

# **Low Carbon Fuel Standard Advisory Panel Draft Workplan Version 2**

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## I. Executive Summary

On April 23, 2009, the California Air Resources Board (ARB or Board) approved the Low Carbon Fuel Standard (LCFS) regulation. The regulation became effective as of April 15, 2010. Section 95489 of the regulation requires the Executive Officer to conduct two reviews of the LCFS program through a public process. The Executive Officer is also required to convene an Advisory Panel with which he will consult on the reviews. The reviews will address a broad range of implementation topics and may include recommended amendments to the regulation. Staff will present the results of these reviews to the Board by January 1, 2012, and January 1, 2015.

The LCFS Advisory Panel will discuss and provide input on issues focusing on the implementation of the LCFS. Specifically, section 95489(a) of the regulation defines the minimum scope of the two required program reviews. Each review is to include the following topics, at minimum:

- (1) The LCFS program's progress against LCFS targets;
- (2) Adjustments to the compliance schedule, if needed;
- (3) Advances in full, fuel-lifecycle assessments;
- (4) Advances in fuels and production technologies, including the feasibility and cost-effectiveness of such advances;
- (5) The availability and use of ultralow carbon fuels to achieve the LCFS standards and advisability of establishing additional mechanisms to incentivize the use of higher volumes of these fuels;
- (6) An assessment of supply availabilities and the rates of commercialization of fuels and vehicles;
- (7) The LCFS program's impact on the state's fuel supplies;
- (8) The LCFS program's impact on state revenues, consumers, and economic growth;
- (9) An analysis of the public health impacts of the LCFS at the state and local level, including the impacts of local infrastructure or fuel production facilities in place or under development to deliver low carbon fuels, using an ARB approved method of analysis developed in consultation with public health experts from academia and other government agencies;
- (10) An assessment of the air quality impacts on California associated with the implementation of the LCFS; whether the use of the fuel in the state will affect progress towards achieving state or federal air quality standards, or result in any significant changes in toxic air contaminant emissions; and recommendations for mitigation measures to address any adverse air quality impacts identified;
- (11) Identification of hurdles or barriers (e.g., permitting issues, infrastructure adequacy, research funds) and recommendations for addressing such hurdles or barriers;
- (12) Significant economic issues; fuel adequacy, reliability, and supply issues; and environmental issues that have arisen; and

- (13) The advisability of harmonizing with international, federal, regional, and state LCFS and lifecycle assessments.

In addition to these thirteen topics, panelists expressed a need to discuss high carbon intensity crude oil (HCICO) and the development and transparency of the LCFS credit market.

The Panel will be meeting over the next several months to discuss the progress on each of the above topics. As part of evaluating the status of implementation of the LCFS the Panel will hear presentations from LCFS workgroups, ARB staff, as well as others. It is also anticipated that Panel members will contribute their expertise to inform the above topics. Specifically, in addition to providing their perspective on topics related to the LCFS in Panel meetings, panelists will contribute to topic areas by working with ARB staff as part of its evaluation or by performing independently-conducted evaluations. The Panel's effort will be reflected in an LCFS implementation status report that staff will draft and present to the Board by the end of 2011.

## II. Objective of Workplan

The purpose of this workplan is to outline each of the topics the Panel will need to review, based both on the regulation and input from the Panel related to its February 16, 2011, meeting, the high-level questions that staff will focus on discussing with the Panel, and the proposed approach for answering the questions. This plan was developed in response to suggestions by the Panel in order to better inform all stakeholders of the proposed work and objectives of the review. This workplan should be considered a living document that will be updated as necessary, based on feedback from the Panel.

Each chapter of this document, with the exception of the chapter on HCICO and the credit market, corresponds to a specific topic called out in the regulation. The chapter includes the regulatory text, the citation for the topic, and the high-level questions that inform the topic. Lastly, there is a discussion on the approach to answer these questions, as well as the data sources that will inform the assessments.

The regulatory text and the citation to the text within the regulation are included for HCICO. We have also provided background information on why the HCICO provisions exist and along with some different viewpoints on the issue for context. The credit market chapter includes background information on credit generation, poses the questions that will inform the topic of developing a credit market, and describes our approach to addressing these questions.

From this workplan and through discussions with and assistance from the Panel members, staff will generate a report that will be discussed with the Panel as well as at a public workshop, and present that report to the Board in December 2011. The structure of the report will not be topic-by-topic (i.e., 1 -15), but overlapping or similar concepts will be grouped into chapters, much like the structure of the original LCFS staff report presented to the Board in April 2009.

If you have questions or comments regarding this workplan, or would like to contribute to the assessments, please address them to Ms. Michelle Buffington either via email, [mbuffing@arb.ca.gov](mailto:mbuffing@arb.ca.gov), or telephone, 916.324.0368.

### III. Topics to be Addressed by the Panel

#### A. *Topic 1: Progress against Targets*

##### 1. *Regulatory Text, 95489.a.1*

The scope of each review shall include, at minimum, consideration of the following areas: **(1) The LCFS program's progress against LCFS targets;**

##### 2. *Questions to Address as Part of Evaluation*

- ARB will assess progress using the information currently being submitted under the program, and determine whether additional information is needed.
- Are regulated parties accumulating credits to help comply with future year reductions in carbon intensity?
- Are there any concerns with meeting the targets under the program and, if so, what are they and when are they expected to potentially impact meeting the targets?
- If there are challenges in meeting the targets, are they due either to an inability to generate or access low carbon fuels or to access LCFS credits generated by other parties? This is related to topic 5. If there is a shortage of credits, what are the causes of this so that it can be remedied? Should remedies be provided by ARB or should the market be allowed to adjust itself?
- With the current data, are we tentatively projecting that regulated parties will meet the CI reduction targets for 2011-2014? Beyond?
- Is more time needed for a better determination of progress and, if so, how much time would be appropriate?

##### 3. *Approach*

This topic is closely related to topics 2 and 5: adjustments to the compliance schedule and ultralow carbon fuels. Staff will review the data gathered for the reporting periods in the LCFS Reporting Tool (LRT) in order to assess the ability of regulated parties to meet the targets. Through the LRT, staff should be able to determine whether or not credits are being generated. Staff and the Panel will also work to identify the cause of any potential shortage of credits, such as lack of a fungible credit market or price discovery, lack of participation by alternative fuel providers, or an actual volume shortage in low-carbon biofuels together with non-liquid alternatives. With this information, the staff and the Panel can evaluate if there are concerns with meeting the targets and how to address those concerns/issues. Staff will also compile information gathered through the reporting tool and Method 2A/2B applications, which will help inform the Panel about fuels that are currently being used or are close to commercial scale to aid in compliance. We will also consider forecasts, targets, and development of biofuels in an effort to comment on or provide an assessment of progress towards the long-term targets. We will focus on 2011-2014, as the second review of the program will need to be completed by 2015.

We may not have a clear/complete answer because there is a lag between when a quarter ends and when data are reported. Thus, if our report to the Board is in November or December, we will only have the first two and possibly the third quarter. In addition, the regulation provides some time for regulated parties to complete their annual report. For this reason, this assessment will most likely be completed in mid-2012 after the first annual reports have been submitted.

## **B. Topic 2: Compliance Schedule**

### *1. Regulatory Text, 95489.a.2*

The scope of each review shall include, at minimum, consideration of the following areas: **(2) Adjustments to the compliance schedule, if needed.**

### *2. Questions to Address as Part of Evaluation*

- What information is needed to make an assessment and to develop any recommendations for adjustments, if warranted?
- What are the ramifications of any adjustment on current and future investments being made by low-carbon fuel suppliers?
- Are there alternatives to adjusting the compliance schedule that could help ensure compliance while preserving the goals and environmental benefits of the LCFS?
- What types of factors impact the compliance schedule?
- Do the yearly targets of the compliance schedule need to change?
- What considerations should ARB take in recommending any modifications to the compliance schedule?
- What has changed since the adoption of the LCFS that would lead to a shift in compliance schedule?
- What implications would adjusting the compliance schedule have on the low carbon fuels industry and the participation of the investment community seeking to support the development of this industry?
- Is there a strategic timeframe for evaluating this question in the future?
- What factors should we consider in the future to assess these needs?
- What implications would adjusting the compliance schedule have on estimated fuel costs for California consumers?

### *3. Approach*

This topic will likely be informed by assessments made for topic 1 (progress against targets) and tie into assessments made for topic 5 (ultralow carbon fuels). Staff, along with interested panelists, will establish a preliminary list of factors that should be included in the assessment of the compliance schedule. We will evaluate how these factors could potentially impact the compliance schedule and report back to the Panel with our findings. Staff will use data from the LRT, biorefinery registration tool, and Method 2A/2B applications to help determine availability and regulated parties' current and potential future ability to comply. Another element of this evaluation is to discuss the factors and considerations ARB should account for in assessing whether an adjustment to the compliance schedule is necessary. Staff will also solicit input from panelists on the impacts of any adjustment on the LCFS market signal, including on investments in the low carbon fuels market. ARB also will solicit input on alternative mechanisms, if any, that could help ensure compliance while reinforcing or preserving the goals of the LCFS program. It should be noted that adjustments to the compliance

schedule are not likely under any but exceptional circumstances and that we will exhaust all other options before an adjustment would be considered.

We may not have a clear/complete answer because there is a lag between when a quarter ends and when data are reported. Thus, if our report to the Board is in November or December, we will only have the first two and possibly the third quarter. In addition, the regulation provides some time for regulated parties to complete their annual report. For this reason, this assessment will most likely be completed in mid-2012 after the first annual reports have been submitted. Thus, we anticipate following-up with the Board in 2012 (e.g., memorandum, presentation) to report on the outcome of this analysis.

## **C. Topic 3: Lifecycle Assessment**

### *1. Regulatory Text, 95489.a.3*

The scope of each review shall include, at minimum, consideration of the following areas: **(3) Advances in full, fuel-lifecycle assessment.**

### *2. Questions to Address as Part of Evaluation*

- Since the adoption of the LCFS have there been advances in fuel-lifecycle analysis? If so, how does staff plan to address these advances?
- What are the criteria for determining whether new studies merit considering adjustments to the program?
- What potential impacts do the advances have on stakeholders? The regulation?
- How has or is staff planning to incorporate the recommendations of the Expert Work Group (EWG)?
- What is the process for considering and incorporating future advances into the regulation?
- If updates to the lifecycle methodology lead to shifts in the carbon-intensity for a particular or set of fuels, how should the compliance schedule be adjusted to take this into account and ensure a consistent market signal?
- How do we balance the need for market certainty with the need for timely integration of advancements in lifecycle analysis?
- How is staff addressing issues related to sustainability that are outside the scope of traditional lifecycle analysis?

### *3. Approach*

There are two main components to the fuel-lifecycle assessment: direct and indirect effects, which are encompassed in the Method2A/2B process and the on-going land use change group (informed through the Expert Workgroup process). These activities are a key element of the LCFS regulation, as they inform the carbon intensity for each fuel pathway, which in turn translates into the credits or deficits under the program as a function of volumes introduced into the transportation system. Staff will provide periodic updates on its consideration of the EWG recommendations as well as the approach for incorporating pertinent on-going research and advances into the program. We will evaluate the effects of this research and analysis on the carbon intensity and the regulation as a whole and consult with the Panel accordingly.

Additionally, staff will provide updates on the Method 2A/2B process. This includes the current state of Method 2A/2B and the progress to date and its implications to the broader implementation of the program (e.g., production volumes of fuels for pathways that have been assigned low carbon intensities). Also, staff will review the current advances that have been made in the field of carbon intensity calculations and discuss our approach for incorporating them into our calculations.

## **D. Topic 4: Advances in Production**

### *1. Regulatory Text, 95489.a.4*

The scope of each review shall include, at minimum, consideration of the following areas: **(4) Advances in fuels and production technologies, including the feasibility and cost-effectiveness of such advances.**

### *2. Questions to Address as Part of Evaluation*

- Are there recent or expected advances or innovation in fuels and/or production technologies that staff should be made aware of?
- Do these advanced fuels require additional/modified infrastructure?
- How do these advances impact the LCA of the fuel/blendstock? (Relates back to Topic 3.)
- How do these advances impact the program?
- How should the cost-effectiveness of these advances be evaluated? Will certain advances or innovations help in terms of cost-effectiveness?
- Are these advances cost-effective with respect to the program?
- Has there been sufficient development of advanced fuels to support longer-term implementation of the LCFS program and, if not, why?

### *3. Approach*

Topics 3, 4, 5, and 6 are all very closely related and assess the impact LCFS has on current and future transportation fuels. For this topic, the assessment will include current and future fuels. Some of the responses to these questions, however, will be addressed during the assessment of topic 5. In order to determine the availability of these fuels, staff will work with fuel providers, environmental impact report data, information from our Method 2A/2B applications, and funding information from both the Department of Energy (DOE) and the California Energy Commission (CEC) (AB118). From this data, we will identify the status of projects on demonstration, pilot, and commercial scale. We will also investigate ways to assess the cost-effectiveness of the fuels, taking into account current or expected advances and improvements. We also anticipate surveying a broad spectrum of advanced fuel producers and investors to develop a clearer picture of current and future plans for the transition to production.

## ***E. Topic 5: Ultralow Carbon Fuels***

### *1. Regulatory Text, 95489.a.5*

The scope of each review shall include, at minimum, consideration of the following areas: **(5) the availability and use of ultralow carbon fuels to achieve the LCFS standards and advisability of establishing additional mechanisms to incentivize higher volumes of these fuels to be used.**

### *2. Questions to Address as Part of Evaluation*

- What is the current status of ultralow carbon fuels (demonstration, pilot, commercial)?
- What is the current status of investment in these fuels?
- Is it too early in the program to adequately assess whether there will be sufficient ultralow fuels available when they will become critical to compliance under the program?
- Are there sufficient market signals to support the development of ultralow carbon fuels in the future?
- What are the barriers of developing these fuels and getting them to the market?
- Is there a way to expedite the process for bringing new fuels or fuel blends into the state?
- What additional mechanisms, if any, are needed to further incentivize these fuels? Can any of the additional mechanisms considered by Staff and the Panel work synergistically with other regulations or programs to enhance the availability of ultralow carbon fuels?
- If additional mechanisms are added, how will this affect regulated parties' ability to comply?
- What type of monitoring should staff perform in the future?
- What new or amended motor vehicle taxes are expected?
- Will EPA target revisions of RFS2 change LCFS ability to procure ultralow carbon fuels for California?

### *3. Approach*

Topics 4, 5, and 6 are all very closely related and assess the impact LCFS has on current and future transportation fuels. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. This topic focuses in on fuels that are under development or have not shown significant penetration in the market. Ultralow carbon fuels, including renewable/biodiesel from waste, cellulosic ethanol, electricity, hydrogen, biogas-derived fuels, and algal-derived fuels, will be assessed under this topic. In order to determine the availability of these fuels, staff will work with providers, environmental impact reports submitted for alternative fuel projects, DOE funding for fuels projects and CEC funding (AB118). We will also identify projects on demonstration, pilot, and commercial scale. We also anticipate surveying a broad spectrum of stakeholders in an effort to

characterize current as well anticipated investment in the development and commercialization of such fuels for use in transportation.

A panelist has volunteered to perform an analysis based on survey information that they have been collecting regarding pilot scale fuel production, ramp-up capabilities, and investment in these projects. We are also in discussion with the University of California to host a conference that explores questions related to the status of ultralow carbon fuels. This information will be presented and discussed at a future meeting of the Panel.

Staff would like to have a robust conversation with panelists regarding perceived barriers with bringing these fuels to market, whether there are sufficient market signals under the program for their need, and whether additional incentive mechanisms are needed. This ties in closely and is one component of topic 11.

With respect to the incentives, staff will provide background on the incentives that are currently embedded within the LCFS. We will also prepare information on multipliers and volume mandates, along with the pros and cons of these types of incentives as well as others. Panelists are encouraged to bring their ideas on incentives to the table for discussion.

## **F. Topic 6: Supply and Commercialization**

### *1. Regulatory text, 95489.a.6*

The scope of each review shall include, at minimum, consideration of the following areas: **(6) an assessment of supply availabilities and the rates of commercialization of fuels and vehicles.**

### *2. Questions to Address as Part of Evaluation*

- What is the current availability of alternative fuels and vehicles? (See the approach below for list of fuels and vehicles.)
- Is the current availability of fuels sufficient to meet the compliance targets under the program and, if so, for how long?
- What are the market projections for the penetration of alternative fuels and vehicles?
- Are we seeing ramp-up in production?
- What are the current blend limits for biofuels, including alcohol as well as non-alcohol-based biofuels?
- Is this attributed to the LCFS (or something else)?
- What percentage of the low carbon supply is being attracted to California? How does LCFS compare to RFS in attracting supply?
- What are the current barriers as well as the opportunities to address those barriers?
- What information is needed to address these questions and it is currently submitted under the program?
- What type of on-going monitoring, if any, is needed?
- What are the infrastructure requirements associated with each alternative fuel pathway evaluated by ARB, and what actions are being taken to address those needs?

### *3. Approach*

Topics 4, 5, and 6 are all very closely related and assess the impact LCFS has on current and future transportation fuels. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. This analysis will include an assessment of the current supply of the following fuels and vehicles: E85/FFVs, renewable/biodiesel, CNG (petroleum-derived and from biogas), LNG, electricity, and hydrogen. This is also an opportune time to update information regarding algal-derived fuels, cellulosic ethanol, and renewable/biodiesel, if necessary. Staff will access data from the following sources: Energy Information Administration for data related to currently availability of fuels, CEC for data related to funding, U.S. EPA for information on RFS2 development, the Board of Equalization and CEC for information on current use of fuel in California, auto manufacturers on the development of vehicle technology, and other ARB sections who

are developing other regulations that will incentivize bringing fuels/vehicles/infrastructure into the market.

Panelist input will be necessary to have a robust discussion on the barriers to bringing these fuels to market. It would be helpful for panelists that have specific ideas on these barriers, along with suggestions for overcoming them to submit written comments for discussion purposes and perhaps further incorporation in the final review report. This discussion of barriers is closely tied to topic 11.

## **G. Topic 7: Impact on State Fuel Supplies**

### *1. Regulatory Text, 95489.a.7*

The scope of each review shall include, at minimum, consideration of the following areas: **(7) The LCFS program's impact on the state's fuel supplies.**

### *2. Questions to Address as Part of Evaluation*

- What is the current assessment of the availability of transportation fuel in California as well as projections of future availability?
- Is there sufficient fuel available to meet the needs of consumers?
- If there is an increase in the fuel pool diversity, how should it be accounted for in the review?
- Is there sufficient fuel and biofuels to comply with the LCFS?
- Are there provisions in the LCFS regulation that are currently (or could in the future) acting as a barrier to meeting the state's demand for transportation fuels?
- Can the provisions be adjusted in order to assure that the diverse fuels potentially encouraged under the regulation offset/overcome those barriers?
- If there are impacts on the fuel supplies, how do we establish that it is because of the LCFS?
- In what ways can staff monitor the state's fuel supply in order to assess the impact on supplies?
- Should a buy-out provision similar to the Renewable Transport Fuel Obligation (RFTO) in the United Kingdom be used to reduce market pressure if credit availability is low?

### *3. Approach*

Topics 7, 8, 11, and 12 are all closely related as they deal with economics, impacts on supplies, revenues, consumers, growth, and barriers. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. For topic 7, staff will use data from the Energy Information Administration, the Oil Price Information Service, and the CEC to assess the current fuel supplies. Discussions with panelists and fuel providers will aid in rounding out this analysis.

Panelist input will be necessary to establish if there are provisions in the regulations that are acting as a barrier and how encouraging fuel diversity could overcome those barriers. It would be helpful for panelists that have specific ideas on these barriers, along with suggestions for overcoming them to submit written comments for discussion purposes and perhaps further incorporation in the final review report.

## **H. Topic 8: Revenue and Consumers**

### *1. Regulatory Text, 95489.a.8*

The scope of each review shall include, at minimum, consideration of the following areas: **(8) The LCFS program's impact on state revenues, consumers, and economic growth.**

### *2. Questions to Address as Part of Evaluation*

- What information is necessary to conduct this assessment?
- Is there sufficient data to assess the impact of the LCFS on state revenues, consumers, and economic growth and, if so, what data sources should be considered? If the answer to this question is "yes," then:
  - Is the LCFS impacting state economic growth and, if so, how?
  - Is the LCFS impacting consumers and, if so, how?
  - Is the LCFS impacting state revenues and, if so, how?
- Is it too early in the program to adequately address these questions and, if so, what is a more appropriate timetable?
- Are there any updates regarding the economic analysis of the LCFS?
- What are the options for further enhancing any benefits of the program while addressing any adverse impacts?
- If the answer to the first question is "no," what types of data sources need to be monitored, and what type of data needs to be collected to provide a robust analysis of this topic for the next LCFS review?

### *3. Approach*

Topics 7, 8, 11, and 12 are all closely related as they deal with economics, impacts on supplies, revenues, consumers, growth, and barriers. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. There are currently two challenges with conducting an analysis that is responsive to the above questions concerning the impact of LCFS on state revenues, consumers, and economic growth: (1) the program is still in its infancy and the impacts might be too small to identify; and (2) if there are impacts to these areas, it would be relatively difficult to assess whether it is due to the LCFS or something else (i.e. economic downturn, RFS2, etc.).

With that being said, staff plans to work with interested panelists on developing methods for this type of analysis for this and subsequent evaluations of the program.

## ***I. Topic 9: Public Health Impacts***

### *1. Regulatory Text, 95489.a.9*

The scope of each review shall include, at minimum, consideration of the following areas: **(9) An analysis of the public health impacts of the LCFS at the state and local level, including the impacts of local infrastructure or fuel production facilities in place or under development to deliver low carbon fuels, using an ARB approved method of analysis developed in consultation with public health experts from academia and other government agencies.**

### *2. Questions to Address as Part of Evaluation*

- In response to the LCFS are there changes in infrastructure and production at facilities that may impact local communities, and what is the likely timetable for such changes?
- Is there a system in place to identify proposed projects related to the LCFS?
- What are the tools for identifying potential local cumulative impacts from new or modified projects related to the LCFS? Are the tools adequate for identifying potential concerns? If not:
- What tools should be developed in order to appropriately address the issues under topic (9) and how quickly could they be developed and used? What types of data could these tools use? What would these tools ideally require? Are the desired types of data available, and if not what would need to be done in order to be able to collect these data? How could CARB work with local air districts and industry in order to collect these data?

### *3. Approach*

Topics 9, 10 and 11 are all related to environmental impacts concerning the LCFS. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. For topic 9, staff will assess if there have been any changes in infrastructure or fuel production facilities by working with the Air Pollution Control and Air Quality Management Districts, reviewing new or modified permits and talking with/surveying fuel providers. Staff will also develop a plan for analysis of permits or Environmental Impact Reports for related projects as submitted by the State Clearinghouse. Additionally, staff has prepared a biorefinery siting guidance document that will be released shortly. We will review this document with panelists.

## **J. Topic 10: Air Quality Impacts**

### *1. Regulatory Text, 95489.a.10*

The scope of each review shall include, at minimum, consideration of the following areas: **(10) An assessment of the air quality impacts on California associated with the implementation of the LCFS; whether the use of the fuel in the state will affect progress towards achieving state or federal air quality standards, or results in any significant changes in toxic air contaminant emissions; and recommendations for mitigation to address adverse air quality impacts identified.**

### *2. Questions to Address as Part of Evaluation*

- Has anything changed since implementation of the LCFS with respect to the expected number and type of biofuel facilities (e.g., plans for new biofuel plants, proposed or modifications to existing plants)?
- Has California's fuel pool changed (e.g., increase in some fuel usage, decrease in others, etc.)? If so, what are the impacts on air quality associated with this change?
- Is the existing permitting process sufficient to prevent any adverse impacts from occurring at the local, regional, and statewide basis and, if not, what are the limitations of concern?
- Are additional mitigation measures needed to provide the assurance that there will not be any adverse impacts and, if so, what are they?

### *3. Approach*

Topics 9, 10 and 11 are all related to environmental impacts related to the LCFS. Because of these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. Staff will assess whether there is an increase or decrease in statewide fuel consumption, any changes in the air quality impacts from what was reported in the staff report, and any mitigation efforts, if known. Data sources for this assessment will include: multimedia evaluations and other testing conducted by ARB, EPA fuel registration data, and current regulatory proceedings. Staff will also present background information on the multimedia process and our current multimedia projects that are being carried out.

Panelists are encouraged to provide information regarding mitigation options, input on impacts, and suggestions on ways to reduce the air quality impacts within the state.

## **K. Topic 11: Hurdles or Barriers**

### *1. Regulatory Text, 95489.a.11*

The scope of each review shall include, at minimum, consideration of the following areas: **(11) Identification of hurdles or barriers (e.g., permitting issues, infrastructure adequacy, research funds) and recommendations for addressing such hurdles or barriers.**

### *2. Questions to Address as Part of Evaluation*

- Have there been issues with permitting low carbon fuel facilities and, if so, what are they? What are the options for resolving these issues?
- Are there barriers associated with the infrastructure needed to get low carbon fuels to market? How can we reduce or remove these barriers?
- What research funds (federal, state, local) are currently available to support the introduction of low carbon fuels? Should there be changes to the way the funding is allocated to advance low carbon fuels and, if so, why?
- Are there adequate research funds for the development of low carbon technology and, if not, what are the options for securing additional funding?
- What are the assumed time lines to obtain permits and complete construction for biorefineries and associated distribution infrastructure, inside and outside of California by type of alternative fuel?

### *3. Approach*

This topic relates back to almost all of the topics called out in the regulation. This gives the Panel ample opportunity to discuss barriers affecting the success of the LCFS on many different fronts (economic, environmental, technology, etc.). Staff will provide an assessment of current barriers with permitting, infrastructure, and research funding. Our assessment will be based on the U.S. EPA guidance document that was recently released and conversations with/a survey of stakeholders. In addition, an assessment of current federal, state, and local funding of low carbon fuels will be identified. Panelist input will be necessary as well. It would be helpful for panelists that have specific ideas on these barriers, along with suggestions for overcoming them and to submit written comments for discussion and consideration for incorporation into the final review report.

## **L. Topic 12: Economic and Environmental Impacts**

### *1. Regulatory Text, 95489.a.12*

The scope of each review shall include, at minimum, consideration of the following areas: **(12) Significant economic issues; fuel adequacy, reliability, and supply issues; and environmental issues that have arisen.**

### *2. Questions to Address as Part of Evaluation*

- What information is needed to assess the actual economic impacts, benefits as well as costs, associated with the implementation of the LCFS? Might these data needs change over the course of the program and, if so, how?
- Is there sufficient information available to conduct the assessment and, if not, when is the information expected to be available?
- Is the implementation of the LCFS adversely impacting or encouraging the reliability or availability of transportation fuels in California? How might this change over the course of the program?
- Has the LCFS impacted the cost of transportation fuels and, if so, by how much?
- What is the value to the state in terms of increased fuel diversity and reduced exposure to oil price volatility?
- If the LCFS has impacted the cost of transportation fuels, what options should be considered as the program proceeds?
- Has the implementation of the LCFS contributed to any adverse environmental impacts?
- If the LCFS has contributed to adverse environmental impacts, what options should be considered as the program proceeds?
- What type of on-going monitoring would be necessary to ensure that if an issue arose, we would be able to react in a timely fashion?

### *3. Approach*

Topics 7, 8, 11, and 12 are all closely related as they deal with economics, impacts on supplies, revenues, consumers, growth, and barriers. Due to these cross-linkages, the work and any findings on each of these topics will be considered and drawn on as the evaluation proceeds. Because LCFS is still in its infancy, it could potentially be difficult to establish if it is causing any significant economic or environmental issues.

Additionally, because there are many other factors in play (i.e. the economic downturn, etc.) it would be difficult to attribute cost impacts to solely the LCFS. With that being said, staff will also review the economic analysis originally performed for the staff report and will discuss the benefits of preparing an update in the future.

## **M. Topic 13: Harmonization**

### *1. Regulatory Text, 95489.a.13*

The scope of each review shall include, at minimum, consideration of the following areas: **(13) The advisability of harmonizing with international, federal, regional, and state LCFS and lifecycle assessments.**

### *2. Questions to Address as Part of Evaluation*

- What other LCFS-like programs exist and where are they in their development/implementation stage?
- What are the main goals of an effort to harmonize the LCFS with other programs and are there any risks with doing so?
- What criteria and stringency should CARB apply when considering harmonizing with programs deemed to be potentially compatible with California's LCFS?
- In what areas should the LCFS try to harmonize with other programs (e.g., analysis such as lifecycle calculations, credit markets, land use calculations, sustainability requirements, etc.)?
- What should be the approach to harmonizing, if necessary?
- What type of on-going monitoring should ARB do to ensure that our program continues to complement other programs worldwide?

### *3. Approach*

Staff will work with interested panelists and other stakeholders to identify and to summarize the current programs being developed or implemented and develop a list of areas where harmonization could occur. We will also explore the pros and cons of harmonizing and ways to foster harmonization to the extent that it advances the objectives of the LCFS.

## **N. Topic 14: High Carbon Intensity Crude Oil**

### *1. Regulatory Text, 95486(b)(2)(A)*

Section 95486(b)(2)(A) of the LCFS regulation specifies the requirements for using the Lookup Table to determine carbon intensity values for CARBOB, gasoline, and diesel fuel. This section requires a regulated party to use the average carbon intensity value shown in the Lookup Table if the fuel is derived from crude oil that is either:

- “included in the 2006 California baseline crude mix” (defined as a crude oil source which constituted at least 2.0 percent of the 2006 California baseline crude mix, by volume, as shown by California Energy Commission records for 2006, hereafter referred to as baseline crude source) or
- not a HCICO (defined as any crude oil that has a total production and transport carbon intensity value greater than 15.00 gCO<sub>2</sub>e/MJ)

For non-baseline crude oil sources determined to be HCICO, the regulated party must:

- use the carbon intensity shown in the Lookup Table corresponding to the HCICO’s pathway, if available; or
- use the carbon intensity determined via Method 2B if there is no carbon intensity shown in the Lookup Table corresponding to the HCICO’s pathway; or
- upon written Executive Officer approval, use the average carbon intensity value in the Lookup Table provided the GHG emissions from the fuel’s crude production and transport steps are subject to control measures, such as carbon capture and sequestration (CCS) or other methods, which reduce the crude oil’s production and transport carbon-intensity value to 15.00 grams CO<sub>2</sub>e/MJ or less.

### *2. Basis of Regulation Requirements*

The HCICO provision was established to help ensure that the LCFS program accounts for potential increases in the carbon-intensity of crude oils used by refineries (and the resulting gasoline and diesel baseline). The inclusion of HCICOs in the LCFS regulation recognizes that some crude oils require additional energy to produce (e.g., bitumen mining or thermally enhanced oil recovery techniques) or emit higher levels of GHG emissions during the production process (e.g., excessive flaring), significantly beyond the average carbon intensity value used in the baseline. A second goal of the HCICO provision is to provide a signal for oil producers to engage in emission reduction activities such as reducing flaring, improving energy efficiency, and using carbon capture and sequestration.

### *3. Questions to Address as Part of the Evaluation of this Provision*

- Is the HCICO provision achieving its objective?
- Do we need to modify the HCICO provision?

- If so, what should be the guiding principles for alternative proposals?
- What are potential alternatives and how well do they meet the guiding principles?

#### 4. *Approach*

Staff will discuss with Panelists the following topics:

- Potential crude shuffling due to the HCICO provision
- Potential incentive for reducing GHG emissions from crude production due to the HCICO provision (e.g., carbon capture and sequestration, reduced flaring)
- Cost impacts
- Consistency with lifecycle analyses of all fuels
- Consistency with other states' and countries' consideration of HCICOs
- Is the HCICO provision achieving its objective?
- Does the HCICO provision incentivize innovation in low-carbon fuels?
- What is the net global GHG emission impact?
- How does the HCICO provision influence energy security?
- When will CARB complete compliance mechanisms for HCICO?
- What are CARB's enforcement provisions for HCICO?
- Does CARB have authority on an international scale to implement HCICO provisions that will provide a level playing field for in-state producers of transportation fuels?

## **O. Topic 15: Credit Trading Market**

### *1. Background*

The LCFS is structured much like an emissions reduction credit program in which credits are awarded based on fuel performance that exceeds a regulatory standard. The LCFS includes a flexible combination of fuel-vehicle systems and awards credits to the fuel provider if the total emissions generated by the supply and consumption of the fuel are below those of the corresponding gasoline or diesel standards. Beginning in 2011, regulated parties can start generating credits on a quarterly basis. These credits can be banked indefinitely and used for compliance purposes, sold to other regulated parties, or purchased and retired by regulated parties. In addition, under a limited set of circumstances and based on a careful consideration of the issues, the option could be made available to allow credits to be exported to other GHG emissions reductions programs such as AB 32, subject to the requirements of the LCFS and other GHG programs.

### *2. Questions to Address as Part of the Evaluation*

- What type of information is necessary to evaluate the health of the credit market under the program and is the information currently required to be submitted?
- What information should be available to the public, what information should be kept confidential, and what is the rationale for the distinction?
- What are the key elements of a viable credit trading platform?
- How is the LCFS engaging with and shaping the future development of credit markets?
- Should there be additional incentives for early compliance?
- What additional implementation efforts should be considered in order to support the deepening of this market?
- What can be learned from other relevant credit trading programs that can be used to inform the development of an LCFS credit trading platform, and the practical implementation and partnership needs?
- What design elements need to be included to ensure a competitive exchange, and prevent abuses of market power?

### *3. Approach*

Staff will work with interested panelists and other stakeholders on exploring the above questions. This approach will be expanded following the April meeting of the Panel.

## Appendix A: Timeline\*

ITEM	TIME FRAME
First Advisory Panel Meeting	February 16, 2011
Workplan, status updates on topics 5, 9, and 10	April 26, 2011
Status updates on topics 6, 7, and 12, along with HCICO and credit market discussion. Revisit 5, 9, and 10.	June 30 and July 1, 2011
First Public Meeting to discuss review progress	TBD
Status updates on topics 1, 2, 3, 4, 8, 11, and 13	August 25 and 26, 2011
Second Public Meeting to discuss review progress	September 29, 2011
Draft Review Report Discussed with Advisory Panel	October 27, 2011
Deadline for Panel/Public Comments on Draft Report	November 2011
Public Hearing for Board on Report	By December 2011

\*This is subject to change based on panelist feedback.