October 10, 2024

LCFS staff
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Feedback on newly proposed LCFS calculators

Dear CARB staff:

First, I would like to thank you for your work in the new LCFS calculators, which incorporate some of our previous comments. In particular, we appreciate the new hydrogen calculator, building separate calculators for biodiesel and HEFA, and increasing the number of feedstocks that can be specified in the calculators. Below are our comments on the most recent version of the calculators:

Hydrogen calculator:

- Given the following inputs:

Electrolytic GH2 and/or LH2 produced with low-CI electricity.

And after entering the amount of low-CI kWh consumed, as well as the kg of GH2 and/or LH2 produced, the results show 0kg of H2 associated with B&C electricity. In the results, the entire mass of H2 produced is linked to a CI without B&C electricity.

Section 2: Pathway Inputs		
2.1 Pathway Type	○ SMR	◉ Electrolysis
2.2 Hydrogen Production	◉ Site-Specific	○ Default Value
2.3 SMR Feedstock	☐ Natural Gas	☐ Light Hydrocarbons
2.4 Process Energy	☐ Natural Gas ☐ Grid Electricity	☑ Low-CI Electricity
2.5 Coproducts	☐ Exported Steam	
2.6 GH2 Transport	○ No GH2 Pathway ◉ Dispensed at Fuel Production Facility ○ Trucked Direct to Fueling Station ○ Delivered Via Hydrogen Pipeline	
2.7 LH2 Transport	○ No LH2 Pathway ◉ Dispensed at Fuel Production Facility ○ Trucked Direct to Fueling Station ○ Trucked via Transfill	
2.8 Book-and-Claim (B&C)	☐ RNG	☑ Low-CI Electricity

Section 3: Static Operational Data	
3.1 Grid Electricity Region	
tricity Grid EF (gCO_2e/kWh)	
HC EF (gCO_2e/MMBtu, HHV)	
l Electricity EF (gCO_2e/kWh)	125

Hydrogen (H2) Production Quantities									
	Unit	Total	Gaseous Hydrogen (GH2)				Liquified Hydrogen (LH2)		
Total H2 Produced at Facility	kg	100	50				50		
	MJ, LHV	12,000	6,000				6,000		
Produced	kg	100	50				50		
T&D Loss Factor	%	1.3%	0.5%				2.2%		
Delivered H2 for CI Calculations	kg	99	50				49		
	MJ, LHV	11,833	5,970				5,863		
			Without B&C	With B&C RNG Only	With B&C Electricity Only	With B&C RNG and Electricity	Without B&C	With B&C RNG Only	With B&C Electricity Only
Hydrogen Reportable by Pathway	kg	100	50	0	0	0	50	0	0

Our Family of Brands
Laura Verduzco, D.Sc.
Chevron Products Company
A Division of Chevron U.S.A., Inc.
5001 Executive Parkway, Suite 200, San Ramon, CA 94583
925 842 8903
laurav@chevron.com

- Issues with macros in "Pathway Summary" tab:
  - When the user selects an electrolysis pathway with liquid hydrogen and book and claim, the macros doesn't display the results correctly as it hides the B&C results for the liquid pathway. Furthermore, like in the previous point, all the H2 mass is attributed to a CI without B&C.
  - When an electrolysis pathway that makes both liquid and gaseous H2 with B&C is selected, the results show CI and H2 mass values for RNG. Although the mass of H2 for that pathway is 0, neither RNG column should in the results.

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2.8 Book-and-Claim (B&C)	☐ RNG	☑ Low-CI Electricity

Section 3: Static Operational Data	
3.1 Grid Electricity Region	
3.2. Electricity Grid EF (gCO_2e/kWh)	
3.3 Light HC EF (gCO_2e/MMBtu, HHV)	
3.4 Low-CI Electricity EF (gCO_2e/kWh)	125

Hydrogen (H2) Production Quantities				
		Unit	Total	Liquified Hydrogen (LH2)
Total H2 Produced at Facility		kg	50	50
		MJ, LHV	6,000	6,000
H2 Used for LCFS Pathway(s)	Produced	kg	50	50
	T&D Loss Factor	%	2.2%	2.2%
	Delivered H2 for CI Calculations	kg	49	49
		MJ, LHV	5,869	5,869
				Without B&C
Hydrogen Reportable by Pathway		kg	50	50

- CA-GREET 4.0 Tab: The following units for the NG emissions factor are incorrect:

Natural Gas	Combusted in Boiler or CHP	75,496	MMBtu, LHV

The correct units are gCO2e/mmBTU, LHV

- There isn't an option to input sub-metered compression or regasification or to change their emission factors, as they are lumped together. Please break out each component for transparency and to make it easier for the user to substitute default values with operational data, as needed.

GH2	Compression, Precooling and Pumping	3.41	gCO_2e/MJ H_2, LHV
LH2	Storage and Dispensing	4.22	

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Chevron Products Company
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5001 Executive Parkway, Suite 200, San Ramon, CA 94583
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laurav@chevron.com

HEFA Calculator:

- HEFA Instruction Manual, Table 6, Field 5.6:
  - Confirm our understanding on the new verbiage as stated:
    - H2 used in fuel production must be directly connected to low-CI electricity sources, it cannot be book-and-claimed.
    - Book-and-claim RNG can only be used for H2 production as the feedstock, not for any other uses at the H2 production or HEFA production facility (process energy, etc.). Very specifically only for the RNG book-and-claimed for H2 as a feedstock.

- As mentioned in our previous comment letter, the field headers in Section 6 of the calculator do not match the descriptions in HEFA Instruction Manual Table 7. Example:
  - Calculator: 6.5 Imported Hydrogen
  - Manual: 6.5 Alternate Fuel

Section 6: Monthly Operational Data						
		Coproducts Exported Outside Fuel Pathway		Renewable Diesel (RD)		
6.5 Imported Hydrogen	6.6 Hydrogen Produced On-Site	6.7 Light Hydrocarbons Used as H2 Feedstock	6.8 Light Hydrocarbons For Alternate Use	6.9 Beginning RD Inventory	6.10 Ending RD Inventory	
kg	kg	MMBtu, HHV	MMBtu, HHV	gallons @ 60°F	gallons @ 60°F	

6.5 Alternate Fuel (MMBtu, HHV)
6.6 Imported Hydrogen (kg)
6.7 Hydrogen Produced On-Site (kg)

6.8 Light Hydrocarbons Used as H2 Feedstock (MMBtu, HHV)
6.9 Light Hydrocarbons with Alternate Use (MMBtu, HHV)
6.10 Beginning RD Inventory (gallons @ 60°F)

We request that the manual reflects the exact section numbers in the spreadsheet to avoid confusion.

• The flat tailpipe CI has changed from 0.76 to 3.497 gCO2e/MJ for BD/RD (a delta of 2.74 gCO2e/MJ) due to recent data from CARB's EMFAC2021 (v1.0.2), mainly N2O increases. We request that CARB staff provide a clear and detailed explanation for assigning the same tailpipe score determined for ULSD to biodiesel and renewable diesel.

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Laura Verduzco, D.Sc.
Chevron Products Company
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laurav@chevron.com

o We request that staff provide details on the assumptions driving the emission changes between the prior tailpipe emission factor of 0.76 gCO2e/MJ to the new tailpipe emission factor of 3.497. The explanation of the assumptions should be in plain language so that program participants who are not familiar with the EMFAC2021 model can understand the rationale. This explanation can be referenced in the GREET4.0 explanatory document since the relevant reference (7) is a placeholder and provides no information.

- The Simplified Calculators released for the 15-day comment period in August 2024 do not appear to have been updated with the feedstock emission factor information present in the updated CA-GREET4.0 model. The table below shows an example of the different values:

December 2023 Release		August 2024 Release	
Soy-Oil Based Biodiesel (per MMBTU)		Soy-Oil Based Biodiesel (per MMBTU)	
Feedstock (K451)	Fuel (L451)	Feedstock (K451)	Fuel (L451)
20,765	20,005	9,999	18,384

Thank you very much in advance for addressing our concerns.

Best regards,

Laura Verduzco, D.Sc.
Chevron Corporation

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