

**Establishing New Fuel Pathways under the California Low Carbon Fuels Standard  
Procedures and Guidelines for Regulated Parties**

*Concept Paper: August 4, 2009*

*I. Introduction*

On April 23, 2009 the Air Board (ARB/Board) approved the California Low Carbon Fuel Standard (LCFS).<sup>1</sup> The LCFS establishes a compliance schedule which requires fuel providers to reduce the carbon intensity of the fuels they provide each year between 2011 and 2020. The 2020 carbon intensity level is ten percent below the baseline 2010 level. “Carbon intensity” is the total greenhouse gas emissions from the production, transport, storage, dispensing and use of a fuel. It is expressed as grams of carbon dioxide (CO<sub>2</sub>) -equivalent per mega joule of fuel energy (gCO<sub>2</sub>e/mg). In the context of the LCFS, the term ‘carbon intensity’ usually refers to the full lifecycle greenhouse gas emissions associated with a specific fuel ‘pathway.’

The LCFS requires regulated fuel providers to determine the carbon intensity of the fuel they provide, and to report that information, for compliance determination purposes, to ARB. Regulated parties must report the carbon intensities based on values appearing in a table of Board-approved values found in §95486(b)(1) of the LCFS Regulation. As new and improved fuel pathways are developed, the carbon intensities of those pathways must be added to the lookup table. The guidelines below provide regulated parties with the information they need in order to work effectively with ARB to add additional fuel pathway data to the LCFS lookup table.

*II. Establishing New Fuel Pathways*

Regulated parties may use one of two methods to determine the carbon intensity of the transportation fuels they provide. Under Method 1, regulated parties select carbon intensity values from the fuel carbon intensity lookup table found in §95486(b)(1) of the LCFS Regulation. Under Method 2, regulated parties seek to have additional fuel pathways or sub-pathways added to the lookup table. If a proposed pathway or sub-pathway is approved, it is added to the lookup table, and becomes available to all regulated parties.

Method 2 is subdivided into Methods 2A and 2B. Method 2A provides regulated parties with a process whereby they may apply for the establishment of new sub-pathways. Sub-pathways are modified versions of pathways currently present in the lookup table. They are added when a fuel provider can demonstrate that a new or improved fuel production, transport, storage, and/or dispensing process significantly reduces the lifecycle carbon intensity of the existing fuel. Method 2B provides for the establishment of an entirely new fuel pathway. Such a pathway could yield an entirely new class of fuel, or it could describe an entirely new process for producing an existing fuel.

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<sup>1</sup> CCR Title 17, §95480, 95480.1, 95481, 95482, 95483, 95484, 95485, 95486, 95487, 95488, and 95489

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The purpose of this document is to provide regulated parties who wish to add new or modified pathways to the LCFS lookup table with the guidance they need to efficiently and effectively complete the application process. One of the stated goals of the LCFS is to incentivize the development of lower carbon fuels for the California transportation market. As those fuels become available, their pathways must be added to the lookup table before they can begin earning credits for fuel providers. As such, ARB staff has designed the application process to be as streamlined as possible, while retaining the necessary scientific and technical rigor. Regulated parties who closely follow these procedures can expect the full and timely cooperation of ARB staff in processing and evaluating their applications.

### *A. Overview of The Method 2A and 2B Application Processes*

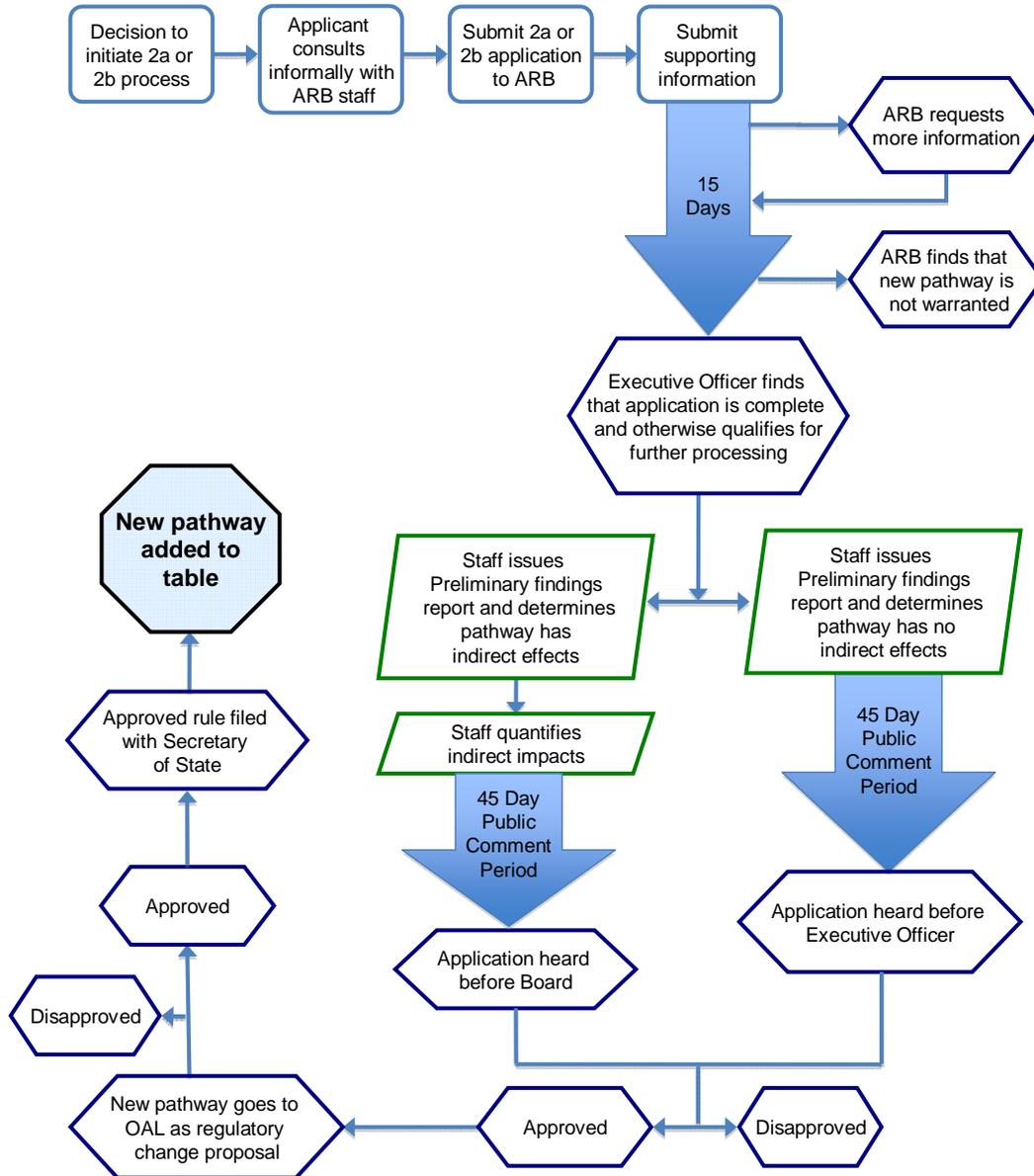
The LCFS fuel pathway lookup table is included in the LCFS regulation. The general process for revising or amending California regulations is as follows:

- Release the proposed changes to the public for a 45-day comment period;
- Conduct a public hearing to formally consider adoption of the proposed changes;
- If the proposed changes are approved by the rulemaking entity (the Board, in this case), they are forwarded to the Office of Administrative Law for consideration;
- Only after the Office of Administrative Law approves the proposed rules, and those rules are filed with the Secretary of State, do they become effective.

In the case of modifications to the LCFS lookup table, the Board has delegated certain authorities to the Executive Officer: so long as the proposed lookup table revisions do not involve indirect land use change emissions (or emissions from other indirect effects), the public hearing to consider those revisions may be held before the Executive Officer. A Method 2A application describing modifications to a primary pathway that includes land use change or other indirect effects can still be heard before the Executive Officer if the proposed modifications do not entail any changes to the indirect effects included for in the primary pathway. Whenever Method 2A or 2B applications involve new or changed indirect effects, including land use change, the regulatory hearing must be conducted before the Board, as described in Section III, below.

A schematic of the application and approval processes is shown in Figure 1.

Figure 1: Schematic of the Method 2A and 2B Application and Approval Process



*B. Method 2A Application Procedures*

Under Method 2A, regulated parties may apply for the establishment of a new fuel sub-pathway. The need for a sub-pathway is created when a fuel producer revises one or more components of an existing pathway. A process improvement in which natural gas or coal requirements are significantly reduced by a conversion to combined heat and power could, for example, produce the requisite reduction of five gCO<sub>2</sub>e/MJ (see the section on substantiality requirements, below). A sub-pathway is created by re-calculating the lifecycle carbon intensity of an existing fuel pathway using one or

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more revised input values. Input values are revised so that they accurately describe the proposed new production process. The LCFS requires the use of the California Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (CA-GREET) model to calculate what are referred to as ‘direct’ pathway emissions. Indirect effects, such as land use change, are evaluated according to the process described in section III, below. Sub-pathways are created by revising CA-GREET input values to reflect revised fuel production, transport, storage, and/or dispensing processes. Proposed modifications can only be approved if they are supported by appropriate scientifically defensible data and documentation and meet other criteria, described below.

The following discussion focuses primarily on the formal application, evaluation, and decision process. In order to expedite the application process, however, applicants are strongly urged to meet with ARB staff prior to initiating a Method 2A application. At a pre-application meeting, the prospective applicant can describe the proposed sub-pathway in detail to staff. The applicant may also submit preliminary documentation to staff for review. Staff, in turn, can begin to provide the applicant with a list of the specific types of information it will need in order to evaluate the applicant’s proposal. Following the informal meeting, the applicant can continue to provide staff with additional information and to seek staff’s guidance during the application development process.

### *(1) How to Apply*

To apply for the establishment of a new sub-pathway, a fuel provider must:

- Fill out and submit a Method 2A application. The application form is a secure web-based application, available at <http://www.arb.ca.gov/fuels/lcfs/.2> It is designed to be completed and submitted on-line. The following information is required:
  - Identification and contact information: the applicant’s name, address, and LCFS organization code, as well as the phone numbers and e-mail addresses of those who will be working with ARB on the evaluation of the proposed new sub-pathway.
  - The existing fuel pathway for which a new sub-pathway is being proposed.
  - The revised CA-GREET input values that would be used to generate the carbon intensity value for the new sub-pathway.
  - The carbon intensity value that results from running CA-GREET using the revised inputs specified in item c, above.
  - A detailed discussion of how each revised CA-GREET input relates to the revised physical fuel pathway used to produce the fuel for which a new sub-pathway is being requested. This discussion should begin with a

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<sup>2</sup> Application will be added to the web when Guidelines are approved.

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clear and thorough overview of the revised production, storage, transport, and dispensing processes in the new sub-pathway. This overview should fully describe and identify all new equipment used in the proposed new processes.

- The annual volume of fuel that would be affected by the creation of the proposed new sub-pathway. The energy contained in that fuel must also be specified (in units of mega joules).
- Submit the necessary documentation in support of the establishment of the proposed new sub-pathway. The files submitted will be use to determine whether the proposed sub pathway meets ARB's minimum requirements for substantiality and scientific defensibility. Electronic files should be submitted using the secure LCFS file upload service available at the application web site (<http://www.arb.ca.gov/fuels/lcfs/>). ARB requests that as many files as possible be submitted in electronic form. Spreadsheets and similar files that contain calculated values must be submitted with all formulas intact and accessible to ARB evaluators. The files submitted will be preserved in their original forms for reference purposes. ARB evaluators will use copies of the original submissions in the evaluation process. Applicants are asked to submit the following documentation at a minimum. Additional documentation that directly supports the proposed new sub-pathway may also be submitted.
  - The official factory technical specifications of new equipment that contributes to the reported carbon intensity reductions.
  - Technical drawings, schematics, flow diagrams, maps, and other graphical representations describing the proposed process changes.
  - Technical papers reporting the results of pertinent greenhouse gas (GHG) emission studies. These could be articles from peer-reviewed journals, unpublished university or consulting reports, or studies that were prepared under contract to the applicant.
  - Emissions monitoring data not included in any of the studies submitted under item c, above. This could be data from governmental regulatory entities, or data collected by entities testing or using the proposed equipment and processes.
  - Spreadsheets, data files, and similar files documenting the quantitative lifecycle analysis behind the carbon intensity value for the proposed new pathway. Except where it is impossible to do so, the applicant must submit files of this type electronically, via the LCFS upload site. All such files must be submitted in a format that permits full and unimpeded access to all the data, formulas, and calculations they contain. In general, files of this type should be submitted in their native formats. CA-GREET files, in particular, must not be converted to any other format. If format conversions appear to be warranted in order to permit or improve access, the applicant must obtain ARB approval before proceeding with the proposed conversions.

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- A preliminary determination concerning the likelihood that the proposed sub-pathway will create significant land use change impacts or other indirect impacts. See section III, below, for a discussion of how to reach a preliminary indirect effects determination, and of ARB's process for evaluating that determination.

### (2) *Evaluation Criteria*

The applicant's Method 2A submittal will be evaluated against the following criteria:

- *Substantiality*
  - The applicant must demonstrate his or her ability and willingness to produce more than ten million gasoline gallon equivalents per year (1,156 MJ) of the fuel covered by the new sub-pathway proposal. This requirement applies only when the total amount of the fuel sold in California by all providers of that fuel exceeds ten million gasoline gallon equivalents per year.
  - The applicant must demonstrate that the proposed new sub-pathway will yield a carbon intensity improvement of at least five gCO<sub>2</sub>e/MJ over the existing primary pathway. This carbon intensity improvement is calculated on a 'well-to-tank' (or 'source-to-tank') basis: all fuel lifecycle emissions except those resulting from the combustion of the fuel must be included.
- *Scientific Defensibility*
  - The minimum standard against which the Scientific Defensibility of a proposed new sub-pathway is measured is the robustness of the data and analysis on which the values existing lookup table are based. The LCFS regulation states, at §95486(e)(1)(A), that a new pathway is deemed to be scientifically defensible if the carbon intensity value it yields is at least as robust as the values currently in the lookup table. This robustness derives from the strength of the scientific and technical data behind the lookup table values.
  - The regulation provides an example of a method by which the scientific defensibility of a proposed new pathway can be demonstrated: publication of an article describing that pathway in a major, well-established and peer-reviewed scientific journal such as Science, Nature, Journal of the Air and Waste Management Association, or the Proceedings of the National Academies of Science (§95486(e)(1)(B)).
  - If the applicant does not publish a description of the proposed new sub-pathway, as described above, staff will evaluate the scientific defensibility of that pathway by, first, verifying all information submitted by the applicant for authenticity. This will consist of checking the information submitted against original sources wherever this is possible (e.g., confirming that

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submitted articles were actually published, and checking with the authors of unpublished reports). Once the authenticity of all submissions has been verified, those submissions will be evaluated to determine whether they adequately support the creation of the proposed new fuel sub-pathway. All calculations will be replicated and evaluated for appropriateness; selected results will be sent to expert third-parties for evaluation; equipment manufacturers will be asked to confirm that the technical specifications submitted are current and still considered to be valid, etc. Because the burden of demonstrating scientific defensibility is on the applicant, issues that arise during the evaluation process will be referred to the applicant for resolution.

- *Other*
  - Before the proposed new sub-pathway can be approved, the Executive Officer must find that the pathway is not already present in the lookup table.
  - Before the proposed new pathway can be approved the, Executive Officer must reach a determination that CA-GREET is capable of being modified to accurately calculate the carbon intensity of the proposed new pathway. If the Executive Officer cannot reach such a finding, the applicant will be required to use Method 1 to determine the carbon intensity of the fuel.
  - The applicant must identify information it considers to be trade secrets in its Method 2A submittal. The pathway application and supporting documentation, except the information that the applicant identifies as consisting of trade secrets, are subject to public disclosure. The Executive Officer shall treat the trade secrets identified by the applicant in accordance with 17 CCR §§ 91000-91022 and the California Public Records Act (Government Code section 6250 et seq.). In deciding on what information to designate as secret, however, applicants must consider the public nature of the rulemaking process. New sub-pathways can be approved only if enough information is available publicly to justify that approval. Once a sub-pathway is approved and added to the lookup table, other regulated parties may use the new pathway to report their fuel carbon intensities if they can demonstrate that the new pathway best describes their processes. Such use by other regulated parties is unrestricted.
  - The Executive Officer can request additional information, as needed, in the evaluation of the Method 2A application.
  - Including carbon intensity values derived from a Method 2A application in an annual LCFS compliance report to ARB before the Board or the Executive Officer issues a formal written approval of the proposed new pathway is a violation of the LCFS.

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### *(3) Completeness*

The Executive Officer has 15 calendar days to determine whether a Method 2A application is complete enough to proceed to a full pathway evaluation. If the Executive Officer determines that an application is sufficiently complete to proceed to a full evaluation, the applicant will be notified of this determination. If an application is deemed to be incomplete, the Executive Officer will notify the applicant in writing of that determination. That notification will identify the deficiencies identified in the application. An applicant notified of a deficiency may submit the missing information. Upon receipt of that information, the Executive will, within 15 days, determine whether the newly submitted information renders the application sufficiently complete to proceed to a full evaluation. If the Executive Officer again finds the application to be incomplete, the notification/re-submittal/re-evaluation process can be repeated. Otherwise, the application will move to the full pathway evaluation phase of the process.

Applications approved for a full pathway consideration are posted to ARB's LCFS web site for public review. The public review period will last a minimum of 30 calendar days.

### *(4) Preliminary Findings*

Staff will evaluate the applicant's submittal package and prepare a set of preliminary findings. The preliminary staff report will cover the following points, at a minimum.

- The extent to which the proposed CA-GREET input changes accurately describe the process that will actually be used to produce the affected fuels
- The direction and magnitude of the proposed CA-GREET input changes are reasonable and are adequately supported by the information submitted.
- The applicant's ability to meet the substantiality requirements described above.
- The likelihood that the proposed sub-pathway will create land use change or other indirect impacts.

Once approved, the preliminary findings document will be released to the applicant for comment. If a final draft acceptable to both staff and the applicant can be prepared, that draft will serve as Initial Statement of Reasons in the subsequent public hearing process (as discussed in the following section III). The preliminary findings document will contain staff's findings concerning the indirect impacts (if any) associated with the proposed sub-pathway. If staff finds that the sub-pathway will involve indirect impacts, those impacts will be quantified using the Global Trade Analysis Project (GTAP) or an equivalent model, and the results will be added to the final draft of the Initial Statement of Reasons. If staff determines that the proposed sub-pathway will entail indirect impacts, the public hearing will be held before the Board rather than the Executive Officer.

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### *(5) Public Hearing and Subsequent Rulemaking Process*

Regardless of whether a Method 2A application is heard before the Executive Officer or the Board, the formal rulemaking process established in the California Administrative Procedures Act must be followed before the LCFS lookup table can be modified. The steps in the rulemaking process are the following:

- ARB publishes a notice of proposed rulemaking in the California Regulatory Notice Register. The publication of this notice initiates a 45-day comment period on the addition of the proposed sub-pathway to the LCFS lookup table.
- At the end of the 45-day comment period, ARB convenes a public hearing to consider the proposed sub-pathway. If the Initial Statement of Reasons (discussed in the previous section) found that the proposed sub-pathway does not entail indirect impacts, the proposal will be heard before the Executive Officer. If the Initial Statement of reasons found that indirect impacts would be involved, the proposal will be heard before the Board.
- The public hearing culminates with a decision on the part of either the Executive Officer or the Board concerning the proposed sub-pathway adoption. The possible decisions are approve, disapprove, and approve subject to specified revisions. The applicant will be notified of the outcome in writing, and the results will be posted to the LCFS web site. If an application is not approved, the letter informing the applicant of that finding will describe the basis of the disapproval.
- If approval comes with a requirement for substantive revisions to the sub-pathway proposal, staff must complete the required revisions, and initiate a 15-day comment period on those changes. A public hearing is not required following a 15-day comment period, but one may be held in some cases. ARB is obligated to fully consider all comments received during the comment period in deciding on the proposed revisions.
- ARB must respond to all comments received during the original 45-day comment period. Those responses are compiled into a document known as a Final Statement of Reasons.
- The Final Statement of Reasons, and other pertinent rulemaking documents, are submitted to the California Office of Administrative law, which is the body responsible for rendering a final decision on all proposed California regulations.
- Within 30 days the Office of Administrative Law must either approve the proposed rule and forward it to the Secretary of State for publication, or disapprove the proposal and return it to the ARB for correction.
- If the Office of Administrative Law rejects a proposed sub-pathway, ARB has 120 days to correct the problems that triggered the rejection. A 15-day comment period is automatically initiated in this case.

A schematic of the application and approval processes is shown in Figure 1.

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### *C. Method 2B Application Procedures*

Under Method 2B, regulated parties may apply to the Executive Officer for the establishment of an entirely new fuel pathway. New pathways are not modifications of existing pathways, as are Method 2A sub-pathways. Pathways approved under Method 2B are primary lookup table pathways, equivalent to the existing set of top-level pathways (electricity, average corn ethanol, hydrogen, compressed natural gas, etc.). Like Method 2A sub-pathways, Method 2B pathways are created using the ARB's carbon intensity determination tools: CA-GREET and GTAP (or an equivalent model).

The following discussion focuses primarily on the formal application, evaluation, and decision process. In order to expedite the application process, however, applicants are strongly urged to meet with ARB staff prior to initiating a Method 2B application. At a pre-application meeting, the prospective applicant can describe the proposed pathway in detail to staff. The applicant may also submit any preliminary documentation to staff for review. Staff, in turn, can begin to provide the applicant with a list of the specific types of information it will need in order to evaluate the applicant's proposal. Following the informal meeting, the applicant can continue to provide staff with additional information and to seek staff's guidance during the application development process.

A schematic of the application and approval processes is shown in Figure 1.

#### *(1) How to Apply*

The Method 2B application process is similar to the Method 2A process. Applicants must:

- Fill out and submit a Method 2B application. The application form is a secure web-based application, available at <http://www.arb.ca.gov/fuels/lcfs/>. It is designed to be completed and submitted on-line. The following information is required:
  - Identification and contact information: the applicant's name, address, and LCFS organization code, as well as the phone numbers and e-mail addresses of those who will be working with ARB on the evaluation of the proposed pathway.
  - A complete description of the proposed new pathway
    - The nature of the fuel (electricity, hydrogen, liquid alcohol, liquid hydrocarbon, compressed hydrocarbon gas, etc.) that would be produced using the proposed new pathway.
    - The fuel's production, transport, storage, and dispensing processes
    - Characteristics of the vehicles that will use the fuel.
    - Expected production volumes.

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- The CA-GREET input values that would be used to generate the carbon intensity value for the new sub-pathway.
- A detailed discussion of how each CA-GREET input relates to the physical fuel pathway for which a new lookup table value is being requested.
- The carbon intensity of the fuel that would be produced using this proposed new pathway, as estimated by CA-GREET.
- Submit the necessary documentation in support of the establishment of the proposed new pathway. The files submitted will be used to determine whether the proposed pathway meets the ARB's minimum requirements for scientific defensibility. Electronic files should be submitted using the secure LCFS file upload service available at <http://www.arb.ca.gov/fuels/lcfs/>. ARB requests that as many files as possible be submitted in electronic form. All spreadsheets and similar files that contain calculated values must be submitted with all formulas intact and accessible to ARB evaluators. The files submitted will be preserved in their original forms for reference purposes. ARB evaluators will use copies of the original submissions in the evaluation process. Applicants are asked to submit the following documentation at a minimum. Additional documentation that directly supports the proposed new pathway may also be submitted.
  - The official factory technical specifications of new equipment that contributes to the GHG reductions from the proposed new pathway.
  - Technical drawings, schematics, flow diagrams, maps, and other graphical representations describing the proposed process change.
  - Technical papers reporting the results of pertinent GHG emission studies. These could be articles from peer-reviewed journals, unpublished university or consulting reports, or studies that were prepared under contract to the applicant.
  - Emissions monitoring data not included in any of the studies submitted under item c, above. This could be data from governmental regulatory entities, or data collected by entities testing or using the proposed equipment and processes.
  - Spreadsheets, data files, and similar files documenting the quantitative lifecycle analysis behind the carbon intensity value for the proposed new pathway. Except where it is impossible to do so, the applicant must submit files of this type electronically, via the LCFS upload site. All such files must be submitted in a format that permits full and unimpeded access to all the data, formulas, and calculations they contain. In general, files of this type should be submitted in their native formats. CA-GREET files, in particular, must not be converted to any other format. If format conversions appear to be warranted in order to permit or improve access, the applicant must obtain ARB approval before proceeding with the proposed conversions.

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- A preliminary determination concerning the likelihood that the proposed sub-pathway will create significant land use change impacts or other indirect impacts. See section III, below, for a discussion of how to reach a preliminary indirect effects determination, and of ARB's process for evaluating that determination.

### (2) *Evaluation Criteria*

The applicant's Method 2B submittals will be evaluated against the following criteria:

- *Scientific Defensibility:*
  - The minimum standard against which the Scientific Defensibility of a proposed new sub-pathway is measured is the robustness of the data and analysis on which the values existing lookup table are based. The LCFS regulation states, at §95486(e)(1)(A), that a new pathway is deemed to be scientifically defensible if the carbon intensity value it yields is at least as robust as the values currently in the lookup table. This robustness derives from the strength of the scientific and technical data behind the lookup table values.
  - The regulation provides an example of a method by which the scientific defensibility of a proposed new pathway can be demonstrated: publication of an article describing that pathway in a major, well-established and peer-reviewed scientific journal such as Science, Nature, Journal of the Air and Waste Management Association, or the Proceedings of the National Academies of Science (§95486(e)(1)(B)).
  - If the applicant does not publish a description of the proposed new pathway, as described above, staff will evaluate the scientific defensibility of a proposed new pathway by, first, verifying all information submitted by the applicant for authenticity. This will consist of checking the information submitted against original sources wherever this is possible (e.g., confirming that submitted articles were actually published, and checking with the authors of unpublished university and consulting reports). Once the authenticity of all submissions has been verified, those submissions will be evaluated to determine whether they adequately support the creation of the proposed new fuel pathway. All calculations will be replicated and evaluated for appropriateness; selected results will be sent to expert third-parties for evaluation; equipment manufacturers will be asked to confirm that the technical specifications submitted are current and still considered to be valid, etc. Because the burden of demonstrating the scientific defensibility is on the applicant, issues that arise during the evaluation process will be referred to the applicant for resolution.
  - In order for the Board or the Executive Officer to approve the proposed new pathway, ARB must reach a finding that the proposed CA-GREET input changes accurately describe the process that will actually be used to

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produce the affected fuels, and that the direction and magnitude of the proposed input changes are reasonable and adequately supported by the information submitted. That finding, if reached, will be documented, and a copy of the document provided to the applicant.

- *Other*
  - Before the proposed new pathway can be approved the Executive Officer must find that the pathway is not already present in the lookup table.
  - Before the proposed new pathway can be approved the Executive Officer must reach a determination that CA-GREET is capable of being modified to accurately calculate the carbon intensity of the proposed new pathway. If the Executive Officer cannot reach such a finding, the applicant will be required to use either Method 1 or Method 2A to determine the carbon intensity of the fuel.
  - The applicant must identify information it considers to be trade secrets in its Method 2B submittal. The pathway application and supporting documentation, except the information that the applicant identifies as consisting of trade secrets, are subject to public disclosure. The Executive Officer shall treat the trade secrets identified by the applicant in accordance with 17 CCR §§ 91000-91022 and the California Public Records Act (Government Code section 6250 et seq.). In deciding on what information to designate as secret, however, applicants must consider the public nature of the rulemaking process. New sub-pathways can be approved only if enough information is available publicly to justify that approval. Once a sub-pathway is approved and added to the lookup table, other regulated parties may use the new pathway to report their fuel carbon intensities if they can demonstrate that the new pathway best describes their processes. Such use by other regulated parties is unrestricted.
  - The Executive Officer can request additional information, as needed, during the evaluation of the Method 2B application.
  - Including carbon intensity values derived from a Method 2B application in an annual LCFS compliance report to the ARB before the Board or the Executive Officer issues a formal written approval of the proposed new pathway is a violation of the LCFS.
  - Unlike Method 2A applications, Method 2B applications are not subject to substantiality requirements.

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### *(3) Completeness*

The Executive Officer has 15 calendar days to determine whether a Method 2B application is complete enough to proceed to a full pathway evaluation. If the Executive Officer determines that an application is sufficiently complete to proceed to a full evaluation, the applicant will be notified of this determination. If an application is deemed to be incomplete, the Executive Officer will notify the applicant in writing of that determination. That notification will identify the deficiencies identified in the application. An applicant notified of a deficiency may submit the missing information. Upon receipt of that information, the Executive will, within 15 days, determine whether the newly submitted information renders the application sufficiently complete to proceed to a full evaluation. If the Executive Officer again finds the application to be incomplete, the notification/re-submittal/re-evaluation process can be repeated. Otherwise, the application will move to the full pathway evaluation phase of the process.

Applications approved for a full pathway consideration are posted to ARB's LCFS website for public review. The public review period will last a minimum of 30 calendar days.

### *(4) Preliminary Findings*

Staff will evaluate the applicant's submittal package and prepare a set of preliminary findings. The preliminary staff report will cover the following points, at a minimum.

- The extent to which the proposed CA-GREET input changes accurately describe the process that will actually be used to produce the affected fuels
- The direction and magnitude of the proposed CA-GREET input changes are reasonable and are adequately supported by the information submitted.
- The likelihood that the proposed pathway will create land use change or other indirect impacts.

Once approved, the preliminary findings document will be released to the applicant for comment. If a final draft acceptable to both staff and the applicant can be prepared, that draft will serve as Initial Statement of Reasons in the subsequent public hearing process (as discussed in the following section). The preliminary findings document will contain staff's findings concerning the indirect impacts (if any) associated with the proposed sub-pathway. If staff finds that the sub-pathway will involve indirect impacts, those impacts will be quantified using the GTAP or an equivalent model, and the results will be added to the final draft of the Initial Statement of Reasons. If staff determines that the proposed sub-pathway will entail indirect impacts, the public hearing will be held before the Board rather than the Executive Officer.

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### *(5) Public Hearing and Subsequent Rulemaking Process*

Regardless of whether a Method 2B application is heard before the Executive Officer or the Board, the formal rulemaking process established in the California Administrative Procedures Act must be followed before the LCFS lookup table can be modified. The steps in the rulemaking process are the following:

- ARB publishes a notice of proposed rulemaking in the California Regulatory Notice Register. The publication of this notice initiates a 45-day comment period on the addition of the proposed pathway to the LCFS lookup table.
- At the end of the 45-day comment period, ARB convenes a public hearing to consider the proposed pathway. If the Initial Statement of Reasons (discussed in the previous section) found that the proposed pathway does not entail indirect impacts, the proposal will be heard before the Executive Officer. If the Initial Statement of reasons found that indirect impacts would be involved, the proposal will be heard before the Board.
- The public hearing culminates with a decision on the part of either the Executive Officer or the Board concerning the proposed pathway adoption. The possible decisions are approve, disapprove, and approve subject to specified revisions. The applicant will be notified of the outcome in writing, and the results will be posted to the LCFS web site. If an application is not approved, the letter informing the applicant of that finding will describe the basis of the disapproval.
- If approval comes with a requirement for substantive revisions to the pathway proposal, staff must complete the required revisions, and initiate a 15-day comment period on those changes. A public hearing is not required following a 15-day comment period, but one may be held in some cases. ARB is obligated to fully consider all comments received during the comment period in deciding on the proposed revisions.
- ARB must respond to all comments received during the original 45-day comment period. Those responses are compiled into a document known as a Final Statement of Reasons.
- The Final Statement of Reasons, and other pertinent rulemaking documents, are submitted to the California Office of Administrative law, which is the body responsible for rendering a final decision on all proposed California regulations.
- Within 30 days the Office of Administrative Law must either approve the proposed rule and forward it to the Secretary of State for publication, or disapprove the proposal and return it to ARB for correction.
- If the Office of Administrative Law rejects a proposed pathway, ARB has 120 days to correct the problems that triggered the rejection. A 15-day comment period is automatically initiated in this case.

A schematic of the application and approval processes is shown in Figure 1.

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### *III. Land Use Change and Other Indirect Effect Determination Process*

Applicants for new pathways and sub-pathways are required to submit a preliminary determination concerning the likelihood that the proposed pathway will create significant land use change impacts or other indirect impacts. To make this determination, the applicant shall consult section IV, below. If the primary pathway from which the sub-pathway is being derived involves land use change impacts, but the proposed sub-pathway does not alter those existing impact levels, the sub-pathway is not subject to a land use change evaluation. The Executive Officer will evaluate the applicant's land-use-change findings, and take appropriate action. The Executive Officer's findings are not constrained by the applicant's findings: if the two are not in agreement, the Executive Officer's findings shall supersede the applicant's. If the Executive Officer determines that significant land use change impacts are likely, the formal Board Hearing process will be initiated.

### *IV. Fuels Deemed to Have Negligible or No Land Use Change or Other Indirect Effects*

On April 23, 2009, the Board approved staff's proposed Low Carbon Fuel Standard, but directed staff to prepare several revisions to that rule, and to take various other actions relative to rule implementation. Among the actions staff was directed to take was the creation of an informal set of "criteria and a list of specific biofuel feedstocks that are expected to have no or inherently negligible land use effects on carbon intensity" (Air Resources Board Resolution 09-31, April 23, 2009, p. 15). The overriding criterion that must be met before a fuel can be included on this list is that production of its feedstock must not compete with the production food. A recent paper published in *Science* (Tillman et al., 2009) also recommends this approach. It places the fuels that meet this criterion into five basic categories:

- Fuel feedstock crops grown on abandoned farmland that is current degraded. Crops grown in this way do not compete with food crops, but they could also prove to be environmentally beneficial. In addition to their potential to improve wildlife habitat and water quality, perennial feedstock crops could increase soil carbon sequestration.
- Crop residues. Although crop residues increase soil fertility, decrease erosion, and improve soil carbon stores when left on fields, some residues can be removed without compromising these benefits. The removable fraction is capable of supporting the production of significant quantities of biofuels.
- Sustainably harvested wood and forest residues. These include the slash that is currently left in place after timber harvesting, residues from milling and pulp production, thinnings from fire prevention operations, as well as wastes from management operations undertaken to reduce competition and hasten the growth of marketable trees. In approving the LCFS, the Board directed the Executive Officer to work with stakeholders to define the terms "biomass" and "renewable biomass." As part of that effort, the Executive Officer is to assess the effects of incentivizing the use of forest biomass as a fuel feedstock, as well as the protections that would be necessary to ensure the sustainable and

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environmentally beneficial use of forest biomass. The goal of this effort would be to certify pathways for fuels produced from forest biomass, should the use of this feedstock be found to be sustainable and environmentally beneficial. In addition to this state-level effort, Congress is also considering the advisability of forest biomass as a feedstock as it debates a new energy bill<sup>3</sup>. Staff’s recommendation to the Board will take into consideration the results of these and other relevant inquiries.

- Double and mixed cropping. Biofuel crops that can be grown and harvested between existing food cropping cycles (and which do not interfere with those cycles) meet the criterion established above. The same is true for crops that can be grown along with food crops (such as between food crop rows).
- Municipal and industrial waste streams. Waste streams that include paper products, yard waste, construction wastes, and plastics are viable sources of feedstocks that do not entail land use change impacts.

Table 1 contains both fuels that meet these criteria, as well as other fuels that staff has determined to entail no significant indirect effects. Regulated parties wishing to apply for new pathways or sub-pathways for the fuels in this table can report on their Method 2A and 2B applications that those pathways will entail no land use change impacts. In support of that conclusion, applicants should cite Table 1.

**Table 1: Fuels Expected to Have No or Inherently Negligible Land Use Effects on Carbon Intensity**

<b>Fuel</b>	<b>Feedstock</b>	<b>Conditions/Restrictions</b>
Biodiesel	Used cooking oil	
	Algae	Specific conditions of operation are to be determined to assess land use impacts if any. There may be a need to demonstrate sustainable production of algae without displacement of crop land..
Renewable Diesel (RD)	Inedible Tallow (sourced in the United States)	
Fischer–Tropsch Diesel	Gasification of Forest Waste, MSW, Medical Waste, Dedicated crops (such as Poplar-see “Forest Waste” and “Dedicated Crops” under “Cellulosic Ethanol,” below)	
	LFG and Digester Gas	
Cellulosic Ethanol	Municipal Solid Waste	
	Food and yard waste	

<sup>3</sup> See for example, the renewable biomass definition in H.R. 2452, The “American Clean Energy And Security Act of 2009,” drafted by Congressmen Waxman and Marky.

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<b>Fuel</b>	<b>Feedstock</b>	<b>Conditions/Restrictions</b>
	Switchgrass	If grown on land unsuitable for crops, then impacts are zero. Also, if grown between traditional crop growing periods, impacts from Land Use Change should be zero. Verification will be required.
	Industrial Waste	
	Perennial plants lands not suitable for agricultural use	Needs verification of land type.
	Crop Residue (stover from corn, straw from rice and wheat)	No impacts if enough residues are left on fields to ensure soil and crop health (only sustainable quantities are utilized for fuel). Requires verification.
	Vineyard Prunings	
	Forest Waste (thinnings)	Criteria Under Development
	Double cropped or mixed cropping	When a feedstock is harvested between traditional food crop plantings. This must be verified.
	Lumberyard mill residues	
	Dedicated crops (such as Poplar) on land unsuitable for food crop cultivation	Needs verification that land is unsuitable for food crop cultivation.
	CNG/LNG	Landfill Gas
Dairy Digester Gas		
Electricity	Derived from new Solar, Wind, Hydro, or Biomass sources.	
	Derived from LFG or Digester Gas	
Hydrogen	Derived from LFG or Digester Gas using electricity from renewable sources	
	Derived from electrolysis with electricity from renewable source	

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### *V. Future Certification Program.*

In its approval of the Low Carbon Fuel Standard, the Board directed the Executive Officer to work with stakeholders to develop “robust, transparent, and specific criteria for conducting Carbon Intensity Lookup Table modifications through a certification process” (Resolution 09-31, April 23, 2009, page 18). The most effective approach to designing a certification process is to base that process upon the experience gained working with regulated parties to develop new pathways and sub-pathways. As the Executive Officer and staff gain experience assisting applicants, evaluating applications, responding to comments, and holding hearings, they will be applying that experience on an ongoing basis to the development of a pathway certification process proposal. Such a process would be similar to the existing ARB fuel additive certification process: proposed additives are subjected to a set of standardized evaluations that are comprehensively described in a certification procedures manual. In order to develop an LCFS fuel pathway certification process, staff will consciously work to systematize and standardize the application evaluation process. This should result in an increasingly streamlined, efficient, and clearly defined process—one that can be readily transformed into a certification process. Staff will report to the Board in December of 2009 on its progress developing a formal certification process.

When a pathway certification process proposal has been drafted, staff will seek Board approval to formally integrate that process into the LCFS regulation. If approved, that process will replace the one described herein.

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*VI. References*

Tilman, David, Robert Socolow, Jonathon A. foley, Jason Hill, Eric Larson, Lee Lynd, Stephen Pacala, John Reilly, Tim Searchinger, Chris Somerville, and Robert Williams. “Beneficial Biofuels—The Food, Energy, and Environment Trilemma.” *Science* 325:270-271. July 17, 2009.