

Biomass-based Diesel in the LCFS

Public Working Meeting for Stakeholder Groups

February 10, 2017



Discussion Outline

Introduction

Definitions

Fuel Pathways [45 minutes]

- | | |
|---|----------------------------------|
| 1. Simplified CI Application Forms | 4. Allocating Fuel to Feedstocks |
| 2. Tier 1 vs. Tier 2 Feedstock Production | 5. Standardize Chemical Inputs |
| 3. Feedstock Source Regions | 6. Facility-Specific Co-Products |

Fuel Reporting [45 minutes]

- | | |
|--|--|
| 1. Standardized Vol. for Liquid Alt. Fuels | 4. System Check for Total Amount of Fuel |
| 2. Exports of Biodiesel and Blends | 5. Fuel Obligation Transfer Period |
| 3. Reconciliation with Counterparties | |

Third Party Verification [45 minutes]

- | | |
|--|--|
| 1. Rationale and Guiding Principles | 4. Potential Upstream Supply Chain Verification Requirements |
| 2. Potential Verification Responsibilities | |
| 3. Exemption for Small Export Volumes | |

Next Steps



Tier 1 Pathways for Biomass-Based Diesel

FUEL PATHWAY EVALUATION



Simplified CI Application Form

Summary: Staff is considering further simplification to the Tier 1 pathway application forms, as a replacement for the CA-GREET 2.0 Tier 1 Calculator.

Rationale:

- To facilitate pathway CI application, evaluation, and verification
- To reduce errors by eliminating intermediate steps to convert operational data to CA-GREET inputs
- To clearly indicate user-input fields subject to verification

QUESTIONS:

- Please review the draft form and provide feedback to identify raw, verifiable data that is metered or otherwise measured.

Download the draft form at:

https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/BD-RD_app.xlsm



Simplified CI Application Form

Feedback requests

QUESTIONS:

- *Are appropriate units of measurement given for each data collection point?*
- *Do the input fields provided in the form align with the feedstock and co-product inventory tracking methods that facilities currently employ?*
- *Will there be comparable records that verifiers can check to confirm these amounts? Can the documentation sources referenced be clarified?*
- *What adjustments (unit conversions or adjustment to normalize climate variations) are made to metered or measured quantities?*
- *Are there variations in the types of meters used, meter location within the production stream, calibration requirements, or other potential sources of inconsistency across producers that staff should be aware of?*
- *Will the fields offered in this form accommodate the majority of production processes?*

Review the Staff Discussion Paper:

https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/02102017discussionpaper_bdrd.pdf



Standardize Feedstock Production Parameters

Summary: Current Tier 1 applicants can modify oil yields and energy inputs to rendering. Staff is considering proposing standard feedstock production parameters for Tier 1 applications. Applicants who wish to use facility-specific rendering/extraction energy could apply for Tier 2 pathways if they meet the minimum reduction for an innovative process.

Rationale:

- If feedstock production parameters are modified, operational data and a monitoring plan for the rendering/extraction facility are necessary to ensure reductions are real and verifiable.

QUESTIONS:

- *Staff is seeking stakeholder feedback regarding potential standard feedstock production parameters in determining the CI for Tier 1 pathways.*
- *Staff requests stakeholder suggestions for application requirements and verification protocols for user-specific feedstock production parameters.*



Multiple Pathways for Feedstocks Sourced from Different Regions

Summary: Fuels CIs derived from a single feedstock sourced from multiple regions may be disaggregated by the applicant. Staff is considering substantiality thresholds. The weighted average transport distance could be used within a region.

Rationale:

- Improve accuracy: Regional differences in electricity mix and transportation distance/modes may lead to significantly different CIs.
- Avoid having too many pathways with small variation in CI.

QUESTIONS:

- *Staff is seeking stakeholder feedback related to allowing disaggregation of single feedstock type over multiple regions rather than aggregating the feedstock using conservative assumptions.*
- *Could substantiality thresholds be used to limit the number of distinct pathways that an applicant may apply for?*
- *Staff requests suggestions for verification protocols to ensure transport distances can be confirmed both during initial CI validation and on an ongoing basis.*



Allocating Fuel Volumes to Multiple Feedstocks

Summary: A fuel producer must be able to unequivocally associate specific quantities of feedstock consumed with specific volumes of fuel. Staff is considering requiring producers to define their allocation methodology in their monitoring plan, and instructing verifiers to check that volumes reported in each quarter reflect feedstock consumption within that quarter.

Rationale:

- To minimize risk of credit adjustments at the conclusion of an entire verification period, we suggest that producers use the simplified data summary forms to track their feedstock consumption within each quarter and ensure accurate volumes are reported for each FPC.

QUESTIONS:

- *Are there challenges associated with assessing feedstock consumption and allocating to fuel volumes sold on a quarterly basis?*
- *Do stakeholders need additional guidance on allocation methodologies and recordkeeping to ensure compliance?*



Standardize Process Chemical Inputs (Excluding Methanol and Hydrogen)

Summary: Staff is considering omitting chemical inputs from the CI application. Standard values could be developed and applied to all Tier 1 pathways.

Rationale:

- Chemical inputs result in a small contribution to CI.
- Standard values would reduce recordkeeping and verification of these inputs.

QUESTIONS:

- *Staff is seeking stakeholder feedback on the suggestion to use standard values for chemical inputs.*
- *If stakeholders prefer facility-specific inputs, we request suggestions for verification protocols to ensure the inputs can be confirmed both during initial CI validation and on an ongoing basis.*



Facility-Specific Co-products in Biomass-Based Diesel Production

Summary: Staff is considering allowing applicants to submit actual co-product yields, and developing allocation methodologies for new co-products that do not currently appear in CA-GREET.

Rationale:

- Glycerin and propane yields are fixed parameters in CA-GREET, but actual yields may vary.
- Some biodiesel applicants claim distillate bottoms and free fatty acids are sold as co-products, and some renewable diesel applicants claim naphtha as a co-product, not currently accounted for in the pathway CI.

QUESTIONS:

- *Should these co-products be considered in Tier 1 pathways?*
- *Staff is requesting stakeholder suggestions on appropriate allocation methodologies for determining the impacts of these co-products to pathway CI.*
- *How can staff ensure that methods for accounting and reporting of the fuel volumes associated with each co-product are accurate and verifiable?*



Potential Non-Regulatory Changes for Enhanced Reporting, and
Potential Regulatory Amendments to Reporting Requirements

FUEL REPORTING



Reporting Standardized Volumes for Liquid Alternative Fuels

Summary: Fuel volumes reported in the LCFS should be adjusted to standard temperature conditions of 60°F. Staff has published a draft guidance on temperature adjustment methodology, consistent with RFS.

Rationale:

- Volume of biomass-based diesel and other liquid alternative fuels changes with the temperature at which they are recorded.
- Consistent reporting of fuel volumes across all reporting parties is necessary to ensure the accuracy of fuel data and credit calculation.

QUESTIONS:

- *Please review the draft guidance posted and provide any feedback.*
- *Is there an industry standard methodology for renewable diesel?*

Draft LCFS Regulatory Guidance 17-01 available at:
https://www.arb.ca.gov/fuels/lcfs/guidance/regguidance_17-01.pdf



Reporting Exports of Fuel Blends Containing Biomass-Based Diesel

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. If the blend percentage of the biomass-based diesel is not known in the exported fuel, please use the following default percentages:

Diesel Fuel Blend	Default blend percentage by volume	Default FPC (CI in gCO ₂ e/MJ)
No FTC labeling identifying the blend level and unknown blend levels of biomass-based diesel	5% Biodiesel + 5% Renewable Diesel	BIOD0116 (15), and RNWD0116 (30)
Diesel fuel labeled as “B-20 Biodiesel Blend”	20% Biodiesel	BIOD0116 (15)
Diesel fuel labeled as “20% Biomass-Based Diesel Blend”	20% Renewable Diesel	RNWD0116 (30)

QUESTIONS:

- *What are the challenges of accurately tracking blend percentages of biomass-based diesel in the fuel blends for the purpose of reporting exports?*
- *Please provide feedback on the suggested default biomass-based diesel blend percentages for the purpose of reporting exports.*



Quarterly Reconciliation with Counterparties in the LRT-CBTS

Summary: Staff is considering placing automated holds on any credits related to unreconciled fuel transactions, allowing only the reconciled fuel transactions to generate credits.

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 verification.

QUESTIONS:

- *What are the primary causes of unreconciled reports?*
- *Staff is requesting feedback on implementing automated credit holds for unreconciled data.*
- *Are there any suggestions for a general rule to resolve credit disputes resulting from unreconciled fuel transactions?*



LRT-CBTS System Check for Total Amount (TA) of Fuel for each FPC

Summary:

- Currently, the system checks for non-negative value of total obligated amounts (TOA check) but does not check non-obligated fuel amounts.
- A Total Amount (TA) system check will prevent over-drafting of fuel amounts to ensure a non-negative fuel amount balance is maintained in a LRT-CBTS account.
- Summed across all reporting periods starting 2016.
- Applicable for all FPCs established pursuant to the 2015 readoption of the LCFS regulation.

Rationale:

- This will prevent over-drafting of fuel amounts to ensure a non-negative balance is maintained in a LRT-CBTS account
- Non-negative fuel balance is critical for proper compliance and accounting of credits and deficits in the program



Fuel Obligation Transfer Period

Obligation for liquid alternative fuel refers to the credits associated with the fuel, or the ability to generate credits, and the requirement to report these volumes. Obligation can be transferred downstream along with ownership of the fuel.

Summary: Staff is considering proposing a fuel obligation transfer period of two quarters.

Rationale:

- Retaining ownership of obligated fuel when the annual CI standard changes also changes the number of credits or deficits associated with the fuel.
- To avoid such situations and ensure the accuracy of credits and deficits in the program, fuel obligation transfer period would ideally be limited to one reporting quarter; however, staff is considering whether a transfer period of two reporting quarters would better accommodate industry practices
- Credits generated from the fuel can always be transferred independently in the LRT-CBTS.

QUESTIONS:

- *Are there alternatives to fuel obligation transfer period that should be considered?*
- *Would there be any challenges with using a two-quarter transfer period?*



Verification Program Overview

Considerations for Biomass-Based Diesel

VERIFICATION



Verification Outline

- Rationale and Guiding Principles
- Considerations for Third-Party Verification of Biomass-based Diesel
 - Potential Verification Responsibilities at, and Downstream of, the Production Facility
 - Exemption for Small Export Volumes
 - Potential Upstream Supply Chain Verification Requirements for Lower CI Feedstocks



Verification: Summary & Rationale

Summary: Addition of mandatory third-party verification of program aspects including, but not limited to:

- Fuel pathway carbon intensities
- Reported fuel quantities
- Chain of custody information

Rationale: Further ensure integrity in LCFS credit market through verification of GHG reduction claims and improve consistency with international standards of assurance



Third-Party Verification – Guiding Principles

- ① ARB retention of sole authority over the LCFS program, including verification requirements, as bestowed through the State's legislative and regulatory process;
- ② Continual improvement in the detection, prevention, and correction of errors or fraud;
- ③ Identification and implementation of cost reducing strategies, while maintaining verification rigor;
- ④ Policy consistency with other ARB verification programs; and
- ⑤ Consideration of the unique attributes of fuel carbon intensities and fuels marketing structure.



Verification Program Considerations for Liquid Alternative Fuels

- All producers, importers (when out-of-state producers do not opt in to be regulated parties), and exporters would have verification responsibilities
- Type of verification responsibilities for each party generally consists of:
 - 1) Verification that the certified CI is not exceeded each calendar year
 - 2) Verification that correct fuel volumes for each FPC are reported



Verification Responsibilities by Entity Type

- Producer
 - Initial CI Validation
 - Ongoing CI Verification
- Producer or Importer
 - Establish chain of custody of fuel delivered into California
 - Ongoing Verification of reported fuel volumes in LRT-CBTS
- Exporter
 - Ongoing Verification of exported fuel volumes in LRT-CBTS



Figure 2a. California Producer

Responsible for

- Validation & Ongoing CI Verification
- Fuel Volumes Verification

Responsible for
Fuel Volumes
Verification

No Verification Required

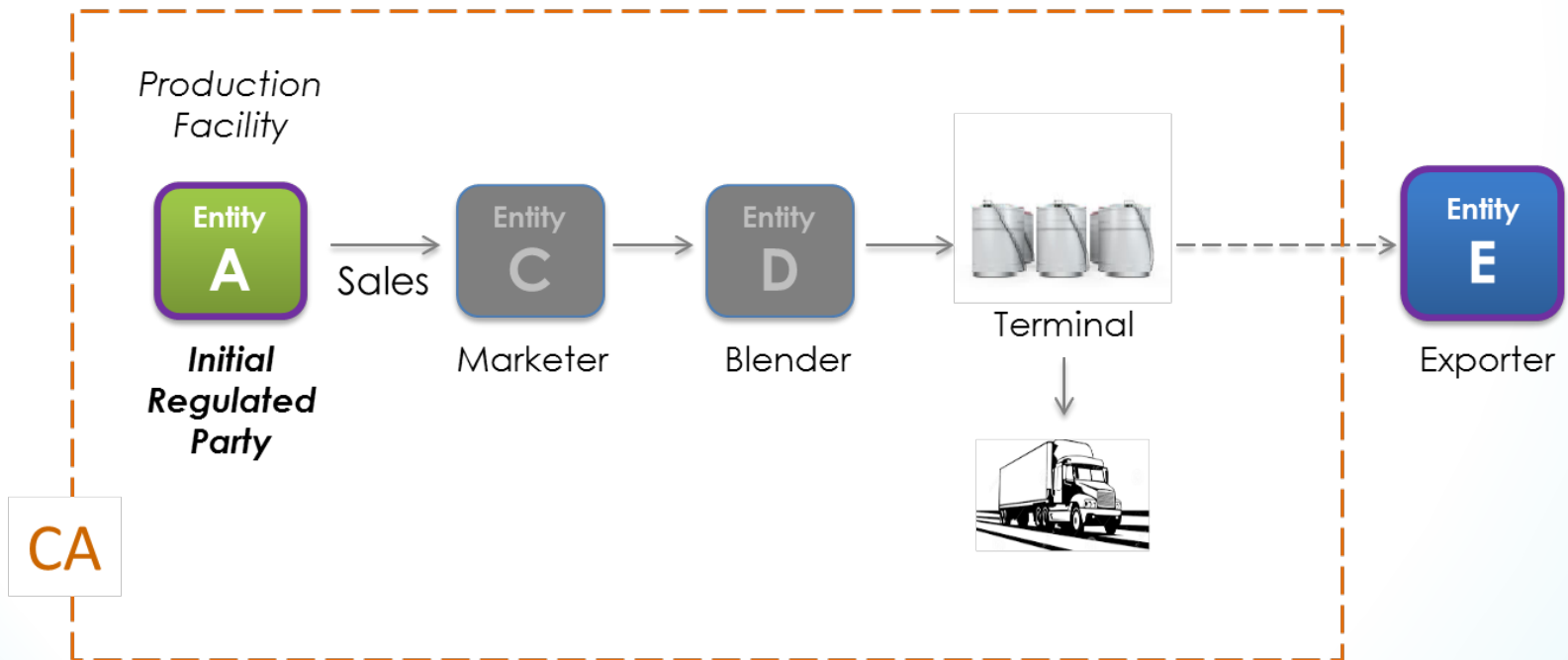


Figure 2b. Out-Of-State Producer Who is Regulated as an Importer

Responsible for

- Validation & Ongoing CI Verification
- Fuel Volumes Verification

Responsible for
Fuel Volumes
Verification

No Verification Required

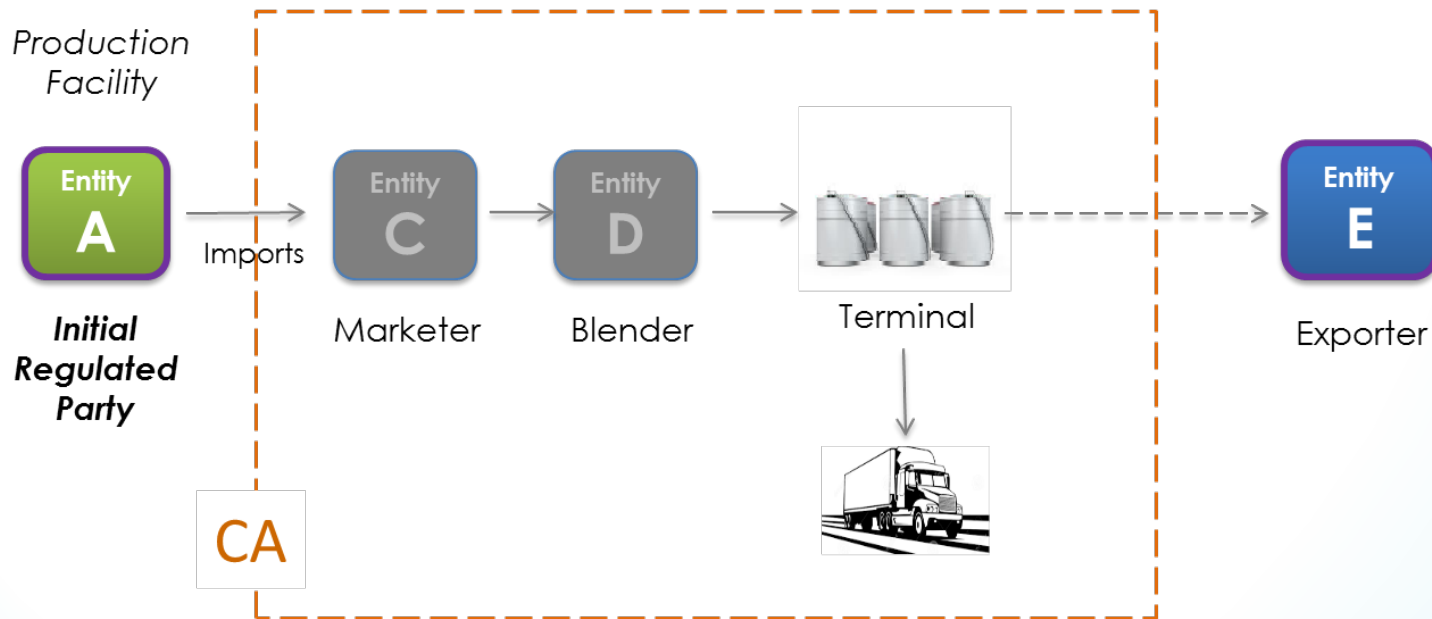


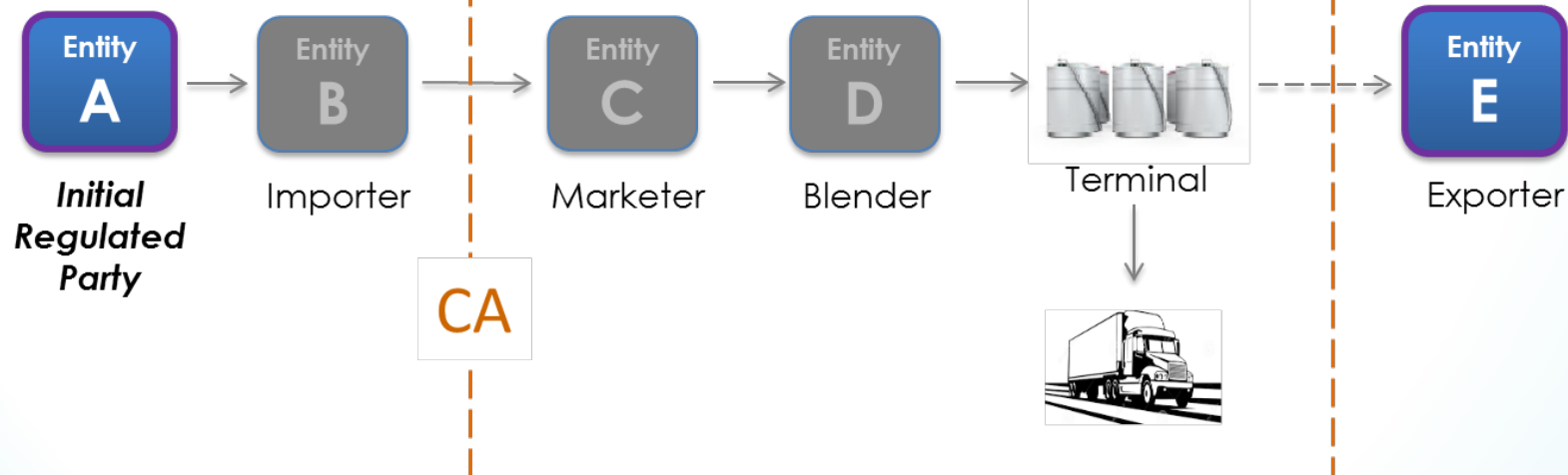
Figure 2c. Out-Of-State Producer Who Decides to Opt-In

- Responsible for
- Validation & Ongoing CI Verification
 - Fuel Volumes Verification

Responsible for Fuel Volumes Verification

No Verification Required

Opt-in
Production
Facility



Initial CI Validation*

- Validate operational data submitted for the initial CI determination
 - Confirm facility geographic location
 - Confirm physical configuration and equipment as represented in process flow diagram
 - Review recordkeeping and data management practices

* See Tables 4 and 5 in the Biomass-Based Diesel Discussion Paper.



Ongoing Verification of CI*

- Verify certified CI was not exceeded using “Simplified CI Application Data Summary Form” and prior calendar year data
- Verify operational data and supporting records for prior calendar year:
 - feedstock inputs (meter records and feedstock purchase invoices)
 - process energy inputs (utility invoices, meter records)
 - fuel production and sales volumes, adjusted to 60°F (meter records, contracts, and sales invoices)
 - amount of co-product produced and sold
 - quantity methanol used (biodiesel example)
 - full material balance and yield analysis
- Verify chain of custody for correct classification of residue-based and secondary product feedstocks
- Verify accuracy of allocation methodology of reported fuel volumes to FPC(s)

* See Tables 4 and 5 in the Biomass-Based Diesel Discussion Paper.



Ongoing Verification of LRT-CBTS Reports*

- Verify the prior year's quarterly fuel volumes first reported in LRT-CBTS:
 - Review product Transfer Documents (PTD) to ensure accurate accounting of fuel volumes per FPC(s) and to document physical delivery
 - Review sales contract terms and PTDs to confirm all California fuel sales are properly labeled by FPC and labeled as sold with or without obligation
 - Review sales invoices and payment records to confirm volumes were sold for transportation and correct fuel transportation distances and modes were used in CI determination

* See Tables 4 and 5 in the Biomass-Based Diesel Discussion Paper.



Verification Cycle and Site Visit Frequency

Summary: Staff is considering an annual verification cycle, based on the calendar year, and annual site visits.

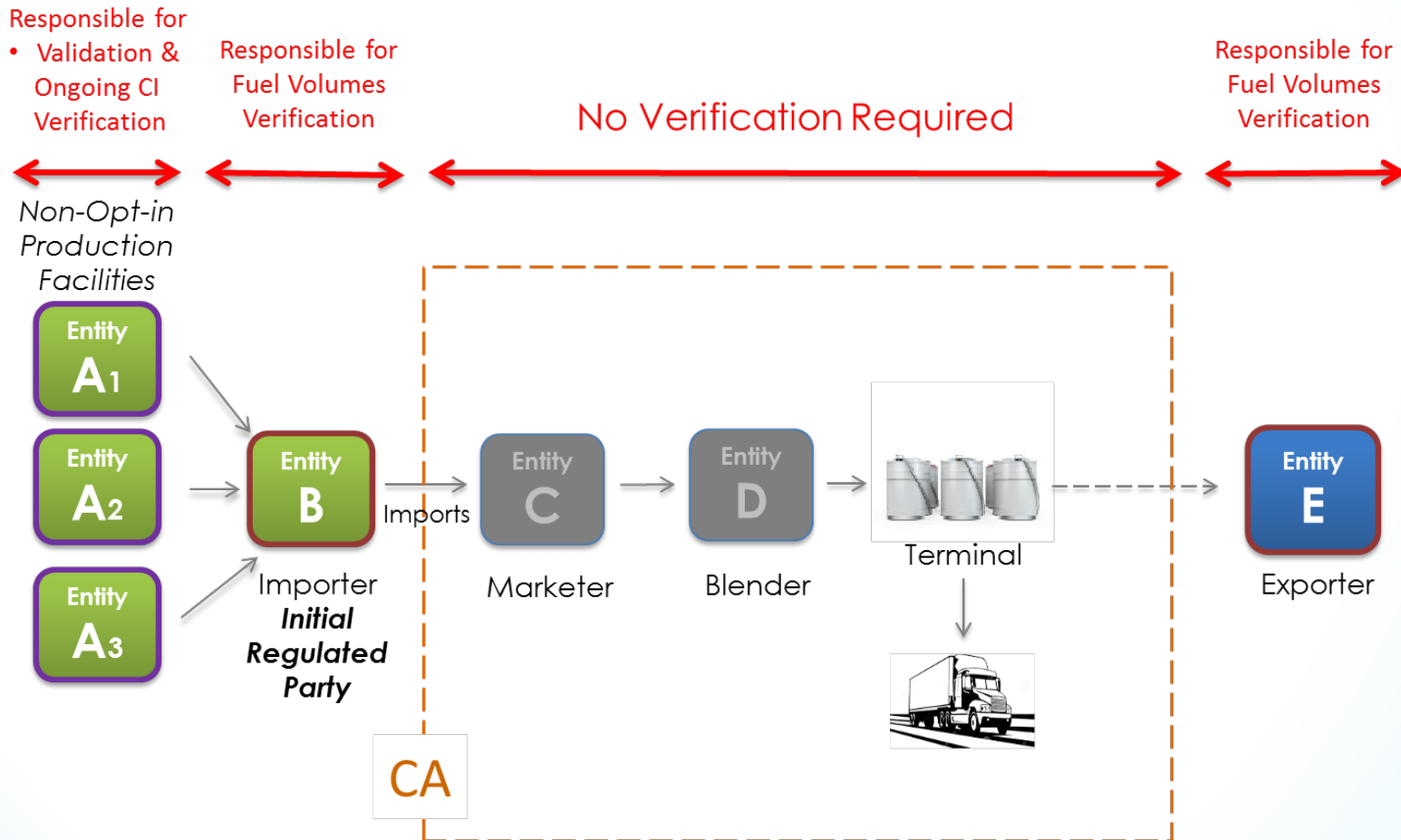
Rationale: An annual verification cycle aligns with the compliance period that is based on the calendar year. Annual site visits would allow verifiers to directly test source data at the fuel production facility, providing a robust review of feedstock consumption by feedstock type, as feedstock type typically has the largest CI impact.

QUESTIONS:

- *Should shorter or longer verification cycles be considered? Why?*
- *How frequently should site visits be conducted? Why?*



Figure 3. Importer When Out-Of-State Producer Does Not Opt-In



Verification of Imported Fuel Volumes

Summary: The Importer would be responsible for verification of prior year's quarterly fuel volumes initially reported in LRT-CBTS and chain of custody demonstration from Fuel Producers into California.

- Staff envisions that imported volumes reported by FPC would be provided to the Producer's verifier to confirm that sufficient volumes were produced and sold to the Importer.

Rationale: A mechanism to assure alignment of fuel volumes between the Producer and Importer would be needed, since reconciliation of transactions does not occur in the LRT-CBTS for this case.

QUESTIONS:

- Are there concerns about assuring alignment of fuel volumes produced and sold (by a producer who does not opt in to report in the LRT-CBTS) with imported fuel volumes reported by the importer?
 - If so, how can these be addressed?
 - Do Importers typically purchase fuel directly from producers or through traders?



Ongoing Verification of LRT-CBTS Reports for Exporters*

Verify the prior year's quarterly reported fuel volumes are accurate by reviewing:

- Methodology for allocation of exported fuel volumes to FPC(s)
- PTDs to ensure accurate accounting of fuel volumes per FPC(s) reported upstream for transportation use in California
- Purchase and sales invoices and payment records to confirm volumes sold for use outside California and for transportation use in California
- Tax records submitted to the Board of Equalization by exporter

* See Tables 4 and 5 in the Biomass-Based Diesel Discussion Paper.



Verification Exemption Considerations for Small Export Volumes

An exemption threshold is considered low risk to the LCFS credit market as it would represent a small fraction of total credits generated each year.

- Exports reported by producers and importers would be within the scope of their verification and not exempt.
- For other exporters, verification would not be required for exporting less than 10,000 gallons of total biomass-based diesel per calendar year.

QUESTION:

- *Staff is seeking feedback on an export exemption threshold.*



Fuel Producer Responsibility for Upstream Supply Chain Verification

- **ALL FEEDSTOCKS** would be verified through review of accounting and operation data at the fuel production facility.
- **Verifiers also would review chain of custody evidence** to assure correct characterization of Secondary Products and Residues
- **In addition,** verifiers would compare a sample of records at Residue suppliers to the fuel producer's records to assure accurate feedstock volumes



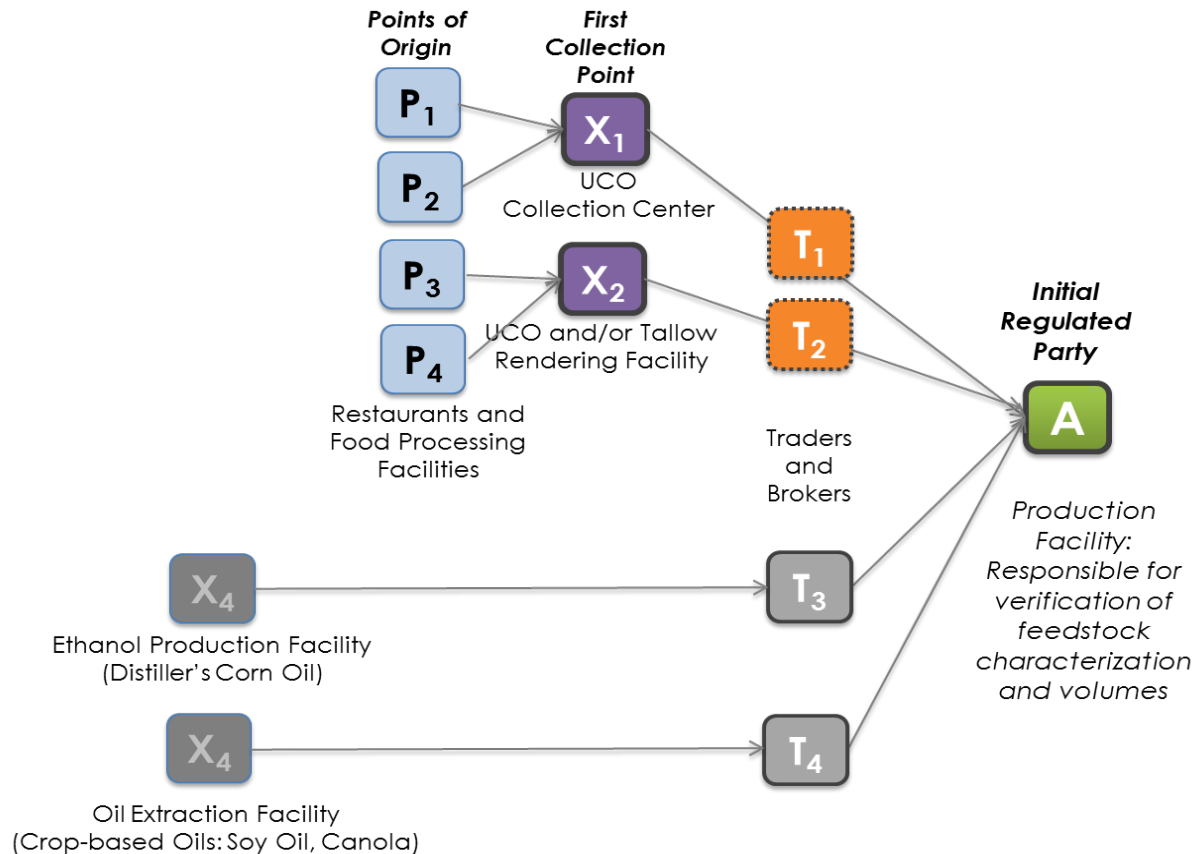
Verification Considerations based on Type of Feedstock

Table A-1. Example Feedstock CI Contributions (gCO₂e/MJ) based on CA-GREET 2.0

BD Feedstock Production	Crop-Based		Secondary Product	Residue-Based	
	<i>Soy Oil</i>	<i>Canola Oil</i>	<i>DCO</i>	<i>UCO</i>	<i>Tallow</i>
Crop Farming, Agricultural Chemicals, N ₂ O in Soil	5	23	--	--	--
Crop Transport	1	1	--	--	--
ILUC	29.1	14.5	--	--	--
Oil Extraction	4	3	5	--	--
Oil Transport	1	3	1	--	--
Treatment/Rendering	--	--	--	5	17
Rendered Oil Transport	--	--	--	3	3
Example Feedstock Upstream CI	40	44	6	8	20
Biodiesel CI Ranges	49-60	51-57	28-29	16-28	28-41
Considering Upstream Site Visit	NO	NO	YES	YES	YES



Figure 4. Illustrative Example of Feedstock Supply Chains of Custody



Chain of Custody – Correct Feedstock Characterization

Confirming chain of custody to the point the feedstock is created would provide additional assurance that lower CI feedstocks are characterized correctly. Either type of evidence would be acceptable:

1. Delivery records showing shipments of material type and quantity directly from the processing facility to the fuel producer (referred to as physical segregation)
2. Material balance systems of intermediate suppliers containing information about their direct suppliers and direct customers—examples include:
 - Aggregation facilities without physical segregation
 - Commodity trader invoicing practices
 - Waste transport manifest requirements

QUESTION: What controls do fuel producers have in place to minimize mischaracterization of Secondary and Residue feedstocks? Please include descriptions of contractual specifications and on-site analyses.



Audit Risk Considerations for DCO

DCO pathways will be based on default values for corn oil extraction, yield, and DGS credit removal. Due to the low CI, staff is considering requesting limited additional upstream verification.

For DCO purchased from ethanol producers that participate in LCFS, ARB could specify that verifiers must accept the published LCFS Fuel Pathway Code as evidence that DCO is being produced.

For DCO purchased from ethanol facilities not participating in LCFS, ARB could specify that verifiers must accept evidence provided by third-party engineers and CPAs retained by ethanol plants in U.S. EPA RFS2

For DCO purchased through aggregators or commodity traders, the fuel producer may need to require that DCO is traceable back to the ethanol facility and that the trader provide information to the producer's verifier.



Audit Risk Considerations for DCO

QUESTIONS:

- Are there concerns for error or fraud in mischaracterizing DCO? Is DCO commingled with other non-food grade corn oil in the supply chain?
- To verify DCO characterization from ethanol production facilities that do not have an LCFS FPC:
 - Should ARB specify additional LCFS requirements that could be reviewed by third-party engineers and CPAs retained by ethanol plants under the U.S. EPA RFS program and require consideration by the fuel producer's verifier?
 - Alternatively, would document review and a site visit at the ethanol facility be necessary?



Audit Risk Considerations for Residue-Based Feedstocks

QUESTIONS:

- *To assure accurate feedstock volumes claimed by the Fuel Producer, should records be reviewed at all or a sample of Residue Suppliers?*
 - Please comment on risk assessment criteria such as relative volumes supplied to the fuel production facility, the relative financial incentives inherent in the claimed FPC, relative commodity value other than LCFS incentives, and other industry considerations.



Additional Audit Risk Considerations for UCO

Summary: Audit risks arise from the ability of fuel producers to use multiple feedstocks interchangeably, the lower CI of fuel produced from UCO, and multiple entities that may be involved in the UCO feedstock supply chain. Various supply arrangements exist for UCO. Fuel Producers may

- collect raw UCO directly and process on-site,
- purchase from a transporter that collects raw UCO,
- purchase from a UCO collection center,
- purchase from a UCO processor which may also produce tallow, or
- purchase processed UCO through a commodity trader.

Rationale: Additional sampling may be needed to mitigate audit risks unique to UCO.



Additional Audit Risk Considerations for UCO

QUESTION:

- *What considerations should guide audit selection at UCO points of origin (restaurants/food processing centers)?*
 - Please consider factors that can inform error risks such as effective tracking procedures with transporter, UCO volumes, length of time contracts have been in place, change in management, and other factors that may be relevant.



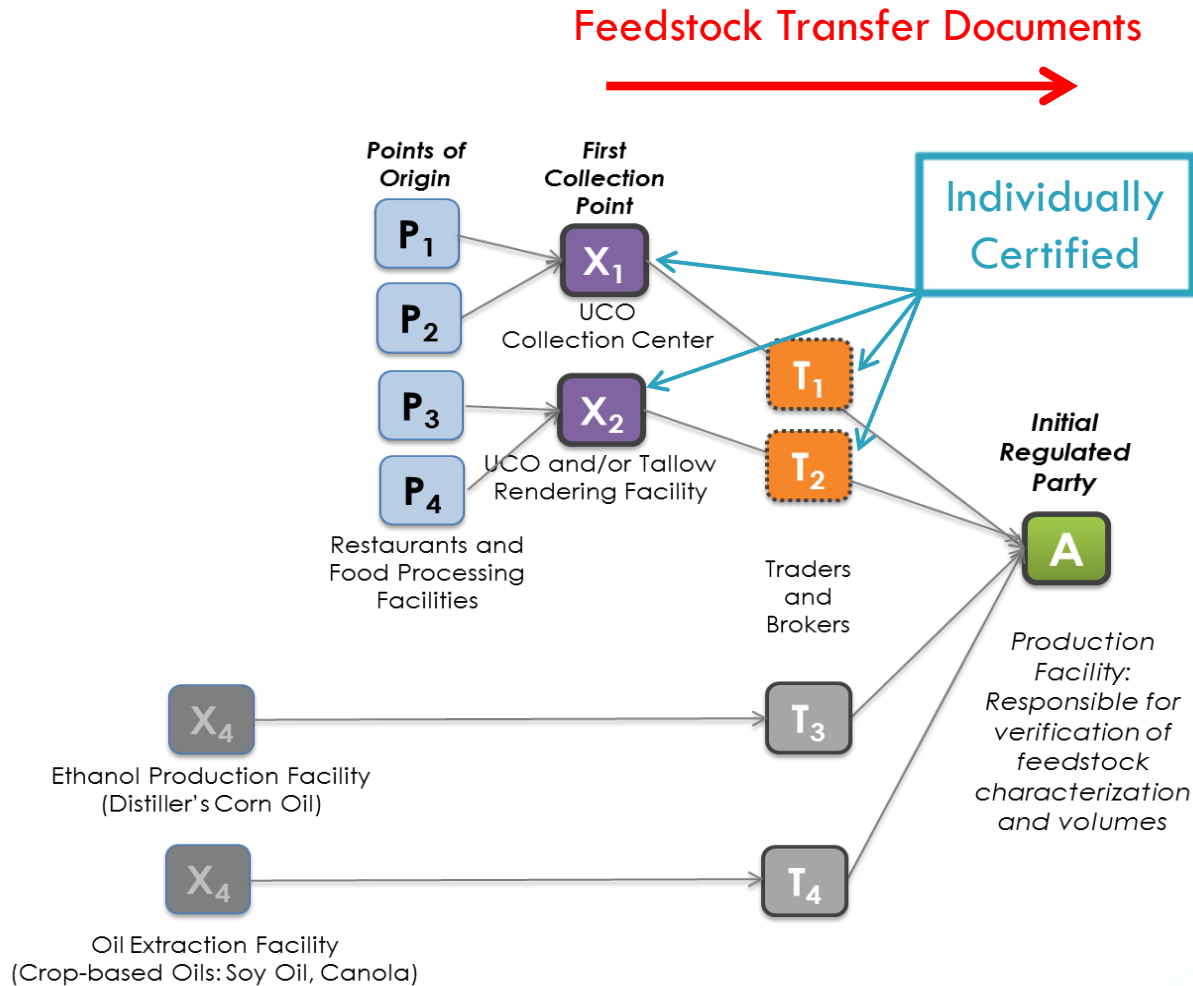
Third-Party Certifications of Feedstock Supply Chains

Summary: Staff is considering third-party-certifications as evidence to assure lower CI feedstock characterizations and volumes. Staff is currently reviewing voluntary certification schemes participating in the European Union Renewable Energy Directive (EU RED).

Rationale: Stakeholders have requested that staff consider opportunities to harmonize and avoid duplication of verification activities, such as when feedstock suppliers sell to multiple fuel producers.



Example of Certifications in Feedstock Supply Chains of Custody



Third-Party Certifications

QUESTIONS:

- *To what extent would recognizing third-party certification of feedstock suppliers reduce the potential for multiple verifications of suppliers?*
- *Staff is seeking suggestions for criteria to evaluate existing third-party certification schemes recognized in the EU.*
- *Staff would like continued stakeholder input on how to adopt best practices from these certification schemes.*



THANK YOU!

Feedback should be sent to

LCFSworkshop@arb.ca.gov

by March 10th, 2017

