

How to Prepare a Complete Petition: Version 1.2

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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](#).²

The RFS regulations at [40 CFR 80.1416\(b\)](#) outline the information requirements for petitions requesting evaluation of a new fuel pathway. 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. (Pursuant to [§ 80.1416\(c\)\(1\)](#), a company may resubmit a petition EPA has rejected as incomplete.) This document provides additional information to help petitioners prepare petitions submitted under the regulations.³

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 needed 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 you do not explain the delay, your petition may be rejected as incomplete, and a new petition will 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 your petition review process, the EPA is also asking that petitioners prepare their application packages using the organization and format specified in this document.⁴

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 2 of this document provides recommendations on how to submit information claimed as confidential business information in a petition. Section 3 provides section-by-section 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 periodically update this document as we identify areas for improvement.

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

² <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

³ This document generally uses "should" to describe information to include in your petition. However, nothing in this document reduces or changes the requirements for submission of information under 40 CFR 80.1416(b).

⁴ See [Appendix A: New Fuel Pathway Petition Outline](#), and [Appendix B: Formatting for New Fuel Pathway Petitions](#).

A. What's New in Version 1.2?

We have added instructions on how to prepare a complete petition for a new pathway that involves the use of a biointermediate to produce a renewable fuel. This version also includes instructions for how a party may suggest a potential biointermediate for inclusion in the RFS program.⁵ In general, a biointermediate is renewable biomass that has been substantially altered at one facility to produce a proto-renewable fuel (referred to as a biointermediate) that is subsequently used at a different facility to produce renewable fuel for which RINs would be generated. On July 1, 2022, EPA promulgated provisions to allow for the use of certain biointermediates to produce renewable fuels if the biointermediate producer and renewable fuel producer meet all applicable regulatory requirements ([87 FR 39600](#)). In the same rulemaking, EPA required that petitions requesting evaluation of a new fuel pathway must include information about biointermediate production and use, when relevant. Additions to this document detailing the information requirements related to biointermediates are found in Section 3. See Section 3.H.1 for more information on biointermediates.

We are now requesting that petitioners who submit a petition with information claimed CBI submit two versions: one version with information claimed CBI clearly marked, and one version with all information claimed CBI redacted. See Section 2 for details.

For petitions that involve feedstocks that are new or may entail a significant weed risk, we are providing more instructions on the type of information to include on mitigating risks of spreading invasive species.

We are clarifying the requirement that every petition must be signed and certified as meeting all the applicable requirements by the responsible corporate officer of the applicant company.

We are not rescinding any of the prior instructions. Other than the clarifications and additions described above, the other revisions are intended to clarify particular things, abbreviate particular descriptions, and update references to webpages.

⁵ The difference between “biointermediates” and “potential biointermediates” is discussed in Section 3.H.1. Other than in Section 3.H.1, we use the term “biointermediates” in this document to refer to both biointermediates and potential biointermediates. That is, the requirements, recommendations, etc. in this document apply to both biointermediates and potential biointermediates, except as noted in Section 3.H.1.

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 information claimed as confidential business information (CBI) in their submissions. Petitions that include CBI claims can be submitted electronically through CDX/OTAQREG, the Agency's secure online portal for handling proprietary information, or via email to rfspathways@epa.gov. To facilitate transparency and public understanding regarding renewable fuels, this section tells petitioners how to notify EPA that a petition contains information claimed as CBI and how to identify this information.

To assert a CBI claim, you may mark the information you seek to keep confidential with, for example, a cover sheet or legend that says, "trade secret," "proprietary," "company confidential," or "CBI claimed information." You may also identify whether you desire confidential treatment until a certain date or until the occurrence of a certain event. Information not claimed as confidential, when received by EPA, may be made available to the public without further notice to you. EPA's regulations covering CBI claims and procedures are at 40 CFR Part 2, Subpart B (40 CFR §§ 2.201 – 2.311), and CBI regulations specific to certain information submitted to EPA as part of the Renewable Fuel Standard program are at 40 CFR § 80.1402 (as amended July 1, 2022, 87 FR 39661). If you are submitting a petition with CBI claims, you should submit two versions: one version that contains the information claimed as CBI, clearly identified, and another version with all of the claimed CBI redacted.

In summary, please follow these instructions to claim CBI in a pathway petition:

- Minimize CBI claims in petition submissions to the extent possible.
- This document designates certain sections of a petition as "(No information claimed CBI)." EPA believes that the information sought in those sections is information that should be available to the public. Clearly identify everything that you claim is CBI.
- State on your petition how you have identified claimed CBI; for example, bracketed, highlighted, etc.
- When submitting a petition with information claimed CBI, submit two versions: one version with information claimed CBI clearly marked, and one version with all information claimed CBI redacted.
- If you submit a petition with information claimed as CBI, indicate whether you desire that it be kept confidential until a certain date or until a certain event has taken place.

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. Any information not claimed as CBI may be released without further notification to you, the petitioner.

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 and provides detailed information on what to include in each section of your 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 your petition is submitted to the EPA.

2. Organization Name

Enter the official name of the organization submitting your 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 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. If there are other co-sponsoring organizations on your petition, they can be listed in Section C of your petition.

3. Location of Headquarters

Specify the location (city, state, country) of the headquarters for the lead organization submitting your 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 potential 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 type, feedstock, 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 fuel types that can be produced from the feedstock and the associated fuel production process technologies. You should add rows to the table as necessary to include all of the fuel pathways requested and ensure that all of the cover page information fits on one page. (If there are additional pathways that do not fit on the cover sheet, they can be listed in Section

B.1 of your petition.) 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. Two examples of how a petition with multiple fuel types with a new feedstock should be listed on the cover sheet 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 your petition. Petitions should have only one POC. EPA recommends that the POC should be affiliated with the lead organization listed in Section A.2 of your petition. 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 your 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 your petition. These recommendations are intended to reduce duplicative communications between EPA and parties associated with a petition.

B. Technical Justification

Pursuant to [40 CFR 80.1416\(b\)\(1\)\(ii\)](#), all petitions must include a technical justification that includes a description of the renewable fuel, feedstock(s), biointermediate(s) and the production process(es). The technical justification must include process modeling flow charts. It should provide a summary of the proposed fuel pathway and a description of any significant differences between the potential 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 potential pathway and any major issues that EPA should consider in its evaluation. It should generally not include information claimed as CBI, and it should be written in such a way that the information can be used to explain the potential pathway to informed members of the general public. Confidential information and more technical details can be provided in the subsequent sections of your petition.

1. Fuel Pathway Description (No information claimed CBI)

This section should provide an executive summary of the potential 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 type, feedstock, biointermediates, production 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 and biointermediate production process(es).
- The production, handling and most likely uses of significant co-products.
- Expected uses for new types of renewable fuel. For example, what types of vehicles and settings the fuel is expected to be used in.

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 must be provided for each row of the table in Section A.5 of your petition. Each flow chart provided in this section should fit on one page. 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 processes⁶ at all stages of fuel, biointermediate and feedstock production and distribution, from feedstock generation or extraction through the distribution, 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, and should correspond with the mass and energy balance data provided in

⁶ [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 co-products, it may be reasonable to combine them together and consider them one unit process in the process flow chart.

Section E.2 of your petition. More technical process modeling diagrams, including any information claimed CBI, should be provided as attachments in Section I of your petition.

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

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

4. Commercial Viability

Provide a brief justification of the commercial viability of the potential pathway (less than two pages). Given limited resources, EPA may not prioritize evaluation of potential 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 potential 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 your 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). Your 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 your petition, including address(es), website(s) and EPA registration number(s) (if applicable). Describe the role of each organization in the supply chain for the potential pathway. This information might 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

Per the RFS regulations at [40 CFR 80.1416\(c\)\(2\)](#), "The petition must be signed and certified as meeting all the applicable requirements of this subpart by the responsible corporate officer of the applicant company." As an attachment to the petition, include a document signed by the responsible corporate officer (RCO) for the lead organization associated with the petition with the certification described above. For example, the certification may say, "As the responsible corporate office for [INSERT ORGANIZATION NAME], I certify that the enclosed petition for evaluation of a new renewable fuel pathway meets all of the applicable requirements of [40 CFR subpart M](#), including [40 CFR 80.1416](#)."

In this section of your petition, provide contact information (name, title, phone, email, address) for the RCO. Official EPA correspondence related to your 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 your petition provides information about the fuel type produced through the potential pathway. Additional information is needed for new fuel types that EPA has not previously evaluated.

1. Technical Description

Your petition must provide a brief technical description for each fuel type associated with your petition, i.e., all of the fuel types listed in the table in Section A.5 of your 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 of your petition 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](#).⁷
- Fuels that EPA evaluated in response to a petition submitted pursuant to [40 CFR 80.1416](#).⁸
- Fuels included in pathways for which EPA has published a lifecycle GHG analysis in a proposed rule, notice of data availability or other *Federal Register* publication.⁹

If after reviewing the information referenced above, you have questions about whether a particular fuel type was previously evaluated by the EPA, please consider submitting a pathway screening tool if you have not already done so.¹⁰

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

i. Chemical Composition

For each new fuel type produced through the potential pathway, provide a laboratory report of the full chemical composition of a representative sample.¹¹ The laboratory report should specify the mass fraction (percent) and energy content (btu lower heating value per lb) for each component of the fuel.

⁷ See the Generally Applicable Pathways section of: <http://www.epa.gov/otag/fuels/renewablefuels/new-pathways/approved-pathways.htm>

⁸ See the Completed Pathway Assessment section of: <http://www.epa.gov/otag/fuels/renewablefuels/new-pathways/approved-pathways.htm>

⁹ See <http://www.epa.gov/otag/fuels/renewablefuels/regulations.htm> for and the list of rulemakings. For Federal Register notices and other actions see: <https://www.epa.gov/renewable-fuel-standard-program/other-actions-renewable-fuel-standard-program>

¹⁰ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

¹¹ Liquid fuels may be collected using sampling procedures specified at [40 CFR 1090.1335](#). For non-liquid samples, the petition should include a description of how a representative sample was collected for chemical analysis.

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, 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 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](#). 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 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 your petition. For convenience, the EV application can be included as an attachment in Section I of your petition.

For recordkeeping purposes, we also ask that applications for alternative equivalence values are submitted to the Fuels Program Helpdesk. The email for the helpdesk is FuelsProgramSupport@epa.gov. The full contact information is also listed on our website.¹²

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 your petition includes a new type of jet fuel, explain the status of the ASTM certification process, and cite the relevant certification numbers. In addition, 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 your petition that EPA should consider in its evaluation.

¹² <https://www.epa.gov/renewable-fuel-standard-program/forms/contact-us-about-renewable-fuel-standards>

E. Production Process

This section of your petition provides information about the production process utilized to produce the biointermediate(s) (if applicable) and fuel(s) under the potential pathway. Additional information is needed for EPA to complete a lifecycle GHG analysis for new production process types that EPA has not previously evaluated. In this document we use the term “production process” to mean the collection of unit processes used to convert renewable biomass feedstocks to biointermediates and/or transportation fuels.

1. Type of Production Process

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

2. Mass and Energy Balances

Per the RFS regulations at [40 CFR 80.1416\(b\)\(1\)\(iii\)](#) and [\(v\)](#), all pathway petitions shall include the following:

- “A mass balance for the pathway, including feedstocks and biointermediates, fuels produced, co-products, and waste materials production.”
- “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.”

Mass and energy balances must be included for each and every pathway listed in Section A.5 of your petition. These data should detail all of the significant inputs and outputs for the processes that produce biointermediate(s) and biofuel(s), including feedstock, biointermediate and energy inputs, and fuel, co-product and waste material outputs.

Separate mass and energy balances should be provided for each facility in the fuel pathway supply chain. For example, one mass and energy balances should be provided for the biointermediate production facility and separate mass and energy balances for the fuel production facility in the supply chain.

For a facility that produces multiple products (e.g., transportation fuel and coproducts, multiple transportation fuels) through multiple unit processes:

- If all of the products are produced together in each unit process, such that it is not practically feasible to determine which inputs contributed to the production of each product other than through the use of allocation methods (e.g., energy allocation), it is acceptable to provide one mass and energy balance for the entire facility.
- Otherwise, provide a separate mass and energy balance for each unit process to the extent possible.

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.¹³ The updated template includes separate tabs for each biointermediate and fuel production process in the supply chain. The data submission template files include detailed instructions on data requirements, units and citations. Petitions should include, as attachments, completed Mass and Energy Balance Data Submission Templates in Microsoft Excel format. This section of your petition should list the attached files and provide a description for each file.

In the case of production processes that co-process multiple renewable biomass feedstocks, and/or co-process renewable biomass with other materials that do not qualify as renewable biomass, your petition should specify the converted fraction of renewable biomass to biointermediate or fuel. Your petition should explain how the converted fraction was estimated, and what testing protocols or other procedures will be followed in the future to demonstrate the converted fractions of renewable biomass to a biointermediate or finished fuel. This information is similar to what would be required upon registration to produce the fuel, per [40 CFR 80.1450\(b\)\(1\)\(xiii\)](#).

Each process flow chart included in section B.2 of your petition should include corresponding data from the mass and energy balances provided in this section. If the mass and energy balance data are claimed as CBI, they can be left out of the process flow chart in section B.2 of your petition, and instead provided in a separate process flow chart as an attachment in Section I of your petition.

3. Historical Process Data

To the extent possible, petitioners should provide historical data supporting the mass and energy balance data provided in Section E.2 of your petition. Petitioners should include monthly data for the most recent 24 months, or for however long the plant(s) has been producing fuel or biointermediate through the potential pathway, whichever is shorter. This section should include summarized time series data on feedstock and biointermediate usage and properties, energy use, fuel and biointermediate production volumes and properties, waste and co-product production, usage of additional reagents or catalysts, and any other data related to supporting the mass and energy balance for the potential pathway. Petitioners are also encouraged to provide documentation (e.g., energy bills) for the time series data as attachments to Section I. In cases where no historical process data are available, your petition should explain why data are not available and the basis for the mass and energy balance data provided in Section E.2 of your petition.

Petitioners who do not operate the fuel production facility that will be used to produce the fuel in their potential pathway should provide historical process data from companies that operate fuel production facilities. If this is not feasible, then data should be provided, to the extent possible, from other sources (e.g., peer-reviewed studies, government reports) in this section. Doing so will help to support/verify the mass and energy balance data in Section E.2 of your petition. Petitioners who cannot supply historical

¹³ <https://www.epa.gov/renewable-fuel-standard-program/how-submit-complete-petition-approved-pathway-renewable-fuel>

mass and energy balance data should explain why in this section. 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](#).¹⁴
- Production processes that EPA evaluated in response to a petition submitted pursuant to [40 CFR 80.1416](#).¹⁵
- 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.¹⁶

If after reviewing the information referenced above, you have questions about whether a particular biofuel production process was previously evaluated by the EPA, we recommend submitting a pathway screening tool if you have not done so already.¹⁷

For all biofuel and biointermediate production processes that are new (i.e., not previously evaluated by EPA), the Agency will need the information described below in Section 3.E.4 of this document to complete its evaluation.

In cases where EPA has previously evaluated the same type of technology as the production process used in the potential pathway, the production process in your petition should still be considered new if approval of the potential 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, your 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.

The production process should be considered new if the potential pathway involves the use of a biointermediate, unless you can find a clear and specific example where EPA evaluated the types of biointermediate and fuel production processes used in your potential pathway which includes the same arrangement of biointermediate and fuel production steps across multiple facilities.

For petitions that involve new production processes, it is common for EPA to share the information provided in this section of your petition with relevant experts at the U.S. Department of Energy (DOE) and the USDA. This consultation process takes time, and questions raised by such experts may require

¹⁴ See the Generally Applicable Pathways section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹⁵ See the Completed Pathway Assessment section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

¹⁶ See <http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm> for the list of rulemakings.

¹⁷ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

further clarification by your petitioner. Petitioners are encouraged to consult with relevant experts at DOE¹⁸ and USDA¹⁹ 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 your 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.

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 of your petition.

ii. Request for Special Provisions

If the argument in your petition for approving the potential pathway hinges on consideration of special provisions for the production process, all such special provisions should be detailed in this section of your petition (less than two pages). Examples of special provisions could include co-product credits, or the use of special emissions factors for process energy use. In particular, if the approval of the potential 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 of your petition, and you should explain how you 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 potential pathway is produced from a chemical conversion process that uses a feedstock which itself was a renewable fuel produced by another party, you should review [40 CFR 80.1426\(c\)\(6\)](#) in the RFS regulations and provide information on the types of renewable fuel used, the expected 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. Consistent with the requirements of 80.1426(c)(6), please include a description of what you intend to do with the RINs generated for the renewable fuel that will be used to produce another renewable fuel in order to ensure that double counting of RINs does not occur (e.g., retire the RINs). Please note that [40 CFR 80.1426\(c\)\(6\)](#) is not intended as a way to avoid regulatory requirements that apply to other similar fuel pathways. For example, we will not accept petitions submitted pursuant to [40 CFR 80.1426\(c\)\(6\)](#) that appear to avoid the biointermediate regulatory requirements by claiming a biointermediate is a renewable fuel feedstock, or through a similar strategy.

5. Other Relevant Information

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

¹⁸ <http://www.energy.gov/eere/bioenergy/bioenergy-technologies-office>

¹⁹ <http://www.usda.gov/oce/>

F. Feedstock

This section of your petition provides information about the feedstock used to produce the biointermediate(s) or fuel(s) through the potential pathway(s). Additional information is needed for new feedstocks that EPA has not previously evaluated. In this document, the feedstock means the renewable biomass that is converted to a biointermediate and/or transportation fuel.

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 whom the feedstock will be grown/produced. If your potential pathway(s) involves a new feedstock, provide the information specified in Section F.2. For previously evaluated feedstocks that may entail a significant risk of spreading invasive species, you should also provide the information specified below in Section F.2.x. If you have questions about what information to provide about feedstock(s) please submit a pathway screening tool if you have not done so already.²⁰

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 your 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](#).²¹
- Feedstocks that EPA evaluated in response to a petition submitted pursuant to [40 CFR 80.1416](#).²²
- 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.²³
- 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.²⁴

If after reviewing the information referenced above, you have questions about whether a particular feedstock was previously evaluated by the EPA, please submit a pathway screening tool if you have not done so already.²⁵

²⁰ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

²¹ See the Generally Applicable Pathways section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

²² See the Completed Pathway Assessment section of: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/approved-pathways.htm>

²³ See <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/other-determinations.htm>

²⁴ See <http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm> for the list of rulemakings.

²⁵ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

If the requested pathway involves the use of a feedstock that EPA has not previously evaluated, the additional information required for petitions is outlined at [40 CFR 80.1416\(b\)\(2\)](#). This additional information is required because, in order to make a determination on your petition, we need to determine if the feedstock qualifies as renewable biomass and 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 of your petition 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, for example, that they apply regardless of the point-of-origin of the feedstock (assuming the feedstock meets the 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 you are undertaking. In fact, in some cases 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, if your petition requests pathways for new feedstocks, you should provide information for all states or countries (or using another regional aggregation justified by the petitioner) that would be reasonably likely to produce and to use the feedstock under the requested fuel pathway if EPA were to approve your petition. This section provides further guidance on how to provide this information in your petition.

It is common practice for EPA to share the information provided in this section of your petition with relevant experts at the DOE and 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 DOE²⁶ and USDA²⁷ 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 your 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

Your petition 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 a proposed definition for your feedstock with references to definitions used by other authoritative organizations as appropriate.

a. Genus and Species (if applicable)

Describe the taxonomy of the feedstock, including the scientific name, 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, or strain within a

²⁶ <http://www.energy.gov/eere/bioenergy/bioenergy-technologies-office>

²⁷ <http://www.usda.gov/oce/>

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 of your petition, as explained below.

b. Chemical Composition

Describe the full chemical composition of the feedstock on a percentage of total using a dry 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.²⁸ To the extent possible, provide peer reviewed literature to support the chemical composition values submitted. 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, or 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 qualify under the program. You must specify which category your feedstock falls under, including a justification for this categorization. If possible, we recommend using the same terminology for feedstocks/categories or renewable biomass that are already listed in the RFS regulations.

For example, if your feedstock is branches left on the ground after logging, we would recommend using the term "slash" as a general term to describe it, and also provide details describing how your feedstock meets the regulatory definition of slash.²⁹ If you use different terminology to describe the material (e.g., "forestry green waste"), we will likely ask you for clarification on precisely what feedstock you are using, and whether it qualifies as slash or another category of renewable biomass as defined under Section 211(o) of the CAA and EPA's regulations at 40 CFR 80.1401.

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 must also include mass and energy balance data, including the yield of fuel per amount of feedstock consumed. Petitioners must also include information on the current and projected volumes of renewable fuel produced from the feedstock, and the quantities of the feedstock that will be used to produce the fuel.

²⁸ EPA, "Cellulosic Content of Various Feedstocks—2014 Update," [Docket EPA-HQ-OAR-2012-0401-0240](#). July 18, 2014.

²⁹ Per [40 CFR 80.1401](#), "Slash is the residue, including treetops, branches, and bark, left on the ground after logging or accumulating as a result of a storm, fire, delimbing, or other similar disturbance."

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 some 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 your company intends to produce renewable fuel, please provide an estimate of the quantity of renewable fuel you expect your company to produce if the pathway is approved. This should include both a near-term estimate (i.e., over the next few years) and longer term estimates (e.g., 10-20 years in the future). 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 you to provide estimates for the total volume of renewable fuel that could be produced under the potential pathway over the next 10 years 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 you (the petitioner) might produce yourself. This estimate should include all fuel that could be produced by any and all producers under this pathway over the next 10 years, 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, your 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 or acre.

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), you should also provide detailed information documenting the process yield of this extraction. This should include all commercially relevant extraction methods, as well as an analysis of which method(s) are most likely to be utilized in future years and which methods you plan to utilize (if applicable).

Similarly, you should provide detailed yield information for any coproducts of feedstock harvesting, processing, or use for renewable fuel production. See Section 3.G of this document for other coproduct information that should be included in your 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 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, you should provide a range of historical and projected estimates that document expected minimum, maximum, and average values for your 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) your 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 meal coproduct from producing vegetable oil).

b. Global Yields Analysis

As explained above, analysis of the market potential for the requested pathway, which may extend beyond the fuel volume you are projecting to produce, 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. These data are 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 feedstock yields in a manner that is most helpful for the EPA to complete its evaluation.

Your petition should provide historical data on average yields.³⁰ Such data should be broken out by country or state, or by using another regional aggregation (in which case you should provide justification for this aggregation). 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

³⁰Regarding 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 tons per hectare or based on the standard units used by USDA or other authoritative organizations.

international scientific bodies) or peer reviewed journal articles should be provided, and if the data are not provided from these sources you should explain why.

In addition to all the historical yield data specified above, we ask you 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 are not available then projections from other authoritative scientific organizations or peer review journal articles should be provided. These data should provide a reasonable range of values across all producers (or producer regions) who might utilize the potential pathway over the next 10 years, including producers outside the United States. We ask that your petition 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 meal coproduct from producing vegetable oil).

v. Land Use Data

You 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, you 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 your 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 your petition.

a. Petitioner Data

Describe the land on which feedstock will be grown for your expected biofuel production. This should include the location and quality of the land, including its most likely alternative use (agriculture, silviculture, pasture, etc.).

b. Suitable Growing Conditions

Your petition 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., frost tolerance), 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

Your petition 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

You 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 you do not believe the feedstock has competitors for land use, you should submit a thorough justification including published materials if possible.

vi. Market Value

Your petition must include information on the market value of the feedstock. Your petition 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 all 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 are 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 only be used when other data do not exist.

vii. Alternative uses

a. Description of Alternative Uses

Your petition must describe 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.

These data are 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 associated with using the feedstock for biofuel production.

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

Your petition should describe the key substitutes for the feedstock for each alternative use. For example, if the feedstock is used as a feed product, you should identify the alternative feed products for which the feedstock is most directly a substitute.

As a part of this description, you 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 corn in dairy cattle diets on average according to the peer reviewed literature, this should be documented with the appropriate source citations in your petition.

d. Information for Livestock Feed

If the feedstock is a livestock feed, then you 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

Your petition should provide information on the quantities of the feedstock that are sold into the various animal markets, both nationally and by region. You 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

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

3. Historical and Projected Feed Prices

Your petition should provide data on the historical feed prices for the feedstock in the United States and on any major international commodity exchanges, if these data exist. You should also provide available data on the projected future price of the feedstock as an animal feed, for example projections from USDA or the Food and Agriculture Organization of the United Nations (FAO). If you do not find these data available, please explain what search methods you used and why you believe the data are unavailable.

4. Data on Maximum Inclusion Rates, Substitutability

Your petition 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. Please provide information on whether this feed's nutritional content makes it a direct or close substitute to other feed types.

5. Approved Status Documentation

Describe the regulatory status of this material for livestock feeding. For example, you should indicate whether or not the feedstock is approved by the FDA, or similar organizations, for use in animal diets. If it has been approved, you should provide documentation of the approval. If it has not been approved but an application has been submitted to the FDA or another organization, please explain the status of the application and, if possible, provide it as an attachment to the petition.

viii. Farm Input Data

Your petition must 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. You 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* (the "data template"), available online.³¹ Use the petition document to provide context for the data in the data template, and to provide any additional information that is not a good fit for the data template.

To the extent possible, all of the data provided in the data template should be supported with peer reviewed publications and/or authoritative governmental reports. Otherwise, provide the best supporting information available and explain the status of data and science on the farming inputs for your feedstock.

a. Petitioner Data

If you are growing the feedstock yourself, you should provide the crop input data specified in the "Crop Inputs" section of the data template.

b. Average Farm Inputs by Region

Regardless of whether you are a feedstock producer, you 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 (Not Biointermediate Production)

If the potential pathway(s) involves any pre-processing steps whereby the feedstock undergoes a form change that does not constitute substantial alteration (i.e., does not result in a biointermediate), you should include mass and energy balance data for all of these pre-processing steps in this section.

Processes that substantially alter renewable biomass at more than one facility involve the production of a biointermediate. In these cases your petition should provide the information described in section H of

³¹ Please see <http://www.epa.gov/otag/fuels/renewablefuels/new-pathways/how-to-submit.htm>

this document. For more information on what qualifies as a form change versus substantial alteration see [40 CFR 80.1460\(k\)](#).

a. Petitioner Feedstock Pre-Processing Data

Your petition should provide mass and energy balance data for each pre-processing step, including all inputs and outputs for each step, for your 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 your petition.

b. Industry-Wide Feedstock Pre-Processing Data

Your petition must, if applicable, include 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 your petition. Differences between the data provided for your operations and the industry average data provided in this section should be explained with appropriate supporting documentation as appropriate.

x. Invasiveness

In the July 2013 Additional Pathways I rule, we discussed the reasons why it is relevant for us, under the RFS program, to consider the potential risk that renewable fuel feedstocks will contribute to the spread of invasive species ([78 FR 41709](#)).

[Executive Order 13112](#), signed in February 1999, calls for each federal agency “to the extent practicable and permitted by law. . . not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.”³² The Executive Order defines “invasive species” as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”

Although there may be the potential for significant indirect GHG emissions associated with remediating the spread of invasive species, EPA is not in a position to estimate the magnitude of GHG emissions that might be associated with any such remediation if the plants are not controlled. Therefore, EPA evaluates the weediness risk of new feedstocks, and when appropriate requires renewable fuel producers to commit, as a condition of RIN eligibility, to the necessary long-term mechanisms to demonstrate that their production of renewable fuel will not significantly contribute to the risk of spreading invasive species. Based on this approach, our lifecycle GHG analyses typically assume no significant indirect greenhouse gas emissions associated with the spread and subsequent remediation of feedstocks when grown for biofuel production for the RFS program. Based on this assumption, the lifecycle analyses do not include any expenditures of energy or other sources of GHGs to remediate the spread of these species, such as mechanical removal or chemical control activities.

³² <http://www.gpo.gov/fdsys/pkg/FR-1999-02-08/pdf/99-3184.pdf>

For these reasons, petitions that involve new feedstocks must provide information regarding the potential invasiveness of the feedstock. If the feedstock presents a risk of spreading invasive species for any reason, your petition must include the following information, as appropriate.

a. Weed Risk Assessment

Your petition shall include the most recent weed risk assessment (WRA) for the feedstock conducted by USDA's Animal and Plant Health Inspection Service (APHIS), or it shall state that no applicable WRA has been completed by APHIS. If no WRA has been conducted by APHIS, the EPA will contact APHIS and request that they initiate such an assessment.

b. Seed, growing and processing information

Your petition should include information on how the feedstock will be produced including: source of seed/seedlings that will be planted in the field, specific variety and properties of the plant especially if it is a specific cultivar that is different from weedy biotypes; growing practices; harvest practices and schedule, especially in regard to setting fruit or producing vegetative offshoots; how will it be transported and stored; and what kind of processing will be done to it, especially in regard to it retaining any viability. This kind of information is critical to understanding whether there is a risk of escape and to evaluate the suitability of any risk management practices.

If the feedstock is genetically engineered (GE) you must include additional information about the genetic engineering. At this time, we do not know precisely what additional information will be required for GE feedstocks. If we receive a petition for a new genetically engineered feedstock, we will contact APHIS and request that they initiate a WRA. Once the process is initiated, you will need to work with APHIS to provide the information they require to complete the assessment.

c. Risk Management Practices

Your petition should include a detailed explanation of the risk of invasive species spread associated with the cultivation, transport and use of the feedstock, and the risk management practices that growers and handlers of the feedstock can take to mitigate these risks.

d. Letter of Support from APHIS

Before EPA approves a pathway involving a new feedstock with risk of contributing to the spread of invasive species, the Agency will likely need a letter from APHIS supporting the use of the feedstock to produce RFS qualifying renewable fuels. This letter will likely specify any conditions of APHIS's support, such as particular risk management practices to be implemented and carried out by the feedstock producers, handlers, processors and/or transporters. 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

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

3. Other Relevant Information

Your petition may include any other information that you feel is relevant to EPA’s lifecycle GHG analysis of the feedstock.

G. Coproducts

Petitions must include information on all coproducts associated with the potential pathway, including their expected use and market value. In the rare case that no coproducts are produced, this section of your petition can be labeled “N/A.” Coproducts include products co-produced with the feedstocks, biointermediates, or fuels associated with any of the potential pathways.

1. Technical Description

Provide a thorough description of each and every coproduct (up to two pages per coproduct) from the potential 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 it is likely that 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.³³
- The requested pathway uses a production process that is similar to a previously evaluated production process (e.g., same type of process technology but with new energy saving technologies).³⁴
- 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

³³ 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.

³⁴ 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 you 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.

You should provide a brief analysis (less than one page) of the key factors impacting historical and projected prices. For projections, your petition 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 are available from a citable source, data for similar commodities may be substituted. If no such commodities exist, 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, you should also submit all of the following information.

i. Animal Market Share and Feed Ratios by Region

Your petition should include information on the quantities of the coproduct that are sold into the various animal markets, both nationally and by region. You 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

You 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

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

iv. Data on Maximum Inclusion Rates, Substitutability

Your petition should include 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. Your petition should indicate whether the feed's nutritional content make it a direct or close substitute to other feed types.

v. Approved Status Documentation

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

H. Biointermediates

Petitions that involve biointermediates or potential biointermediates must include the information described in this section. (Note that instructions for including information about the biointermediate production process(es) and coproducts of biointermediates production are covered under the Production Process and Coproducts sections above.)

Some pathways involve renewable biomass that has been substantially altered at one facility to produce a proto-renewable fuel (referred to as a biointermediate) that is subsequently used at a different facility to produce renewable fuel for which RINs would be generated. EPA determined that additional regulatory structure was needed in this situation and, in 2022, promulgated provisions to allow for the use of certain biointermediates to produce renewable fuels if the biointermediate producer and renewable fuel producer meet all applicable regulatory requirements. These regulatory provisions specify which biointermediates are allowed under the program ([40 CFR 80.1401](#)) and what parties that produce, transfer, and use biointermediates must do to demonstrate compliance ([40 CFR 80.1450](#), [80.1451](#), [80.1453](#), [80.1454](#)).

1. Potential Biointermediates

The term “biointermediate” is defined in the RFS regulations. Sub-paragraph (5) of the definition lists the types of materials that may qualify as a biointermediate. A “potential biointermediate” is a feedstock that is:

1. Renewable biomass that was substantially altered at a facility other than the renewable fuel production facility;
2. Not a renewable fuel; and
3. Not one of the types of biointermediates listed in the definition at [40 CFR 80.1401](#).

Under the regulations at [40 CFR 80.1460\(k\)\(2\)](#), the use of a potential biointermediate feedstock for RIN generation is prohibited, and the only lawful way to use such a feedstock would be for EPA to amend its regulations to allow for such use. As noted in the final rule, we “will likely continue to periodically issue rulemakings related to the RFS program to set volume requirements, promulgate new pathways, and technically amend the RFS regulatory provisions. These ongoing regulatory activities will provide ample

opportunities to add new biointermediates to the program with any other necessary regulatory changes on a regular basis.” See [87 FR 39638](#).

Thus, before a party can generate RINs for fuel produced from a potential biointermediate, a party will need to submit a petition for rulemaking and EPA will need to undertake a rulemaking that adds the potential biointermediate to the RFS regulations. For questions on how to submit a petition for rulemaking, please contact the fuels program support line at FuelsProgramSupport@epa.gov.

In some cases, once a potential biointermediate is added to the regulations and thus becomes a biointermediate, fuel produced from this biointermediate might qualify for an existing pathway in [Table 1 to 40 CFR 80.1426](#). In these cases, parties do not need to submit a petition requesting evaluation of a new fuel pathway pursuant to [40 CFR 80.1416](#).

In other cases, there might not be an existing pathway for the fuel produced from the potential biointermediate, e.g., because the process used to produce the biointermediate is not listed as part of an already approved pathway. In these cases, a new fuel pathway petition needs to be submitted prior to RIN generation. Thus, two things must occur before a party can generate RINs for fuel produced from a potential biointermediate if there is not currently an applicable pathway: 1) EPA must revise the RFS regulations to make the potential biointermediate a biointermediate under the program pursuant to a petition for rulemaking, and 2) the party will need to submit a new fuel pathway petition to EPA pursuant to [40 CFR 80.1416](#) following the instructions in this document.

EPA review of petitions for rulemaking and new pathway petitions can be dual tracked to happen simultaneously. In other words, EPA may consider potential pathways that include the production or use of potential biointermediates prior to adding the potential biointermediate to the regulations. If EPA approved a pathway that included the production or use of a potential biointermediate, RINs could not be generated until EPA amended its regulations to include the potential biointermediate.

In other sections of this document, we refer to biointermediates and potential biointermediates simply as “biointermediates.” In most cases, this term can be read as “biointermediates or potential biointermediates.” For example, the instructions in Section 3.E.2 for mass and energy balance data applies for processes that produce biointermediates or potential biointermediates, even though we only use the term biointermediates in that section. For questions on whether or how to prepare LCA petitions that involve biointermediates or potential biointermediates we recommend submitting a pathway screening tool if you have not already done so.³⁵

2. Technical Description

Your petition should include a brief technical description for each biointermediate produced or used in the potential pathways. The technical description should be less than one page for each biointermediate and provide information about the chemistry and characteristics of the biointermediate and how it is used.

³⁵ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

3. Information for New Biointermediates

If EPA has previously evaluated the GHG emissions associated with all of the biointermediates in your petition, this section of your petition should explain that, and the rest can be labeled “N/A.” If you have questions about whether a particular biointermediate was previously evaluated by the EPA, please submit a pathway screening tool if you have not already done so.³⁶

For all biointermediates that are new, the agency will need the information described below to complete its evaluation.

i. Chemical Composition

For each new biointermediate produced as part of the potential pathway, provide a laboratory report of the full chemical composition of a representative sample.³⁷ The laboratory report should specify the mass fraction (percent) and energy content (Btu lower heating value per lb) for each component of the biointermediate.

If the chemical composition of the biointermediate 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 biointermediate, and include a narrative explaining why the composition varies and what factors influence the composition of the biointermediate.

4. Other Relevant Information

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

I. List of Attachments

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

³⁶ <https://www.epa.gov/renewable-fuel-standard-program/forms/renewable-fuel-pathway-screening-tool>

³⁷ Liquid fuels may be collected using sampling procedures specified at [40 CFR 1090.1335](#). For non-liquid samples, the petition should include a description of how a representative sample was collected for chemical analysis.

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

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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):