Accessed online 17 March 2009 at <http://www.epa.gov/ttn/atw/hlthef/hapindex.html>.

¹⁵ National Institutes of Health – National Toxicology Program. “Formaldehyde.” June 2011. Accessed online 4 July 2011 at <http://www.niehs.nih.gov/about/materials/formaldehydefs.pdf>.

¹⁶ U.S. Environmental Protection Agency. “Health Effects Notebook for Hazardous Air Pollutants.” 2007. Accessed online 4 July 2011 at <http://www.epa.gov/ttn/atw/hlthef/hapindex.html>.

Acetaldehyde is a strong respiratory irritant and toxicant that is especially dangerous to children and adults with asthma.¹⁷ EPA considers acetaldehyde a probable human carcinogen, based on studies in laboratory animals and in exposed workers.¹⁸ Higher concentrations of acetaldehyde in car emissions could lead to increased cancer incidence and greater prevalence of respiratory disorders.

Nitrous oxide emissions aggravate asthma, airway inflammation and respiratory disease.¹⁹ Nitrous oxide contributes to the formation of ground-level ozone, a respiratory toxicant; it is also associated with acid rain as well as with harmful effects on soils and surface waters.²⁰

Misfueling explained

EPA's final rule on misfueling, issued June 27, is aimed at mitigating damage that a fuel like E15 can inflict upon unapproved engines like older cars and trucks and small or off-road engines. EPA's misfueling rule will require gasoline stations to place approved labels on pumps and take other measures to help consumers choose the correct fuel blends for their vehicles or equipment. This rule will not, in fact, avert widespread misfueling and resulting engine warranty problems and needless expense incurred by vehicle owners. The label EPA has designed for gasoline pumps is not sufficient to alert consumers to the hazards of misfueling. EPA has given little guidance as to who, if anyone, will be held responsible when a motorist fills an unapproved vehicle or engine with E15.

Earlier this year, Environmental Working Group called the national headquarters of 13 automobile manufacturers and asked two simple questions:

1. Could vehicles from model years 2001 and later use E15 if it were to come on the market over the next year or so?
2. Would the company's warranty be voided if a vehicle had engine trouble related to E15?

Not a single automobile manufacturer provided detailed answers to our questions.²¹ Four said that engine problems caused by E15 would void their warranties. Most companies passed the buck, recommending that we ask a local dealer or check back later. Four suggested using a high-octane (and

¹⁷ McCarthy, MC, O'Brien, TE, Charrier, JG, and Hafner, HR. "Characterization of the Chronic Risk and Hazard of Hazardous Air Pollutants in the United States Using Ambient Monitoring Data." 2009. *Environmental Health Perspectives* 117(5): pp. 790–96; see also U.S. Environmental Protection Agency. 1991. *Integrated Risk Assessment System (IRIS)*. Acetaldehyde (CASRN 75-07-0). Available: <http://www.epa.gov/iris/subst/0290.htm>

¹⁸ U.S. Environmental Protection Agency. "Acetaldehyde." 6 November 2007. Accessed online 4 July 2011 at <http://www.epa.gov/ttnatw01/hlthef/acetalde.html>.

¹⁹ Weinmayr G, Romeo E, De Sario M, Weiland SK, Forastiere F. 2010. Short-term effects of PM10 and NO2 on respiratory health among children with asthma or asthma-like symptoms: a systematic review and meta-analysis. *Environ Health Perspect* 118(4): 449-57.

²⁰ U.S. Environmental Protection Agency. "National Air Quality - Status and Trends through 2007 EPA-454/R-08-006." 2008. Accessed online 20 January 2009 at <http://www.epa.gov/airtrends/2008/index.html>.

²¹ Environmental Working Group. "You Could Be On Your Own If Ethanol Messes up Your Engine." 9 May 2011. Accessed online 4 July 2011 at <http://www.ewg.org/agmag/2011/05/you-could-be-on-your-own-if-ethanol-messes-up-your-engine/>.

more expensive) blend. Only Chevrolet said its warranty would *not* be voided by E15-related damage if the correct octane level had been used.

Small engines such as lawnmowers, outboard motors and chainsaws are even more vulnerable to E15-related damage because they were not manufactured to run on higher ethanol blends. The small engine industry has petitioned EPA to ensure that E10 will still be available. EPA denied this request last week.

In the end, it seems that consumers, convenience store owners, car companies, local dealers and small engine manufacturers will be on their own to sort out the risks of E15.

Leaking underground storage tanks

In its recent guidance, EPA has reported that ethanol is more corrosive than gasoline and can cause underground gasoline storage tanks to leak. We suggested that EPA determine the implications of storing higher blends of ethanol in these tanks. Since researchers have established that storing gasoline-ethanol blends in incompatible tanks can cause leaks, EPA should assess the increased risk of soil and water contamination before it allows E15 to be introduced. We thank this committee for taking leadership on this important issue.

Biofuels policy on wrong track

The many uncertainties surrounding E15 are symptoms of a much larger problem. Our nation's biofuel policy is on the wrong track. The Renewable Fuel Standard, set in the 2007 energy bill, calls for production of 36 billion gallons of renewable fuels by 2022. In practice, this standard does little or nothing to accomplish Congress' primary objective—to bring to market a new generation of so-called advanced biofuels that do not compete with food crops. More than 90 percent of ethanol produced in the U.S. is refined from corn. Corn ethanol production — conceived as a first-generation biofuel solution — continues to exceed the maximum production level set by the Renewable Fuel Standard mandate. At the same time, production of cellulosic biofuels has lagged. EPA has been forced to reduce mandates for them by more than 90 percent over the past two years.

The notion that the Renewable Fuel Standard set up corn ethanol as a bridge to better advanced biofuels is simply false. Corn ethanol is proving to be a bridge to nowhere.

Meanwhile, corn ethanol production consumes a disproportionate share of renewable energy tax credits. The Biomass Crop Assistance Program, an offshoot of the U.S. Department of Agriculture's Farm Service Agency that intended to facilitate the development of cellulosic biofuels, has veered seriously off track. Instead of funding crops like switchgrass, envisioned as a cellulosic feedstock, more than 80 percent of this program's budget has gone to existing pulp and paper companies.

This year, Congress has considered bills and amendments to limit funding for ethanol blender pumps and to repeal the Volumetric Ethanol Excise Tax Credit. EWG and at least 89 other organizations

support repealing this tax credit this year.²² We have urged Congress not to spend scarce taxpayer funds on blender pumps and other corn ethanol infrastructure. Wasting money on corn ethanol will only lock in this environmentally unsustainable fuel while locking out alternatives, among them drop-in fuels -- those made from switchgrass, wood and crop residues and algae -- that do not require special infrastructure.

The Department of Energy has recently announced grants and loan guarantees for research and development of advanced drop-in biofuels, following 2009 recommendations of the Interagency Task Force on Biofuels.²³ Meanwhile, in April, USDA announced an interim final rule that would make ethanol blender pumps eligible for Rural Energy for America Program funding.²⁴ Congress created the program to fund solar, wind, hydropower and energy efficiency projects that have true potential to reduce dependence on foreign oil and create rural jobs. Funding blender pumps will accomplish neither of these goals. The taxpayers will subsidize the corn ethanol industry once again.

It is time to take a fresh look at our biofuels and transportation fuel policies. The first and immediate priority should be to reduce overall gasoline consumption by improving vehicle fuel efficiency, supporting alternative transportation opportunities and other such measures. We should follow the recommendations of the Interagency Task Force on Biofuels and focus on bringing advanced drop-in fuels to commercialization. We should undertake careful assessments of the performance of advanced biofuels before forcing them onto the market or spending large amounts of taxpayer dollars on subsidies and other incentives.

It is critical that federal policy encourage those biofuels that are compatible with existing infrastructure, that conserve soil, water, air and wildlife habitat, that do not compete with the food supply and that do not use land that is used for food production. We cannot make the same mistakes that were made with corn ethanol.

We believe that EPA's recent E15 waiver runs counter to scientific evidence that mid-level ethanol blends worsen pollution. We support the committee's draft legislative language calling for a study by the National Academy of Sciences of the implications for public health of mid-level ethanol blends.

We thank the committee for holding this important hearing. We look forward to working with you to ensure that E15 is not prematurely introduced into our fuel supply at the expense of consumers, the environment and public health.

²² National Resources Defense Council. "Coalition of 90 Group Urges Congress to End Corn Ethanol Subsidies." 1 March 2011. Accessed online 4 July 2011 at http://switchboard.nrdc.org/blogs/slyutse/today_a_whopping_87_organizati.html.

²³ The White House. "Growing America's Fuel: An Innovation Approach to Achieving the President's Biofuels Target." 3 February 2010. Accessed online 4 July 2011 at http://www.whitehouse.gov/sites/default/files/rss_viewer/growing_americas_fuels.PDF.

²⁴ U.S. Department of Agriculture. "Rural Energy for America; Final Rule." 14 April 2011. Accessed online 4 July 2011 at http://www.agri-pulse.com/uploaded/REAP_14Apr11.pdf.