# REQUEST FOR CORRECTION OF INFORMATION

**submitted on behalf of**

**THE ENERGY FUTURE COALITION, URBAN AIR INITIATIVE, and**

**GOVERNORS' BIOFUELS COALITION**

**Concerning the U.S. Environmental Protection Agency's**

**LIFECYCLE ANALYSIS OF ETHANOL AND GASOLINE**

**UNDER THE RENEWABLE FUEL STANDARD**

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## EXECUTIVE SUMMARY

The Energy Future Coalition, Urban Air Initiative, and Governors' Biofuels Coalition (Petitioners) respectfully petition the United States Environmental Protection Agency (EPA) to correct information concerning ethanol's lifecycle emissions of greenhouse gas (GHG) and other pollutants. This information was first published in the Regulatory Impact Analysis (2010 Lifecycle Analysis) accompanying EPA's 2010 Renewable Fuel Standard (RFS) Rule and in EPA's 2011 First Triennial Report to Congress on the environmental impacts of the RFS. EPA continues to use this information in recent RFS rules and other regulatory actions and to publish it on the Agency's website.

EPA's information on ethanol's lifecycle emissions is inaccurate and outdated. Contrary to the Agency's 2010 Lifecycle Analysis and its 2011 Report to Congress, the best available science shows that blending ethanol into gasoline has significantly reduced emissions of GHGs and other air pollutants and that displacing gasoline with higher concentrations of ethanol would reduce emissions even further. EPA's continued reliance on erroneous lifecycle estimates will result in damaging legislative and regulatory biofuel policies. And continued dissemination of this misleading information distorts the public's perception of the nation's only viable low-carbon transportation fuel.

EPA should correct its 2010 Lifecycle Analysis for future RFS rules, submit a corrected triennial report to Congress (now two years overdue), and cease to rely upon and disseminate its current, erroneous information. EPA's ethanol lifecycle emissions estimates were inaccurate when they were published six years ago, and they have only become more inaccurate in the intervening years as ethanol production has become cleaner and gasoline has become dirtier.

### GREENHOUSE GAS EMISSIONS

New evidence shows that GHG emissions from ethanol are lower than EPA predicted in its 2010 Lifecycle Analysis, and much lower than the lifecycle emissions of gasoline. In particular, new evidence shows that:

- Increased demand for corn causes much less land-use change and related emissions than EPA predicted in 2010. This evidence includes improved economic models and newly available land-use data from periods of increasing corn ethanol production, which show significant increases in yield but no significant increases in forest conversion.
- Improved agricultural practices and technologies are substantially reducing the carbon intensity of ethanol by increasing the ability of soil to capture and retain carbon deep below ground. This evidence includes updated science on soil organic carbon, which indicates that best tillage practices sequester more carbon in the soil than previously thought. In fact, the evidence suggests that many corn fields are net carbon "sinks," capturing more carbon than land-use change and corn farming releases.
- More efficient agricultural practices and technologies have also reduced the per bushel amount of nitrogen fertilizer applied to the corn crop and converted into the greenhouse gas nitrous oxide ($N_2O$).
- Biorefineries have become much more efficient, using less natural gas and electricity to produce each gallon of ethanol. Biorefineries are also producing new co-products that reduce the carbon intensity of ethanol. These include distillers' grains, which is used as animal feed; corn oil, which replaces soy-based biodiesel; and other co-products that lower the carbon intensity of corn ethanol.
- By contrast, petroleum-based fuels are becoming increasingly carbon-intensive. As a result, the gasoline carbon intensity baseline should be significantly higher than EPA suggested, increasing the comparative benefit of ethanol.

Considered in light of this new evidence, the lifecycle GHG benefits of the RFS are much greater than EPA predicted. Indeed, blending the volumes of renewable fuel called for by the RFS through 2022 would result in substantial cumulative reductions in carbon emissions—the RFS has already prevented more than 354 million metric tons of GHG pollution, according to a recent conservative estimate, and it will result in even higher savings in the future.

EPA should also consider the following information when updating its lifecycle analysis:

- Any initial $CO_2$ emissions associated with the initial implementation of the RFS are now "sunk costs," since corn ethanol has already reached the levels projected by the RFS. Thus, continued ethanol use is substantially less carbon-intensive than EPA suggested in 2010 and offers net GHG savings compared to the gasoline it displaces.

- Other tailpipe emissions associated with conventional gasoline aromatic hydrocarbons (which ethanol can replace), produce non-GHG "climate forcing agents" such as black carbon that contribute to climate change, whereas ethanol *reduces* those emissions.
- Ethanol's pollution-reducing benefits could be even greater if it were used to produce higher-octane fuel blends, replacing toxic and carbon-intensive fuel additives while allowing carmakers to increase vehicle fuel economy through next-generation engine design.

In light of this new evidence, EPA should correct its 2010 Lifecycle Analysis to conform to the best available science.

**CONVENTIONAL AIR POLLUTANTS**

Like EPA's GHG analysis, the Agency's 2010 Lifecycle Analysis and the 2011 Report to Congress also contain erroneous estimates of ethanol's effect on emissions of non-GHG (or "conventional") pollutants. In particular, new evidence shows that:

- The farming technologies that have increased yields and lowered carbon intensity have also reduced emissions of conventional air pollutants.
- Improved control technologies and other innovations have lowered emissions from biorefineries.
- U.S. gasoline is increasingly produced from "tight oil," which does more damage to the nation's air quality because it is produced domestically and because it produces higher air toxic emissions during extraction and refining.
- The negative health effects of aromatics—the octane additives in gasoline that are displaced by ethanol—are worse than previously estimated, increasing urban particulate matter and other air toxics.

The latest fuel effects studies also show that EPA erred in its estimate of tailpipe emissions from E10. In particular, new evidence shows that:

- E10 reduces benzene, toluene, ethylbenzene, and xylene emissions.
- E10 reduces particulate matter, especially in modern gasoline direct injection engines.
- E10 also reduces dangerous polycyclic aromatic hydrocarbons, as well as secondary organic aerosols.
- E10 has little or no effect on nitrogen oxides; in modern engines with oxygen sensors, E10 reduces nitrogen oxide emissions.

- E10 does not increase volatile organic compound emissions. In fact, ethanol reduces these emissions when it is blended into gasoline in higher volumes.

In addition to the emissions reductions ethanol has already achieved, transitioning to gasoline blends with a higher ethanol content, such as E30, would significantly reduce lifecycle emissions and improve air quality.

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A review of the scientific literature confirms that EPA fundamentally erred in the conclusions it reached about the lifecycle emissions of GHGs and other pollutants from ethanol. Despite significant improvements in the relevant technology and a growing body of updated scientific studies, EPA continues to regulate on the basis of its 2010 Lifecycle Analysis, relying on it as recently as last month in a new fuel pathway determination and last year in the 2014–2016 RFS Standards. And EPA continues to publish its outdated 2011 Report to Congress online, having failed to correct its inaccurate information in a follow-up triennial report, as the law requires. Petitioners therefore urge EPA to correct its analysis of the comparative lifecycle pollution effects of ethanol and gasoline in light of the best available science. Continued dissemination of and reliance on erroneous estimates undermines the scientific basis for important policy decisions in the critical area of fuel regulation.