

December 21, 2022

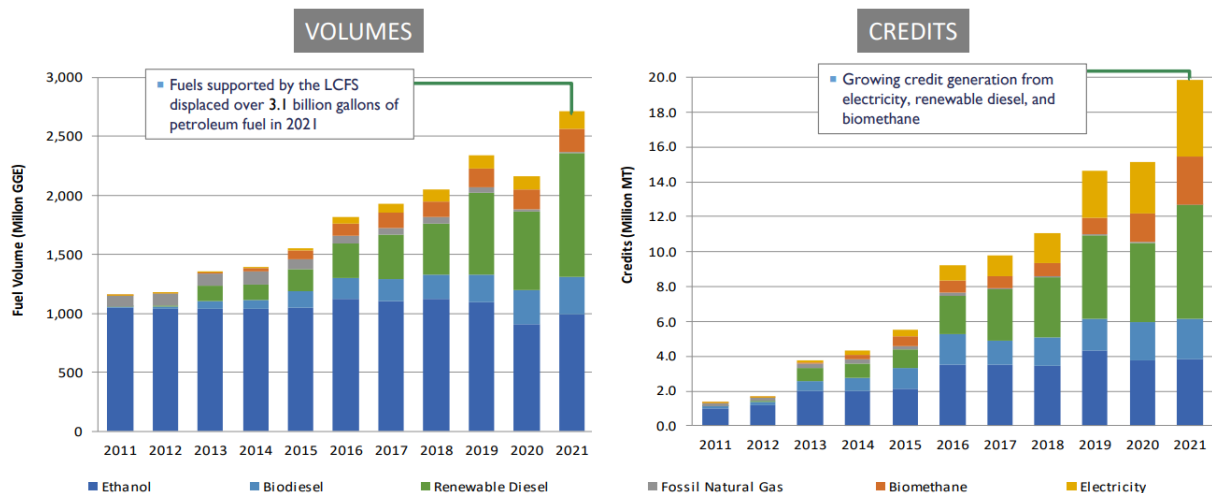
California Air Resources Board  
 1001 I Street  
 Sacramento, CA 95814  
 Rajinder Sahota  
 Deputy Executive Officer, Climate Change and Research

Reference: November 9, 2022 LCFS Workshop, Compliance Requirements

Thank you for the opportunity to comment on November 9 Workshop. CARB staff presented interesting options regarding credit generation that affect the value of LCFS credits as well as confidence in the program. The following comments hopefully provide some insight into potential directions on credit generation.

Figure 1 illustrates the sources of LFS credit generation which relates to the underlying effects on credit pricing.

- Growth in renewable diesel, electric, and low CI biomethane have resulted in a rapid through predicable growth in credit generation
- Low gasoline demand due to COVID

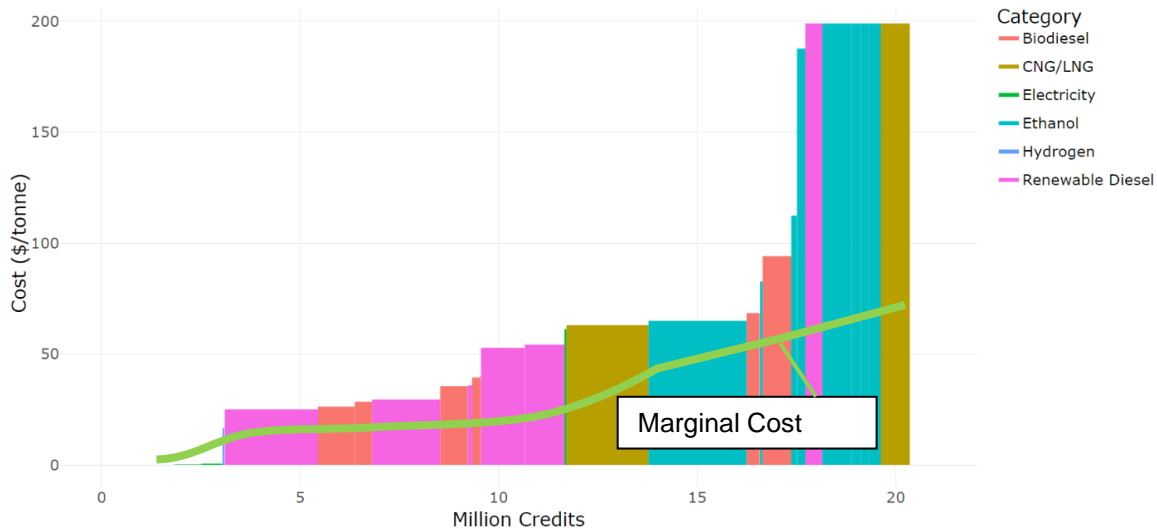


**Figure 1.** LCFS Fuel Volumes and Credit Generation

The rapid growth in EV credits is due to a combination in the change in credit assignments to home EV charging in combination with the advent of negative CI electric power. CARB has been aware of the evolution of low CI RNG and low CI power and the evolution of these new credit sources should not be taken as a signal that the program is broken. CARB simply allowed pathways for additional credit generation and the compliance curve should be adjusted to take these credit sources into account.

Figure 2 shows a supply curve for LCFS credits based on analysis by Life Cycle Associates on both a levelized cost and marginal cost basis. The marginal cost of production for many fuels is below the credit price of \$65/tonne while the revenue from credit generation is necessary to support many technologies such as public EV charging, hydrogen, and low CI RNG.





**Figure 2.** LCFS Credit Supply Curve, Levelized Cost, truncated at \$200/tonne

Key factors affecting the credit supply curve include:

- Levelized costs include capital, excluding EV home charging
- Homeowner cost is not reflected in electric charging
- BD and RD net costs depends on BOHO spread and distribution of blenders tax credit
- Ethanol use is required to meet fuel specifications
- Most significant source of RD and BD credits are UCO and Tallow
- Higher credit prices would support ZEV technologies including BEVs and hydrogen

The net effect is that the LCFS has drawn in more fuels than anticipated and the marginal cost of many fuels is below the current credit price. These low credit prices are inconsistent with the introduction of technologies that CARB would like to advance including:

- Zero emission hydrogen
- Expanded public charging
- Zero emission heavy-duty vehicles
- Zero emission port equipment

CARB is left with several policy options with the following pros and cons.

- Kick out price takers out of the LFS
  - Inconsistent policy message
  - Reduces use of low carbon fuels in California
  - Abandons leadership in technology neutral regulation
  - Allows CARB to select technology winners that are in fashion
- Extend LCFS stringency
  - Helps achieve state GHG reduction targets
  - Avoids CARB need to select technology winners
  - Promotes higher credit prices
  - Allows for ratcheting of credit demand based on program experience
- Bifurcate program into technology pools
  - Adds program complexity
  - Limits price taking activity to technology groups
  - Promotes lowest CI within a technology group



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The solution is simple. CARB should enact changes to the regulation that promote maximum stringency in compliance while maintaining a consistent treatment of existing fuel pathways. If a concern exists about excess credit generation among technology options, CARB could bifurcate the program in a manner like the RFS to provide a more balanced mix of credit generation among technology options.

Thank you for your consideration.

Best Regards,

A handwritten signature in black ink that reads "Stefan Unnasch".

Stefan Unnasch  
Managing Director  
Life Cycle Associates, LLC

