

December 02, 2022

Chair, California Air Resource Board 1001 I Street  
Sacramento, CA 95814

Submitted electronically

RE: Low Carbon Fuel Standard concepts and tools for Compliance Target Modeling. Nov 9, 2022, public workshop.

Dear Chair of the workshop

The market for biomethane has not expanded sufficiently to take credit reduction into account. Additionally, the competitiveness in biomethane research to convert hydrogen should not be undervalued.

First, according to IEA, biofuel has a growth potential of 50% by 2040, which indicates that the biofuel industry has yet to mature. Instead, CARB should consider increasing credits. In the U.S. In fact, the Cost of biofuel was less than one-fourth of natural gas in 2018. However, biofuel production in the U.S. is lower than 20% compared to Europe. Also, while the biofuel installed power generation capacity has almost doubled in Europe from 2010 to 2018, the biofuel power capacity in the U.S. remained the same. The arable land of the US is only 17%, while that of the EU is 24.7% in 2022. This can fundamentally limit the growth of biogas in the US (World Bank, 2020).

Moreover, the fund allocated to biogas in the U.S. is far smaller than that of Europe. The statewide funding for the monetary incentive program of biomethane is capped at \$40 million in U.S. However, E.U Recovery and Resilience Facility (RRF) Fund allocated 2.03 billion dollars for biogas. Allocating a sufficient budget to biomethane is essential to encourage continued growth in biofuel production effectively. Conversely, lowering credits for an area would only make sense if the market is matured or related companies are profitable.

Secondly, according to the slide in this workshop, supporting a policy for using biomethane from hydrogen is one of the critical factors for scenario analysis of biomethane credits. The national Laboratory of US Energy (NREL) showed that little progress had been achieved in using hydrogen from biogas. There hasn't been much development in the study of producing hydrogen from biogas. There is a significant level of investment and competition. For example, in 2021, Austrian research found the world's first purity of hydrogen from biogas (Sergio Matteucci, 2021). The Australian company expects green hydrogen production to increase by 15 million tons annually by 2030.

Current economic conditions should also be considered in scenario modeling. As raw material prices fluctuate with record-high inflation, business conditions will continue to deteriorate. LCSF policy should reflect these challenges – inflationary forces must be considered when establishing credit levels. The macroeconomic business environment has recently been harsh with a high inflationary rate. On Oct.13.2022 Consumer Price Index (CPI) YoY was 8.2%, which is way higher than the historical target inflation of 2%. To suppress inflation, Federal Reserve System (Fed) is continuously increasing the interest rate, which is 3.25% as of October 2022.

As mentioned in the slides, alternative C would reduce the highest amount of greenhouse gases with a high reliance on Crop-based fuels. Putting constraints or limits on credits for crop-based biofuels would deter investment in that industry. Many biomethane projects also get investment from private parties. Biomethane credits allure private parties. Thus, CARB can promote partnerships between private companies more aggressively. For example, Chevron made a partnership on dairy biomethane projects. Dietary farms can benefit from these methane-capturing projects, which convert methane to renewable natural gas.

To conclude, The CARB still needs to promote the biomethane business, which has enormous development potential.

If there are any questions, CARB staff can feel free to contact Ray Kang ([raykang@ucdavis.edu](mailto:raykang@ucdavis.edu))

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[reference]

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2. IEA (2020, Mar) *Sustainable supply potential and costs*  
<https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/the-outlook-for-biogas-and-biomethane-to-2040#abstract>
3. IEA (2020, Mar) *The outlook for biogas and biomethane to 2040*
4. Eurostat statistics Explained (2022, December)  
[Renewable energy statistics - Statistics Explained \(Europa.eu\)](#)