

# New Fuel Pathway Petitions Under the RFS and California LCFS

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# U.S. Renewable Fuel Standard

# U.S. Renewable Fuel Standard

## *Background*

- Renewable Fuel Standard enacted 2005, revised in 2007 (“RFS2”). RFS2 regulations finalized in 2010.
- RFS2 established mandated volumes of 4 categories of renewable fuel to be used in the U.S. each year through 2022.
- Established the criteria for each fuel category.
- Producers of qualifying fuels can generate Renewable Identification Numbers (RINs): tradable credits with tangible value.

# U.S. Renewable Fuel Standard

## *Fuel Categories*

<b>Fuel Category (RIN type)</b>	<b>Required Feedstock</b>	<b>Minimum GHG Emission Reduction</b>
Renewable Fuel (D6)	Ethanol from corn starch; other qualifying fuels	20%
Advanced Biofuel (D5)	Any renewable feedstock except corn starch	50%
Biomass-Based Diesel (D4)	Any renewable feedstock	50%
Cellulosic Biofuel (D3, D7)	Renewable cellulose, hemi- cellulose, or lignin	60%

# U.S. Renewable Fuel Standard Fuel Pathways, RIN Requirements

- RFS pathways include three components:  
(1) fuel type, (2) feedstock, (3) production process.
- Each combination of the three components comprises a separate fuel pathway.
- Certain pathways were evaluated and approved by EPA at the time of the 2010 rulemaking; listed in Table 1 of 40 CFR 80.1426(f).

Environmental Protection Agency			§ 80.1426
TABLE 1 TO § 80.1426—APPLICABLE D CODES FOR EACH FUEL PATHWAY FOR USE IN GENERATING RINS—Continued			
Fuel type	Feedstock	Production process requirements	D-Code
Ethanol	Com starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least one of the advanced technologies from Table 2 to this section plus drying no more than 65% of the distillers grains with solubles it markets annually.	6
Ethanol	Com starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and drying no more than 50% of the distillers grains with solubles it markets annually.	6
Ethanol	Com starch	Wet mill process using biomass or biogas for process energy.	6
Ethanol	Starches from crop residue and annual covercrops.	Fermentation using natural gas, biomass, or biogas for process energy.	6
Biodiesel, and renewable diesel.	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating Excluding processes that co-process renewable biomass and petroleum	4
Biodiesel	Non-food grade corn oil Canola oil	Trans-Esterification using natural gas or biomass for process energy.	4
Biodiesel, and renewable diesel.	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating Includes only processes that co-process renewable biomass and petroleum	5
Ethanol	Sugarcane	Fermentation	5
Ethanol	Cellulosic Biomass from crop residue, slash, pre-commercial thinnings and tree residue, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard waste; and cellulosic components of separated food waste; and cellulosic components of separated MSW.	Any	3
Cellulosic Diesel, Jet Fuel and Heating Oil.	Cellulosic Biomass from crop residue, slash, pre-commercial thinnings and tree residue, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard waste; and cellulosic components of separated food waste; and cellulosic components of separated MSW.	Any	7
Butanol	Com starch	Fermentation; dry mill using natural gas, biomass, or biogas for process energy.	6
Cellulosic Naphtha	Cellulosic Biomass from crop residue, slash, pre-commercial thinnings and tree residue, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard waste; and cellulosic components of separated food waste; and cellulosic components of separated MSW.	Fischer-Tropsch process	3
Ethanol, renewable diesel, jet fuel, heating oil, and naphtha.	The non-cellulosic portions of separated food waste.	Any	5
Biogas	Landfills, sewage waste treatment plants, manure digesters.	Any	5

# U.S. Renewable Fuel Standard

## *Fuel Pathways, RIN Requirements*

- The 2010 rule created a provision for applicants to petition to have a new fuel or a novel production pathway evaluated and accepted into the program (40 CFR 80.1416).
- Approved pathways are added to Table 1 of 40 CFR 80.1426(f).
- Once a pathway is approved, manufacturers have other requirements before they can issue RINs (e.g., third party facility audit, facility registration).

# U.S. Renewable Fuel Standard

## *Original Pathway Approval Process*

- Petition requirements found in 40 CFR 80.1416.
- EPA staff, website, were helpful but previously provided only minimal guidance for how to draft and submit petitions.
- From 2010 to March 2014, EPA approved 24 petitions, but there was a backlog of 36 petitions awaiting action.
- University of Illinois study (McCubbins and Endres 2013)\* showed EPA's average review time for new petitions was over 500 days.

\*<http://farmdocdaily.illinois.edu/2013/05/epa-biofuel-pathways-petitions.html>

# U.S. Renewable Fuel Standard

## *New Pathway Petition Process*

- March 2014, EPA announced it was reviewing the petition process, to streamline the procedure, enable more timely decision-making and provide improved guidance for applicants.
- EPA asked applicants to voluntarily withhold new petitions during the expected 6-month internal review period.
- On September 30, 2014, EPA announced the completion of its review and the revamping of its website and guidance for applicants.

# U.S. Renewable Fuel Standard

## *New, Simplified Website*

The screenshot shows the EPA website's navigation and content for the Renewable Fuel Standard (RFS) New Fuel Pathways. The top navigation bar includes the EPA logo, search options, and menu categories. The main content area features a breadcrumb trail, a title, a descriptive paragraph, and three columns of links for 'About', 'Petitions', and 'Need Help?'. A sidebar on the left provides additional navigation options.

**EPA** United States Environmental Protection Agency

Advanced Search **A-Z Index**

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**You are here:** EPA Home » Transportation & Air Quality » Fuels & Fuel Additives » Renewable Fuel Standard (RFS) » New Fuel Pathways

## New Fuel Pathways

[RFS Home](#) [Regulations & Standards](#) [Compliance Help](#) [Notices](#) [EMTS](#) [Quality Assurance Plan](#) [New Pathways](#)

In 2010, EPA established a process for companies to petition for new fuels pathways to qualify for the Renewable Fuel Standard (RFS) program. A fuel pathway is a specific combination of three components: (1) feedstock, (2) production process and (3) fuel type. Assessment of lifecycle greenhouse gas (GHG) emissions is necessary to determine which fuel pathways can qualify. Follow the links below to learn more about new fuel pathways and whether you should submit a petition.

### About



- What is a fuel pathway?
- Lifecycle greenhouse gas emissions
- Approved pathways
- Pending petitions
- Other determinations

### Petitions



- Should I submit a petition?
- Petition review process
- Use the Pathway Screening Tool
- How to submit a complete petition
- Efficient Producer petition process for certain corn and sorghum ethanol producers

### Need Help?



- Contacts
- What's new

**Fuels & Fuel Additives Home**

**Basic Information**

**Fuel Programs**

- Renewable & Alternative Fuels
- Gasoline
- Diesel
- State (Boutique)
- Emergency Fuel Waivers

**Compliance Information**

- Fuels & Additives Registration
- Fuels Reporting Registration
- Fuels Programs Reporting

**General Information**

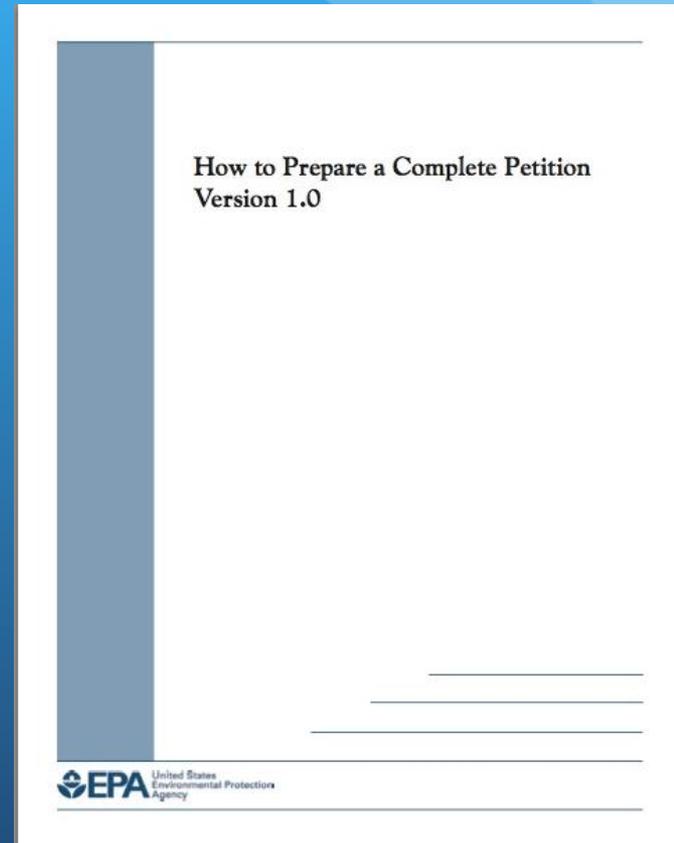
- Publications & Data
- Frequent Questions
- Related Links
- Support & Help

<http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/>

# U.S. Renewable Fuel Standard

## *Improved Guidance for Petitions*

- Template to organize data and information in petitions.
- Guidance document providing detailed instructions for petition contents.
- Spreadsheet to input data on feedstock, mass and energy balance.
- Pathway Screening Tool to determine need for new pathway petition.



# U.S. Renewable Fuel Standard

## *Efficient Producer Petition Process*

- New, expedited “Efficient Producer” petition process for corn starch and grain sorghum ethanol producers that can demonstrate superior process efficiency.
- To be used for evaluation of fuel pathways involving fuel types, feedstocks and production technologies that EPA has evaluated previously.
- Tools available on EPA website for producers to determine eligibility, after which EPA conducts expedited review of petition.

# U.S. Renewable Fuel Standard

## *Key Components of Petition (1)*

A. *Cover Sheet*, with suggested formatting.

B. *Technical Justification*. Information on the pathway, the production process, its commercial viability, past and projected fuel volumes.

C. *Organizational information* on the applicant.

D. *Fuel Type*. Technical description of the fuel, its chemical composition, how it complies with regulatory definition, certification status.

# U.S. Renewable Fuel Standard

## *Key Components of Petition (2)*

E. *Production Process*, including mass and energy balances (e.g. LCA and GHG reduction), historical process data.

F. *Feedstock*. Detailed information, including genus/species of feedstock crop, chemical composition, market projections, market value, land use, invasiveness, etc.

G. *Co-Products*. Information about potential co-products and their market value.

H. *Attachments* of additional relevant information.

# U.S. Renewable Fuel Standard

## *Additional EPA Guidance*

- Previous applicants will not have to resubmit, possibly except some who filed during “moratorium”.
- EPA has no specific expectations for review times; but will notify applicants early if a petition is missing any important information.
- The requested 2-5 years historical process data is not absolutely required, but helps EPA prioritize those petitions closer to commercial implementation.
- The petition process will be used only for company-specific pathways: generic pathways will require rule-making as was previously the case.

# U.S. Renewable Fuel Standard

## *Current Status: Pathway Petitions*

- A total of 37 petitions have now been approved, including 4 during “moratorium” and 9 in November 2014.
- All 9 approved in November were submitted under the “Efficient Producer” process.
- 32 petitions are now pending, including several that were filed during the unofficial moratorium.

# California Low Carbon Fuel Standard

# California LCFS

## *Background*

- Adopted as part of Assembly Bill 32, the California Global Warming Solutions Act of 2006.
- Part of the state's overall program of reducing carbon emissions to 1990 levels by 2020, administered by California Air Resources Board (ARB)
- Under Executive Order S-1-07, the LCFS requires 10% reduction of carbon intensity of transportation fuels by 2020.
- Escalating mandated targets for regulated parties to meet each year through 2020.

# California LCFS

## *Carbon Intensities of Fuels*

- Fuels are assigned Carbon Intensity (CI) values relative to baseline gasoline or diesel GHG emissions.
- CI values are not tiered like EPA RFS - each fuel gets a discrete CI value based on life cycle assessment (including indirect land usage).
- Regulated parties comply by combinations of renewable fuel usage and credits. Credits created by overcompliance in any year by a regulated party.
- Incentivizes development of low-carbon fuels, since economic value is directly proportional to GHG reduction.

# California LCFS

## *Fuel Pathways*

- The regulations created a “Look-up Table” listing CIs for common fuel types: regulated parties can use CI values from the Table (“Method 1”).
- Alternatively, developers of new fuels can petition for a CI value customized for its fuel:
  - Method 2A petitions for variations of existing pathways.
  - Method 2B petitions for new pathways.

# California LCFS

## *Method 2A, 2B Applications*

- Company, facility information.
- Pathway description, including process flow diagrams.
- Carbon intensity of new pathway relative to baseline pathway.
- Projected fuel production volumes.
- Justification of “scientific defensibility”.

Method 2 Application for the Establishment of a New Fuel Pathway under the California Low Carbon Fuel Standard (LCFS)



Release Date: January 30, 2014  
Version 4.0

California Environmental Protection Agency  
 Air Resources Board

# California LCFS

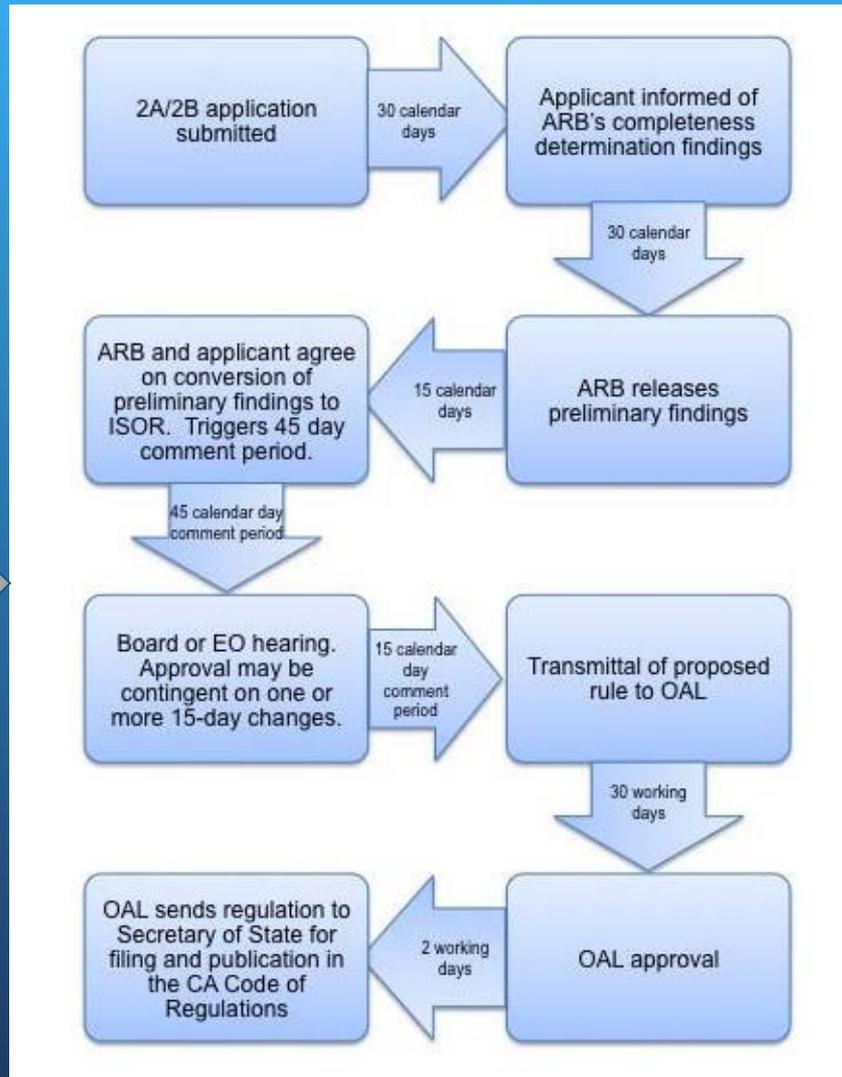
## *Method 2A, 2B Applications*

In addition to completed application form, provide:

- Fuel production records, utility invoices, other records for 2 years of fuel production.
- CA-GREET spreadsheet.
- Air pollution control permits.
- List, specifications of all combustion-powered equipment.
- Third party engineering report.

# California LCFS

## Method 2A, 2B Application Process



“Interim Status”  
upon publication

Source: California  
ARB, August 2010  
Guidance  
Document

According to ARB  
guidance document,  
“Total Application  
Time Investment  
(typically about 6  
months).”

# California LCFS

## *Status of Petitions*

- As of November 2014, 97 “Method 2” applications submitted - only 6 given final approval.
- 12 ARB-initiated pathways - only 3 given final approval.
- But pathways, once published, can be used on an interim basis before final ARB approval.
- Manufacturers of fuels with alternate production routes are each entitled to their own CI.
- Therefore, ARB staff has been overwhelmed by the need to review multiple petitions to cover minor process differences, even for first generation biofuels like corn ethanol.

# California LCFS

## *April 2014 Proposed Revisions*

- Reduce staff burden for review of conventionally produced first-generation biofuels by creating two tiers of new fuel pathways.
- First-generation biofuels = Tier 1; advanced generation biofuels = Tier 2.
- Tier 1 fuels would be assigned to “bins” grouped by the CI of the fuel. For example, all the fuels within a tier with the range of 90-100 gm CO<sub>2</sub>/MJ would be assigned a CI of 95 gm/MJ.
- More rigorous review of Tier 2 applications.

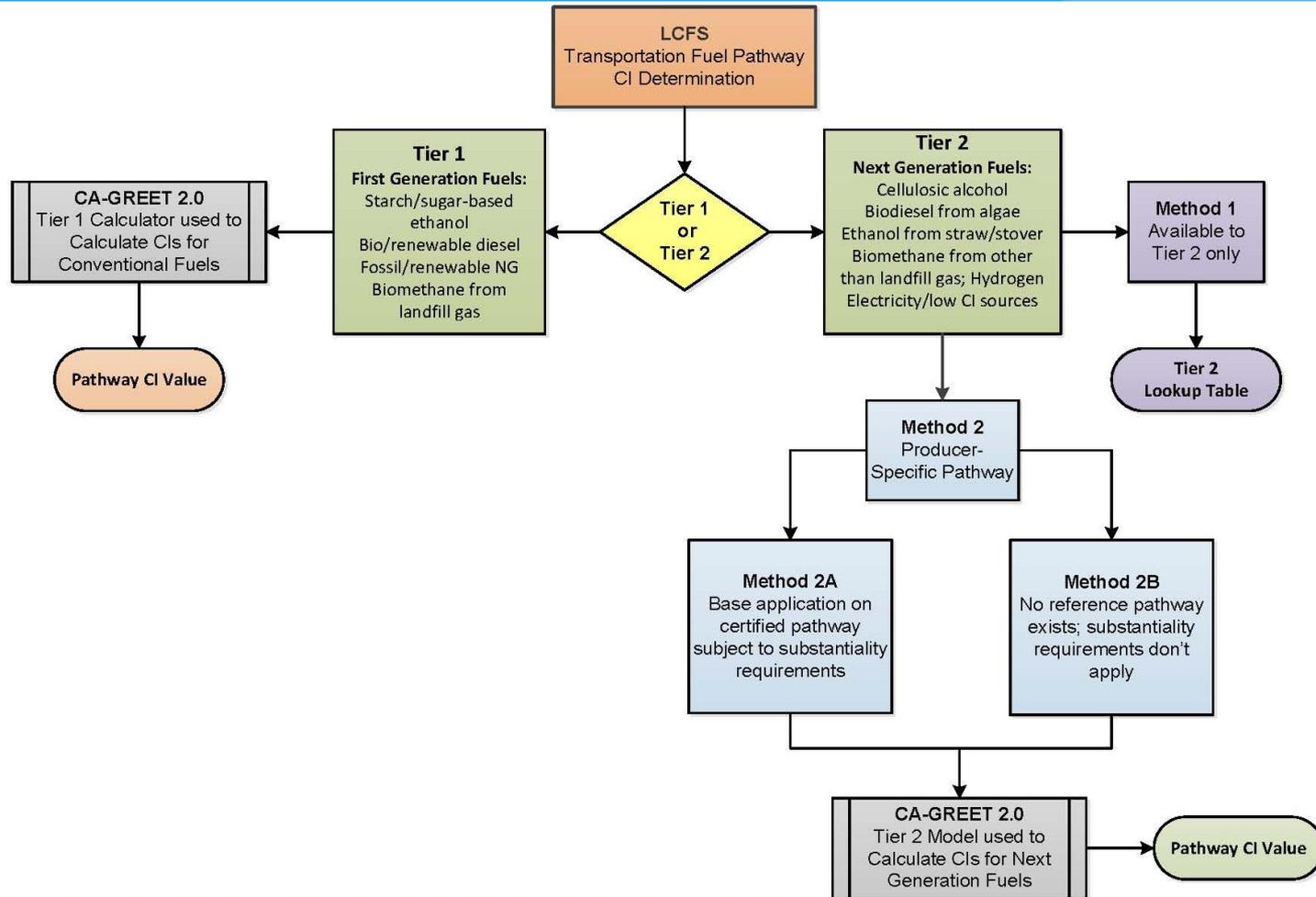
# California LCFS

## *May 2014 Revised Proposal*

- ARB still proposing to distinguish between Tier 1 (1<sup>st</sup> Gen) fuels and Tier 2 (2<sup>nd</sup> Gen) fuels, but “bin” concept no longer being considered.
- All Tier 1 fuels would use “Tier 1 Calculator” under CA-GREET 2.0 to establish CI value; no need for petition.
- Tier 2 fuels would be able to utilize Method 1 (Look-up Table) or Methods 2A or 2B (using CA-GREET 2.0) to determine CI value.
- Streamline process by consolidating pathway application with producer registration.

# California LCFS

## Proposed Tiered Review Process



Source: California ARB, November 13, 2014

# European Union Renewable Energy Directive

*Comparison to RFS and LCFS Petition  
Processes*

# Pathway Approvals: *RFS, LCFS, EU RED*

- *RFS*: Petitions required for fuels, pathways not in Table 1 of 40 CFR 80.1426(f).
- *LCFS*: Method 2 applications required for fuels not on the look-up table (or where a more favorable CI can be demonstrated).
- *EU RED*: Biofuel suppliers need to certify compliance with carbon emission and sustainability criteria through third party audits and conformance with “sustainability schemes”.

# Conclusions

- New EPA guidance provides greater clarity on the process and the requirements for petitions; should facilitate and expedite reviews.
- California ARB proposals, if adopted, would streamline petition process, especially for 1<sup>st</sup> generation fuels.
- Both EPA, CARB require submission of significant amounts of technical information to document compliance with regulations. As always, prior consultation with the agency would be recommended.
- The number of filed petitions shows the level of corporate interest in renewable fuels, provides evidence that these laws are working.

# Thank you very much

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