

How to Prepare a Complete Petition

Version 1.1

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Transportation and Climate Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

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1. Introduction

The EPA is providing detailed information on how to prepare a complete petition for a new fuel pathway under the Renewable Fuel Standard (RFS) program. Parties who are considering a petition application are strongly encouraged to start by reviewing the background information provided on EPA's website,¹ and to use the *Pathway Screening Tool* (available for download on the website). Using this tool—which is intended to save fuel producers and the Agency time as compared to submitting a full petition that is unnecessary or incomplete—gives the EPA an opportunity to review information about a proposed pathway and respond with questions or suggested next steps before a party starts preparing a petition.

The RFS regulations at 40 CFR 80.1416(b) outline the information requirements for petitions requesting evaluation of a new fuel pathway. This document provides additional information to help petitioners meet the requirements outlined in the regulations. Petitions that do not include the information required at § 80.1416(b) will be rejected as incomplete and the Agency will take no further action.

This document outlines the information that EPA needs to complete lifecycle greenhouse gas (GHG) assessments for different types of petitions, based on the methodology and modeling approach developed for the March 2010 RFS final rule (75 FR 14670). After receiving a petition, the EPA may ask for additional information to complete its evaluation and specify a time period in which the additional information is requested (e.g., 30 business days). If the requested information is not provided in a timely manner, and the petitioner does not explain the delay, the petition may be rejected as incomplete and a whole new petition would need to be submitted. Carefully following the recommendations in this document should help to limit the extent of additional information requested by the Agency. As part of our efforts to streamline the petition review process, the EPA is also asking that petitioners prepare their application packages using the organization and format specified in this document.²

Ultimately, this document is intended to help improve the quality and uniformity of incoming petitions, thereby improving the overall efficiency of the petition process. The subsequent sections are organized as follows: Section two of this document provides recommendations on how to submit information claimed as confidential business information in a petition. Section three provides step-by-step instructions for preparing a complete petition, including step-by-step instructions for petitions that involve new feedstocks as these petitions often require additional information for EPA to complete its evaluation.

This document was prepared based on EPA's experience implementing the petition process since its creation in March 2010. As we continue to receive and evaluate more petitions, we expect to continue to update this document as we identify areas for improvement. We welcome constructive input from petitioners on these updates. Stakeholders who wish to provide input can do so by emailing the EPA Fuels Program Support Line at support@epamts-support.com with "Petition Process Input" as the subject line.

¹ <http://www.epa.gov/otaq/fuels/renewablefuels/rfs2-lca-pathways.htm>

² See Appendix A: New Fuel Pathway Petition Outline, and Appendix B: Formatting for New Fuel Pathway Petitions.

A. What's New in Version 1.1?

Compared to Version 1.0 from September 2014, we have added more guidance for petitioners on how to determine if the EPA has previously evaluated the GHG emissions associated with a fuel, production process or feedstock for the RFS program.³ For example, we are clarifying that previously evaluated feedstocks include the feedstocks for which EPA has published in the *Federal Register* its analysis of GHG emissions associated with the production/growth and transport of the feedstock for use in making biofuels.⁴ Within the context of the petition process for new RFS fuel pathways, the EPA considers feedstocks, production processes, and fuels that have not been previously evaluated by the agency to be new. It is important for petitioners to know which components of their requested pathways have not been previously evaluated because the EPA requests that petitions include more information about these new pathway components. Section 3 provides details on how to determine whether pathway components are new, and what information to include in each section of your petition.

³ This additional information can be found in sections 3(D)(2), 3(E)(4) and 3(F)(2)

⁴ See <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/other-determinations.htm>

2. Submitting Information Claimed as Confidential Business Information

We recognize that in order to provide the information required for new pathway petitions, petitioners may need to include confidential business information (CBI) in their submissions. Petitions that contain CBI can now be submitted electronically through CDX/OTAQREG, which is the Agency's secure online portal for handling proprietary information. (Petitions may also be submitted to EPA by email via rfspathways@epa.gov.) This section provides recommendations on the appropriate sections of the petition in which to include CBI and how to mark such information in your submission.

EPA seeks to provide as much information to the public regarding its fuel programs as possible. In addition, petitions that include a CBI claim are more time consuming for EPA. Therefore, EPA asks that petitioners refrain from making CBI claims if possible, with the understanding that their petitions may be made publicly available. In the alternative, EPA requests that petitioners minimize their CBI claims. In particular, EPA believes petitioners should be able to avoid CBI claims in the sections below that are marked as "*(No information claimed CBI)*."

For these reasons, we are asking petitioners to adhere to all of the following recommendations regarding CBI claims:

- Whenever possible, provide information that is not claimed as CBI.
- We are asking that certain sections of the petition include no information claimed by the petitioner as CBI. These sections are marked "*(No information claimed CBI)*" in the relevant sections.
- Any information claimed as CBI should be clearly marked as such:
 - At a minimum, we ask petitioners to mark all of the specific pages that include information claimed as CBI. All such pages should include a CBI disclaimer in the header.
 - As a best practice, we ask petitioners to clearly mark which specific paragraphs, sentences, words and data are claimed as CBI. All pages where information is claimed as CBI in this manner should include a note in the header specifying how information claimed as CBI is demarcated, e.g., bracketed or highlighted yellow.

The objective of these recommendations is to improve the petition review process and help the Agency with the proper handling of any proprietary or confidential information included in petitions.

3. Section-by-Section Instructions

As part of our efforts to streamline the petition review process, petitioners should prepare application packages using the standard organization and format provided in this document. (See Appendix A: Formatting for New Fuel Pathway Petitions.) This document also addresses each part of the petition outline and provides detailed information on what to include in each section of the petition.

The rest of this section walks through the information requirements for all types of petitions and provides details on what additional information EPA will need to complete its evaluation.

A. Cover Sheet (No information claimed CBI)

Every petition should include a one-page cover sheet with general information. The cover sheet serves as a quick reference, designed to help EPA staff efficiently and systematically process and review incoming petitions. An example cover sheet is provided in Appendix B.

1. Date Submitted

Enter the date that the petition is submitted to the EPA.

2. Organization Name

Enter the official name of the organization submitting the petition. Enter only the name of one organization on the cover sheet. In cases where there are multiple organizations associated with a petition, the cover sheet should only list the primary organization. If there are other co-sponsoring organizations on the petition, they can be listed in Section C.

If there are multiple organizations associated with a petition, and only one of them is a fuel producer or importer which intends to register for and generate RINs for fuel produced through the requested pathway, that organization should be listed as the lead petitioner.

3. Location of Headquarters

Specify the location (city, state, country) of the headquarters for the lead organization submitting the petition.

4. Location of Biofuel Production Facility

Specify the location (city, state, country) of the biofuel production facility that will produce the finished fuel associated with the proposed pathway. For petitioners who do not have a specific biofuel production facility in mind (e.g., a seed company petitioning for a new feedstock), this section of the cover sheet should be marked "N/A."

5. Fuel Pathway Requested

Enter the fuel, feedstock and production process technology and RIN D-code for each pathway requested. A single petition may involve more than one fuel pathway. For example, a petition involving a new feedstock may seek evaluation of multiple types of fuels that can be produced from the feedstock, and the associated fuel production technologies. Add rows to the table as necessary to include all of the fuel pathways requested, but please make sure that all of the cover page information

fits on one 8.5x11-inch sheet of paper. (If there are additional pathways that do not fit on the cover sheet they can be listed in Section B(1).) If multiple fuel types are associated with the same combination of feedstock, production process technology and RIN D-code, all of the fuels should be listed in the same row, etc. Two examples of how a petition for algal oil as a new feedstock should be listed on the cover sheet be are provided below in Table 1 (note, the example pathways have already been evaluated by EPA).

Table 1: Example listing of requested fuel pathways

Fuel Type	Feedstock	Production Process Technology	RIN D-code Requested
Biodiesel	Algal oil	Transesterification	4
Renewable diesel, jet fuel	Algal oil	Hydrotreating excluding processes that co-process renewable biomass and petroleum	4

6. Primary Point of Contact

Provide the requested contact information (see Appendix B) for the primary point of contact (POC) for the petition. Petitions should have only one POC. EPA recommends that the POC should be affiliated with the lead organization listed in Section A(2). If the POC is not affiliated with the lead organization, at least one appropriate official from the lead organization should be listed under the “Additional Contact Info” section of the Petition Cover Sheet, and included in any subsequent meetings or calls related to the petition. EPA will send all communications regarding a petition to the POC, and it is the POC’s responsibility to disseminate information to other parties associated with the petition. These recommendations are intended to reduce duplicative communications between EPA and parties associated with a petition.

B. Technical Justification

All petitions should include a technical justification that includes a description of the renewable fuel, feedstock(s), and the production process. The technical justification should provide a summary of the proposed fuel pathway, process modeling flow charts and a description of any significant differences between the proposed pathway and similar pathways previously evaluated by the EPA. The technical justification section by itself should provide a reader with a sound understanding of the proposed pathway and any major issues that EPA should consider in its evaluation. It should generally not include information claimed CBI, and it should be written in such a way that the information can be used to explain the proposed pathway to informed members of the general public. Confidential information and more technical details can be provided in the subsequent sections of the petition.

1. Fuel Pathway Description (No information claimed CBI)

This section should provide an executive summary of the proposed pathway. It should generally be less than one page, and always less than two pages. It should provide a summary of the components of the requested fuel pathway (fuel, feedstock, process technology and requested RIN D-code), and a summary of other key aspects of the pathway, such as:

- The types of process energy used in the fuel production process.
- A summary of energy saving technologies that the petitioner wants EPA to consider in the lifecycle GHG analysis.
- The production, handling and most likely uses of significant co-products.
- Expected uses for new types of renewable fuel.

For examples of the types of information to include in this section, petitioners can review the “Summary” section of EPA’s previous determination documents and rulemaking preambles for the RFS program.

2. Process Flow Charts (No information claimed CBI)

A process flow chart should be provided for each row of the table in Section A(5) of the petition. Each flow chart provided in this section should fit on one standard sheet of paper (portrait layout is acceptable). Flow charts should not include information claimed CBI, as they may be used as the basis for information presented in public determination documents. The flow charts should include all significant unit processes⁵ at 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. For each unit process, all significant inputs and outputs, including co-products and their expected uses, should be clearly depicted and labeled. More technical process modeling diagrams, including any information claimed CBI, can be provided as attachments in Section H.

⁵ ISO 14040 defines a unit process as the “smallest element considered in the life cycle inventory analysis for which input and output data are quantified.” Petitioners should use discretion in defining the unit processes to be large enough for consideration in lifecycle analysis. For example, if there are a group of elements in a process that perform similar functions, use the same process energy and produce the same products and/or co-products, it may be reasonable to combine them together and consider them one unit process in the process flow chart.

3. Comparison to Previously Evaluated Pathways (No information claimed CBI)

Briefly describe significant differences between the proposed pathway and any similar pathways previously evaluated by the EPA (less than one page). For example, if the proposed pathway includes the same feedstock and fuel types as a previously evaluated pathway but involves a different fuel production technology, the petition should explain the differences between the two fuel production technologies, such as differences in process energy types, energy saving technologies or co-products.

4. Commercial Viability

Provide a brief justification of the commercial viability of the proposed pathway (less than two pages). Given our limited resources, EPA may not prioritize evaluation of proposed pathways that do not have a reasonable justification for viability at commercial-scale production. The justification should explain how the commercial viability of the pathway has been demonstrated at pilot scale, and the business plan for commercialization, including funding and facility construction options.

5. Renewable Fuel Production Volumes (Historic and Projected)

Explain the historic and projected future volumes of renewable fuel production through the proposed pathway (1-4 pages). Liquid fuel volumes should be presented in terms of millions of gallons, and the average energy content of the fuel (lower heating value Btu per gallon) should also be specified. Non-liquid fuels should be presented in terms of the energy content of produced fuel (lower heating value Btu). Historical volumes should be reported starting five years before the petition is submitted or the first year significant volumes were produced, whichever is more recent. Annual projected volumes extending out for ten years are recommended based on available information such as corporate business plans, government or industry reports and facility construction options (all information sources should be clearly cited). The petition should include a best estimate of projected volumes as well as a high and low scenario, with explanation of the key assumptions/factors behind each scenario.

C. Organization Information

In this section petitioners should provide pertinent background information about their organization.

1. Organization Description

Provide a brief (one page or less) description of the organization(s) associated with the petition, including address, website and EPA registration numbers (if applicable). Describe the role of the organization in the supply chain for the proposed pathway, and any major partners. This information may not be considered in EPA's lifecycle analysis, but it can provide Agency staff with helpful background when reviewing a petition.

2. Responsible Corporate Officer

Provide contact information (name, title, phone, email, address) for the Responsible Corporate Officer (RCO) for the lead organization associated with the petition. Official EPA correspondence related to the petition evaluation (e.g., the cover letter for the determination document) will be addressed to the RCO, and the primary point of contact will be copied via email.

D. Fuel Type

This section of the petition provides information about the type of fuel produced through the proposed pathway. Additional information is needed for new fuel types that EPA has not previously evaluated.

1. Technical Description

The petition should provide a brief technical description for each fuel type associated with the petition, i.e., all of the fuel types listed in the table in Section A(5) of the petition. The description can be very brief (one sentence) for standard fuel types that EPA has previously evaluated, such as ethanol, biodiesel and butanol. For fuel types that EPA has not previously modeled the technical description should be longer (1-2 paragraphs) and provide information about the chemistry and characteristics of the fuel and for what applications (e.g., light duty vehicles, aircraft) it is well suited.

2. Information for New Fuel Types

If EPA has previously evaluated the GHG emissions associated with all of the fuel types in your petition, this section should be labeled “N/A.” Fuel types that EPA has previously evaluated for the RFS program include all of the following:

- The fuels listed in Table 1 to 40 CFR 80.1426.⁶
- Fuels that EPA evaluated in response to a petition submitted pursuant to 40 CFR 80.1416.⁷
- Fuels included in biofuel pathways for which EPA has published a lifecycle GHG analysis in a proposed rule, notice of data availability or other *Federal Register* publication.⁸

If after reviewing the information referenced above, you have questions about whether a particular fuel type was previously evaluated by the EPA, you may email your questions to the EPA Fuels Programs Support Line at support@epamts-support.com.

For all fuel types that are new (i.e., not previously evaluated by EPA), the agency will need the information described below in sub-sections 3(D)(2)(i)-(iv) to complete its evaluation.⁹

i. Chemical Composition

For each new type of fuel produced through the proposed pathway, provide a laboratory report of the full chemical composition of a representative sample.¹⁰ The laboratory report should specify the mass (lbs), volume (gal) and energy content (btu lower heating value per lb) for each component of the fuel.

If the chemical composition of the fuel varies from batch to batch, attach a laboratory report specifying the most likely value and the high and low ends of the range for each chemical component of the fuel,

⁶ See the Generally Applicable Pathways section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

⁷ See the Completed Pathway Assessment section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

⁸ See <http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm> for and the list of rulemakings.

⁹ See Section 1 (Introduction) of this document for information on how to determine whether a process has been previously evaluated by the EPA.

¹⁰ See 40 CFR 80.127 for guidelines on selecting a representative sample.

and include a narrative explaining why the composition varies and what factors influence the composition of the fuel.

ii. Regulatory Definition Justification

To qualify for a RIN D-code, a fuel must be renewable fuel, advanced biofuel, cellulosic biofuel or biomass-based diesel as defined in the RFS regulations at § 80.1401. If the petition requests qualification for biomass-based diesel RINs (D-code 4) the fuel must satisfy the regulatory definition for biomass-based diesel, and if the petition requests cellulosic diesel (D-code 7) RINs, the fuel must satisfy the regulatory definition for cellulosic diesel. We ask petitioners to provide a brief justification (one paragraph) for each new fuel type explaining how it meets the RFS regulatory definitions to qualify for the corresponding requested RIN D-code.

iii. Equivalence Value Application

Provide the equivalence value (EV) application as specified at 40 CFR 80.1415 in the RFS regulations for each new fuel type associated with the petition. For convenience, the EV application can be included as an attachment in Section H.

iv. Fuel Registration

For each new fuel type, explain the registration/certification status of the fuel for use in the applications discussed in Section D(1), and provide appropriate citations. For example, if the petition includes a new type of jet fuel, explain the status of the ASTM certification process, and cite the relevant certification numbers. As another example, explain the status of the fuel with respect to the regulations for the Registration of Fuels and Fuel Additives (40 CFR Part 79).

3. Other Relevant Information

Provide up to one page discussing other relevant information about the fuel types associated with the petition that EPA should consider in its evaluation.

E. Production Process

This section of the petition provides information about the production process utilized to produce the fuel through the proposed pathway. Additional information is needed for EPA to complete a lifecycle GHG analysis for new production process types that EPA has not previously evaluated.

1. Type of Production Process

Provide a brief explanation of each biofuel production process technology listed in the Table in Section A(5). For process technologies that EPA has previously evaluated a 1-3 sentence explanation should suffice. For new process technologies, the explanation should be no more than two pages, as more details can be provided in the sub-sections that follow.

2. Mass and Energy Balances

A mass and energy balance should be included for every new process (e.g., processes not previously evaluated by the EPA, or a process that was previously evaluated but whose approval is contingent on the use of energy saving technologies not previously considered by EPA) listed in Section A(5). This data should detail all of the significant inputs and outputs for the biofuel production process, including feedstock and energy inputs and fuel, co-product and waste material outputs.

The Agency is providing updated Mass and Energy Balance Data Submission Templates in Microsoft Excel format, available for download on the same EPA website as this document. The data submission template files include detailed instructions on data requirements, units and citations. Review will be expedited for petitions that attach completed Mass and Energy Balance Data Submission Templates to the petition in Microsoft Excel format. In this case, this section should list the attached files and provide a description for each file.

3. Historical Process Data

Petitioners who own or operate the biofuel production facility that will be used to produce the fuel in their proposed pathway should provide historical data supporting the mass and energy balance data provided in Section E(2). Petitioners should include monthly data for the most recent 24 months, or for however long the plant has been producing fuel through the proposed pathway, whichever is shorter. This section should include summarized time series data on feedstock and energy use, fuel and co-product production, and any other data related to supporting the mass and energy balance for the proposed pathway. Petitioners are also encouraged to provide documentation (e.g., energy bills) for the time series data as attachments to Section H. In cases where no historical process data is available, the petition should explain why data is not available and the basis for the mass and energy balance data provided in Section E(2).

Petitioners who do not operate the biofuel production facility that will be used to produce the fuel in their proposed pathway may wish to provide historical process data from another source in this section. Doing so will help to support/verify the mass and energy balance data in Section E(2). Otherwise, the petitioner can mark this section as “N/A”, but it should be noted that a lack of historical data may delay the review process or make it impossible for EPA to complete a lifecycle assessment.

4. Information for New Production Processes

If the EPA has previously evaluated the GHG emissions associated with all of the production processes in your petition, this section should be labeled “N/A.” Production processes that EPA has previously evaluated for the RFS program include all of the following:

- The production processes listed in Table 1 to 40 CFR 80.1426.¹¹
- Production processes that EPA evaluated in response to a petition submitted pursuant to 40 CFR 80.1416.¹²
- Production processes included in biofuel pathways for which EPA has published a lifecycle GHG analysis in a proposed rule, notice of data availability or other *Federal Register* publication.¹³

If after reviewing the information referenced above, you have questions about whether a particular biofuel production process was previously evaluated by the EPA, you may email your questions to the EPA Fuels Programs Support Line at support@epamts-support.com.

For all biofuel production processes that are new (i.e., not previously evaluated by EPA), the agency will need the information described below in sub-sections 3(E)(4)(i)-(iii) to complete its evaluation.

In cases where EPA has previously evaluated the same type of technology as the production process used in the proposed pathway, the production process in the petition should still be considered new if approval of the proposed pathway hinges on consideration of energy saving technologies or other process improvements that EPA did not consider in its previous analysis. For all production processes that have not previously been evaluated by EPA, the petition must include information pertaining to energy saving technologies or other process efficiencies. Guidance on how to provide this information is provided below in this section.

For petitions that involve new production processes, it is standard practice for EPA to share the information provided in this section of the petition with relevant experts at the U.S. Department of Energy (DOE) and/or the USDA. This consultation process takes time, and questions raised by such experts may require further clarification by the petitioner. Petitioners are encouraged to consult with relevant experts at DOE¹⁴ and/or USDA¹⁵ before submitting a petition to EPA, and to list such experts in their petition. To expedite the review process as much as possible, petitioners are encouraged to include a signed letter from experts who have reviewed and support the petition as providing a fair representation of the best scientific information available about the new production process. Doing so will generally decrease the likelihood of a request for additional information from the EPA.

¹¹ See the Generally Applicable Pathways section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹² See the Completed Pathway Assessment section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹³ See <http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm> for the list of rulemakings.

¹⁴ <http://www.energy.gov/eere/bioenergy/bioenergy-technologies-office>

¹⁵ <http://www.usda.gov/oce/>

i. Energy Saving Technologies or Other Process Improvements

Provide up to one page of additional information per energy saving technology or other process improvement that was not already included in Section E(1).

ii. Request for Special Provisions

If the argument in the petition for approving the proposed pathway hinges on consideration of special provisions for the production process, all such special provisions should be detailed in this section (less than two pages). Examples of special provisions could include novel mass or energy balance allocations and/or co-product credits, or the use of special emissions factors for process energy use. In particular, if the approval of the proposed pathway depends on the petitioner meeting any special conditions (e.g., a maximum amount of grid electricity use per gallon of fuel produced), such conditions should be spelled out in this section, and the petitioner should explain how they propose to document and keep reliable records showing compliance with any such conditions.

iii. Processes that Use Renewable Fuel Inputs

If the fuel from the proposed pathway is produced from a chemical conversion process that uses a feedstock which itself was a renewable fuel produced by another party, the petitioner should review 40 CFR 80.1426(c)(6) in the RFS regulations and provide information on the types of renewable fuel used, the suppliers of such fuel and the fate of the renewable fuel after it goes through the chemical conversion process (for example explain if it ends up in the finished fuel, in a coproduct or is recycled back into the process). The fate of the renewable fuel feedstock should be specified on a mass and energy basis, and documented based on appropriate test procedures and laboratory reports.

5. Other Relevant Information

Provide up to one page discussing other relevant information about the production process associated with the proposed pathway that EPA should consider in its evaluation.

F. Feedstock

This section of the petition provides information about the feedstock used to produce the fuel through the proposed pathway. Additional information is needed for new feedstocks that EPA has not previously evaluated.

1. Type of Feedstock (No information claimed CBI)

Briefly describe the general characteristics of the feedstock. Specifically note which portions of the feedstock will be transformed into fuel (e.g., starch, cellulosic sugars, lipids). To the extent applicable, compare and contrast the feedstock to other similar feedstocks which EPA has previously evaluated. Provide a brief description of where and by who the feedstock will be grown/produced.

2. Information for New Feedstocks

If EPA has previously evaluated the GHG emissions associated with all of the feedstocks in your petition then this section of the petition should be labeled "N/A." Feedstocks that EPA has previously evaluated include all of the following:

- The feedstocks listed in Table 1 to 40 CFR 80.1426.¹⁶
- Feedstocks that EPA evaluated in response to a petition submitted pursuant to 40 CFR 80.1416.¹⁷
- Feedstocks for which EPA has published its analysis in the *Federal Register* of the GHG emissions associated with the production/growth and transport of the feedstock for use in making biofuels.¹⁸
- Feedstocks included in biofuel pathways for which EPA has published a lifecycle GHG analysis in a proposed rule, notice of data availability or other *Federal Register* publication.¹⁹

If after reviewing the information referenced above, you have questions about whether a particular feedstock was previously evaluated by the EPA, you may email your questions to the EPA Fuels Programs Support Line at support@epamts-support.com.

If the requested pathway involves the use of a feedstock that EPA has not previously evaluated, the additional information required for such petitions is outlined at 40 CFR 80.1416(b)(2). This additional information is required because in order to make a determination on the petition, we need to evaluate the lifecycle GHG emissions associated with the requested pathway, including significant indirect emissions as required by Section 211(o) of the Clean Air Act. This section provides additional details on the information that EPA needs to complete its evaluation of new feedstocks.

In accordance with the approach taken in the March 2010 RFS rule, EPA's lifecycle analyses of biofuel pathways are country-neutral – meaning they apply regardless of the point-of-origin of the feedstock (assuming the feedstock meets the regulatory definition of renewable biomass). Thus, we need to consider the impacts of approving the requested pathway, which may extend beyond the fuel and feedstock operations undertaken by the petitioner. In fact, we need to consider the global impacts of production from any country that may import the feedstock or resulting fuel under the requested pathway. For these reasons, petitioners requesting pathways for new feedstocks should provide information for all states or countries (or using another regional aggregation justified by the petitioner) that would be reasonably likely to use the feedstock under the requested fuel pathway if EPA were to approve the petition. This section provides further guidance on how to provide this information in your petition.

It is standard practice for EPA to share the information provided in this section of the petition with relevant experts at the DOE and/or the USDA. This consultation process takes time, and questions raised by such experts may require further clarification by the petitioner. Petitioners are encouraged to consult with relevant experts at DOE²⁰ and/or USDA²¹ before submitting a petition to EPA, and to list

¹⁶ See the Generally Applicable Pathways section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹⁷ See the Completed Pathway Assessment section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹⁸ See <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/other-determinations.htm>

¹⁹ See <http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm> for the list of rulemakings.

²⁰ <http://www.energy.gov/eere/bioenergy/bioenergy-technologies-office>

²¹ <http://www.usda.gov/oce/>

such experts in their petition. To expedite the review process as much as possible, petitioners are encouraged to include a signed letter from experts who have reviewed and support the petition as providing a fair representation of the best scientific information available about the new feedstock. Doing so will generally decrease the likelihood of a request for additional information from the EPA.

i. Technical Definition

The petitioner should describe the defining characteristics of the feedstock in sufficient detail that the feedstock being used can be differentiated from other similar feedstocks. The description should include proposed regulatory language on how the feedstock could be defined at 40 CFR 80.1401, with references to definitions used by other authoritative organizations as appropriate.

a. Genus and Species (if applicable)

Describe the taxonomy of the feedstock to the extent possible and applicable. This section is most applicable if the feedstock is a planted crop or forestry product, but also applies to algal feedstocks. If the feedstock is a specific genus, species, subspecies, and/or strain within a larger group, the petitioner should provide that information. This is especially important if particular subtypes of the feedstock have significantly different qualities as biofuel feedstock than others.

Further, if some types of the feedstock are potentially invasive in the United States, it is important to differentiate which types are and are not invasive. The taxonomic nuances of any such dynamic should be detailed here and the more detailed discussion of any potential invasiveness should be detailed in Section F(2)(x) below.

b. Chemical Composition

Describe the full chemical composition of the feedstock on a percentage of total mass basis. Include the percentage of fats, starches, cellulose, hemicellulose, lignin, other sugars, minerals, ash, and any other molecules present in order to account for the full mass balance of the feedstock's composition.²² To the extent possible, provide peer reviewed literature as documentation of the figures in the mass balance. To the extent that there is variance in these percentages (due to variance in growing conditions, degradation between harvest and conversion to fuel, or any other significant factor), provide minimum and maximum expected ranges as well as expected averages. Document ranges using peer reviewed literature to the extent possible, including non-peer reviewed sources where peer reviewed literature is not available or outdated.

ii. Category of Renewable Biomass

The definition of "renewable biomass" in 40 CFR 80.1401 of the RFS regulations includes several subcategories of biomass that can be considered renewable. The petitioner should specify which category their feedstock falls under, including a justification for this categorization.

²² EPA, "Cellulosic Content of Various Feedstocks—2014 Update," Docket EPA-HQ-OAR-2012-0401-0240. July 18, 2014.

iii. Volume of Renewable Fuel Produced from the Feedstock

Information on the current and projected quantities of the feedstock that will be used to produce the fuel is needed for petitions that involve a new feedstock. Petitions should also include mass and energy balance data, including the yield of fuel per amount of feedstock consumed. Therefore, petitioners should include information on the current and projected volumes of renewable fuel produced from the feedstock.

To complete its evaluation EPA needs some understanding of the current and expected volumes of fuel that are produced from this pathway, or which could be produced should the pathway be approved for inclusion in the RFS. We understand projecting expected volumes can in certain circumstances be a difficult task that can be associated with significant uncertainty, but in such cases petitioners should provide a best estimate, a plausible range, and an explanation of how the estimate and range were derived. Recommendations on what to include, and how to present this information, are provided below.

a. Petitioner Volumes

To the extent that the petitioner plans to produce renewable fuel themselves, they should provide an estimate of the quantity of renewable fuel they expect to produce if the pathway is approved. This should include both a near-term estimate (i.e., over the next few years) and an estimate for the year 2022. Ranges for all of these projections should also be provided, and accompanied with a brief explanation of the key factors that would likely drive the eventual outcome towards the low or high ends of the range.

b. Market Potential

In accordance with the methodology and modeling framework developed for the March 2010 RFS rule, the evaluation of significant indirect emissions, including emissions from land use change and other market-mediated impacts, is a necessary and integral part of the EPA's evaluation of new biofuel pathways. In order to complete this evaluation, the Agency needs an understanding of the market potential for the requested pathway. Provided below are recommendations on what information to include in this section of your petition, and how to characterize the market potential in a manner that is most helpful for the EPA to complete its evaluation.

We ask the petitioner to provide estimates for the total volume of renewable fuel that could be produced under the proposed pathway in the year 2022 by all potential producers. This includes both producers in the United States and any potential production in other countries. To be clear, this is not limited to the volume of fuel that the petitioner might produce themselves. This estimate should include all fuel that could be produced by any and all producers under this pathway in the year 2022, and volumes from each country should be broken out separately in the projection. It should be an estimate of the quantity of fuel that could be produced under reasonable economic assumptions. To support this projection, the petition should include analysis of key parameters that influence the market potential for the fuel, including feedstock availability, fuel production capacity and market demand for the finished fuel. Ranges for all of these projections should also be provided, and accompanied with

explanation of the key factors that would likely drive the eventual outcome towards the low or high ends of the range.

iv. Yields

EPA needs detailed and reliable estimates of the current and projected feedstock and fuel production yields associated with this pathway. If the feedstock is a planted crop, this should include estimates of feedstock production per hectare.

If the feedstock is an extract of some other type of renewable biomass (e.g., vegetable oil extracted from oilseeds, sugar extracted from beet or cane), then the petitioner should also provide detailed information documenting the process yield of this extraction. This should include all currently known extraction methods, as well as an analysis of which method(s) are most likely to be utilized in future years and which methods the petitioner themselves plans to utilize (if applicable).

Similarly, the petitioner should provide detailed yield information for any coproducts of feedstock harvesting, processing, or use for renewable fuel production. See Section G for other coproduct information that should be included in the petition.

We ask that all yield estimates be documented with peer reviewed literature or data from USDA to the extent possible. If peer reviewed literature and/or USDA data are not available, then it should be explained why and the best available information should be submitted for consideration.

a. Petitioner Yields

For all of the yield data specified above, the petitioner should provide a range of historical and projected estimates that document expected minimum, maximum, and average values for their operations. Projected yields should extend at least ten years into the future, including low, high and best estimate projections. For each projection scenario (low, high and best estimate) the petition should provide analysis of key factors that are likely to influence the future yield trajectory for the feedstock.

In cases where there are significant coproducts from the feedstock production stage of the lifecycle, the historical and projected yield data explained above should include information about the coproduct yields (e.g., yield of soybean meal coproduct from producing soybean oil).

b. Global Yields Analysis

As explained above, analysis of the market potential for the requested pathway, which may extend beyond the fuel volume projected by the petitioner, is a key part of the EPA's evaluation of new fuel pathways. In order to properly estimate these impacts, we need to understand the best available information on feedstock yields covering the full market potential for the pathway. This data is especially important for feedstocks that are derived from planted crops, but it may be important for other types of feedstocks as well. Provided below are recommendations on what information to include in this section of your petition, and how to characterize the global feedstocks yields in a manner that is most helpful for the EPA to complete its evaluation.

The petitioner should provide historical data on average yields.²³ Such data should be broken out by country or state, or by using another regional aggregation justified by the petitioner. Official USDA data are preferred, especially for domestic data. If data from USDA are not available then data from other authoritative scientific organizations (e.g., governmental or international scientific bodies) and/or peer reviewed journal articles should be provided, and if the data are not provided from these sources the petitioner should explain why.

In addition to all of the historical yield data specified above, we ask the petitioner to provide a range of projected estimates that document expected low, high, and average yields values for all countries (and for each U.S. state) where significant production can be reasonably expected to take place using this pathway. Again, USDA projections are preferred, and if such data is not available then projections from other authoritative scientific organizations or peer review journal articles should be provided. This data should provide a reasonable range of values across all producers (or producer regions) who might utilize the proposed pathway by the year 2022, including producers outside the United States. We ask the petitioner to include a low, high and best estimate for each yield projection, by region. The projected yield data provided in this section should be accompanied by an explanation/analysis of the key factors that would likely drive the eventual outcome towards the low or high ends of the yield ranges provided.

Again, in cases where there are significant coproducts from the feedstock production stage of the lifecycle, the historical and projected yield data explained above should include information about the coproduct yields (e.g., yield of soybean meal coproduct from producing soybean oil).

v. Land Use Data

The petitioner should submit detailed information regarding the land where the feedstock is currently grown, including maps and accompanying data tables with land area by region (i.e., all countries and each U.S. state) for all regions of significant production. Such data should be accompanied with written analysis of the types of land displaced/used for current production of the feedstock (e.g., cropland, grown in rotation, pasture, forest).

To complete its analysis of significant indirect impacts, EPA also requires information on the projected locations and types of land that would likely be impacted if the requested pathways are approved. Therefore, the petitioner should provide a written analysis of the locations and types of land that would be the most likely to be impacted under the projected volume scenario(s) described in Section F(2)(iii) of the petition. Such analysis should consider suitable growing conditions for the feedstock, available land and competing land uses.

Provided below are recommendations for how this land use data and analysis should be organized and presented in the petition.

²³Regarding units, domestic production for field crops yields should be provided in bushels per acre or based on the standard units used in USDA publications. For foreign field crops yield should be provided in metric tonnes per hectare or based on the standard units used by USDA or other authoritative organizations.

a. Petitioner Data

The petitioner should describe the land on which feedstock will be grown for their expected biofuel production. This should include the quality of the land, including its most likely alternative use (agricultural, silvicultural, pasture, etc.).

b. Suitable Growing Conditions

The petitioner should describe the physical conditions required to grow the feedstock. This should include any limitations related to soil moisture (e.g., requires arid conditions, tropical conditions), temperature conditions (e.g., the feedstock is not frost tolerant), and any other relevant factors that EPA might utilize to understand the conditions under which this feedstock can be grown for commercial production.

c. Global Land Use Analysis

The petitioner should provide detailed historical data documenting the location and extent of planted acres of the feedstock. This should include the name and historical acreage quantity for every country and U.S. state where the feedstock is currently grown or has been grown in the past. This analysis should also identify countries and U.S. states where the feedstock might be grown in the future, based on growing condition suitability.

d. Competing Land Uses

The petitioner should provide information regarding the feedstock's main competitors for land use. This should include any agricultural commodities that, at commercial scale, the feedstock is likely to compete with for acreage. To the extent that the feedstock already has established competitors for land, those should be highlighted. If the petitioner does not believe the feedstock has competitors for land use, they should submit a thorough justification including published materials if possible.

vi. Market Value

The petitioner should provide data on the historical and projected market prices of the feedstock, the plant it is derived from (if applicable) and any feedstock coproducts that are currently marketed or that are likely to be marketed in the future. This should include data on farm gate prices, prices on commodity exchanges, and other relevant domestic and international price data for any of these commodities. To the extent that any of these commodities are currently marketed, historical price data should be from a reliable published public source, such as USDA, or the administrative data of the relevant commodity exchange(s). Projected price data should include USDA projections if such data are available. Data should be reported in as frequent an interval and as regionally disaggregated as is available.

If no historical or projected price data is available from a citable source, data for similar feedstocks may be substituted. If no such feedstocks exist, then a price based on projected bottom-up cost of production data may be presented as a last resort. Such estimates should not be used in lieu of more generalizable data, but only when other data does not exist.

vii. Alternative uses

a. Description of Alternative Uses

The petitioner should describe any established alternative uses for the feedstock. This should include the scale of historical and projected use (i.e., is demand from this alternative use likely to increase, decrease, or remain flat in the future?) and the price that the feedstock commands for alternative uses.

This data is especially important if the feedstock is currently used for food or animal feed. But it is also relevant if the feedstock is used in any significant volumes for other industrial or commercial purposes for the purpose of evaluating potential indirect impacts of an approved biofuel pathway.

b. Domestic Use and Exports

The description of alternative uses should provide historical data and projections regarding the domestic use and export of the feedstock for these alternative uses.

c. Substitutes and Displacement Ratios

The petitioner should describe the key substitutes for the feedstock for each alternative use. For example, if the feedstock is used as a feed product, the petitioner should identify the alternative feed products that the feedstock is most directly a substitute for.

As a part of this description, the petitioner should provide data and analysis regarding the displacement ratio of the feedstock to its substitutes. For example, if one pound of the feedstock displaces 0.8 pounds of wheat in dairy cattle diets on average according to the peer reviewed literature, this should be documented with the appropriate source citations in the petition.

d. Information for Livestock Feed

If the feedstock is a livestock feed, then the petitioner should submit all of the following information. If not, this section should be labeled "N/A."

1. Animal Market Share and Feed Ratios by Region

The petitioner should provide information on the quantities of the feedstock that are sold into the various animal markets, both nationally and by region. The petitioner should also provide data regarding historical average feed ratios of the feedstock in animal diets for each animal that eats the feedstock, both nationally and by region.

2. Feed Market Contract Specifications

The petitioner should provide information regarding standard or common contract specifications for the feedstock, if this data exists. This should include any minimum or maximum nutrient values that the feedstock must meet to be sold on contract as feed. If this data does not exist, this section may be labeled "N/A".

3. Historical and Projected Feed Prices

The petitioner should provide data on the historical feed prices for the feedstock in the United States and on any major international commodity exchanges, if this data exists. The petitioner should also provide available data on the projected future price of the feedstock as an animal feed, especially if such data is available from USDA or the Food and Agriculture Organization of the United Nations (FAO). If this data does not exist, this section may be labeled “N/A”.

4. Data on Maximum Inclusion Rates, Substitutability

The petitioner should provide data regarding the maximum inclusion rates of the feedstock in animal diets, for each animal type (e.g., beef cattle, dairy cattle, swine, poultry) that is capable of eating the feedstock. Petitioner should provide information on whether this feed’s nutritional content make it a direct or close substitute to other feed types.

5. Approved Status Documentation

The petitioner should indicate whether the feedstock is approved by the FDA for use in animal diets, or not. If it has been approved, the petitioner should provide documentation of that approval. If it has not been approved, petitioner should provide information on the application status.

viii. Farm Input Data

The petition should list chemical and energy inputs needed to produce the feedstock and prepare it for processing. This section provides recommendations on how to provide this information. The petitioner should provide all of the following data regarding the farm inputs used to grow the feedstock. More specifically, the petitioner should submit all data requested in the “Crop Inputs” section of the “New Feedstock” tab of EPA’s *Data Submission Template for New Pathway Petitions*, available online.²⁴

a. Petitioner Data

If the petitioner is growing the feedstock themselves, they should provide the crop input data specified in the “Crop Inputs” section of the “New Feedstock” tab of EPA’s *Data Submission Template for New Pathway Petitions* for their own farming operations.

b. Average Farm Inputs by Region

Regardless of whether the petitioner is themselves a feedstock producer, they should provide average farm data for each input specified in the above template by region for every U.S. state and country where the feedstock is grown.

ix. Mass and Energy Balance Data for Feedstock Pre-Processing

If there are any pre-processing steps (e.g., soybean crushing) in the lifecycle for the requested pathway between the harvest of the feedstock and its delivery to the production process facility, the petitioner should include mass and energy balance data for all of these steps in this section.

²⁴ Please see <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/how-to-submit.htm>

a. Petitioner Feedstock Pre-Processing Data

The petitioner should provide mass and energy balance data for each pre-processing step, including all inputs and outputs for each step, for its operations. Such data should be provided in the same format and follow all of the other recommendations as for the mass and energy balance data required in Section E(2) of the petition.

b. Industry-Wide Feedstock Pre-Processing Data

The petitioner should provide industry average mass and energy balance data for each pre-processing step. Such data should be provided in the same format and follow all of the other recommendations as for the mass and energy balance data required in Section E(2) of the petition. Differences between the data provided for the petitioners operations and the industry average data provided in this section should be explained with appropriate supporting documentation as appropriate.

x. Invasiveness

The producer should provide any information regarding the potential invasiveness of the feedstock in the United States.

a. Governmental Invasive Species and Noxious Weed Lists

If the feedstock is included on any federal, state, or local invasive species or noxious weed lists, the petitioner should note this in their petition.

b. Other Information on Potential Invasiveness

Even if the feedstock is not currently included on any government list, if there is official U.S. government or peer-reviewed literature which suggests that the feedstock may be invasive in certain areas, the petitioner should include this literature in their petition. Furthermore, if there are any concerns that the feedstock could be an invasive species and/or noxious weed that could require mitigation or remediation of any kind we strongly recommend that the petitioner discuss these issues with relevant experts, such as experts at the USDA or university researchers. If the experts consulted agree that the feedstock does not pose any risk of invasiveness that should be considered in EPA's lifecycle GHG analysis, the petitioner is advised to include a letter supporting this conclusion signed by relevant experts.

If the petitioner acknowledges that the feedstock poses a risk of invasiveness, this section should explain the risks and recommend mitigation strategies and other procedures that growers/users of the feedstock could take to prevent and address any potential problems. As an example of the type of requirements that could be put into place see the registration requirements for using *Arundo donax* as a renewable fuel feedstock at 40 CFR 80.1426(f)(14).

xi. Other Potential Environmental Impacts

The petitioner should note any other potentially significant environmental impacts that the feedstock may have if produced at commercial scale.

3. Other Relevant Information

The petitioner may include any other information that they feel is relevant to EPA's lifecycle GHG analysis of the feedstock.

G. Coproducts

Petitions should include information on all coproducts associated with the proposed pathway, including their expected use and market value. If in the rare case that no coproducts are produced this section can be labeled "N/A."

1. Technical Description

Provide a thorough description of each and every coproduct (up to two pages per coproduct) from the proposed pathway. The description for each coproduct should include an analysis of its expected uses and market value, and should include information on the other products that would likely be displaced in the market (e.g., feed corn and soybean meal are displaced by distillers grains and solubles used as livestock feed). The analysis should include available data/analysis on how the coproduct is currently used and on the other products used for the same purposes.

If all of the following apply for a coproduct from the requested pathway, then the EPA has previously evaluated the GHG emissions impacts attributable to the coproduct, and the technical description of the coproduct can be brief (1-2 paragraphs) with an explanation of why EPA's previous evaluation applies in terms of the coproduct's expected uses and the other products it would displace in the market:

- The requested pathway uses a previously evaluated feedstock and fuel type.²⁵
- The requested pathway uses a production process that is similar to a previously evaluated production process (e.g., same type of process technology with new energy saving technologies).²⁶
- The new aspects of the production process in the requested pathway do not impact the market value or likely uses of any of the coproducts compared to the coproducts from the previously evaluated production process.

2. Market Value

Information on the market value of all coproducts is required. Provide data on historical and projected market prices for all of the coproducts. If available, historical price data should be from a reliable published public source, such as USDA or the administrative data of the relevant commodity exchange(s). If data from reliable published sources are unavailable, explain why and provide the best available data. In general, twenty years of historical annual data and ten years of projected annual data

²⁵ For information on how to determine whether a feedstock and fuel type have been previously evaluated by EPA see sections 3(F)(2) and 3(D)(2), respectively, in this document.

²⁶ For more on how to determine if a production process was previously evaluated by EPA see section 3(E)(4) of this document.

are advisable, but the petitioner may use discretion in terms of providing data over the most relevant periods for each coproduct.

Projected price data should include USDA projections if such data are available. Data from other reputable sources (e.g., other governmental organizations, industry trade associations) can be included for comparison. If projected price data are unavailable explain why and provide the best available information.

The petitioner should provide a brief analysis (less than one page) of the key factors impacting historical and projected prices. For projections, the petitioner should explain important market trends that could significantly impact the price of each coproduct in the near and long term.

If no historical or projected price data is available from a citable source, data for similar commodities may be substituted. If no such commodities exist then a price based on projected bottom-up cost of production data may be presented as a last resort. Such estimates should not be used in lieu of more generalizable data, but only when other data does not exist.

If the coproduct was previously evaluated by the EPA (see the criteria listed above), the market value data provided for the co-product can be brief, with a reference to current market data and a short (1-2 paragraph) explanation of why EPA's previous evaluation applies in terms of the coproduct's market value.

3. Co-Products used as Livestock Feed

For any coproducts that will be used as livestock feed, the petitioner should also submit all of the following information.

i. Animal Market Share and Feed Ratios by Region

The petitioner should provide information on the quantities of the coproduct that are sold into the various animal markets, both nationally and by region. The petitioner should also provide data regarding historical average feed ratios of the coproduct in animal diets for each animal that consumes the feedstock, both nationally and by region.

ii. Feed Market Contract Specifications

The petitioner should provide information regarding standard or common contract specifications for the coproduct. This should include any minimum or maximum nutrient values that the coproduct must meet to be sold on contract as feed.

iii. Historical and Projected Feed Prices

The petitioner should provide data on the historical feed prices for the coproduct in the United States and on any major international commodity exchanges. The petitioner should also provide available data on the projected future price of the coproduct as an animal feed, especially if such data is available from USDA or FAO.

iv. Data on Maximum Inclusion Rates, Substitutability

The petitioner should provide data regarding the maximum inclusion rates of the coproduct in animal diets, for each animal type (e.g., beef cattle, dairy cattle, swine, poultry) that is capable of eating the coproduct. The petition should indicate whether the feed's nutritional content make it a direct or close substitute to other feed types.

v. Approved Status Documentation

The petitioner should indicate whether the coproduct is approved by the FDA for use in animal diets, or not. If yes, the petitioner should provide documentation of that approval. If not, the petitioner should provide the current status of the approval request.

H. List of Attachments

Provide a list of the attachments submitted with the petition, including a short name and brief description (1-2 sentences) for each attachment.

Appendix A: Formatting for New Fuel Pathway Petitions

Electronic file type: PDF

Font and Section Headings:

- For the body of the document: Calibri, size 11, black color
- First level section headings (e.g., **F. Feedstock**): Cambria, size 14, bold, no indent, capitalize the first letter of each word, color = Blue, Accent 1, insert page break
- Second level section headings (e.g., **2. Information for New Feedstocks**): Calibri, size 13, bold, capitalize the first letter of each word
- Third level section headings (e.g., **vii. Alternative Uses**): Calibri, size 11, normal font, indent by one tab, capitalize the first letter of each word
- Fourth level section headings (e.g., ***d. Information for Livestock Feed***): Calibri, size 11, italics, indent by one tab, capitalize the first letter of each word
- Fifth level section headings (e.g., **1. Animal market share and feed ratios by region**): Calibri, size 11, normal font, indent by one tab, capitalize only the first letter of the first word

Paper size: Standard 8.5 by 11-inch copier paper

Table of Contents: Include a table of contents

Appendix B: Petition Cover Sheet Template

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Date Submitted: [MM/DD/YYYY]

[Organization Name]

Location of Headquarters: [City, State, Country]

Location of Biofuel Production Facility (if applicable): [City, State, Country]

Fuel Pathway Requested

Fuel	Feedstock	Production Process Technology	RIN D-code Requested

Primary Point of Contact

Name:

Title:

Address:

Phone Number:

Alternate Phone Number:

Email address:

Additional Contact Info (if any):