

California Environmental Protection Agency



Air Resources Board

***Low Carbon Fuel Standard
Rulemaking***

July 10, 2014

Agenda

- Overview
- Refinery and Crude Oil Provisions
- Regulated Party Provisions
- Next Steps

Refinery and Crude Provisions

Low Complexity – Low Energy Use Refinery Provision

New Provision

- Section 95481
 - New Definitions
- Section 95489
 - Calculation methodologies
 - Reporting requirements

Low Complexity – Low Energy Use Refinery Provision

Definitions added

- Low Complexity – Low Energy Use Refinery
- Nelson Complexity Score
- Modified Nelson Complexity Score
- Transmix

Acronyms added

- MMBtu

Section 95489(e)(1)(A) and (B)

Calculation methodology for low complexity – low energy use criteria

- Modified Nelson Complexity Score
- Annual energy use

Section 95489(e)(2)

Reporting Requirements

- Requires reporting of volumes of CARBOB and CARB diesel produced from
 - Crude oil
 - Intermediates
 - Transmix
- Requires reporting of volumes of CARBOB and CARB diesel purchased for blending

Section 95489(e)(3)

Calculation methodology for credits and deficits for CARBOB and CARB diesel

Low Complexity – Low Energy Use Refinery Provision

Questions?

Crude Provision Agenda

- **Refinery-specific Incremental Deficit Option**
- OPGEE and Crude Lookup Table Revisions
 - Revisions incorporated in OPGEEv1.1 Draft C
 - Draft 2010 Baseline Crude Average CI value
 - Updated crude lookup table CI values
 - Proposed future update cycle
 - New OPGEE contract
- Proposed changes to innovative crude provision

Refinery-specific Incremental Deficit Option

- Low complexity – low energy use (LC-LE) refineries can be affected by a California Average incremental deficit but cannot affect the Annual Crude Average CI
- Proposing to offer the option for refinery-specific incremental deficit accounting to LC-LE refiners
 - Incorporate option into LC-LE refinery provision
 - Large, complex refineries will continue to follow the California Average approach

Basic Provisions for Participating Refineries

- One-time option for interested refineries
- Incremental deficit assessed if refinery Annual Average CI exceeds the LC-LE refinery 2010 Baseline Average CI
- Applicable to the volume fraction of finished fuel derived from crude oil supplied to the LC-LE refinery
- Finished fuels derived from intermediate feedstocks, blendstocks, etc. will be subject to the provisions of the California Average approach (i.e., incremental deficits apply, if warranted)

Crude Provision Agenda

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OPGEE Revisions

- Past presentations (March 5, 2013, and March 11, 2014) describe revisions made in OPGEEv1.1 Drafts A and B and the effect of revisions on crude CI values
- OPGEEv1.1 Draft C and model documentation is posted at the workshop webpage
- All revisions are summarized in Appendix E of the model documentation

OPGEEv1.1 Draft C Revisions

- Emission factors, power plant efficiency values, upstream fuel cycle emission values updated to GREET1 2013
- Electricity module revised to allow for variable power plant efficiencies and power mixes
- Energy use calculation for pump and compressor drivers revised
- Bitumen extraction and upgrading sheet updated to GHGenius 4.03

Draft 2010 Baseline Crude Average CI

- Model inputs spreadsheet and a description of the calculation are posted to the workshop webpage
- Volume weighted average CI of crudes supplied to California refineries in 2010
- Crude CIs estimated using OPGEEv1.1 Draft C
- 2010 crude production data used where available
- Draft 2010 Baseline CI value is 12.81 g/MJ, which is greater than the current value of 11.39 g/MJ calculated using OPGEEv1.0

Draft 2010 Baseline Crude Average CI

- Increase over current lookup table CI value largely results from:
 - Correction to the fugitive emissions calculation
 - Reduction in credit for export of electricity produced by combined heat and power
 - Increase in upstream fuel cycle emissions for imported natural gas
- Items 2 and 3 above are the result of the update to GREET1 2013 values for power plant efficiencies and fuel cycle emissions

Draft Crude Lookup Table CI Values

- All crudes supplied to California refineries from 2010 to 2013
 - Approximately 165 California oil fields and 130 national and international imports
- Obtained 2012 crude production data from:
 - California DOGGR
 - Alaska Oil and Gas Conservation Commission
 - Alberta Energy Regulator
 - Nigerian National Petroleum Corporation
 - North Dakota Industrial Commission, Texas Railroad Commission, Colorado Oil and Gas, etc.
- 2012 flaring data not available from NOAA

Draft Crude Lookup Table CI Values

- Proposed draft CI values presented in Table 8 of regulation language
- Current lookup table values will be used through 2015. Revised values will be used in 2016 following OAL approval
- Revised modeling approach for in situ oil sands
- Many crude CIs have increased from current lookup table values as the result of:
 - Revisions to OPGEE
 - Update to 2012 production data

Default CI for New Crudes

Table 8 includes a single default carbon intensity

- Set equal to the 2010 Baseline Crude Average CI of 12.81 g/MJ
- Used for crudes not listed in Table 8 until the Executive Officer certifies a CI value for the crude
- Proposed Executive Officer certification process is described in the regulation language

Draft Crude Lookup Table CI Values

- Encourage stakeholders to provide feedback on the model inputs and modeling approach
- Very willing to work with stakeholders who can provide additional and/or better data for modeling individual crudes
- Highly encourage refineries to provide names of additional crudes not listed in Table 8

Proposed Three Year Revision Cycle

- Every three years, an Executive Officer hearing will be held to:
 - Adopt revisions to OPGEE
 - Add newly certified crude names to Table 8
 - Update the CI values for all crudes in Table 8 using the most recent production data available
 - Revise the 2010 Baseline Crude Average CI, if necessary
- Executive Officer hearing is a full regulatory amendment process presided over by the EO

New OPGEE Contract

- Issued to Adam Brandt of Stanford University
- Working with Joule Bergerson (University of Calgary) and Heather MacLean (University of Toronto)
- Revisions to OPGEE will include:
 - Improvements to the existing OPGEE model
 - Pathways for oil sands and extra-heavy oil production
 - Pathways for tight oil and gas production
 - Pathways for enhanced oil recovery with CO₂ injection
 - Pathways for other innovative crude methods
- Two year contract

Crude Provision Agenda

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- **Proposed changes to innovative crude provision**

Innovative Crude Provision

- Initial proposal for regulation language changes presented on April 18
- Received a lot of stakeholder feedback
- Summarize the major revisions to the proposed regulation language made following April 18

Summary of Innovative Crude Revisions

Clarified the allowable innovative methods

- Steam generation considered to be 75 percent quality steam or greater
- Solar or biomass-based heat generation added as an innovative method. Examples include:
 - Steam generation of less than 75 percent quality
 - Water preheating
- Renewable steam, heat, or electricity must be consumed onsite at the crude production facility
- Carbon capture for CCS projects must occur onsite at the crude oil production facility

Carbon Capture with CO₂ EOR

- Emissions benefits of carbon capture with CO₂ EOR allocated to the capture facility
- Example of carbon capture with CO₂ EOR project that would qualify as an innovative crude method
 - Carbon captured from a steam generator or CHP plant at crude production facility with carbon stored at same or different oil field via CO₂ EOR. Only the crude produced at the oil field where capture occurs is innovative.
- Example of project that would not qualify
 - Carbon capture from an ethanol facility that is stored via CO₂ EOR
 - Ethanol facility may apply for reduced CI for CCS

Summary of Innovative Crude Revisions

- Required project start date of 2015 or later
 - Processing of the application can be initiated after Board approval late this fall
 - Posting of the application for comment and final method approval will not occur until OAL approval of the regulation later in 2015
- Application for innovative method must include the third party as joint applicant with the crude producer if the third party:
 - Supplies renewable steam, heat, or electricity to the crude producer
 - Receives carbon captured by the crude producer and subsequently stores the carbon

Summary of Innovative Crude Revisions

- Proposing an either/or minimum threshold of:
 - 0.10 g/MJ CI reduction from comparison baseline
 - 5000 metric ton annual CO₂ reduction
- Removed the “maximum credit limit” proposed at the April 18 workshop
- Slightly revised the default credit calculations for solar steam and solar or wind electricity
- Require all applicants to submit a map, including GPS coordinates, of the innovative method facilities
- Require quarterly recordkeeping by the applicant

Feedback Requested by July 25

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Regulated Party Provisions

Regulated Party Provisions

- Transfer of obligation for Diesel
- Regulated Parties for Natural Gas
- Establishing an LRT Account
- Opting Out Process
- Multiple Parties Claiming Regulated Party Status

Transfer of Obligation for Diesel

§ 95481

- New Definition: “Rack”

§ 95483(a)(2)(E)

- Prohibit diesel obligation transfer below rack
- Limit flow of obligation to downstream entities that are likely not subject to the regulation

Regulated Parties for Natural Gas

§ 95481 Definitions

- “Biomethane”
- “Biogas”
- “L-CNG”
- “Bio-CNG,” “Bio-LNG,” “Bio-L-CNG”

Regulated Parties for Natural Gas (contd.)

§ 95483(d)

- Updated bio-CNG/LNG regulated party
 - Producer or entity that injects biomethane in pipeline
- Regulated parties for L-CNG
 - Align with LNG

Organization Information

- Name and Location
- Federal Identification Number (FEIN)
- Basis for regulation
- Signatory Authority
- Assignment of Account Administrators

Account Users

- Disclosure Statements
- Roles and Duties
 - Account Administrators
 - Contributor/Reviewer
 - Credit Facilitator/Broker

§ 95483.2 *Opt-Out Process*

- Removed paper based notifications
- Streamlined process through LRT-CBTS
- Outstanding reports submitted and deficits balanced prior to opt-out

§ 95483.4 Multiple Parties Claiming Regulated Party Status

- **Removal of Language**

Section 95483.3(c)(1-4) outlining the general opt-in hierarchy

- **Rationale**

Default language has been covered in other areas of the regulation

Next Steps and Contact Information

Next Steps

- Feedback due July 25, 2014, to Katrina Sideco at ksideco@arb.ca.gov
- Board Update – July 2014
- Staff Report – TBD
- Board Hearing – TBD

Contact Information

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Thank You