



Staff Discussion Document Refinery Investment Credit Pilot Program (RICPP) Workshop

The Refinery Investment Credit Pilot Program (RICPP) allows refineries to generate credits for projects that reduce refinery greenhouse gas (GHG) emissions by at least 0.1 grams carbon dioxide equivalent per mega joule (gCO₂e/MJ), calculated based on pre- and post-project GHG emissions at the refinery level. Staff is evaluating whether to make changes to the RICPP as part of the Low Carbon Fuel Standard (LCFS) regulatory amendments. The staff proposal seeks to simplify the credit calculation method based on the project level GHG emissions to make it applicable to a broad range of refinery investment projects. As part of the ongoing public process on the LCFS regulatory amendments, staff has scheduled a workshop on September 14, 2017 to elicit feedback and comments on how to best design the RICPP to encourage investments in GHG reduction projects at California refineries.

To help facilitate the discussion, staff has prepared this document for circulation to stakeholders in advance of the workshop. This document provides additional details regarding the topic areas that staff seeks to discuss and obtain input on from stakeholders.

1. **Eligible projects:** The purpose of the RICPP is to encourage reductions in GHG emissions from major process improvements, fuel switching, and carbon capture and sequestration. Minor improvements such as minor component replacement, and reductions due to maintenance or shutdown of process equipment are not currently eligible for credits.

Within these three broad categories of projects, many specific types of projects are possible. Although many process efficiency improvement projects have been already implemented, there are still some process improvement projects that can qualify for the RICPP. Staff seeks input from stakeholders to identify specific types of potential projects for discussion which would serve the basis for developing criteria for project eligibility.

2. **Revision to carbon reduction threshold:** Smaller GHG reductions within specific processes within a refinery are difficult to quantify, monitor and verify. Hence, the current provision sets a GHG reduction threshold of 0.1 gCO₂e /MJ to incentivize major projects that result in significant GHG emissions reductions. Staff seeks input from stakeholders regarding potential changes to the carbon reduction threshold. Potential options include increasing the threshold from 0.1 g CO₂e/MJ (e.g. 0.2 g CO₂e/MJ), specifying an absolute reduction threshold in metric tons carbon dioxide equivalent per year (MT CO₂e/year) (e.g. 25,000 MT/year), or specifying a minimum percent reduction based on refinery-wide GHG emissions (e.g. x% of total refinery GHG emissions).



- 3. Delineation of project boundary:** Making a change in one process unit as part of the refinery investment credit project may physically impact one or more other process units/equipment directly or indirectly either due to changes in output, stream routing, fuel energy requirements, or fuel switching. As part of the changes to the credit calculations, staff is considering including emissions not only from the unit where improvement is being made but also from other process units/equipment affected directly or indirectly by implementation of the project. For example, it may be possible to increase the yields of high octane gasoline and alkylate through process optimization of the fluid catalytic cracking (FCC) unit which may impact energy use at the hydrotreater and alkylation unit. Thus, to fully capture changes in GHG emissions from the implementation of the project, we not only need to account for emissions associated with the FCC unit but also those emissions associated with the hydrotreater and alkylation unit.

The project boundary defines all the directly and indirectly affected process units and associated emissions that must be included in credit calculations.

Staff seeks input on how to delineate a project boundary that indicates which units and emissions are included in the credit calculations.

- 4. Process-level GHG accounting:** By moving away from the current refinery-wide emission estimates and focusing on a project-specific system boundary, it is necessary to develop a robust GHG accounting methodology at the process unit level.

Refineries are complex with many interconnected processes and equipment. Not all process units/equipment may have dedicated meters to measure electricity and process fuel consumption, and not all process units/equipment are impacted by refinery improvement projects. If dedicated metering exists for each affected process unit, refiners must use the metered data to estimate energy use. Staff seeks input from refinery stakeholders and experts regarding the best way to estimate energy use and emissions assigned to a particular process unit when dedicated metering is not available or too costly to install for individual process units. For example, are engineering/modelling estimates acceptable? These are relevant to equipment such as boilers, furnace, electric pumps, etc.

Also, if two or more process units have a common meter, the credit calculations require that energy use and emissions are allocated among the units sharing the common meter. Staff seeks input from refinery stakeholders and experts regarding how the energy use and emissions allocation among the units that share the same meter should be carried out. Potential options include:

- 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.

In cases where other units are indirectly affected as a result of changes made in one process unit/equipment, and if applicants provide evidence of GHG emission reductions from the indirectly affected units, applicants may choose to omit these indirect emissions reductions from the credit calculations if estimating these indirect GHG emissions reductions are difficult. However, if the process unit/equipment changes lead to increases in GHG emissions elsewhere, these GHG emissions increases must be accounted for in the credit calculations.

5. **Projected volume vs actual volume:** As required by the current RICPP, it is important to normalize the GHG emissions pre-project and post-project by volumes of diesel and CARBOB produced at the refinery to ensure that any decreases in emissions (and credits generated therefrom) are not due to shutdown, maintenance, or decreases in throughput. Ideally, normalization by actual volumes produced pre-project and post-project is the preferred approach. However, staff seeks input on whether there is merit in using the projected volumes of diesel and CARBOB to estimate credits assuming steady-state production and energy use. Under such a circumstance, if applicants wish to generate credits based on projected volumes and steady-state operations in advance of the actual reductions, the credits will be subjected to a retroactive revision if the projected volumes and energy use differ from the actual volume produced and actual energy used.
6. **Credit calculation revision:** The goal of the revision is to simplify the calculation method and make it broadly applicable to wide-ranging refinery projects. Staff seeks input on the proposal revise the credit calculation method to include the following steps:
 - Delineate a project system boundary, including affected process units and equipment;
 - Calculate pre-project and post-project GHG emissions and the net decrease (MT CO₂e/year) in GHG emissions from a refinery investment project;
 - Divide the net decrease in GHG emissions (MT CO₂e/year) by the total amount (MJ) of CARBOB and diesel produced to estimate the decrease in carbon intensity; and
 - Multiply the decrease in carbon intensity by the amount (MJ) of CARBOB and diesel sold, supplied or offered for sale in California to estimate the credits.
7. **Incorporation of carbon capture and sequestration (CCS) projects:** Staff is proposing to include on-site carbon capture and sequestration projects as eligible projects for the RICPP. GHG reductions from CCS would be included as part of



post-project GHG emissions. Projects would have to conform to the accounting and permanence protocols for CCS.

8. **Other revisions identified by stakeholders:** Staff seeks input from stakeholders regarding other revisions that could improve the RICPP.
9. **Develop regulatory language for revised RICPP:** Staff seeks input on specific regulatory language related to the proposed revisions identified above.