Biomass-based Diesel in the LCFS

Public Working Meeting for Stakeholder Groups

May 15, 2017

Discussion Outline

Fuel Pathways

1. Update to CA-GREET
2. Simplified CI Calculator
3. Stakeholder Feedback Summary

Fuel Reporting

1. Allocating Fuels Volume by Feedstock
2. LRT-CBTS Reconciliation
3. Reporting of Fuel Exports
4. Stakeholder Feedback Summary

Next Steps

Tier 1 Pathways for Biomass-Based Diesel

FUEL PATHWAY EVALUATION

Fuel Pathway Evaluation Discussion Outline

1. Update to CA-GREET
2. Simplified CI Calculator
   - Input Value Definitions
   - Feedstock Rendering/Treatment/Oil Extraction Energy
   - Transport Distances
   - Options for BD and RD production
3. Stakeholder Feedback Summary
4. New Feedback Requests

Update to CA-GREET

- CA-GREET 3.0 will be based on Argonne National Laboratory's GREET1 2016
- A draft version expected to be released for stakeholder review and feedback in June/July 2017
- California-specific modifications envisioned:
  - Electricity grid resource mix from e-GRID 2014
  - Tailpipe emission factors from ARB EMission FACtors (EMFAC) model 2014
  - Natural gas emission factors based on updates from ARB OGGM branch (expected Aug 2017)
  - California refinery crude slate
  - Others as appropriate based on available data

Simplified CI Calculator

- *Summary:* Posted an updated CI Calculator specific to biodiesel and renewable diesel pathways. Will be a replacement for the CA-GREET Tier 1 Calculator.
- *Update:* Added full functionality and introduced new definitions.
  - *Site-specific:* a value inputted by the applicant. All site-specific inputs must be measured, metered and verifiable. Shown as yellow in the calculator.
  - *Standard:* CA-GREET values that are not inputted by the applicant in the simplified calculator. These values are intended to be the same for all applicants of a given fuel type and will not be validation or verification points.
  - *Conditional default*: A conservative input value established by ARB staff that may be used under specified conditions. Use of conditional default values may require validation that the specified conditions are met, but not to further verification.

All yellow fields in the current draft calculator are intended to be site-specific and would be subject to verification

Inputs to the Calculator related to Feedstocks (1)

- Treatment, Rendering and Oil Extraction
  - Energy inputs for oil extraction and rendering or treatment of tallow/UCO are standard values
  - Tier 2 will be available for site-specific values for rendering /treatment/oil extraction energy (need to meet threshold to be eligible for Tier 2)
- Feedstock sourcing and processing regions
  - Standard regions available include California, United States, Canada, and Brazil
  - Option to add new feedstock sourcing regions (with corresponding electricity, natural gas and crude emission factors)

Inputs to the Calculator related to Feedstocks (2)

- Feedstock transport distance can be site specific, but we'd like conditional defaults to also be available:
  - For vegetable oil
    - Suggest monthly weighted average distance from oil extraction facility to fuel production facility
    - If source unavailable, requesting stakeholder feedback on appropriate default
  - For Used Cooking Oil
    - Monthly weighted average from treatment facility to fuel producer
    - If sourcing from restaurants directly, requesting stakeholder feedback to estimate transport distance
  - For Tallow
    - Monthly weighted average from renderer to fuel producer

Inputs to the Calculator related to BD/RD Production

- Option to add new regions (with corresponding electricity, natural gas and crude emission factors)
- Suggest that use of chemicals be standard inputs with the exception of Methanol (BD) and Hydrogen (RD)
- Provision for the use of bottom distillates as a process fuel
- Accounting for free fatty acids, renewable naphtha, and purge gas as co-products, if applicable

Feedstock related stakeholder feedback

- Included:
  - Offer the option to use a weighted average transport distance
  - Offer region-specific energy mixes
  - Standardize oil extraction yields for soybeans, canola and DCO
  - Option to report feedstocks in tons, lbs. or gallons
  - Allow use of site-specific oil extraction data
- Not yet included:
  - Establish a CI threshold (suggest 2 g/MJ) to facilitate differentiation between pathways for feedstock sourced from different regions
  - Assign maximum moisture content as standard rather than monthly reporting of moisture content

Finished-fuel related stakeholder feedback

- Included:
  - Account for additional co-products (i.e., distillate bottoms)
  - Accounting of FFA should be optional
  - Purchase records requested do not account for methanol embedded in chemicals used (i.e., in sodium methylate) and underestimate GHG emissions
  - Requiring temperature correction meters and temperature corrected inventory may be a challenge
  - Allow reporting of natural gas use in flow or energy units
  - Allow for the use of distillate bottoms as a process fuel
- Not yet included:
  - Chemical usage should not be standardized
  - Define minimum yields and allow producers to justify a higher yield from plant production data
  - Suggest pathway CI tolerance of ± 5% or ± 2.5 g/MJ

New Feedback Requests (1)

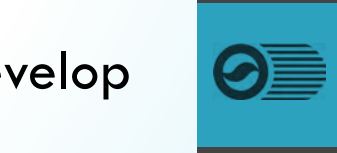
QUESTIONS:

- Please review and provide feedback on appropriateness of the draft Simplified CI Calculator for BD/RD pathways
- Staff is seeking input on transport distance for feedstocks shipped directly to a fuel production facility without transferring to a rendering/treatment facility
- Staff is seeking input on the suggestion to require modeling of CI for site-specific treatment/rendering/oil extraction to be considered under a Tier 2 pathway
- Staff is seeking feedback regarding suggested quantification of co-products from BD/RD production. Would a requirement to demonstrate sales invoices be a feasible option?

New Feedback Requests (2)

QUESTIONS:

- Would stakeholders provide specifics on chemical inputs for consideration of site-specific values?
- What is the current practice for sourcing feedstocks from oilseeds? Do most fuel providers source directly from the processing facility, or is it common to purchase from traders/brokers? How likely are traders/brokers to withhold listing locations of feedstock sources on bill of ladings?
- For vegetable oil sourced from indeterminate sources, requesting feedback on appropriate transport distances
- Is it reasonable to require information on point of origin for UCO and tallow?
- Can stakeholders provide feedback on the suggestion to develop user-defined factors for electricity, NG and crude?



New Feedback Requests (3)

QUESTIONS:

- For facilities which receive a reviewed CI, changing sources of feedstock could potentially lead to higher pathway CIs leading to non-compliance for reporting. Would stakeholders suggest options to ensure the CI of fuel supplied conforms to the originally certified value?

Clarification of LCFS reporting requirements and potential changes under consideration

FUEL REPORTING

Reporting Requirements Discussion Outline

1. Allocating Fuel Volumes by Feedstock
2. Quarterly Reconciliation with Counterparties in the LRT-CBTS
3. Reporting Exports of Fuel Blends Containing Biomass-Based Diesel
4. Stakeholder Feedback Summary

Allocating Fuel Volumes by Feedstock (1)

Summary:

- If multiple feedstocks are processed at a fuel production facility then the fuel producer must be able to associate specific quantities of feedstock consumed with specific amounts of fuel produced during that quarter
- ARB's suggested accounting methodology to be used for allocating produced fuel volumes by feedstock
- Any other accounting methodology needs to be approved by ARB at the time of fuel pathway certification

Rationale:

- Allocation of fuel volumes to specific feedstock is critical for accurate reporting of fuel and CI's in the LCFS

Allocating Fuel Volumes by Feedstock (2)

ARB's suggested accounting methodology

- Fuel allocated to each FPC during a quarter should not be greater than the estimated production amount for that FPC during that quarter

  $$\textbf{\textit{Estimated production amount}} = average\ yield\ as\ determined\ during\ fuel\ pathway\ certification \times amount\ of\ feedstock\ consumed$$

- Any amount of fuel produced in excess of the estimated production amount should be allocated:
  - To the FPC with the highest CI for the facility
  - In cases where some of the feedstocks consumed do not have certified CI's under LCFS, a temporary FPC should be requested

Allocating Fuel Volumes by Feedstock (3)

Example: Assuming a facility is producing fuel using four different types of feedstock as shown below.

- In this example, the maximum production amount reported in LCFS for Q1 for all FPCs, with the exception of the highest CI FPC (FPC3), cannot exceed the estimated production amounts as shown
- Assuming the actual total fuel produced at the facility is 600,000 gallons resulting in an excess of 16,000 gallon more than the total estimated production amount
- The excess fuel amount must be allocated to FPC3 i.e., the maximum amount that can be allocated to FPC3 in this case would be 136,000 gallons. (120,000+16,000 gallons)

Feedstock Types	FPC (CI)	Average yield determined during fuel pathway certification	Q1 Feedstock consumption (lbs)	Estimated production amount based on average yield for Q1 (gal)	Max. Q1 fuel production amount that can be allocated for LCFS reporting
Type 1	FPC1 (40)	0.8	*300,000*	240,000	240,000
Type 2	FPC2 (42)		*200,000*	160,000	160,000
Type 3	FPC3 **(55)**		150,000	120,000	**136,000**
Type 4	FPC4 (16)		*80,000*	64,000	64,000
Total			***730,000***	**584,000**	**600,000**

Unreconciled Fuel Amounts and Associated Credits in 2015 and 2016

The amount of BD/RD (and credit value) un-reconciled in the LRT-CBTS increased in 2016 from 2015

2015				
Fuel Type	**Fuel Volume (gal)**	**Credits**	**% of Total LCFS Credits**	**Value***
Biodiesel/ Renewable Diesel	2,735,952	18,936	0.3%	$1,174,032
Ethanol	21,783,654	126,647	2.3%	$7,852,114

2016				
Fuel Type	**Fuel Volume (gal)**	**Credits**	**% of Total LCFS Credits**	**Value***
Biodiesel/ Renewable Diesel	4,909,351	51,413	0.6 %	$5,192,713
Ethanol	13,837,872	28,814	0.3 %	$2,910,214

*VWA credit price of $62 for 2015 and $101 for 2016.

(Source: ARB's Monthly LCFS Credit Transfer Activity Reports http://www.arb.ca.gov/fuels/lcfs/credit/lrtmonthlycreditreports.htm)

Quarterly Reconciliation with Counterparties in the LRT-CBTS

Summary:

- Staff is considering enhancing the LRT-CBTS system to issue credits only for reconciled fuel data
- The credits or deficits associated with the unreconciled fuel amounts will be retained in the upstream entity's account as shown below

Reporting party's (RP) quarterly report submission	Business partners' (BP) quarterly report submission	LRT-CBTS Reconciliation
Includes sale of credit/deficit generating fuel with obligation	No counter report	Credits/deficits are not issued in the BPs account ledger and remains in the RP's account
No counter report	Includes purchase of credit/deficits generating fuel with obligation	

Rationale:

- Eliminate the need for third-party verification of fuel transactions reported downstream of initial regulated party
- Limit the cost and scope of verification program while ensuring high quality of credits

Reporting Exports of Fuel Blends Containing Biomass-Based Diesel (1)

Summary:

- If biomass-based diesel (neat or fuel blend) reported in the LCFS is subsequently exported, then the exported amount of biomass-based diesel must be reported.
- Table below shows the entities responsible for reporting export of fuel

Scenarios	Entity responsible for reporting the export
Fuel sold or delivered above the rack for export This refers to delivery or sale of fuel for export at pipeline origin points, pipeline batches in transit, and at terminal tanks before the diesel has been loaded into trucks or other means of non-bulk transfer.	The entity holding the title of the fuel as it crosses the border on its way toward the first point of sale/delivery is responsible for reporting the export in the LRT-CBTS.
Fuel sold at the rack for export This refers to the sale of fuel for export at the terminal through truck or other means of non-bulk transfer and the delivery destination is known at the time of sale.	The entity holding the title of the fuel as the fuel crosses the rack is responsible for reporting the export in the LRT-CBTS.
Fuel diverted out of state (below the rack) This covers the sale of fuel at the rack with a California destination which later gets diverted out of state through truck or other means of non-bulk transfer or any other export scenario not covered above	The entity holding the title of the fuel, as it crosses the border, is responsible for reporting the export in the LRT-CBTS.

Reporting Exports of Fuel Blends Containing Biomass-Based Diesel (2)

- Currently, ARB allows significant flexibility for the purposes of the initial LCFS reporting and a reporting party may choose to report biomass-based diesel blends as 100% Ultra Low Sulfur Diesel (ULSD) in the LRT-CBTS
- If the blend percentage or FPC of the biomass-based diesel is not known in the exported fuel, use the following values for LCFS reporting

Diesel Fuel Blend	Default blend percentage by volume	Substitute FPC (CI in gCO_2e/MJ)
Diesel fuel with unknown blend levels of biofuel and with no FTC labeling identifying the blend level.	100% ULSD	102.01 for ULSD
Diesel fuel with unknown blend level and labeled as "20% Biomass-Based Diesel Blend"	20% RD	35.86 for RD
Diesel fuel with unknown blend level and labeled as "B20 Biodiesel Blend"	14.3% BD	16.94 for BD
Pure Renewable Diesel with unknown CI	100% RD	35.86 for RD
Pure Biodiesel (B99/B100) with unknown CI	100% BD	16.94 for BD

BD stands for Biodiesel and RD stands for Renewable Diesel

- Default blend percentages for B20 could be the state-wide average blend levels based on ADF reporting
- Default blend percentages for renewable diesel are based on FTC labeling requirements
- Substitute FPCs will have the average CI's for that fuel in the prior year

Stakeholder Feedback Summary

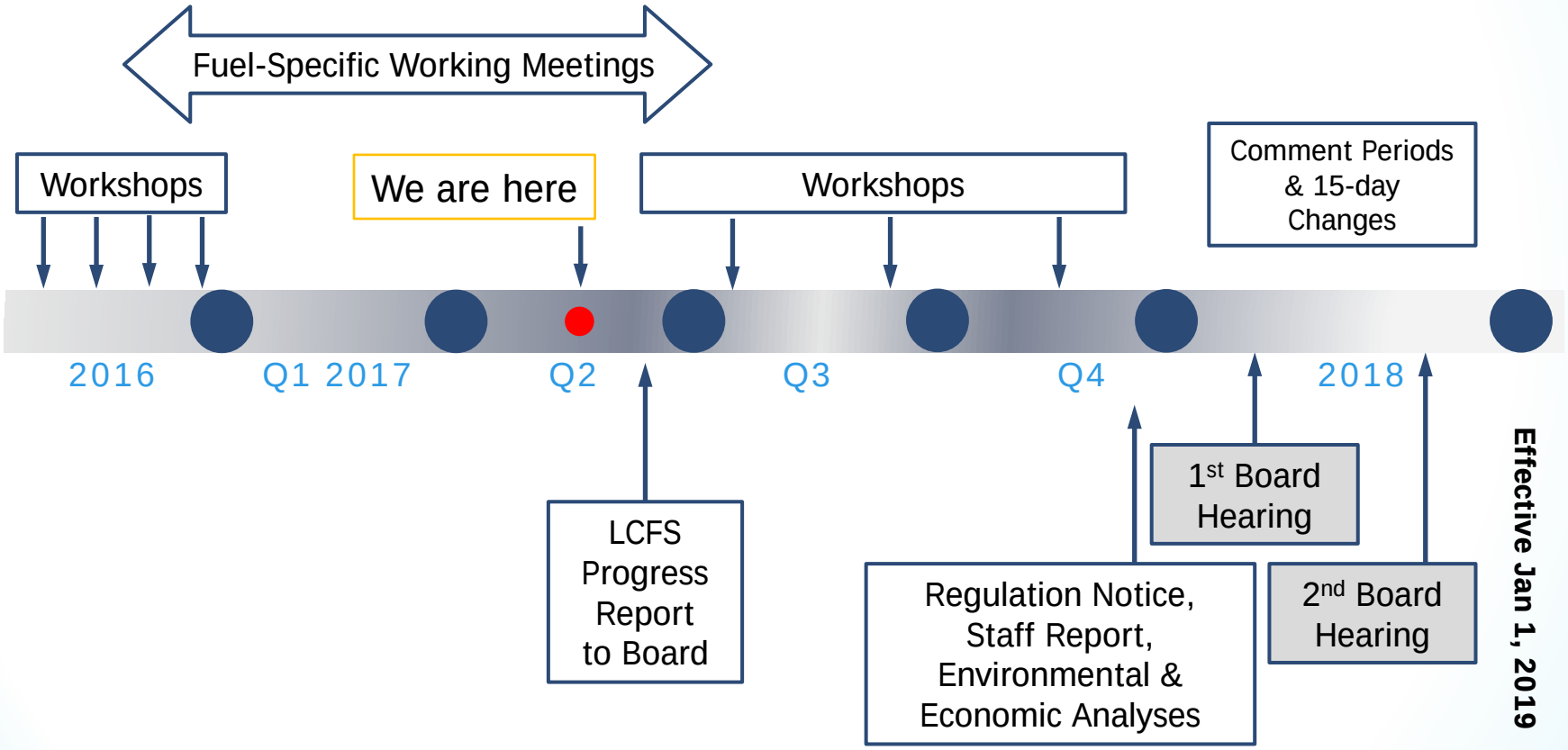
Feedback on issues without clear support:

- Requested clarification on enhanced report reconciliation in the LRT-CBTS
- Request to establish clear responsibility for reporting of fuel exports
- Reconsider the default blend levels and substitute FPCs to be used for reporting of fuel exports

Support for following issues:

- Standardizing the temperature corrections for fuel reporting
  - *The draft LCFS Regulatory Guidance 17-01 available at:* https://www.arb.ca.gov/fuels/lcfs/guidance/regguidance_17-01.pdf
- Implementing Total Amount (TA) check for each FPC in the LRT-CBTS system
- Adopting Fuel Obligation Transfer Period

Public Process (subject to change)



THANK YOU!

Feedback should be sent to

LCFSworkshop@arb.ca.gov

by June 5th, 2017