

**Low Carbon Fuel Standard Advisory Panel
Meeting Summary
Sacramento, CA
February 16, 2011**

The first meeting of the Low Carbon Fuel Standard Advisory Panel was held at the Cal-EPA headquarters in Sacramento, CA on February 16, 2011. Richard Corey, Chief, Stationary Sources Division, California Air Resources Board, chaired the meeting. Michelle Buffington, Air Pollution Specialist, Fuels Section co-chaired the meeting. Please note that this summary consolidates technical comments while emphasizing higher level comments in keeping with the Panel's charge.

Relevant links:

Presentations for this meeting can be found here:

<http://www.arb.ca.gov/fuels/lcfs/workgroups/advisoryPanel/advisoryPanel.htm>

Panel Comments can be submitted here:

http://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=lcfsadvpanmembers-ws&comm_period=1

Public Comments can be submitted here:

http://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=lcfsadvisoryPanel-ws&comm_period=1

To view Panel Comments:

<http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=lcfsadvpanmembers-ws>

To view Public Comments:

<http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=lcfsadvisoryPanel-ws>

For general information regarding the Panel:

[LCFS Advisory Panel Homepage](#)

Opening Comments from Mary Nichols, Chairman, Air Resources Board:

Chairman Nichols thanked the Panel for contributing to the Board's efforts. The Board has asked staff to report progress on the implementation of the Low Carbon Fuel Standard (LCFS) to make sure the program delivers the hoped for results. The LCFS is a key element for meeting the greenhouse gas emission reductions called for under

AB 32. In approving the regulations, the Board wants to ensure that there is a smooth implementation and there are no unintended consequences. Therefore, the Board directed staff to periodically report back on status of program implementation including any recommended adjustments that may be necessary. Chairman Nichols asked the Panel to think of themselves as high-level advisors and act as if their words were coming directly to the Board. Each Panel member is a subject-matter expert in business, science, academia, or government and the Board seeks the top line messages that such expertise can provide.

Opening Comments from James Goldstene, EO, Air Resources Board:

Mr. Goldstene thanked the Panel members and reiterated Chairman Nichols' message, also asking that the Panel prioritize the workload for the LCFS.

Introductions

Attending the February 16, 2011 were: Richard Corey, Michelle Buffington, Dan Adler, William Barrett, Stephanie Batchelor, Robert Bienenfeld, Eric Bowen, Geoff Cooper, Matthew Crosby, Harrison Dillon, Bob Epstein, Bob Fletcher, Christopher Frantz, Remy Garderet, Christopher Hessler (remote), James Holland, James Iacoponi, Alex Kim, Christopher Malins (remote), Ralph Moran, Allan Morrison, Simon Mui, Michelle Passero, John Reese, Cathy Reheis-Boyd, Gordon Schremp, Frederick Sciance, John Shears, H. Daniel Sinks, Dwight Stevenson, Russell Teall, James Uihlein, Jurgen Weiss, Bob Whiteman, Paul Wuebben, Sonia Yeh, Todd Campbell, and Adam Langton.

A complete list of Panel members and their affiliations may be found on the [LCFS Advisory Panel Homepage](#).

Comments from the Advisory Panel Chair, Richard Corey:

Panel Chair Corey stated that the purpose of today's meeting was to be clear with the charter and overall game plan. Staff must keep to the schedule and at a minimum consider the thirteen areas identified in Section 95489 of the Regulation.

Review of the Bagley-Keene Act – Floyd Vergara, Manager, Industrial Section

A review of the Bagley Keene Open Meeting Act was presented with special emphasis given to “serial” meetings conducted via email or telephone. All documents referenced can be accessed on the [LCFS Advisory Panel Homepage](#).

Advisory Panel Guidelines Presentation, Michelle Buffington, APS, Fuels Section *General Summary of Presentation*

This presentation covered the topics regarding the guidelines of the Panel. This included the purpose of the Advisory Panel, the role of the Panel members, the code of conduct, and other areas. The Panel will not be voting on any issues, but rather will be gathering information to help synthesize recommendations. The information gathered will be shared through the Advisory Panel website whenever possible. It was also pointed out that the meetings will not be recorded or transcribed, but that a meeting summary will be prepared. This will include summaries of Panel members’ comments. Staff has provided a way for the Panel members and the general public to post comments to the website, and Panelists are encouraged to provide their input. Staff also covered the LCFS workgroups, with the intent that these workgroups will provide the Panel with updates throughout the year. Lastly, staff reminded the audience that all notices for this group will go out to the Fuels and Low Carbon Fuel Standard listservs.

Please see the presentation on the Advisory Panel website for more details.

Panel Discussion:

The following concepts/concerns/observations were introduced by Panel members:

- Panelists were interested in contacting specific workgroups that are on-going and producing technical work that will potentially be used to guide the Panel through higher level discussions. If you are interested in participating in any of these workgroups, please contact Michelle Buffington and she will put you in touch with the lead staff of the workgroup.
 - The Panel asked how ARB staff plan to deal with copyrighted material that may be needed to inform the review process. Staff in the legal department at ARB has determined that copyrighted material can be distributed for educational purposes to the Panel. Any further distribution may require contacting the author or publisher of the work.
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Overview and Update Presentation, Michelle Buffington, APS, Fuels Section

General Summary of Presentation

This presentation covered a basic primer on the LCFS as well as provided updates to the Panel on work that has been completed since the Board hearing in April 2009. This included an update on LCFS workgroups that were designed to deal with technical issues or specific topics of interest that were called out in Resolution 09-31. Please see the presentation on the Advisory Panel website for more details.

Summary of Panel Comments:

The following concepts/concerns/observations were introduced by Panel members:

- Panelists wanted to know if staff was open to the idea of forming an additional workgroup for technical or implementation issues. For example: CNG/LNG and its role in the LCFS. Staff responded that they are willing to consider additional workgroups as they are needed.
- Panelists asked for clarification on several aspects of the regulation, including opt-in provisions and applying for individual carbon intensity (CI) pathways. Staff addressed their concerns.
- Panelists also brought up technical comments related to High Carbon Intensity Crude Oil (HCICO) and “Food for Fuel” issues. Staff responded that there are workgroups formed to deal with the technical aspects of these subjects (specifically the HCICO and Sustainability workgroups). Staff will also include high level policy discussions regarding HCICO in the Advisory Panel workplan. Part of this discussion may include accounting for ways that a potential HCICO can obtain a lower CI value (e.g., carbon sequestration)
- Panelists discussed a variety of ways to incentivize low carbon fuels, such as providing credit for higher octane fuels, light duty dieselization, and having the Panel consider the policy structure to ensure that it encourages the use of low carbon fuels. Staff affirmed that this was one of the 13 topics that we were required to cover under the regulation.
- Some Panelists suggested that the biorefinery registration should be required under the regulation.

Draft Workplan and Agenda Presentation, Michelle Buffington, APS, Fuels Section

General Summary of Presentation

In this presentation, staff reviewed the 13 topics that were called out in the regulation that they are required to address. The presentation included a tentative schedule for when these topics would be presented to the advisory Panel, including some specific

tasks that staff felt addressed the main topics. Staff suggested a two-day meeting in August, and two public checkpoints in July and September of 2011. Panel members were encouraged to attend the public checkpoint meetings.

Please see the presentation on the Advisory Panel website for more details.

Summary of Panel Comments

- Several Panel members would like to frontload the discussion topics, which will provide additional time for gathering background information and allowing for a comprehensive discussion as well as considering interactions between topics (e.g. the interconnectivity between topics 5 and 11). Staff has responded to this and is revising the workplan for additional discussion at the April meeting.
- Panelists also suggested that we have another two-day meeting in order to cover all of these topics thoroughly. Staff responded by making the June meeting two days (June 30 and July 1) and the August meeting two days (August 25 and 26).
- Panelists stated that the meeting revolved around staff presentations and not going around the table and asking what they thought was important. The Panel needs the opportunity to express their priorities and opinions on topics to discuss. Staff will take this into consideration for future meetings.
- Panelists commented that the determination of achievable pathways will be based upon current and future technology; however, there may be issues regarding anti-trust laws. Companies might not be able or willing to provide data outlining future market direction.
- Panelists also expressed concern that the LCFS is a policy driven market transformation that translates to real world impact and that capital investments will be difficult to acquire and the market will be slow to develop without more specifics on the market design. One example is the way the credit-trading regime would overlay the policy. The markets need to know exactly how the incentives will work or which standards will be supported on the technical side before capital can be brought in or a transparent credit trading market can be formed.
- Panelists commented that separate barriers are present in the non-blended fuel industry and investors will look towards the market design before investing capital. Some technologies do not change the fuel but adjust the CO₂ output at the point of use.
- Panelists commented that the availability and the infrastructure have to be considered together, because if fuels cannot be transported, stored, blended, and delivered to consumers, then there is no benefit. Evaluation on how the entire infrastructure will be set to ensure targets can be met.
- Panelists commented that credits can be purchased for the Cap and Trade program but not for the LCFS. There is no market or cost control for consumer

protection. The sooner a defined system can be set in the place, the quicker the market can reach equilibrium. Staff responded that credits generated under the LCFS can be traded or sold within the LCFS.

- Panelists suggested that staff think about whether adjustment is needed in the compliance issue (Topic 3) more broadly rather than just revising the schedule.
- Staff encouraged Panelists to submit information and comments. Any confidential information must be so marked.

Summary of Public Comments

- It was requested that the Panel be briefed on other AB 32 activities that may have interactions with the LCFS (e.g. cap and trade, regional transportation-related GHG targets, medium/heavy duty hybridization, vehicle efficiency measures, etc.).
- It was also requested that a status report be given during the June meeting regarding what is happening in the state with conventional fuel because there was a concern about a disconnect in the ability to produce and market finished fuels that incorporate LCFS requirements in the timeframe of the regulation.

Summary of Expert Workgroup Recommendations Presentation, Jim Duffy, ARE, Alternative Fuels Section

General Summary

See the presentation for more information regarding this topic.

Summary of Panel Comments

- Panelists asked if recommendations from the Expert Workgroup (EWG) considered that more fertilizer and water may be needed to achieve greater yields and what affect that would have on emissions? Staff's response as that although the issue was raised a few times during EWG meetings, none of the subgroups of the EWG addressed this directly in their report. The Emission Factors subgroup discussed the potential for increased fertilizer use to achieve higher yields but no consensus was achieved and no recommendation was made.
- Panelists raised the issue that in many regions, water is a limiting resource. If you use this water to produce corn (and sequester carbon that is then allocated as a credit in the biofuel lifecycle assessment), it is no longer available to improve sequestration of carbon elsewhere. Was this issue addressed by the EWG? Staff confirmed that it was briefly discussed but not addressed within the subgroup reports.
- A Panelist asked if GTAP includes information on where land use change (LUC) is occurring within the U.S.? Staff responded that GTAP provides LUC information at the AEZ level for each of 18 world regions.

- One Panelist commented that the Elasticity Values subgroup suggested two differing recommendations concerning the price-yield elasticity value (leaving it at 0.25 for all crops and regions or including different values which are crop and region specific). Is ARB disregarding the recommendation from the Elasticity Values subgroup? Staff responded that they received different recommendations from the subgroup and from Steve Berry. Staff will be evaluating evidence supplied by the Elasticity Values subgroup, the independent reviewer Steve Berry, as well as other research to determine the proper approach and value(s) to use in future modeling.
 - One Panelist commented that Steve Berry's work on the price-yield response is more compelling than that of the Elasticity Values subgroup.
 - Panelists asked if staff will use the Terrestrial Ecosystem Model approach to estimate yields on lands newly converted to cropland? Staff responded that several subgroups and independent reviewers recommended adopting the Terrestrial Ecosystem Model approach as a near-term modeling revision because it was better than what was currently used in ARB modeling. In the longer-term, they also recommended that we continue to research and evaluate this and other approaches.
 - A Panelist commented that several subgroups recommended adding land pools to the GTAP database, but before doing so shouldn't the CET function in GTAP be revised? Currently staff believes that these are short to long-term projects and will likely not be accomplished in the near-term model revisions.
 - Panelists asked for clarification on the primary objective of LCFS – is it to drive innovation or to reduce GHG? Panel suggests there are cheaper ways to lower GHG if that is the driver. Some in the fuels market look at it as reducing GHG but others see efforts from the sector to also innovate and believe that both cannot be achieved in unison.
 - Panelists asked as staff contemplates calculation methods, what effects will ARB's current contemplation of calculation methods have on past and current compliance methods and will revisions to the calculation persist? Some panelists believe that frequency cannot be too often as investment in future technology cannot be sustained if the baseline is ever changing.
 - Panelists asked if uncertainty in LUC values been determined? Staff responded that some sensitivity analysis has been performed by both staff and Purdue University; however, it has not been system wide characterization of uncertainty. UC Berkeley has developed a reduced-form model for LUC and has performed Monte-Carlo simulations to characterize uncertainty in LUC estimates. This published work indicates that 30 gCO₂/MJ is at the lower end of the possible range of LUC values for corn ethanol. The Uncertainty subgroup has also made several short and long-term recommendations to better characterize uncertainty.
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Status of the Method 2A/2B Process Presentation, Wes Ingram, APS, Alternative Fuels Section

General Summary

Please see the presentation for more information on this topic.

Summary of Panel Comments

- Panelists asked if there were any minimum requirements to proceed through the Method 2A/2B process. Staff indicated that Method 2A pathway applications are subject to two “substantiality” requirements: a minimum carbon intensity reduction of 5 gCO₂/MJ, and a minimum production volume of 10 million gallons/year. Staff responded that they would like to hear how other approaches, such as a credit-based approach, are working.
- Panelists were concerned over the amount of time it takes to have a pathway approved through the Method 2A/2B process. Staff responded that they are working toward a certification process, which would allow Method 2A and 2B applications to be approved without a regulation change. This would significantly expedite the full approval process.
- Panelists asked if measures to expedite the release of CIs exist, and if released CI values are guaranteed for any length of time. Staff responded that such measures are contained in LCFS Regulatory Advisory 10-04. Those measures allow Method 2A/2B applicants to begin using the CIs for which they have applied as soon as their applications are posted to the 2A/2B web page. In order to add certainty to the process, posted CIs can be used for up to six months after they have been acted upon at hearing. This permanent provision allows applicants to continue using posted CIs for six months even if they are denied or increased at hearing. Several applications which account for significant volumes of fuel have received temporary CIs under these provisions. Until the board approves a 2A/2B certification process, review by the Executive Officer will be necessary for final approval.
- A potential issue raised by some Advisory Panel members is the mismatch between the needs of the 2A/2B process for an actual functioning plant, and the needs of investors for some indication that a proposed plant will be approved at a favorable CI under the LCFS. Staff agreed that there was a need for certainty in the early stages, but also stated that there was a need for real-time data, not just modeled plant dynamics. Staff indicated that during the rulemaking we would

make every effort to provide an indication of what the CI would be for investment purposes subject to confirmation and certification upon building of the facility.

- Panelists proposed that one purpose of the 2A process is to spur innovation and to encourage companies to take measures to reduce energy consumption. The 2A process should provide incentives to reduce CIs in both current and future facilities.
 - Panelists commented that the 2A/2B does not explicitly evaluate the economic viability of proposed fuel pathways. The CI can be seen as a weak proxy for economic viability in that fuels with lower CIs are expected to be more valuable in the marketplace. Low-CI fuels also earn marketable LCFS credits. But economic viability depends upon more than CI, of course.
 - Panelists pointed out that there is no empirical laboratory (or similar) approach to pathway verification. Staff agreed, but showed that the process is as stringent as it can possibly be in the absence of engineering audits of applicants' production processes. Applicants are required to submit air pollution control permits, utility bills, process flow diagrams, equipment lists and full lifecycle analyses. Staff has been working to implement an enforcement program, but is unlikely to conduct validation audits at each site.
 - Panelists asked staff to consider "plug and play" tools for pathway development. For example: a new pathway might be satisfactorily developed by combining components of two or more already approved pathways. The renewable fuels agency in the UK uses a carbon calculator that implements this "plug and play" approach. Staff is willing to work with these ideas, but, like all pathways, ones developed using such tools must be enforceable and verifiable.
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Next steps:

- Submit any comments via the website within 2 weeks.
 - Today's meeting summary will be available as soon as possible.
 - The next meeting is April 26.
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Parking Lot:

- Consider adding a CNG/LNG workgroup
 - Consider adding a light duty dieselization workgroup
 - Consider market design, capitalization (cost control and consumer protection)
 - Consider advancements in EER calculation
 - Suggest additional discussion of Topic 3 – LCA
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Comments from the Panel Chair:

Appreciate the participation. Will look at comments and how they map over the 13 topics that must be considered.

Key points:

- The back loaded schedule – we will consider pulling up topics sooner which includes adding a two-day meeting earlier in the process.
 - Methodologies and data sources will be useful and we will get that to you in a form that can be discussed at the next meeting.
 - The integration statement is a good one – trying to organize and structure the topics. Many are so inter-related that we need to find a way to talk about their interactions. A suggestion is to take time during the next meeting and talk about how to do that.
 - Volunteering – We will follow up with those who want to do more in depth work that supports staff efforts as well extend additional opportunities at the next meeting.
 - Staff will make every effort to map concerns and priorities of the Panel to topics called out in the regulation, workgroups in progress and topics that may have to be revisited outside the scope of this Panel (i.e. the next program review).
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Panel Assignment:

Submit top 5 priorities as comments to the website. Staff will review these comments and make adjustments to the workplan accordingly.

DRAFT