

High Carbon Intensity Crude Oil (Topic 14) Draft Outline

Description of Issue:

The LCFS regulation requires regulated parties to use the carbon intensity (CI) values in the Lookup Tables associated with high-carbon-intensity crude oils (HCICOs) and to calculate and report the associated deficits from these sources (Section 95486(b)(2)(A)). The purpose of this requirement is to account for additional emissions generated beyond the 2006 gasoline and diesel baseline from the use of HCICOs and to encourage emission reduction activities from these sources. If those CI values have not yet been determined and published in the Lookup Tables, the regulated party is required to propose a new pathway for its HCICO and obtain approval of the Executive Officer. Since no CI values for HCICO yet exist in the Lookup Tables, regulated parties are required to develop CI values by using a technically rigorous methodology referenced elsewhere in the regulation.

When the Board approved the LCFS on April 23, 2009, it directed staff, through Resolution 09-31, to work with stakeholders to develop an informal screening process for assessing the carbon intensity of new or modified fuel pathways. Staff convened the Crude Screening Workgroup to address new fuel pathways for HCICOs. The intended outcome of the screening process was to identify those crudes which are clearly not HCICO, thereby reducing the number of crudes that would be subject to the more rigorous technical analyses. A screening process to implement Section 95486(b)(2)(A) is nearly complete and can be used together with an interim default CI value until more specific pathways for HCICOs are determined.

However, the regulated parties subject to the HCICO provision have requested that the 2006 baseline value be used for all CARBOB, gasoline or diesel fuel regardless of whether it entailed use of HCICO (i.e. no differentiation between the carbon intensities of crude oils). ARB staff has indicated its willingness to discuss alternative approaches and has been meeting with stakeholders to better understand concerns and to secure supporting documentation in an effort to identify potential alternative approaches.

The outline below for the portion of the Advisory Panel report that staff will present to the Board in December 2011 contains these items: additional background information on the current regulation, including the need to address HCICOs; a brief description of five possible approaches that have come to our attention for addressing HCICOs; and a list of the types of data needed that would inform our decision-making process for choosing the most appropriate approach to addressing HCICO in the LCFS. However, as with other potential regulatory amendments ARB staff will initiate a parallel public process to discuss amendments for consideration by the Board at the end of the year. It is anticipated that among the recommended amendments will be adjustments to the HCICO provision.

Draft Outline of HCICO Chapter of 2011 Report to Board

A. Background

1. Regulation Requirements

- a. Basis for Compliance Schedule: The CA baseline crude oil mix is used to calculate average Lookup Table values for CARBOB and diesel. Gasoline compliance targets calculated relative to CI for CaRFG (90% CARBOB and 10% Average Ethanol). Diesel compliance targets calculated relative to CI for ULSD.
- b. Base Deficit: All producers of gasoline (diesel) calculate a “Base” deficit using the difference between the average Lookup Table value for CARBOB (ULSD) and the compliance target in that year.
- c. Incremental Deficit: An incremental deficit is applied only to those companies which use HCICO from non-baseline sources. HCICO is defined as crude oil with a production and transport CI greater than 15 g/MJ.
- d. Promoting Innovation: For HCICO, the average CI values from the Lookup Table may be used if the oil is produced using innovative methods such as CCS or other methods which reduce the CI to less than 15 g/MJ.

2. Summary of Crude Screening workgroup process and progress.

3. Regulatory Advisory 10-04A.

4. Discussion of the need for a HCICO provision

B. Path Forward: Potential approaches for Regulation amendments or revisions will be considered and evaluated by ARB staff, stakeholders, and the Advisory Panel. Part C of this outline briefly discusses the proposed methodology for assessing these potential approaches. Staff’s intention is to recommend one of these approaches (a variant of one of the below approaches or a different alternative yet to be identified) to the Board in December in the form of a regulation revision.

1. **Current Approach with amendments:** These amendments clarify the regulation requirements and provide details for implementation. Amendments are based on the draft Crude Screening proposal that has been used to generate the list of non-HCICO sources attached to Regulatory Advisory 10-04A. The amendments may:

- a. Include Step 1 of the screening process to codify the method used to generate the non-HCICO list. This will be presented as a certification process allowing for Executive Officer approval of additions to the non-HCICO list.
 - b. Include a provision that a regulated party will not be retroactively penalized if a crude source which has been added to the non-HCICO list is later removed.
 - c. Include language which sets an interim default HCICO CI for non-baseline crudes that are not on the non-HCICO list.
 - d. Briefly outline the process by which a regulated party must get a crude source that “fails” the initial screen either added to the non-HCICO list or determined to be HCICO.
 - e. Include a provision that a regulated party can retroactively use the average CI in place of the default HCICO CI if a crude source is later determined to be non-HCICO and put on the non-HCICO list.
2. **California Average Approach:** The base deficit is calculated the same as in the current approach. However, an incremental deficit is applied to all companies if the average crude slate refined in California becomes more carbon intensive over time. This allows for “the industry as a whole” to shift its crude slate and not be penalized as long as the average CI of the California crude slate does not increase over time relative to the baseline year.
- a. Base Deficit: All producers of gasoline (diesel) will calculate a “Base” deficit using the difference between the average Lookup Table value for CARBOB (ULSD) and the compliance target in that year. This calculation is the same as currently in the regulation on page 52 and will be the same for each company regardless of their own crude slate.
 - b. California Average Incremental Deficit: For the California crude refining industry:
 - i. Each year of the regulation, a “current” California average CI would be calculated using the crude slate refined in CA during a prior year.
 - ii. If the “current” California average CI is greater than the “baseline” California average CI, then all companies will incur an incremental deficit calculated using the difference between the current CI and the baseline CI.
 - iii. An individual company can earn credits if it purchases crude from sources that have implemented innovative methods such as CCS to reduce emissions for crude recovery. The number of credits will be tied to the emissions reduction achieved by the innovative method.

3. **Hybrid California Average/Company Specific approach:** The base deficit for individual companies is calculated the same as in the current approach. However, individual companies only incur an Incremental Deficit if their own crude slate becomes more carbon intensive over time relative to their crude slate refined in the baseline year. This allows for individual companies to shift the crude slate they refine in California and not be penalized as long as the average CI of their own crude slate does not increase.
- a. Base Deficit: All producers of gasoline (diesel) will calculate a “Base” deficit using the difference between the average Lookup Table value for CARBOB (ULSD) and the compliance target in that year. This calculation is the same as currently in the regulation on page 52 and will be the same for each company regardless of their own crude slate.
 - b. Company-Specific Incremental Deficit (Approach A): For each oil company:
 - i. A “baseline” volume of HCICO would be determined using the crude slate refined by that company in CA during the baseline year.
 - ii. Each year of the regulation, a “current” volume of HCICO would be calculated using the crude slate refined by that company in CA during a prior year.
 - iii. If the company’s “current” volume of HCICO is greater than its “baseline” volume of HCICO, then the company will incur an incremental deficit calculated using the difference between the current volume and the baseline volume.
 - iv. An individual company can earn credits if it purchases crude from sources that have implemented innovative methods such as CCS to reduce emissions for crude recovery. The number of credits will be tied to the emissions reduction achieved by the innovative method.
 - c. Company-Specific Incremental Deficit (Approach B): For each oil company:
 - i. A “baseline” CI value would be calculated using the crude slate refined by that company in CA during the baseline year.
 - ii. Each year of the regulation, a “current” CI would be calculated using the crude slate refined by that company in CA during a prior year.
 - iii. If the “current” company-specific CI is greater than the “baseline” company-specific CI, then the company will incur an incremental deficit calculated using the difference between its current CI and its baseline CI.

- iv. An individual company can earn credits if it purchases crude from sources that have implemented innovative methods such as CCS to reduce emissions for crude recovery. The number of credits will be tied to the emissions reduction achieved by the innovative method.
4. **Company Specific Approach:** Each oil company will have distinct Lookup Table values and compliance targets for gasoline and diesel which are based on the crude slate refined by that company in California in the baseline year. Individual companies only incur an Incremental Deficit if their own crude slate becomes more carbon intensive over time. This allows for individual companies to shift their crude slates and not be penalized as long as the average CI of their own crude slate does not increase.
- a. Company-Specific Base Deficit: Each producer of gasoline (diesel) will calculate a “Base” deficit using the difference between their average Lookup Table value for CARBOB (ULSD) and their compliance target in that year.
 - b. Company-Specific Incremental Deficit: For each oil company:
 - i. Each year of the regulation, a “current” CI would be calculated using the crude slate refined by that company in CA during a prior year.
 - ii. If the “current” company-specific CI is greater than the “baseline” company-specific CI, then the company will incur an incremental deficit calculated using the difference between its current CI and its baseline CI.
 - iii. An individual company can earn credits if it purchases crude from sources that have implemented innovative methods such as CCS to reduce emissions for crude recovery. The number of credits will be tied to the emissions reduction achieved by the innovative method.
5. **Worldwide Average Approach:** This approach bases the average Lookup Table CI values for CARBOB and diesel and the compliance schedule on worldwide average crude oil production and refining emissions in the baseline year. A Base Deficit is calculated using the difference between the average Lookup Table values for CARBOB (diesel) and the compliance target for the current year. An Incremental Deficit is applied to all companies if the worldwide average crude production and refining becomes more carbon intensive over time.
- a. Worldwide Average Base Deficit: All producers of gasoline (diesel) will calculate a “Base” deficit using the difference between the average Lookup Table value for CARBOB (ULSD) and the compliance target in that year.

b. Worldwide Average Incremental Deficit:

- i. Each year of the regulation, a “current” worldwide average CI would be calculated using the crude slate produced and refined worldwide during the previous year.
- ii. If the “current” worldwide average CI is greater than the “baseline” worldwide average CI, then all companies will incur an incremental deficit calculated using the difference between the current CI and the baseline CI.

C. Issues to consider when evaluating the alternatives: This section will provide an evaluation of the “pros and cons” of the current HCICO provision and proposed alternatives with respect to the issues listed below. This evaluation will require a significant amount of data and analysis to be provided by California refiners with regard to their historic, current, and projected crude slates, costs for crude purchase from each source, constraints and barriers to changing crude slates, etc. This data for each refinery has already been requested by ARB staff.

1. Accurately accounting for emissions from production of crude oil used by California refineries.
2. Potential for crude shuffling to generate credits, avoid deficits, or otherwise comply with the regulation.
3. Market signal generated and/or direct incentive given for reducing GHG emissions from crude production and promoting the use of innovative methods for emission reduction.
4. Potential impact on criteria pollutant emissions from refining in California
5. Potential cost impacts to California refineries, oil producers, and consumers
6. Potential fuel supply impacts
7. Consistency with LCA methodology used for other fuels and fairness versus other fuel providers
8. Requirements for implementation and data availability for calculations
9. Simplicity of methodology (e.g., availability of data, ease of application)