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

DEC 10 2010

OFFICE OF
AIR AND RADIATION

Mr. Fred Witmer, President and CEO
Triton Energy LLC
205 Industrial Parkway
Waterloo, Indiana 46793

Dear Mr. Witmer:

You requested a determination of whether Triton Energy's proprietary renewable diesel fuel products, when made with natural gas as a process energy source and feedstocks such as soybean oil, would qualify as biomass-based diesel and advanced biofuel under the Renewable Fuel Standard Program (RFS2).

The Triton fuel pathway is not described under the existing approved fuel pathways in the RFS2 regulations. Through the petition process described under 40 CFR 80.1416, Triton submitted data to EPA necessary to perform a lifecycle greenhouse gas analysis of the Triton fuel pathway. In conducting our detailed assessment, my staff largely relied on the soy biodiesel modeling that we conducted for the RFS2 final rule, adjusting the analysis to account for Triton's unique production process. The attached document "Triton Energy LLC Request for Fuel Pathway Determination under the RFS2" describes the data submitted by Triton, the analysis conducted by EPA, and our determination of the lifecycle greenhouse gas emissions associated with the fuel production pathway described in Triton's petition.

Based on our assessment, the proposed Triton soy/renewable diesel pathway qualifies for Biomass-Based Diesel and Advanced Biofuel (D-codes 4 & 5, respectively) RINs under the RFS2. The pathway has been determined to qualify based on an analysis of soybean oil as a feedstock. However, our approval also covers certain other feedstocks that have been analyzed as part of the RFS2 rule and determined to have lower GHG emissions than soybean oil. These additional feedstocks are:

- Oil from annual cover crops;
- Algal oil;
- Biogenic waste oils/fats/greases;
- Non-food grade corn oil

This approval applies specifically to Triton Energy LLC, and to the process, materials used, fuel produced, and process energy sources as specified in the petition request submitted by Triton

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow Triton to register and generate RINs for the production of renewable diesel from the above feedstocks using a production process identified in EMTS as "Triton Process."

If you have additional questions about this or related issues, please contact Robert Larson of my staff at 734-214-4277.

Sincerely,

Margo T. Oge

Margo Tsirigotis Oge
Director
Office of Transportation and Air Quality

Enclosure

Triton Energy LLC Request for Fuel Pathway Determination under the RFS2
Office of Transportation and Air Quality
December 10, 2010

Summary: Triton Energy LLC ("Triton") petitioned the Agency to generate D-code 4 & 5 RINs under the RFS2 program for the production of non-ester renewable diesel fuel using natural gas for process energy and, for feedstock, soy bean oil, oil from annual cover crops, algal oil, biogenic waste oils/fats/greases and/or non food grade corn oil (the proposed "Triton soy/renewable diesel pathway.")

Through the petition process described under 40 CFR 80.1416, Triton submitted data to EPA to perform a lifecycle greenhouse gas emissions analysis of the Triton soy/renewable diesel pathway. This involved a straightforward application of the same methodology, and much of the same modeling, used for the RFS2 final rule. Triton's process represents a unique biofuel production facility compared to the pathways specifically modeled as part of the final rulemaking, but otherwise does not significantly differ from the existing comparative modeled fuel pathways. As outlined in the preamble to the final RFS2 rule, this is the type of pathway that EPA envisioned would be evaluated by comparing the applicant fuel pathway to pathway(s) that had already been analyzed. EPA's evaluation of the Triton pathway did not require significant new analysis. EPA performed its assessment based on the modeling done for the soybean biodiesel pathway performed as part of the RFS2 rulemaking. Compared to soybean biodiesel[1], the Triton process is more efficient and therefore had less GHG impacts related to feedstocks, but does not produce a co-product like soybean biodiesel so had higher GHG impacts comparative to the soybean oil fuel production process. Based on the data submitted and the existing soy biodiesel modeling, EPA conducted a lifecycle assessment and determined that the Triton soy/renewable diesel pathway meets the 50% lifecycle GHG threshold requirement defined in EISA for biomass-based diesel and advanced biofuels. For the Triton soy/renewable diesel pathway, the midpoint of the range of results is a 57% reduction in GHG emissions compared to the diesel fuel baseline. Based on our assessment, the Triton soy/renewable diesel pathway qualifies for generating RINs for Biomass-Based Diesel and Advanced Biofuel (D-codes 4 & 5, respectively).

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 Triton's request and applies to all petitions submitted pursuant to 40 CFR 80.1416.
- *Section II. Compliance by the Applicant with Information Requirements*: This section contains background information on Triton and describes the information that Triton provided and how it complies with the petition requirements outlined in Section I.

[1] Triton produces a "non-ester renewable diesel", rather than "biodiesel," as defined in 40 CFR 80.1401. However, the soybean biodiesel pathway analyzed for the RFS2 final rulemaking is the closest modeled pathway to the Triton process, and was therefore used to evaluate the Triton process where appropriate.

- *Section III. Analysis and Discussion*: This section describes the lifecycle analysis done for the Triton soy/renewable diesel pathway and identifies how it differs from the analysis done for soybean biodiesel in the RFS2 final rule. This section also describes how we have applied the lifecycle results to determine what category of D-Codes the Triton soy/renewable diesel pathway qualifies for.
- *Section IV. Public Participation*: The section describes how this petition is an extension of the analysis done as part of the RFS2 final rulemaking.
- *Section V. Conclusion*: The section summarizes our conclusions regarding Triton's petition, including the D-codes Triton may use in generating RINs for fuel produced using the Triton soy/renewable diesel pathway.

I. Required Information and Criteria for Petition Requests

A. Background and Purpose of Petition Process

As part of changes to the Renewable Fuel Standard program (RFS2, published March 26, 2010), EPA adopted new regulations that specified the types of renewable fuels eligible to participate in the RFS2 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.

Pursuant to § 80.1426(f) (1) of the RFS2 regulations:

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, or as approved by the Administrator.

Table 1 to § 80.1426(f) of the RFS2 regulations lists 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 RFS2 program, or a third party may petition for EPA to evaluate a new fuel pathway in accordance with § 80.1416 (discussed further later in this section).[2]

The petition process under § 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.

[2] In addition, producers of facilities identified in 40 CFR 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 80.1426(f)(6).

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. Compliance by the Applicant with Information Requirements

A. Background on Triton

Triton requested authorization to generate D code 4 and 5 RINs for the Triton soy/renewable diesel pathway. A petition is required because the Triton soy/renewable diesel pathway is not included as an approved process under the Advanced Biofuel or Biomass-Based Diesel categories in Table 1 to § 80.1426(f) of the RFS2 regulations. The Table includes renewable diesel made from soybean oil, but only if the production process is trans-esterification or hydrotreating. The Triton's fuel production process is not considered either trans-esterification or hydrotreating. Triton has a proprietary process that subjects soybean oil or other feedstocks to high shear and temperature conditions in the presence of ethanol and catalyst, producing a renewable diesel[3].

B. Compliance with Required Information

In terms of Triton's petition to generate Biomass-Based Diesel and Advanced Biofuel RINs from soy bean oil, oil from annual cover crops, algal oil, biogenic waste oils/fats greases and non-food grade corn oil, there are two relevant existing pathways excerpted from Table 1 as shown below:

Fuel Type	Feedstock	Production Process Requirements	D-Code
Biodiesel, and renewable diesel	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating *Excluding processes that co-process renewable biomass and petroleum*	4 (Biomass-Based Diesel)
Biodiesel, and renewable diesel	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating *Includes only processes that co-process renewable biomass and petroleum*	5 (Advanced Biofuel)

[3] In accordance with Triton's registration under 40 CFR Part 79, their fuel additives (Triton Agri Gold and Gen2 Renewable Diesel) may only be blended up to 5 percent by volume with diesel fuel used for on-road transportation fuel purposes.

As discussed in Section I(C) above, a fuel pathway under RFS2 is defined by three components: (1) fuel type, (2) feedstock, and (3) production process. For the Triton soy/renewable diesel pathway addressed in Triton's petition, Triton would use feedstock and produce a fuel that has already been analyzed as part of the RFS2 final rule and included in Table 1 to § 80.1426(f) of the RFS2 regulations. Therefore no new feedstock modeling was required as that was already done as part of the RFS2 final rule. Similarly, EPA has already evaluated the end use tailpipe emissions impact of using renewable diesel as a transportation fuel. This petition only requires EPA to evaluate a new fuel production process.

The same analytical approach that was used to evaluate the lifecycle GHG emissions of the two existing pathways noted above was used to analyze the Triton soy/renewable diesel pathway. The only difference is that the fuel production process step was adjusted to reflect the Triton process. The Triton fuel production process was evaluated for its direct emissions and its impact on the amount of feedstock and fuel produced which in turn impacts other parts of the analysis as described in the following sections. Figure 1 describes the modeling approach used and highlights the changes that were made from the analysis used in the RFS2 final rule to analyze the Triton petition request.

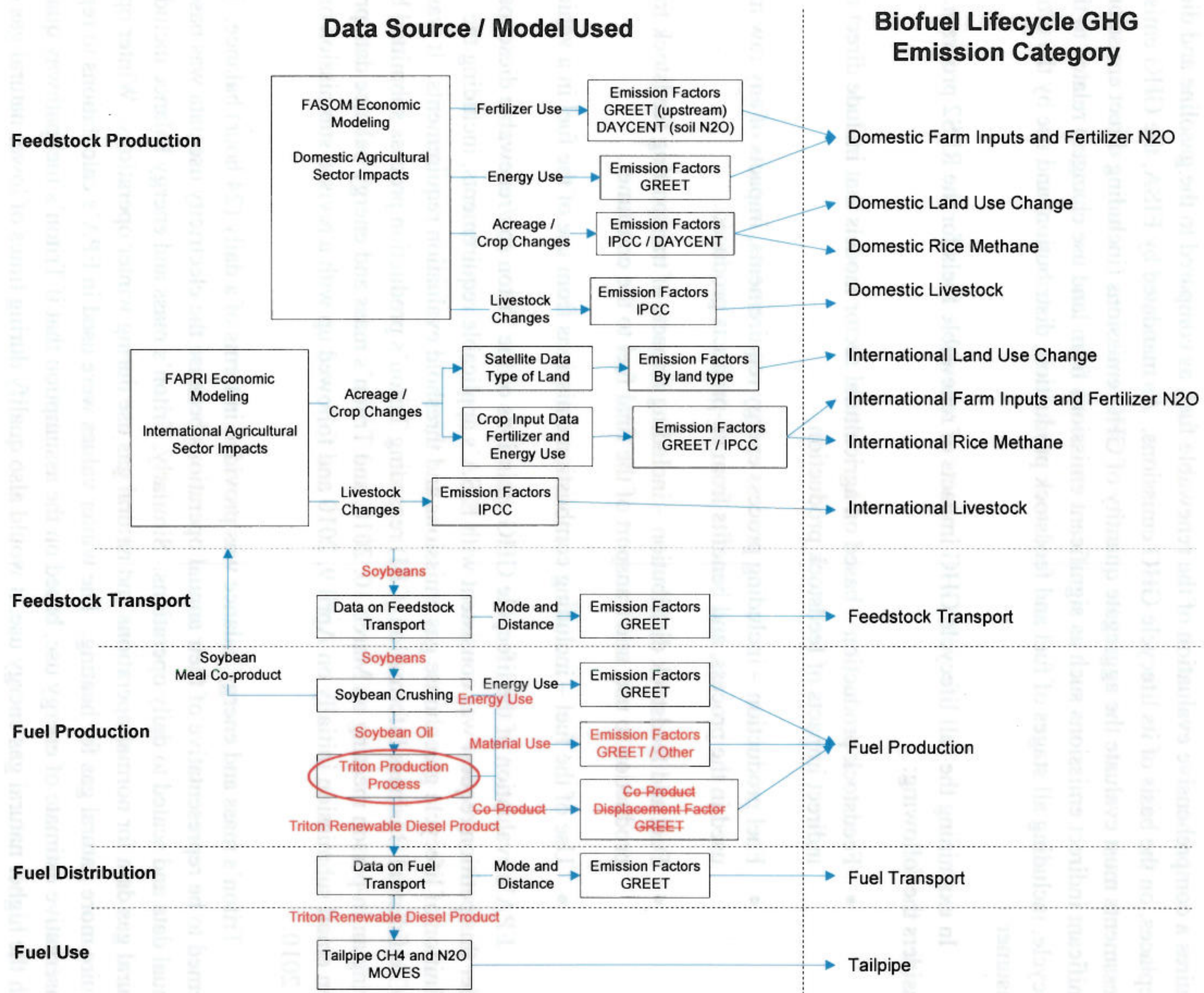
The left side of Figure 1 shows the models and data used (boxes) as well as the input and output streams (arrows) from those models to calculate the emissions for each of the lifecycle stages shown on the right of the figure. The biggest change highlighted in the figure was replacing the biodiesel production process data with the Triton process data. This resulted in the following changes to the modeling (described in more detail in the following sections):

- Amount of soybean oil used in the fuel production process reduced to reflect Triton's efficiency in terms of oil input per Btu of fuel produced
- Amount of soybeans needed in feedstock transport and production also reduced to reflect Triton's yield efficiency
- Amount of energy used by the fuel production process and associated emissions from fuel production and use changed to reflect Triton's data provided in their energy balance
- Amount and type of materials used in the fuel production process and associated emission factors for production of those materials changed to reflect Triton's data provided in their mass balance
- Elimination of co-product produced in the fuel production process to reflect the fact that Triton's process does not produce a co-product
- Amount and type of fuel product produced changed to reflect Triton's yield and type of fuel produced

This was a straightforward analysis based on existing modeling done for the RFS2 final rule and substituting Triton's proprietary process data, which for the most part only altered the amounts of inputs and outputs and not the fundamental modeling approach.

Triton has supplied all the required information on their production process for EPA to analyze their product and make a determination. Information submitted includes fuel and facility registration information, 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.

Figure 1: Description of the Triton Soy/Renewable Diesel Pathway Modeling Approach and Changes Made (Highlighted in Red) From the RFS2 Final Rule Analysis of Soy/Renewable Diesel Pathways as listed in Table 1 to 80.1426.



III. Analysis and Discussion

A. Lifecycle Analysis

Determining a fuel pathway's compliance with EISA's lifecycle GHG reduction thresholds requires a comprehensive evaluation of the renewable fuel, as compared to the gasoline and diesel that it replaces, on the basis of its lifecycle GHG emissions. As mandated by EISA, 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 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 RFS2 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 of the Triton soy/renewable diesel pathway under this petition request was consistent with EISA's applicable requirements, including the definition of lifecycle greenhouse gas emissions and threshold evaluation requirements. It was based on Confidential Business Information (CBI) regarding Triton's production process submitted by Triton during an in-person meeting on March 10, 2010, and Triton's mass and energy balance data provided in an email submission initially on April 9, 2010 and followed up with a revised submission on April 22, 2010.

Triton's mass and energy balance was provided in terms of a daily (24 hour) balance. This was deemed to be representative of their annual operations because the electricity use data was based on annual data and scaled to daily operations. Similarly, Triton's mass and energy balance included natural gas data for normal operations and natural gas use during winter operations. Winter operations require more natural gas for heating. The winter values were used in EPA's calculations to represent a conservative estimate of energy use, based on the assumption that if Triton's fuel pathway qualified with the higher natural gas energy use, it would also qualify during times of lower natural gas energy use. Triton's fuel lifecycle GHG emissions were determined as follows:

Feedstock production – Triton's fuel product utilizes feedstocks noted above in Table 1 to § 80.1426(f) of the RFS2 regulations, which have already been evaluated as part of the RFS2 final rule lifecycle GHG determinations, and therefore no new feedstock production modeling was required. For the analysis of Triton's process, EPA chose soybean oil to use as the base feedstock from which to analyze the Triton soy/renewable fuel pathway because it is one of the existing feedstocks proposed for use by Triton and is also the feedstock proposed for use by Triton with the highest GHG emissions. This conservative approach assumes that if Triton's soy/renewable diesel pathway passed the 50% lifecycle GHG thresholds for biomass based diesel and advanced biofuel with soybean oil, it could be determined that the pathway would also qualify using other lower GHG emitting feedstocks.

As shown in Figure 1, the FASOM and FAPRI models were used to analyze the GHG impacts of the feedstock production portion of a fuel's lifecycle. The same FASOM and FAPRI raw results representing the emissions from an increase in soybean oil production that were generated as part of the RFS2 final rule analysis of soybean biodiesel were used in this analysis of the Triton soy/renewable diesel pathway. These results represent agriculture / feedstock production emissions for a certain quantity of soybean oil produced. For the RFS2 analysis, this was roughly 4,100 million lbs of soybean oil used for fuel[4]. We have calculated GHG emissions from feedstock production for that amount of soybean oil. We do not believe Triton's alternative process for converting soy oil into renewable diesel will materially affect the total amount of soy oil used for biofuels and modeled as part of the RFS2 final rule. Therefore, the existing agricultural sector modeling analyses for soy oil as a feedstock remain valid for use in estimating the lifecycle impact of renewable fuel produced using the Triton soy/renewable diesel pathway. (See discussion of scaling adjustments, below).

For the soybean biodiesel case this resulted in approximately 63,720,000 mmBtu of soybean biodiesel produced, based on a yield of 7.6 lb of oil/gal of biodiesel and a heating content of 118,000 Btu/gal of biodiesel. The FASOM and FAPRI agricultural sector GHG results were divided by the total energy value of fuel produced to get emissions per mmBtu.

Triton provided as part of their CBI data information on the process yield in terms of pound of oil per gal of fuel produced as well as the heating content of their fuel in Btu/gal. Based on that data, Triton's process yield is more efficient than soybean biodiesel production in terms of gallons produced per lb of soybean oil used and the energy content of Triton's fuel product is greater than soybean oil biodiesel. Therefore, compared to biodiesel already analyzed, the Triton process results in ~4% more Btus of fuel produced for the same amount of soybean oil feedstock. Therefore the FASOM and FAPRI results were scaled down by ~4% based on the greater amount of energy produced by the Triton process compared to soybean biodiesel to get new feedstock production emission for Triton.

The scaling down of the agricultural sector results impacted several components of the Triton fuel lifecycle analysis. It impacted feedstock production, direct and indirect emissions as well as the indirect land use change emissions. The following components were impacted:

- Domestic Livestock
- Domestic Farm Inputs and Fertilizer N2O
- Domestic Rice Methane

[4] The actual amount was slightly different between the FASOM and FAPRI models due to slightly different volumes of fuel modeled. FAPRI results are used for illustrative purposes.

- Domestic Land Use Change
- International Livestock
- International Farm Inputs and Fertilizer N2O
- International Rice Methane
- International Land Use Change

Overall, compared to the soybean biodiesel production, the Triton soy/renewable diesel pathway is more efficient, meaning there is less land use change (with associated greenhouse gas emissions) and fewer agricultural sector impacts per Btu of fuel produced. Table 1 highlights the differences between the agricultural and land use change results of the Triton soy/renewable diesel pathway and the soybean biodiesel pathway.

Table 1: Comparison of Agricultural Sector and Land Use Change Impacts for Triton Renewable Diesel and Soybean Biodiesel

Lifecycle Stage	Soybean Biodiesel ($g\ CO_2$-eq./mmBtu)	Triton Renewable Diesel ($g\ CO_2$-eq./mmBtu)
Domestic Livestock	-2,100	-2,015
Domestic Farm Inputs and Fertilizer N_2O	106	101
Domestic Rice Methane	-7,950	-7,627
Domestic Land Use Change	-8,896	-8,535
International Livestock	-6,436	-6,174
International Farm Inputs and Fertilizer N_2O	5,402	5,182
International Rice Methane	2,180	2,091
International Land Use Change	42,543	40,816
Total Feedstock Production Emissions:	**24,848**	**23,839**

Fuel production – Triton's fuel production method is different than the two approved production processes (trans-esterification and hydrotreating) already analyzed for the RFS2 final rule. The yield of biofuel per pound of soy oil and the amount of energy and raw materials used are different than production methods that were analyzed. One difference is that Triton's process results in more fuel product produced per amount of raw materials used. Another difference is that no co-product is produced, unlike the soybean biodiesel production process. To analyze the GHG impacts of Triton's process, EPA utilized the same approach that was used to determine the impacts of processes considered as part of the RFS2 final rule.

The GHG emissions for the fuel production component of Triton's fuel lifecycle determination were based on the following emission sources:

- Type and amount of energy used and associated emissions per mmBtu of fuel produced
- Type and amount of raw materials used and associated emissions per mmBtu of fuel produced
- Beneficial use of any co-products produced

The amount and type of energy used was taken from Triton's CBI GEN 2 Mass Balance & Energy Balance submitted to EPA. Triton submitted energy data on natural gas (in Btus) and electricity (in kWhs) inputs, as well as gallons of fuel produced.

The natural gas use was based on the winter operations and represents a conservative estimate of total annual natural gas usage. The electrical energy use was based on electricity used for the Molecular Shear Process (shear pumps, centrifuge, & lights) and the Ethanol Extraction & Recycle (vacuum pump & heater). Natural gas and electricity use for soybean oil extraction (to extract oil and meal from the soybeans) were also accounted for.

The emissions from the use of this energy was calculated by multiplying the amount of energy by emission factors for fuel production and combustion, based on the same method and factors used in the RFS2 final rulemaking. The emission factors for the different fuel types are from GREET and were based on assumed carbon contents of the different process fuels. The emissions from producing electricity in the U.S. were also taken from GREET and represent average U.S. grid electricity production emissions.

Individual process input and output energy flows within the plant were not needed for this analysis. Instead, a total input and output from the entire plant was used. The data provided by Triton verifiable and can be obtained through available utility bills and production data as well as fuel physical properties such as energy content of the fuel.

Emissions from other material used in the Triton process were based on multiplying the amount of material used by emission factors for material production and use. Material use amount was based on Triton's CBI GEN 2 Mass Balance & Energy Balance submitted to EPA. Triton provided input data on soybean oil, ethanol and a proprietary catalyst.

Individual process input and output flows within the fuel production plant were not needed for this analysis rather, as was done for the RFS2 final rulemaking analysis, a total input and output from the entire plant was used. The data provided by Triton was verifiable and can be obtained through available production, purchasing, and inventory data as well as raw material and fuel physical properties such as density.

The emission factors for ethanol were based on the lifecycle results for average natural gas fired corn ethanol as calculated as part of the RFS2 final rule. The emission factors for Triton's proprietary catalyst were based on the emission factors for Sodium Hydroxide which were developed as part of the RFS2 final rule (as an input to the soybean oil biodiesel process). Sodium Hydroxide was assumed to be an appropriate surrogate based on discussions with Triton on the makeup of their proprietary catalyst.

Triton's process does not produce any co-products so there was no co-product benefits accounted for in our analysis of the Triton soy/renewable diesel pathway.

Triton's process uses less energy than the soybean biodiesel process which results in a reduction in GHG emissions. However, as the Triton process does not produce any co-products, there are no co-product credits assigned to Triton which result in an increase in GHG emissions compared to soybean biodiesel. Overall, based on these differences, the Triton process results in higher fuel production GHG emission impacts compared to the soybean biodiesel pathway as shown in Table 2.

Table 2: Comparison of Fuel Production Emissions for Triton Renewable Diesel and Soybean Biodiesel

Lifecycle Stage (soybean crushing and fuel production)	**Soybean Biodiesel ($g\ CO_2$-eq./mmBtu)**	**Triton Renewable Diesel ($g\ CO_2$-eq./mmBtu)**
On-Site Emissions	9,486	7,139
Upstream (natural gas and electricity production)	9,312	7,105
Co-Product Credit	-5,645	0
Total Fuel Production Emissions:	**13,153**	**14,245**

Fuel and feedstock distribution – Triton's feedstock and fuel type were already considered as part of the RFS2 final rule. Therefore, the existing feedstock and fuel distribution lifecycle GHG impacts for soybean oil and renewable diesel fuel were applied to our analysis of the Triton pathway.

Use of the fuel – Triton's process produces a fuel that was analyzed as part of the RFS2 final rule. Thus, the fuel transportation and combustion emissions calculated as part of the RFS2 final rule for renewable diesel were applied to our analysis of the Triton pathway.

Triton's fuel was then compared to baseline petroleum diesel, using the same value for baseline diesel as in the RFS2 final rule analysis. The results of the analysis indicate that the Triton soy/renewable diesel pathway using soybean oil would result in a GHG emissions reduction of 57% in GHG emissions compared to the diesel fuel it would replace, as discussed further in the following section.

B. Application of the Criteria for Petition Approval

Triton's petition request involved a fuel pathway with a new production process, using feedstocks and producing a fuel product already considered as part of the RFS2 final rule. Triton provided all the necessary information that was required for this type of petition request.

Based on the data submitted and information already available through analyses conducted for the RFS2 final rule, EPA conducted a lifecycle assessment and determined that the Triton soy/renewable diesel pathway would meet the 50% lifecycle GHG threshold requirement specified EISA for biomass-based diesel and advanced biofuels.

Figure 2 below illustrates the results of the modeling. It shows the percent difference between lifecycle GHG emissions for 2022 for the Triton soy/renewable diesel pathway as compared to the 2005 petroleum diesel fuel baseline. In the figure, the zero on the x-axis represents the lifecycle GHG emissions equivalent to the 2005 petroleum diesel fuel baseline. The y-axis in the figure represents the likelihood that possible results would have a specific GHG reduction value shown. The area under the curve represents all the possible results. No new uncertainty analysis was done for the Triton process, rather the uncertainty ranges developed as part of the RFS2 final rule analyses were scaled based on the differences in the Triton process as were described previously.

For Triton's fuel pathway, the midpoint of the range of results is a 57% reduction in GHG emissions compared to the diesel fuel baseline. The 95% confidence interval around that midpoint results in range of a 23% reduction to an 84% reduction compared to the 2005 petroleum diesel fuel baseline. These results justify authorizing the generation of biomass-based diesel and advanced biofuel RINs for fuel produced by the Triton soy/renewable diesel pathway, 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 EISA.

Figure 2: Distribution of LCA Results for Triton's Fuel Pathway

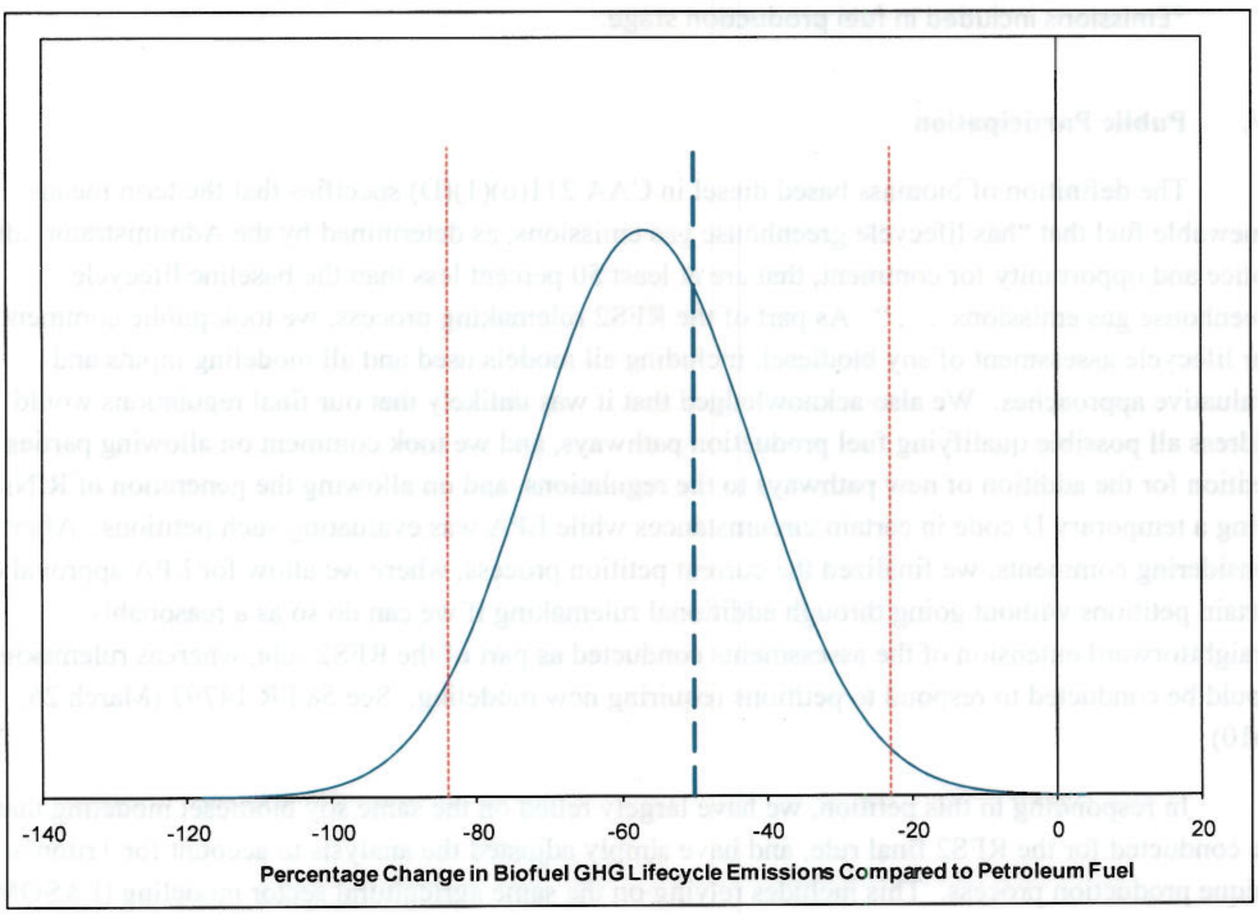


Table 3 below breaks down by stage the lifecycle GHG emissions for the Triton soy/renewable diesel pathway, the soybean biodiesel fuel pathway done as part of the RFS2 final rule, and the 2005 diesel baseline. The Triton soy/renewable diesel pathway reflected in this table, and analyzed in this document, assumes that natural gas is used for process energy. This table demonstrates the contribution of each stage in the fuel pathway and its relative significance in terms of GHG emissions.

Table 3: Lifecycle GHG Emissions for Triton's Fuel Pathway, 2022 (kg CO2-eq./mmBtu)

Fuel Type	Soybean Oil Biodiesel	Triton	2005 Diesel Baseline
Net Domestic Agriculture (w/o land use change)	-10	-10	
Net International Agriculture (w/o land use change)	1	1	
Domestic Land Use Change	-9	-9	
International Land Use Change, Mean *(Low/High)*	43 *(15/76)*	41 *(14/73)*	
Fuel Production	13	14	18
Fuel and Feedstock Transport	3	3	*
Tailpipe Emissions	1	1	79
Total Emissions, Mean *(Low/High)*	**42 *(14/76)***	**42 *(15/74)***	**97**

*Emissions included in fuel production stage.

IV. Public Participation

The definition of biomass based diesel in CAA 211(o)(1)(D) specifies that the term means renewable fuel that "has lifecycle greenhouse gas emissions, as determined by the Administrator, after notice and opportunity for comment, that are at least 50 percent less than the baseline lifecycle greenhouse gas emissions. . . . " As part of the RFS2 rulemaking process, we took public comment on our lifecycle assessment of soy biodiesel, 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 parties to petition for the addition of new pathways to the regulations, and on allowing the generation of RINs using a temporary D code in certain circumstances while EPA was evaluating such petitions. 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 the assessments conducted as part of the RFS2 rule, whereas rulemaking would be conducted to respond to petitions requiring new modeling. See 58 FR 14797 (March 26, 2010).

In responding to this petition, we have largely relied on the same soy biodiesel modeling that we conducted for the RFS2 final rule, and have simply adjusted the analysis to account for Triton's unique production process. This includes relying on the same agricultural sector modeling (FASOM and FAPRI results) that was conducted and commented on as part of the RFS2 final rule to represent feedstock production. This also includes use of the same emission factors and types of emission sources that were used in the RFS2 final rule analysis. Thus, the fundamental analyses relied on for this decision have been made available for public comment as part of the RFS2 final rule, consistent with the reference to notice and comment in the statutory definition of "biomass based diesel." Our approach today is also consistent with our description of the petition process in the preamble to the final RFS2 rule, as our work in responding to the petition was a logical extension of analyses already conducted.

V. Conclusion

Based on our assessment, fuel produced using the Triton soy/renewable diesel pathway qualifies for Biomass-Based Diesel and Advanced Biofuel (D-codes 4 & 5, respectively) RINs under the RFS2. The pathway has been determined to qualify based on an analysis of soybean oil as a feedstock. However, our approval also covers certain other feedstocks that have been analyzed as part of the RFS2 rule and determined to have lower GHG emissions than soybean oil. These additional feedstocks are:

- Oil from annual cover crops;
- Algal oil;
- Biogenic waste oils/fats/greases;
- Non-food grade corn oil

This approval applies specifically to Triton Energy LLC, and to the process, materials used, fuel produced, and process energy sources as outlined and provided in the petition request submitted by Triton. EPA will extend a similar approval to other petitioners utilizing the same fuel pathway as Triton upon verification that the pathway is indeed the same.

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow Triton to register and generate RINs for the production of renewable diesel from the above feedstocks using a production process of "Triton Process."