

## EPA Issues Supplemental Determination for Renewable Fuels Produced under the Final RFS2 Program from Grain Sorghum

The U.S. Environmental Protection Agency (EPA) is issuing a supplemental rule associated with the Renewable Fuel Standard (RFS) program. This final rule contains a lifecycle greenhouse gas (GHG) analysis for grain sorghum ethanol and a regulatory determination that grain sorghum ethanol qualifies as a renewable fuel under the RFS Program.

EPA's analysis indicates that ethanol made from grain sorghum at dry mill facilities that use natural gas for process energy meets the lifecycle GHG emissions reduction threshold of 20% compared to the baseline petroleum fuel it would replace, and therefore qualifies as a renewable fuel. It also contains our regulatory determination that grain sorghum ethanol produced at dry mill facilities using specified forms of biogas for both process energy and most electricity production, has lifecycle GHG emission reductions of more than 50% compared to the baseline petroleum fuel it would replace, and that such grain sorghum ethanol qualifies as an advanced biofuel under the RFS program.

### General Background

In the March, 2010 RFS2 final rule, EPA assessed the lifecycle GHG emissions of multiple renewable fuel pathways (defined as feedstock, fuel type, and fuel production process). Assessment of lifecycle GHG emissions is necessary to determine which fuel pathways meet the GHG reduction thresholds for the four renewable fuel

categories specified in Clear Air Act (CAA) Section 211 (o), as amended by the Energy Independence and Security Act of 2007 (EISA). The CAA requires a 20% reduction in lifecycle GHG emissions for renewable fuel produced at new facilities (those constructed after EISA enactment), a 50% reduction for biomass-based diesel or advanced biofuel, and a 60% reduction for cellulosic biofuel.

Assessing whether a fuel pathway meets these thresholds requires a comprehensive evaluation of the lifecycle GHG emissions of the renewable fuel as compared to the lifecycle GHG emissions of the gasoline or diesel fuel that it replaces. The CAA defines lifecycle GHG emissions as follows:

The term ‘lifecycle greenhouse gas emissions’ means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.<sup>1</sup>

In the March, 2010 RFS2 final rule, EPA focused our lifecycle analysis on fuels that were anticipated to contribute relatively large volumes of renewable fuel by 2022, and thus did not cover all fuels that either are contributing or could potentially contribute to the program. In the preamble to the March, 2010 RFS2 final rule, EPA indicated that we would continue to examine several additional pathways not analyzed for the final rule, including those from grain sorghum, and would complete this process through a supplemental rulemaking process. On June 12, 2012, EPA published a Notice of Data Availability Concerning Renewable Fuels Produced From Grain Sorghum Under the RFS Program (see 77 FR 34915). In that notice of data availability, we provided an opportunity for comment on EPA’s analysis of grain sorghum used as a feedstock to produce ethanol under the RFS program. This supplemental rulemaking finalizes our analysis of potential pathways for ethanol produced from a grain sorghum feedstock.

## Lifecycle Analysis

In order to calculate lifecycle GHG emissions for the supplemental final rulemaking regarding grain sorghum biofuel pathways, EPA utilized models developed for the March, 2010 RFS2 final rule. These models take into account energy and emissions inputs for fuel and feedstock production, distribution, and use, as well as economic models that predict changes in agricultural markets.

EPA used the same general approach to estimate global land use change GHG emissions from using grain sorghum as a feedstock as we have used to analyze other biofuel pathways.

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<sup>1</sup> Clean Air Act Section 211(o)(1)

## Pathway Determinations

EPA's analysis found that ethanol produced from grain sorghum has an estimated lifecycle GHG emissions reduction of 32% when produced at dry mill ethanol facilities that use natural gas and produced an industry average of 92% wet distillers grains, and 52% when produced at dry mill ethanol facilities that use only biogas for process energy and purchase/receive from an off-site supplier 0.15 kWh of electricity per gallon of ethanol produced, compared to the baseline gasoline fuel it would replace. Therefore, grain sorghum ethanol produced at dry mill ethanol facilities using natural gas meets the minimum 20% GHG emissions reduction threshold for conventional biofuels, and grain sorghum ethanol produced at plants using only biogas for process energy and purchasing/receiving from an off-site supplier no more than 0.15 kWh of electricity per gallon of ethanol produced, meets the 50% GHG emissions reduction threshold for advanced biofuels as required by EISA.

## For More Information

You can access documents on RFS regulations on EPA's Office of Transportation and Air Quality (OTAQ) website at:

[www.epa.gov/otaq/fuels/renewablefuels/regulations.htm](http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm)

To submit a question on the RFS program, and to view Frequently Asked Questions, please visit:

[www.epa.gov/otaq/fuels/renewablefuels/compliancehelp/index.htm](http://www.epa.gov/otaq/fuels/renewablefuels/compliancehelp/index.htm)

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