

Reporting Co-processing and Renewable Gasoline Emissions under MRR



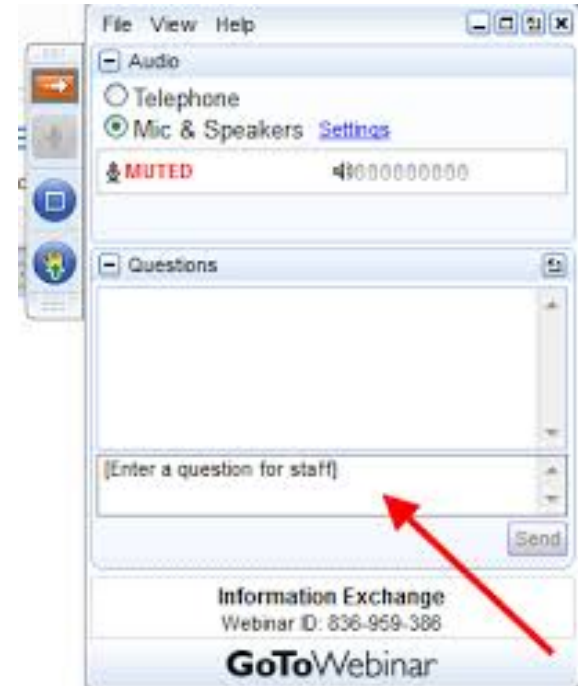
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PRESENTATION: [HTTPS://WW2.ARB.CA.GOV/OUR-WORK/PROGRAMS/MANDATORY-GREENHOUSE-GAS-EMISSIONS-REPORTING/MRR-INFORMAL-REGULATORY-ACTIVITY-WORKSHOPS](https://ww2.arb.ca.gov/our-work/programs/mandatory-greenhouse-gas-emissions-reporting/mrr-informal-regulatory-activity-workshops)

Agenda

- Background and Goals of the Webinar
- Co-processing Basics
- Current MRR Biogenic Emissions Reporting Requirements
- Existing Alternative Method
- Discussion of Potential MRR Modifications for Quantifying Co-processing Emissions
- Definitions for Renewable Fuels
- Coordination with Cap-and-Trade and Low Carbon Fuel Standard
- Feedback and Next Steps

Webinar Questions



Background

- Renewable fuels may be produced via co-processing of biogenic feedstocks with petroleum feedstocks
- Co-processing utilizes existing refinery infrastructure to produce partially biogenic fuels and stack gas emissions
- MRR has limited methods to quantify the biogenic portion of fuels that are produced via co-processing, and the biogenic portion of stack emissions
- The Mandatory Reporting Regulation (MRR) currently allows reporting of several biogenic fuels, but does not include a definition for renewable gasoline or renewable propane

Goals of this Webinar

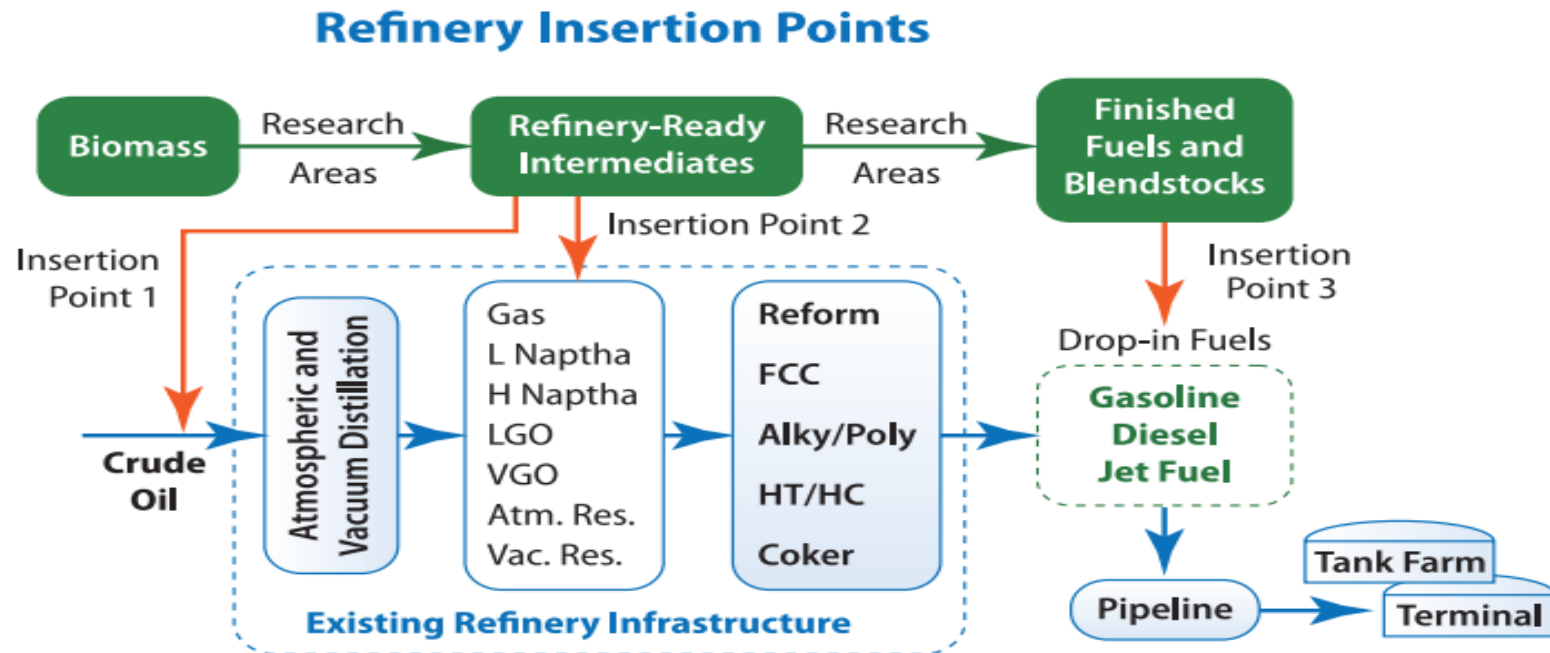
- Provide an overview of current emissions quantification methods associated with co-processing of biogenic feedstocks in petroleum refineries
 - Stack emissions, and emissions from finished fuels
- Gather information from interested parties to inform potential MRR updates
 - New methods for accurately quantifying the biogenic portion of stack emissions and finished fuels

What is Co-processing?

- Co-processing refers to the simultaneous transformation of biogenic feedstocks and intermediate petroleum products (such as vacuum gas oil) or crude oil in existing petroleum refinery process units to produce partially renewable hydrocarbon fuels
- Co-processing involves cracking, hydrogenation, or other reformation of semi-processed biogenic oils, vegetable oils and fats in combination with petroleum intermediates to obtain finished fuels such as diesel, gasoline, and jet fuels

Co-processing Overview

Biogenic feedstocks may be added to petroleum refineries at different blending points – Co-processing most commonly involves insertion of biogenic feedstocks at Point 2



Source: https://ww3.arb.ca.gov/fuels/lcfs/lcfs_meetings/lcfs_meetings_2016.htm

Co-processing and Low Carbon Fuel Standard

- The Low Carbon Fuel Standard (LCFS) program incentivizes lower carbon intensity transportation fuels
- Co-processing provides opportunities to produce low carbon renewable fuels at economically competitive prices
- LCFS incentives may impact MRR emissions reporting by encouraging increases in the types and quantities of biomass feedstocks used for co-processing

Current Biogenic Emissions Reporting

Facility Combustion Emissions

- Reporting of all fuel volumes required
 - Combustion emissions of pure biogenic fuels are calculated using heat content and default emission factors
 - Combustion emissions from mixed biogenic fuels are calculated using a monthly fuels-based representative sampling to determine biogenic content (section 95115(e)(2))
- Facilities with CEMS can calculate the fraction of combustion and process emissions from partially biogenic feedstocks by sampling stack gases following ASTM test method D-6866 (40 CFR §98.34(e))

Bio-RFG Combustion Emissions

- Separate metering for RFG and bio-RFG
 - Usually not feasible, per our understanding
 - If separately metered, bio-RFG emissions can be estimated using any Tier method and measurement does not need to meet the §95103(k) specifications
- If CEMS is used, ^{14}C testing of stack gases may be required in order to report fraction of emissions as biogenic (exempt from a C&T compliance obligation)
 - Because co-processing may be done only sporadically at refineries, this method would rely on samples taken during co-processing activities and applied only to those time periods
- If not separately metered and no CEMS, bio-RFG would have to be reported as fossil-based

Finished Fuel Combustion Emissions

- Biomass-based ethanol, biodiesel, and renewable diesel are reportable fuels under Subpart MM, as specified in section 95121 of MRR
- Reporting is based on fuels meeting the regulatory definition and being “supplied” at point of regulation in MRR
- MRR does not include definitions for some renewable finished fuels that may be produced via co-processing

MRR Alternative Methods

- Section 95103(m)(2) allows an operator or supplier to submit a request to the Executive Officer for approval of an alternative measurement/ monitoring method when MRR methods are not available at this moment
 - Method must achieve accuracy equivalent to the ± 5 percent required by section 95103(k)(6)
- Potential alternative methods:
 - Finished fuels ^{14}C testing
 - Feedstock measurement for finished fuels

Discussion of Potential MRR Modifications for Quantifying Co-processing Emissions

Standardized Method or Rely on Executive Officer Approval of Alternative Method?

- Advantages of standardized methods
 - Improves certainty
 - Streamlines reporting and verification
- Disadvantages of standardized methods
 - May limit operator flexibility
- Standardized methods can be based on previously approved alternative methods
- Additional standardized methods would be required
- CARB staff is seeking feedback on options

Alternative Method: Finished Fuels ^{14}C Testing

- ^{14}C testing of the biogenic content of the finished fuels
- Establish testing frequency of finished fuels from co-processing
 - Should address facility-specific variability
 - Sampling of tank when it is locked and certified as CARB Diesel or RBOB
 - Continuous processes
- Technical challenges
 - Co-mingled feed to/from FCCU
 - Changes to unit feed rate and blending ratios

Alternative Method: Finished Fuels Feedstock Measurement

- Renewable Fuels Standard allows quantification of finished fuels based on heat energy of feedstock and default factors
 - For example, see [Method A](#) of EPA RFS 40 CFR Part 80.1426(f)(4)(i)(A)
 - Verifier would request several BOLs from different feedstock suppliers to confirm source of feedstock
- Would need to be shown to result in accurate finished fuels quantification
- Establish frequency of feedstock analysis

Hybrid method

- If specified standards cannot be met, a revised “alternate method” approach could still be used
- CARB establishes a minimum data quality standard while still allowing some flexibility for complicated projects

Renewable Fuels Definitions

- Renewable gasoline and renewable propane are not currently included in MRR as reportable fuels
 - Currently required to be reported as fossil
 - Needs precise definition in MRR
- What other blendstocks and bio-based products may also need to be included?

Quantifying Bio-RFG Emissions

- A method to allow emissions from bio-propane released from de-esterification of biogenic feedstock to be quantified
 - The data or the method would need to be determined to be accurate and broadly applicable across the sector
- Revision could include specific methods for CEMS stack gas testing that account for emissions from sporadic co-processing events

Coordination with Cap-and-Trade and LCFS

Cap-and-Trade Regulation

- Cap-and-Trade Regulation dictates which fuels are exempt from a compliance obligation
- Regulation would require modifications to define new fuels and emissions without a compliance obligation
- If co-processed transportation fuel definitions are added in MRR, and added as emissions without a compliance obligation in Cap-and-Trade, then emissions are not “covered” in MRR
 - Emissions still covered until both MRR and Cap-and-Trade Regulation are updated

Possible Updates to Cap-and-Trade Regulation

- Add “Renewable Gasoline”, “Renewable Naphtha”, and “Renewable Propane (LPG)” to section 95852.2(a) – emissions without a compliance obligation
- Add “Onsite bio-RFG Combustion Emissions” to section 95852.2(a) – emissions without a compliance obligation
- Add “Biogenic Process Emissions” to 95852.2(b) as exempt emissions
- Are there any other fuels, blendstocks, or feedstocks that should be included in this section?

Aligning of MRR Requirements with LCFS

- Coordinate MRR changes with existing LCFS requirements where practical and consistent with MRR standards
- Opportunities include:
 - Calculation methods for determining biogenic content in finished fuels
 - Fuel sampling frequency
 - Allowing data generated from LCFS to be submitted for reporting and verification under MRR
- Some LCFS requirements for crediting are conservative and allow for under-reporting of credits
 - For MRR, there are specific accuracy requirements that must be met
- Verification of both MRR and LCFS reports could be done by same verification body if accredited in both MRR and LCFS programs

LCFS Approach to Renewable Fuel Quantification

- Requires the ^{14}C method (ASTM D6866) to determine biogenic content in co-processed fuels except in circumstances where the ^{14}C method is not appropriate or practical. Examples where ^{14}C method may not be practical include:
 - Co-processing of renewable feedstock in low ratios (<1%) that may result in biogenic carbon content in fuels below the detection limit
 - Need for continuous or highly frequent sampling such as measuring biogenic content in refinery fuel gas
 - Co-processing of partially biogenic feedstock
- Alternative methods including but not limited to mass balance, process modelling, feedstock chemical makeup characterization, and extrapolation based on pilot-scale data may be considered in determining biogenic content for cases where the ^{14}C method is not appropriate or practical.

Seeking Feedback on the Following Topics

- More information on common monitoring practices in refining industry during co-processing
 - Co-processing pilot program findings
- Should CARB explore methods to report biogenic emissions from finished fuels only? Or also process and combustion emissions?
- If ^{14}C testing is used for finished fuels, at what frequency should that be done? What inputs would need to be included to demonstrate normal operations?

Seeking Feedback on the Following Topics (2)

- Should CARB accept alternate methodologies for GHG quantification from different unit types such as FCC and hydrotreaters?
- How could measurement accuracy be assured when a refinery project shares metering with other equipment or process units/inputs?
- What types of information could be provided to demonstrate accuracy/completeness of the proposed method?

Next Steps

- **Submit comments by October 15:** <https://ww2.arb.ca.gov/our-work/programs/mandatory-greenhouse-gas-emissions-reporting/mrr-informal-regulatory-activity-workshops>
- Feedback may be used to help inform any changes that need to be made to MRR through a public regulatory process
- CARB will announce details of next webinar/ workshop based on feedback received
- CARB staff will continue to work on LCFS, MRR and Cap-and-Trade alignment for reporting biogenic emissions with co-processing

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