UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR - 6 2014

OFFICE OF
AIR AND RADIATION

Mr. Robert Toth
Plant Manager
E-Energy Adams, LLC
13238 East Aspen Road
Adams, Nebraska 68301

Dear Mr. Toth:

You petitioned the Agency on behalf of E-Energy Adams, LLC to approve a pathway for the generation of renewable fuel RINs under the renewable fuel standard ("RFS") program for the production of ethanol for expanded capacity above the facility's baseline volume that is exempted from the requirement of having a 20% reduction in GHG lifecycle emissions. E-Energy Adams's facility, located in Adams, Nebraska, receives and processes corn kernels for use as a feedstock and produces ethanol from corn starch using a dry mill process; total energy use is no more than 24,000 Btus of natural gas per gallon of ethanol produced and no more than 2,600 Btus of grid electricity per gallon of ethanol produced (the "E-Energy Adams Process").

Through the petition process described under 40 CFR 80.1416, E-Energy Adams submitted data to the U.S. Environmental Protection Agency to perform a lifecycle greenhouse gas emissions analysis of their ethanol production process. EPA's analysis involved a straightforward application of the same methodology and much of the same modeling used for the final rule published on March 26, 2010 (75 FR 14670)("the March 2010 RFS rule"). The difference between this analysis and the analyses completed for the March 2010 RFS rule is the evaluation of a modified fuel production process.

The attached document "E-Energy Adams, LLC Request for Fuel Pathway Determination under the RFS Program" describes the data submitted by E-Energy Adams, the analysis conducted by the EPA, and our determination of the lifecycle greenhouse gas emissions associated with the fuel production pathway described in E-Energy Adams's petition.

Based on our assessment, fuel produced pursuant to the E-Energy Adams Process qualifies under the Clean Air Act (CAA) for renewable fuel (D-code 6) RINs, assuming the fuel meets the conditions and associated regulatory provisions discussed in the attached document, and the other definitional criteria for renewable fuel (e.g., production from renewable biomass, and used to reduce or replace petroleum-based transportation fuel, heating oil or jet fuel) specified in the CAA and EPA implementing regulations.

This approval applies specifically to E-Energy Adams, LLC, and to the process, materials used, fuel produced, and process energy sources as outlined and described in the petition request submitted by E-Energy Adams.

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow E-Energy Adams to register and generate RINs for the production of ethanol from corn starch feedstock above the facility's baseline volume that is exempted from the requirement of having a 20% reduction in GHG lifecycle emissions using a production process of "E-Energy Adams Process." This document has no impact on the ability of E-Energy Adams to use the OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application to register and generate RINs for the facility's baseline volume of fuel using a production process of "Grandfathered (Dry Mill, Natural Gas Fired)."

Sincerely,

Christopher Grundler,
Office of Transportation and Air Quality

Enclosure

E-Energy Adams, LLC Request for Fuel Pathway Determination under the RFS Program
Office of Transportation and Air Quality

Summary: E-Energy Adams, LLC petitioned the Agency to approve their generation of renewable fuel RINs (D-code 6) under the renewable fuel standard ("RFS") program for the production of ethanol for expanded capacity above the facility's baseline volume that is exempted from the requirement of having a 20% reduction in GHG lifecycle emissions. E-Energy Adams's facility, located in Adams, NE, receives and processes corn kernels for use as a feedstock and produces ethanol from corn starch using a dry mill process; total energy use is no more than 24,000 Btus of natural gas per gallon of ethanol produced and no more than 2,600 Btus of grid electricity per gallon of ethanol produced (the "E-Energy Adams Process").[1]

Through the petition process described under 40 CFR 80.1416, E-Energy Adams submitted data to EPA to perform a lifecycle greenhouse gas emissions analysis of their ethanol production process. EPA's analysis involved a straightforward application of the same methodology and much of the same modeling used for the final rule published on March 26, 2010 (75 FR 14670)("the March 2010 RFS rule"). The difference between this analysis and the analyses completed for the March 2010 RFS rule is the evaluation of a modified fuel production process.

As outlined in the preamble to the March 2010 RFS rule, the E-Energy Adams Process is the type of new pathway that EPA envisioned would be evaluated by comparing the applicant's fuel pathway to pathway(s) that EPA has already analyzed. EPA performed its assessment of E-Energy Adams's process based on the modeling done for the corn starch ethanol pathways analyzed as part of the March 2010 RFS rule (the "2010 corn ethanol pathways"). Our analysis shows that the GHG impacts related to corn starch ethanol production for the process described in E-Energy Adams's petition are slightly lower than the comparable emission impacts for the 2010 corn ethanol pathways because the process consumes less natural gas and electricity per gallon of ethanol produced and has a slightly higher fuel yield in terms of gallons of ethanol produced per bushel of corn. Based on the data submitted and the existing modeling for the 2010 corn ethanol pathways, EPA conducted a lifecycle assessment and determined that the process described in E-Energy Adams's petition achieves a 25% reduction in GHG emissions compared to the gasoline fuel baseline. In this determination EPA is specifying certain conditions on the maximum amount of natural gas and electricity that may be consumed per gallon of ethanol produced using the approved E-Energy Adams Process. These specifications (no more than 24,000 Btus of natural gas per gallon of ethanol produced and no more than 2,600 Btus of grid electricity per gallon of ethanol produced) are based on the maximum amount of energy that can be used per gallon of ethanol produced while still meeting the required 20% GHG reduction, and conservatively assuming that E-Energy Adams achieves the industry average fuel yield

[1] For the purposes of this decision letter, Btus of natural gas are expressed on a lower heating value (LHV) basis and gallons of ethanol are expressed on an undenatured (neat) basis unless otherwise specified.

per bushel of corn feedstock. Based on our assessment, the fuel produced through the E-Energy Adams Process satisfies the 20% GHG reduction requirement for the generation of RINs for renewable fuel (D-code 6).

This document is organized as follows:

- *Section I. Required Information and Criteria for Petition Requests*: This section contains information on the background and purpose of the petition process, the criteria EPA uses to evaluate the petitions and the information that is required to be provided under the petition process as outlined in 40 CFR 80.1416. This section is not specific to E-Energy Adams's request and applies to all petitions submitted pursuant to 40 CFR 80.1416.
- *Section II. Available Information*: This section contains background information on E-Energy Adams and describes the information that E-Energy Adams provided and how it complies with the petition requirements outlined in Section I.
- *Section III. Analysis and Discussion*: This section describes the lifecycle analysis done for the process described in E-Energy Adams's petition and identifies how it differs from the analysis done for the corn starch ethanol pathway analyzed as part of the March 2010 RFS rule. This section also describes how we have applied the lifecycle results to determine the appropriate D-Code for the E-Energy Adams Process.
- *Section IV. Conditions and Associated Regulatory Provisions:* This section describes the regulatory provisions associated with this petition and the maximum amount of process energy use per gallon of fuel produced that is permissible under the approved E-Energy Adams Process.
- *Section V. Public Participation*: This section describes our administrative process to consider E-Energy Adams's petition and explains how this petition analysis is an extension of the analysis done as part of the March 2010 RFS rule.
- *Section VI. Conclusion*: This section summarizes our conclusions regarding E-Energy Adams's petition, including the D-code E-Energy Adams may use in generating RINs for fuel produced using the E-Energy Adams Process.

I. Required Information and Criteria for Petition Requests

A. Background and Purpose of Petition Process

As a result of changes to the Renewable Fuel Standard program in Clean Air Act ("CAA") section 211(o), as amended by the Energy Security and Independence Act of 2007 ("EISA"), EPA adopted new regulations, published at 40 CFR 80.1400 *et. seq*. The RFS program regulations specify the types of renewable fuels eligible to participate in the RFS program and the procedures by which renewable fuel producers and importers could generate Renewable Identification Numbers ("RINs") for the qualifying renewable fuels they produce through approved fuel pathways. *See* 75 FR 14670 (March 26, 2010); 75 FR 26026 (May 10, 2010); 75 FR 37733 (June 30, 2010); 75 FR 59622

(September 28, 2010); 75 FR 76790 (December 9, 2010); 75 FR 79964 (December 21, 2010); 77 FR 1320 (January 9, 2012); 77 FR 74592 (December 17, 2012); 78 FR 41703 (July 11, 2013); and 78 FR 62462 (October 22, 2013).

Pursuant to 40 CFR 80.1426(f)(1):

> *Applicable pathways.* D-codes shall be used in RINs generated by producers or importers of renewable fuel according to the pathways listed in Table 1 to this section, subparagraph 6 of this section, or as approved by the Administrator.

Table 1 to 40 CFR 80.1426 lists the three critical components of a fuel pathway: (1) fuel type; (2) feedstock; and (3) production process. Each specific combination of the three components, or fuel pathway, is assigned a D-code. EPA may also independently approve additional fuel pathways not currently listed in Table 1 for participation in the RFS program, or a third party may petition for EPA to evaluate a new fuel pathway in accordance with 40 CFR 80.1416. In addition, producers of facilities identified in 40 CFR 80.1403 (c) and (d) that are exempt from the 20% GHG emissions reduction requirement of the Act may generate RINs with a D-code of 6 pursuant to 40 CFR 80.1426(f)(6) for a specified baseline volume of fuel, assuming all requirements other than the 20% GHG reduction provision are satisfied.

The petition process under 40 CFR 80.1416 allows parties to request that EPA evaluate a new fuel pathway's lifecycle GHG reduction and provide a determination of the D-code for which the new pathway may be eligible. In the event that EPA determines that the pathway described in a petition qualifies for a D-code, EPA will consider extending a similar approval to other petitioners utilizing the same fuel pathway upon verification that the pathway is indeed the same, assuming all other requirements are met.

B. Required Information in Petitions

As specified in 40 CFR 80.1416(b)(1), petitions must include all of the following information, and should also include as appropriate supporting documents such as independent studies, engineering estimates, industry survey data, and reports or other documents supporting any claims:

- The information specified under § 80.76 (registration of refiners, importers or oxygenate blenders).
- A technical justification that includes a description of the renewable fuel, feedstock(s), and production process. The justification must include process modeling flow charts.
- A mass balance for the pathway, including feedstocks, fuels produced, co-products, and waste materials production.
- Information on co-products, including their expected use and market value.

- An energy balance for the pathway, including a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
- Any other relevant information, including information pertaining to energy saving technologies or other process improvements.
- Other additional information as requested by the Administrator to complete the lifecycle greenhouse gas assessment of the new fuel pathway.

In addition to the requirements stated above, parties who use a feedstock not previously evaluated by EPA must also include the following, and should also include as appropriate supporting information such as state, county, or regional crop data, commodity reports, independent studies, industry or farm survey data, and reports or other documents supporting any claims:

- Type of feedstock and description of how it meets the definition of renewable biomass.
- Market value of the feedstock.
- List of other uses for the feedstock.
- List of chemical inputs needed to produce the renewable biomass source of the feedstock and prepare the renewable biomass for processing into feedstock.
- Energy needed to obtain the feedstock and deliver it to the facility. If applicable, identify energy needed to plant and harvest the source of the feedstock and modify the source to create the feedstock.
- Current and projected yields of the feedstock that will be used to produce the fuels.
- Other additional information as requested by the Administrator to complete the lifecycle greenhouse gas assessment of the new fuel pathway.

II. Available Information

A. Background on E-Energy Adams

E-Energy Adams submitted a petition requesting authorization to generate D-code 6 RINs for fuel produced through the E-Energy Adams Process. A petition is required because the E-Energy Adams Process is not included as an approved process in Table 1 to 40 CFR 80.1426. Table 1 (relevant portions of which are reproduced below) includes pathways for ethanol from corn starch, but requires that fuel producers dry no more than 50% of the distillers grains with solubles (DGS) that they produce or use two advanced technologies listed in Table 2 to 40 CFR 80.1426 E-Energy Adams dries more than 50% of the DGS that is produces on an annual basis and does not use any of the advanced technologies listed in Table 2 to 40 CFR 80.1426. As a result, fuel produced pursuant to the E-Energy Adams Process does not qualify for the generation of RINs under any of the existing pathways in Table 1 to 40 CFR 80.1426.

E-Energy Adams's petition states that their baseline volume of grandfathered fuel is approximately 63 million gallons per year of denatured ethanol. E-Energy Adams has petitioned EPA to receive approval under the RFS regulations to generate RINs for volumes it produces pursuant to the E-Energy Adams Process.[2]

B. Information Available Through Existing Modeling

A fuel pathway under the RFS regulations is defined by three components: (1) fuel type; (2) feedstock; and (3) production process. For the pathway addressed in E-Energy Adams's petition, E-Energy Adams would use a feedstock – corn starch – that has already been analyzed as part of the March 2010 RFS rule, as noted in Table 1. As a result, no new feedstock modeling was required as modeling for corn starch was already done as part of the March 2010 RFS rule. Similarly, no new emissions impact modeling of using ethanol as a transportation fuel was required as that was already done as part of the March 2010 RFS rule. This petition only requires EPA to evaluate a modified fuel production process for an existing fuel type.

Table 1: Relevant Existing Corn Ethanol Fuel Pathways from 40 CFR 80.1426

Fuel Type	Feedstock	Production Process Requirements	D-Code
Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least two advanced technologies from Table 2 to this section	6 (Renewable Fuel)
Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least one of the advanced technologies from Table 2 to this section plus drying no more than 65% of the distillers grains with soluble it markets annually	6 (Renewable Fuel)
Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and drying no more than 50% of the distillers grains with soluble it markets annually	6 (Renewable Fuel)

[2] This determination document has no impact on baseline production volumes for purposes of registration pursuant to 40 CFR 80.1450.

The same analytical approach that was used to evaluate the lifecycle GHG emissions of the existing pathways noted above was used to analyze the process described in E-Energy Adams's petition. The preamble to the March 2010 RFS rule describes the modeling approach used to estimate lifecycle GHG emissions from corn starch ethanol. The preamble describes the models and data used as well as the input and output streams from those models to calculate the emissions for each of the lifecycle stages. To modify the corn starch ethanol analysis to reflect the process described in E-Energy Adams's petition, the only change required was replacing the corn ethanol production process data with the E-Energy Adams process data. This resulted in the following changes to the modeling (described in more detail in the following sections):

- Amount of corn used in the fuel production process was decreased to reflect E-Energy Adams's process yield in terms of bushels of corn input per gallons of ethanol produced; and
- Amount of energy used by the fuel production process and associated emissions from fuel production and use was changed to reflect data provided in E-Energy Adams's energy balance.

This was a straightforward analysis based on existing modeling done for the March 2010 RFS rule and substituting E-Energy Adams's proprietary process data, which only altered the amounts of inputs and outputs. The analyses completed for EPA's response to E-Energy Adams's petition utilizes the same fundamental modeling approach as was used in the March 2010 RFS rule analyses.

C. Information Submitted by E-Energy Adams

E-Energy Adams has supplied all the required information on their production process that EPA needs to analyze the lifecycle GHG emissions associated with the process at their Adams, NE facility. Information submitted includes a technical justification that has a description of the fuel, feedstocks used, and their proprietary production process with modeling flow charts, a detailed mass and energy balance of the process with information on co-products as applicable, and other additional information as needed to complete the lifecycle greenhouse gas assessment.

III. Analysis and Discussion

A. Lifecycle Analysis

Determining a fuel pathway's compliance with the lifecycle GHG reduction thresholds specified in the CAA for different types of renewable fuel requires a comprehensive evaluation of the renewable fuel, as compared to the gasoline or diesel fuel that it replaces, on the basis of its lifecycle GHG emissions. As mandated by the CAA, the GHG emissions assessments must evaluate the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions

such as significant emissions from land use changes) related to the fuel's full lifecycle, including all stages of fuel and feedstock production, distribution, and use by the ultimate consumer.

In examining the full lifecycle GHG impacts of renewable fuels for the RFS program, EPA considers the following:

- Feedstock production – based on agricultural sector models that include direct and indirect impacts of feedstock production.
- Fuel production – including process energy requirements, impacts of any raw materials used in the process, and benefits from co-products produced.
- Fuel and feedstock distribution – including impacts of transporting feedstock from production to use, and transport of the final fuel to the consumer.
- Use of the fuel – including combustion emissions from use of the fuel in a vehicle.

EPA's evaluation of the lifecycle GHG emissions from the process described in E-Energy Adams's petition request is consistent with the CAA's applicable requirements, including the definition of lifecycle GHG emissions and threshold evaluation requirements. It was based on information regarding E-Energy Adams's production process that was submitted under a claim of Confidential Business Information (CBI) by E-Energy Adams on May 25, 2012. The information provided included the mass and energy balances necessary for EPA to evaluate the lifecycle GHG emissions of E-Energy Adams's process.

The lifecycle GHG emissions of fuel produced using the process described in E-Energy Adams's petition were determined as follows:

Feedstock production – The process described in E-Energy Adams's petition uses corn starch as a feedstock for the production of ethanol. As previously noted, corn starch is one of the feedstocks already listed in Table 1 to § 80.1426 of the RFS regulations. Since corn starch has already been evaluated as part of the March 2010 RFS rule, no new feedstock production modeling was required.

The FASOM and FAPRI models were used to analyze the GHG impacts of the feedstock production portion of the fuel's lifecycle. The same FASOM and FAPRI results representing the emissions from an increase in corn production that were generated as part of the March 2010 RFS rule analysis of the corn ethanol pathways were used in our analysis of the process described in E-Energy Adams's petition. These results represent agriculture / feedstock production emissions for a certain quantity of corn produced. For the analysis in the March 2010 RFS rule, we found that roughly 960 million bushels of corn is used to produce 2.6 billion gallons of fuel, and we calculated GHG emissions from feedstock production for that amount of corn. For the 2010 corn ethanol pathways, the use of 960 million bushels of corn resulted in approximately 197,480,000 mmBtu of corn ethanol produced, based on a yield of 2.71 gallons ethanol per bushel of corn and a lower heating value (LHV)

of 76,000 Btus per gallon of ethanol. The FASOM and FAPRI agricultural sector GHG results were divided by the total energy value of fuel produced to get emissions per mmBtu of ethanol.

E-Energy Adams's process for converting corn into ethanol is the same as that modeled as part of the March 2010 RFS rule. Therefore, the existing agricultural sector modeling analyses for corn as a feedstock remain valid for use in estimating the lifecycle impact of renewable fuel produced using the process described in E-Energy Adams's petition. E-Energy Adams submitted data from calendar year 2011 indicating that their process yield in terms of gallons of fuel produced per bushel of corn is greater than what was modeled as part of the March 2010 RFS rule for an average dry mill corn ethanol production facility in 2022 ("2022 average dry mill"). Therefore, the lifecycle GHG emissions from feedstock production and transport for the process described in E-Energy Adams's petition are lower, on a per Btu of ethanol basis, than the corresponding emissions for a 2022 average dry mill estimated by EPA for the March 2010 RFS rule, as shown in Table 5.

Fuel production – E-Energy Adams's fuel production method involves the production of ethanol from corn starch in a dry mill process. However, the process described in E-Energy Adams's petition is more efficient in terms of energy use than the corn ethanol pathways that were analyzed under the March 2010 RFS rule. According to E-Energy Adams this is because they dry their DGS less than a typical dry mill ethanol plant.

The process described in E-Energy Adams's petition produced three varieties of DGS based on moisture content. According to the petition, 8% of the DGS is dried to a moisture content of 10% or less, producing a product called dry DGS (DDGS). The petition stated that 92% of the DGS is dried to approximately 50% moisture content producing a product called modified DGS (MDGS). Because drying DGS is relatively energy intensive, producing less DDGS reduces energy use (e.g., natural gas) and associated GHG impacts.

To analyze the GHG impacts of E-Energy Adams's process, EPA utilized the same approach that was used to determine the impacts of processes in the corn starch ethanol pathways analyzed in the March 2010 RFS rule, taking into account the differences noted above. The GHG emissions for the fuel production component of the E-Energy Adams's process were based on an assessment of the type and amount of energy used and associated emissions per mmBtu of fuel produced.

The amount and type of energy used was taken from the information submitted to EPA on E-Energy Adams's mass balance and energy balance. E-Energy Adams submitted energy data on natural gas (in mmBtus) and electricity (in MWhs) inputs, as well as gallons of fuel produced. Natural gas and grid electricity are the only sources of energy used at E-Energy Adams's facility, according to their petition. E-Energy Adams provided an energy balance reporting the amount of energy used from the point of delivery of the feedstock material to E-Energy Adams's Adams, NE facility, through the fuel

and co-product production plant and associated equipment, to the point of final storage of the end product fuel and co-products at the Adams, NE facility ("feedstock, fuel and co-product operations").

E-Energy Adams has a tower grain dryer co-located with its dry mill ethanol plant in Adams, NE. Generally, harvested corn requires further drying after it is harvested and before it is ground into powder for use in a dry mill ethanol production process. Such drying generally takes place at farms, grain elevators or ethanol plants. E-Energy Adams uses its tower dryer when it receives corn that has not been sufficiently dried, for example when farmers deliver undried corn directly to the plant or when weather conditions make the delivered corn unusually damp. EPA's modeling for the March 2010 RFS rule assumed that on average corn drying, with propane and electricity as process energy, is required to remove moisture from the corn before it is used in dry mills, and the emissions from such drying were accounted for as part of the FASOM modeling for the March 2010 RFS rule.[3] EPA analyzed the energy used at E-Energy Adams's grain dryer and determined that on average it does not result in more GHG emissions per bushel than the industry average grain drying practices evaluated for the March 2010 RFS rule. As such, average lifecycle GHG emissions from grain drying as assessed in the March 2010 RFS rule were included in EPA's assessment of the lifecycle GHG emissions associated with the ethanol produced by E-Energy Adams. Such emissions are included in the feedstock production stage of the fuel lifecycle, in the category called Net Domestic Agriculture in Table 5, below.

E-Energy Adams's process uses less energy per gallon of fuel produced than the corn ethanol processes analyzed in the March 2010 RFS rule, which results in lower GHG emissions. The emissions from the use of energy were calculated by multiplying the amount of energy used by emission factors for fuel production and combustion, based on the same method and factors used in the March 2010 RFS rule. The emission factors for the different fuel types are from GREET and were based on assumed carbon contents of the different process fuels. Table 3 below summarizes the emission factors used in the E-Energy Adams analysis.

Table 3: Fuel Production Emission Factors for Natural Gas and Electricity in 2022

Fuel Type	**Emission Factor (gCO_2e/mmBtu fuel input)**
Natural Gas Production	9,392
Natural Gas Combustion	59,183
Electricity	219,824

Individual process input and output mass and energy flows within the production plant were not needed for this analysis; rather, as was done for the March 2010 RFS rule analysis, total input and

[3] U.S. EPA. February 2010. Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. EPA-420-R-006, http://www.epa.gov/OTAQ/renewablefuels/420r10006.pdf, (see p. 330).

output mass and energy flows from the feedstock, fuel and co-product operations were used. No additional raw materials used in the E-Energy Adams process result in significant lifecycle GHG emissions, thus no emissions were calculated for additional raw materials for this analysis.

Since DGS impact the agricultural markets, such inclusion was modeled as part of the FASOM and FAPRI modeling as already described in the feedstock production section above. Thus no additional co-product credits were applied for the fuel production stage of the analysis.

The estimated fuel production emissions from the process described in E-Energy Adams's petition are shown below in Table 4.

Table 4: Fuel Production Emissions for the E-Energy Adams Process

Fuel Production Source	Pathway for Corn Ethanol, Natural Gas Fired, Dry Mill, 100% Dry DGS, No Advanced Technologies (gCO_2e/mmBtu ethanol produced)	E-Energy Adams Process as Described in Petition (8% DDGS, 92% MDGS) (gCO_2e/mmBtu ethanol produced)
On-Site Emissions	22,317	17,246
Upstream (natural gas and electricity production)	10,052	8,820
Total Fuel Production Emissions	**32,369**	**26,067**

Fuel and feedstock distribution – We used the same feedstock distribution emissions analysis considered for corn ethanol in the March 2010 RFS rule for E-Energy Adams's corn feedstock. The fuel type, ethanol, and hence the fuel distribution for ethanol, was already considered as part of the March 2010 RFS rule. Therefore, we applied the existing feedstock and fuel distribution lifecycle GHG impacts for corn ethanol to our analysis of the E-Energy Adams petition.

Use of the fuel – E-Energy Adams's process produces a fuel that was analyzed as part of the March 2010 RFS rule. Thus, we applied the fuel combustion emissions calculated as part of the March 2010 RFS rule for ethanol to our analysis of ethanol produced by E-Energy Adams.

Lifecycle GHG Emissions – E-Energy Adams's fuel was then compared to baseline gasoline, using the same value for baseline gasoline as in the March 2010 RFS rule analysis. Our analysis indicates that the fuel produced using the process described in the E-Energy Adams petition would

result in a GHG emissions reduction of 25% compared to the gasoline it would replace. Table 5 below breaks down by stage the lifecycle GHG emissions for ethanol produced using the process described in E-Energy Adams's petition, a corn ethanol pathway analyzed as part of the March 2010 RFS rule that does not use any of the advanced technologies specified in the RFS regulations and dries all of its co-product DGS, and the 2005 gasoline baseline. This table demonstrates the contribution of each stage in the fuel pathway and its relative significance in terms of GHG emissions.

Table 5: Lifecycle GHG Emissions for the Process Described in E-Energy Adams's Petition (kg CO2-eq./mmBtu ethanol produced)

Fuel Type	Pathway for Corn Ethanol, Natural Gas Fired, Dry Mill, 100% Dry DGS, No Advanced Technologies	E-Energy Adams Process, (8% DDGS, 92% MDGS)	RFS 2005 Gasoline Baseline
Net Domestic Agriculture (w/o land use change)	4	4	
Net International Agriculture (w/o land use change)	12	12	
Domestic Land Use Change	-4	-4	
International Land Use Change, Mean (*Low/High*)	32 (*21/46*)	32 (*21/46*)	
Fuel Production	32	26	19
Fuel and Feedstock Transport	4	4	*
Tailpipe Emissions	1	1	79
Total Emissions, Mean *(Low/High)*	**82 *(71/96)***	**75 *(64/89)***	**98**
% Reduction	**17%**	**25%**	

*Emissions included in fuel production stage.

B. Application of the Criteria for Petition Approval

In response to input from E-Energy Adams, EPA is basing this petition approval on somewhat greater energy use per gallon than was described in the E-Energy Adams petition, consistent with attaining the 20% GHG reduction threshold required for renewable fuels. As such, EPA is specifying certain conditions on the maximum amount of natural gas and electricity that may be used per gallon of ethanol produced in the approved E-Energy Adams Process (see Section IV). EPA has determined that the E-Energy Adams Process (defined to allow no more than 24,000 Btus of natural gas per gallon

of ethanol produced and no more than 2,600 Btus of grid electricity per gallon of ethanol produced) meets the 20% lifecycle GHG threshold requirement specified in the CAA for renewable fuel. These results justify authorizing the generation of renewable fuel RINs for fuel produced by the E-Energy Adams Process, assuming that the fuel meets the other definitional criteria for renewable fuel (e.g., produced from renewable biomass, and used to reduce or replace petroleum-based transportation fuel, heating oil or jet fuel) specified in the CAA and EPA implementing regulations.

The process described in E-Energy Adams's petition produces 8% DDGS and 92% MDGS, and that is the assumption that EPA used in the lifecycle GHG analysis for the results shown in Tables 4 and 5. Drying DGS requires additional energy, so in general lifecycle GHG emissions increase when a greater percent of DGS is dried. For this reason two of the corn ethanol pathways listed in Table 1 to § 80.1426 specify maximum percentages of DGS drying as part of the production process requirements.[4] For this determination, EPA is not specifying a maximum percentage of DGS drying for the E-Energy Adams Process. Instead, EPA is specifying certain conditions on the maximum amount of natural gas and electricity that may be used per gallon of ethanol produced in the approved E-Energy Adams Process. Because the impact of DGS drying on lifecycle GHG emissions is caused by the amount of energy required for such drying, by setting conditions on maximum levels of energy use per gallon it is unnecessary to set any conditions on the maximum percent of DGS that may be dried as part of the approved E-Energy Adams Process.

For this determination, EPA is not specifying a minimum ethanol yield (in terms of gallons of ethanol per bushel of corn feedstock used) for the E-Energy Adams Process, because the data provided by E-Energy Adams shows there is little risk that the E-Energy Adams Process will achieve ethanol yields that are worse (lower) than the industry average yield of 2.71 gallons per bushel that EPA assumed for the 2010 corn ethanol pathways. E-Energy Adams provided twelve months of data from calendar year 2011 showing that their process achieves a better than 2.71 gallon per bushel ethanol yield. Based on the information provided in the E-Energy Adams petition, EPA has no reason to believe that process yield will decrease significantly over time. The equipment improvements that E-Energy Adams has implemented to improve energy efficiency are now hardwired into the plant, and now that the investments have been made there are good economic reasons for the company to maintain these equipment and process upgrades going forward. Furthermore, based on our review of the data provided, we believe that the plant's ethanol yield is correlated with its energy efficiency. We believe there is a low probability that the ethanol yield achieved by E-Energy Adams will become significantly worse without a corresponding decrease in energy efficiency and, therefore, that the energy efficiency conditions specified in this approval will also assure continued high ethanol yield. EPA has considered the added assurance of including ethanol yield as another condition upon approval, but we have determined that the benefit of guarding against the small probability that ethanol yield will decline significantly without a corresponding decrease in energy efficiency is outweighed by

[4] See rows B and C in Table 1 to § 80.1426.

the additional administrative and tracking burden that adding this additional condition and associated verification requirements would place on EPA and E-Energy Adams.

IV. Conditions and Associated Regulatory Provisions

As part of the registration process related to the E-Energy Adams Process, E-Energy Adams must have registration materials accepted by EPA that include all of the following signed by a Responsible Corporate Officer:

1. A utility drawing prepared and signed by a professional engineer, who is licensed by an appropriate state agency with professional work experience in the chemical or electrical engineering fields and who satisfies the requirements related to an independent third-party that are specified in sub-section § 80.1450(b)(2)(ii), showing the supply and metering of all energy used from the point of delivery of corn kernels to E-Energy Adams's Adams, NE facility, through feedstock processing, and fuel and co-product production, to the point of final storage of the end product fuel and co-products at the Adams, NE facility ("feedstock, fuel and co-product operations").[5]
2. A statement verifying that the utility drawing is accurate and the meters included in the diagram meter all of the energy used for all feedstock, fuel and co-product operations.

E-Energy Adams is also subject to the general registration, recordkeeping and reporting provisions in 40 CFR subpart M that apply to renewable fuel producers. In addition, the authority for E-Energy Adams to generate RINs pursuant to the E-Energy Adams Process is expressly conditioned on E-Energy Adams demonstrating through records available as of the date of RIN generation and maintained by the producer for a minimum of five years from the date of RIN generation that the amount of ethanol used to generate the RINs meets the following requirements:

1. Corn starch was used as the only feedstock.
2. The ethanol was produced by a dry mill process no more than 365 days prior to the date that E-Energy Adams wishes to generate RINs for the fuel.

[5] Energy for feedstock, fuel and co-product operations must include all energy used in any building that is used in any part for the storage and/or processing of feedstock and all energy used in any building that is used in any part for the production and/or storage of finished fuel or co-products. It also includes any energy related to feedstock or waste handling. It need not include energy used in any separately-metered stand-alone building that is used solely for administrative purposes. It also need not include energy used at the tower grain dryer to dry corn kernels prior to grinding, because the emissions from such energy use has been taken into account as part of the feedstock production stage of the fuel lifecycle (see Section III for further explanation).

3. No more than 24,000 Btu of natural gas was used for all feedstock, fuel and co-product operations per gallon of ethanol produced, calculated as an average across the sum of all gallons of ethanol produced over a time period ending on the day prior to the day that E-Energy Adams generates RINs pursuant to the E-Energy Adams Process and beginning on the day after signature of this document or 365 days prior to the date of RIN generation, whichever is more recent.

4. No more than 2,600 Btu of purchased grid electricity was used for all feedstock, fuel and co-product operations per gallon of ethanol produced, calculated as an average across the sum of all gallons of ethanol produced over a time period ending on the day prior to the day that E-Energy Adams generates RINs pursuant to the E-Energy Adams Process and beginning on the day after signature of this document or 365 days prior to the date of RIN generation, whichever is more recent.

The energy-related conditions listed above that include an averaging period apply to all gallons of ethanol produced by E-Energy Adams during the averaging period, which may include fuel for which RINs are generated with a D-code of 6 pursuant to 40 CFR 80.1426(f)(6), and those for which RINs are generated with a D-code of 6 pursuant to the E-Energy Adams Process. If E-Energy Adams's calculations at the time of RIN generation indicate that the ethanol batch does not meet the conditions and regulatory provisions associated with the E-Energy Adams Process, E-Energy Adams may generate RINs for the batch with a D-code of 6 pursuant to § 80.1426(f)(6) providing that the cumulative volume of such RIN generation during the calendar year does not exceed their baseline volume of grandfathered fuel. During a given calendar year, E-Energy Adams is not required to exceed their baseline volume of grandfathered fuel production before generating RINs pursuant to the E-Energy Adams Process.[6] This document does not impact E-Energy Adams's responsibilities under § 80.1403(e) to not exceed the number of RINs that can be generated pursuant to 40 CFR 80.1426(f)(6) for their specified volume of baseline fuel in a given calendar year. EPA discussed implementation options with the petitioner and confirmed that E-Energy Adams is comfortable with this approach.

If E-Energy Adams fails to comply with the demonstration requirement specified above, or fails to meet the elements of the approved E-Energy Adams Process for any amount of fuel for which it generates RINs pursuant to the E-Energy Adams Process, all such RINs shall be considered improperly generated under 40 CFR 80.1431(a). EPA may modify the conditions and associated regulatory provisions specified above, as necessary, to make them align with any future changes to the RFS regulations, including but not limited to registration, recordkeeping and reporting requirements. If EPA makes any changes to the conditions and associated regulatory provisions for the E-Energy

[6] This means that E-Energy Adams may switch between generating RINs pursuant to § 80.1426(f)(6) and the E-Energy Adams Process for various batches of fuel, assuming all of the associated conditions and regulatory provisions are satisfied.

Adams Process, the Agency will explain such changes in a public determination letter, similar to this one, and specify in that letter the effective date for any such changes.

V. Public Participation

As part of the March 2010 RFS rule, we took public comment on our lifecycle assessment of the 2010 corn ethanol pathways, including all models used and all modeling inputs and evaluative approaches. We also acknowledged that it was unlikely that our final regulations would address all possible qualifying fuel production pathways, and we took comment on allowing the generation of RINs using a temporary D-code in certain circumstances while EPA was evaluating such new pathways and updating its regulations. After considering comments, we finalized the current petition process, where we allow for EPA approval of certain petitions without going through additional rulemaking if we can do so as a reasonably straightforward extension of prior analyses, whereas rulemaking would be conducted to respond to petitions requiring new modeling. *See* 58 FR 14797 (March 26, 2010).

In responding to E-Energy Adams's petition, we have relied on the corn ethanol modeling that we conducted for the March 2010 RFS rule, and have simply adjusted the analysis to account for E-Energy Adams's specific production process. We relied on the same agricultural sector modeling (FASOM and FAPRI results) that was conducted and commented on as part of the March 2010 RFS rule to represent feedstock production. This also includes use of the same emission factors and types of emission sources that were used in the March 2010 RFS rule analysis. Thus, the fundamental analyses relied on for this decision have already been made available for public comment as part of the March 2010 RFS rule. Our approach today is also consistent with our description of the petition process in the preamble to the March 2010 RFS rule. Our evaluation in response to the petition is a logical extension of analyses already conducted for the March 2010 RFS rule.

VI. Conclusion

Based on our lifecycle GHG assessment, fuel produced pursuant to the E-Energy Adams Process satisfies the 20% GHG reduction requirement for the generation of renewable fuel (D-code 6) RINs. The fuel must also meet other applicable requirements specified in the CAA or EPA implementing regulations to qualify for RIN generation, including being produced from renewable biomass, and for use as transportation fuel, heating oil or jet fuel.

This approval applies specifically to E-Energy Adams, LLC, and to the process, materials used, fuel produced, and process energy sources as outlined and described in the petition request submitted by E-Energy Adams. EPA will consider extending a similar approval to other petitioners utilizing the same fuel pathway as E-Energy Adams upon verification that the pathway is indeed the same, assuming all other requirements are met. This approval is effective as of signature date. Fuel

produced pursuant to the E-Energy Adams Process does not meet the requirements for delayed RIN generation, as outlined in 40 CFR 80.1426(g)(1)(ii), because the complete petition was not received by EPA by January 31, 2011, as required by 40 CFR 80.1426(g)(1)(i)(A).

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow E-Energy Adams to register and generate RINs for the production of ethanol from corn starch feedstock above the facility's baseline volume that is exempted from the requirement of having a 20% reduction in GHG lifecycle emissions using a production process of "E-Energy Adams Process." This document has no impact on the ability of E-Energy Adams to use the OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application to register and generate RINs for the facility's baseline volume of fuel using a production process of "Grandfathered (Dry Mill, Natural Gas Fired)."