Union of Concerned Scientists

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Subject: Lipid feedstock safeguard

Lipid based fuels including biodiesel (BD), renewable diesel (RD) and Sustainable Aviation Fuel (SAF) are an important part of the non-petroleum fuel mix, but the recent announcements of oil refinery conversions to RD raise important questions about the impacts of sourcing feedstock at the scale required to supply these facilities. EIA summarized the situation in July 2020, finding that facilities already under construction would increase production capacity from 600 million gallons a year in 2020 to over 3 billion gallons a year in 2024, and including proposed and announced projects the total could reach 5.1 billion gallons by 2024[1]. The key issue is sourcing the 43 billion pounds of vegetable oil or other lipids it would take to produce 5.1 billion gallons of RD (to say nothing of BD). This feedstock requirement exceeds total domestic production of edible fats and oils in recent years (37 billion pounds in 2019)[2]. Just two projects in the San Francisco Bay Area have a substantial role in the scaleup, with the Philips 66 Rodeo project planning to produce up to 67K bpd (1 billion gallons a year) of RD and the Marathon facility at Martinez producing up to 48K bpd (735 million gallons). Together these two facilities alone would require approximately 15 billion pounds of feedstock.

Environmental groups have been raising concerns about the role of vegetable oil-based fuels as a driver of deforestation for many years. Soybean oil and palm oil together account for two thirds of global vegetable oil production and are linked to deforestation in South America and Southeast Asia respectively. Soy and palm oil are substitutable products that trade on global markets, so expanded fuel production from one will also substantially affect demand for the other. The scale and rate of the potential growth in demand for vegetable oils by the ongoing RD capacity expansion is unprecedented, and even agricultural industry commenters agree that demand for feedstock to supply these RD facilities will have dramatic implications for soybean oil supply and soybean acreage, as described in this recent article by article by Chris Clayton titled "Marrying Soybeans and Renewable Diesel: Renewable Diesel Plans Could Outstrip Soybean Acres, Soy Oil Supplies."[3]

There is no guarantee that the announced facilities will be built and even if they are they may not run at full capacity. And increased consumption of RD may come at the expense of decreased consumption of BD, mitigating demand for feedstocks to some extent. But the potential is certainly present for a massive surge in lipid-based fuel consumption that could rival or exceed the scaleup of corn ethanol between 2003 and 2010. Given the much lower yield of fuel per acre for oilseed crops versus ethanol the implications for land use could be even more substantial. Given that vegetable oil prices are leading the FAO Food Price Index to a ten year high, there is also a very real risk that diversion of vegetable oil to fuel use could exacerbate already high food prices[4].

California is quickly becoming the most important driver of demand in this marketplace

California consumption of lipid based renewable fuels under the LCFS has grown rapidly over recent years, from under 15 million gallons (MG) in 2011 (12.5 MG BD and 1.8 MG RD) to more than 850 MG in 2020 (266 MG BD and 589 MG RD), and the first half of 2021 has seen this rate of growth accelerate, despite record

[1] https://www.eia.gov/todayinenergy/detail.php?id=48916
[2] USDA ERS Oil Crop Yearbook
[3] www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2021/12/16/renewable-diesel-plans-outstrip-soy
[4] www.fao.org/worldfoodsituation/foodpricesindex/

high prices for feedstocks. In this same timeframe national consumption of lipid-based fuels has also grown, from 948 MG in 2011 (886 MG BD + 62 MG RD) to 2.7 billion gallons in 2020 (1.876 MG BD + 822 MG RD)[5].

In the early years of the LCFS, California's contribution to overall demand for lipid-based fuels was very low (less than 2% in 2011) and since fuels used for LCFS compliance also general RFS compliance, even this small contribution was arguably not increasing total lipid-based fuel consumption, but instead shifting that demand towards the lowest carbon pathways, particularly to second use oils and fats. However, that situation has changed, and in 2020 California's share of total lipid-based fuel consumption (BD + RD) exceeded 30%. With new facilities poised to increase US RD production capacity by 2.4 billion gallons in the next few years, primarily to serve the CA LCFS market, California could become the dominant source of demand in this sector. There is not an adequate supply of underutilized secondary oils and fats to meet this level of demand and importing used cooking oil from international sources raises concerns about fraud. Moreover, as other jurisdictions follow California in adopting new and strengthened clean fuel policies, the impact of these policies on national and global markets for oils and fats is becoming a major concern.

Sensible safeguards can avoid problems and send clear market signals to all market participants

However, the potential problems described above are avoidable with commonsense safeguards. Generally, BD and RD are economically uncompetitive without substantial policy support and will only be consumed to the extent they are supported or required by policy. Historically the federal RFS was the main driver of demand for lipid-based fuels, and the RFS excludes lipid-based fuels from the largest category of RFS eligibility that is reserved for cellulosic feedstocks. But the California LCFS is poised to become the leading driver of this fuel use, and unlike the RFS, the LCFS does not have any feedstock-based safeguards limiting how large a draw the policy makes on lipid-based feedstocks.

To safeguard against excessive draw on US and global vegetable oil and lipid supplies, CARB should implement a cap on lipid-based fuel used for LCFS compliance. The level of the cap should be based on an assessment of feedstock availability, which should be regularly updated based on relevant yields, trends in agriculture and new technology. In this way the cap can allow for sustainable growth when feedstocks are available, while providing a clear assurance that California's transportation fuel policy will not drive excessive diversion of vegetable oil into fuel markets, either directly or indirectly.

Providing clear information on how much of a draw the LCFS will place on vegetable oil markets will allow all stakeholders to plan accordingly. It is no one's interest to have a short-term boom in demand for lipid-based fuels lead to a backlash that discredits policies and undercuts investments when policymakers finally address the problem. With a cap in place, fuel producers can concentrate on minimizing emissions associated with the fuels they produce and look to innovative conversion technology to access more sustainable and available feedstocks to meet needs beyond what can be sustainable be produced from lipid-based feedstocks.

[5] EIA Monthly Energy Review