



Refinery Investment Credit Pilot Program (RICPP) Workshop

Emerging Technology Section

Industrial Strategies Division

Air Resources Board

September 14, 2017

Meeting participation

- Posted materials can be found on the LCFS Meetings webpage
 - ❑ https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/lcfs_meetings.htm
- Watch and listen via the Webcast:
 - ❑ <https://video.calepa.ca.gov/>
- Ask questions or provide feedback during the working meeting
 - ❑ Email: coastalrm@calepa.ca.gov
- Participate via conference call
 - ❑ Toll Free: 877-918-6320
 - ❑ Toll/Outside the United States: 1-517-308-9077
 - ❑ Participant Code: 7145825

Agenda

- Staff Presentation
- Discussion
- Summary

Background

- California refineries emitted about 31 million metric tons (MMT) of CO₂e in 2015
- Refineries have a set carbon intensity under LCFS and the program awards credits for refinery GHG reductions under:
 - Refinery Investment Credit Pilot Program (RICPP)
 - Renewable Hydrogen Refinery Credit Pilot Program
 - Low-complexity/low-energy-use Refinery Credit
- There are several opportunities for GHG reductions at refineries:
 - Process efficiency improvements
 - Fuel switching
 - Carbon capture and sequestration (e.g., from steam methane reforming)

Overview of the existing RICPP

- Recognizes GHG reductions from refinery projects
 - ❑ Provides credits for GHG reductions at refineries that lower carbon intensities of CARBOB and diesel
 - ❑ GHG reductions estimated for the refinery as a whole based on pre-project and post-project GHG emissions
 - ❑ Minimum GHG reduction threshold of 0.1 g CO₂e/MJ CARBOB and diesel
 - ❑ Limit on credit generation
 - ❑ No more than 20% of refiner's annual obligation (deficits)
 - ❑ Credits can only be used towards the refiner's obligation (deficits) and cannot be sold in the market or transferred to another party

Overview contd.

- Growing interest in the program
- No projects have been approved for credits so far
 - No formal applications received yet
- Four refiners in discussions with ARB about potential projects

Topics under review for regulatory amendments

- GHG emissions reductions from a refinery investment project may be overshadowed by other changes in a refinery due to the magnitude of emissions at the refinery level
 - Refinery-wide GHG estimates may underestimate or overestimate reductions achieved by a refinery investment project
- Needs clarity on eligible refinery investment projects
- Scope and flexibility (e.g. does not specify requirements for CCS projects)

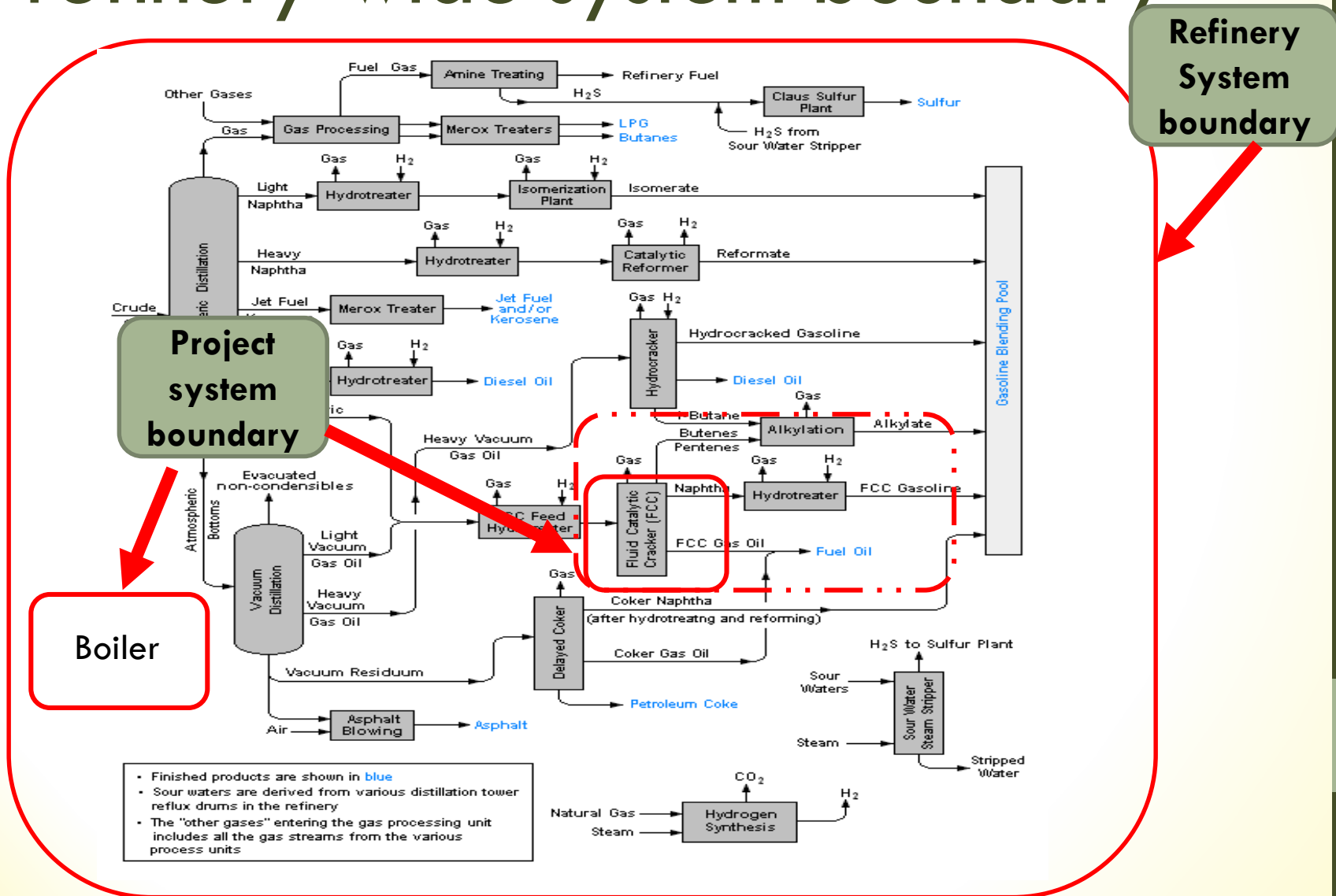
Objective

- Update the program to achieve the following:
 - Develop a robust GHG accounting guideline at the process level to estimate GHG reductions from individual refinery projects
 - Simplify and streamline the credit calculation methodology
 - Identify and list specific refinery investment credit project types that are eligible
 - Revise RICPP to encourage additional GHG reductions at refineries; while not increasing criteria pollutants and toxics

DISCUSSION POINTS



Project system boundary vs refinery-wide system boundary



Credit calculation method

- Staff is proposing to develop a project-specific credit calculation method that:
 - ❑ Incorporates changes in GHG emissions (direct and indirect) due to implementation of a project
 - ❑ Estimates a reduction in carbon intensity (CI) by dividing project GHG reductions with total MJ of CARBOB and diesel produced
 - ❑ Calculates the amount of credit by multiplying the change in CI with the total amount of MJ of CARBOB and diesel sold, supplied offered for sale in California

Staff seeks feedback on the proposed credit calculation method described in the discussion document and appreciates feedback including other potential alternative methods.

Process unit level GHG accounting

- The proposed method relies on process unit level GHG accounting
- Refineries are complex with many interconnected process units and equipment
 - Not all process units/equipment may have meters to estimate energy use and associated emissions
- In the absence of dedicated meters, how to estimate energy use and emissions?
 - Engineering/modelling estimates?
 - Should metering be required for all units involved in project?

GHG emissions allocation at process level

- If two or more process units/equipment have a common meter, GHG emissions allocation is necessary
 - Based on energy content of petroleum feedstock/intermediates processed by process units sharing the common meter
 - Based on volumetric flows to the units sharing common meter
- How to deal with the allocation when a refinery project involves equipment such as boiler and share a meter with other equipment or process unit?
- Other methods?

Staff seeks input on how to design a robust allocation methodology.

Crediting threshold

- To ensure that project GHG reductions are additional requires a minimum threshold
- Options include
 - Increasing the current threshold from 0.1 g CO₂e/MJ (for example 0.2 g/MJ CO₂e?)
 - Minimum GHG reductions of 25,000 MT/year
 - Fixed percentage of total refinery-wide emissions (e.g. X% of total refinery emissions)

Staff seeks feedback on the best way to establish the minimum threshold requirements.

Actual vs projected operation data

- The intent of RICPP is to award credits after GHG reductions have occurred based on actual operation data and volumes of fuel produced
- Allow projected energy use and production data that assume steady state operation?
 - Subject to credit revision if actual production and energy use data do not match with the projected data

Staff seeks input on the merit of allowing projected energy use and production data.

Eligible projects

- Current regulation lacks specificity, but potential eligible projects include
 - Process/efficiency improvements
 - Fuel switching
- For consideration: On or off site solar generation projects, flare modifications, renewable steam generation
- Not eligible: GHG reductions due to maintenance, shutdown, and minor equipment replacement
- Staff is proposing to specify CCS projects at refineries as eligible projects under RICPP
 - Credits calculated in accordance with the CCS accounting protocol

Staff seeks feedback on potential refinery projects that fall under the process improvements and fuel switching category.

Other discussion points

- Staff appreciates input from stakeholders regarding other revisions not identified here and that could improve the RICPP
- Develop regulatory language for revised RICPP
 - Should we keep the “Pilot” designation for this provision? What are the implications of keeping vs changing?

Staff seeks input on specific regulatory language related to the proposed revisions identified above.

DISCUSSION



Summary

- Summarize discussion points
- Summarize feedback
- Next step
 - Staff seeks feedback on the issues identified here and on potential revisions to the regulatory text by September 29, 2017
 - Staff to review feedback by early-October, 2017
 - Staff to finalize potential regulatory text amendment language for RICPP by mid-October, 2017

Feedback

Feedback related to Refinery Investment Credit Pilot Program
should be sent to:

LCFSworkshop@arb.ca.gov

by September 29, 2017

Presentation and discussion document available at:

http://www.arb.ca.gov/fuels/lcfs/lcfs_meetings.htm