



Submitted electronically

March 15, 2023

Dr. Cheryl Laskowski
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comments on February 22, 2023 Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard

Dear Dr. Laskowski:

The Advanced Biofuels Association (ABFA), founded in 2007, represents more than 40 members from around the world who collectively produce more than 4 billion gallons of low carbon fuels a year. ABFA represents some of the largest refinery companies in California and the world as well as the largest sustainable aviation fuel (SAF) facility in the state. Our membership, in response to the state's goals, has already begun to transition existing refining facilities into renewable fuels facilities. Several of our members are well along in making this conversion, and two of our companies will deliver close to a billion and a half gallons of renewable diesel to the state by the end of 2025. Having made these investments, current discussions concerning eliminating the use of crop-based feedstocks under this program are extremely concerning.

ABFA congratulates the tremendous progress that has occurred in the low carbon liquid transportation fuels market in California. Clearly, the California program has driven an economic boost to this sector, drawing more gallons of available advanced biofuels to the California market than any other. With yearly demand for diesel fuel around 3 billion gallons per year, the state of California has doubled its use of these Advanced Biofuels in the last decade. The percentage of blending of lower carbon replacement fuels has risen significantly in the diesel pool specifically and is predicted by many experts to reach 80 percent of the diesel demand requirement in the state by 2025. Currently, the overwhelming amount of those 50 percent GHG reduction fuels are produced from fats, oils, tallow, and greases. Many of these waste oils are specifically a by-product of food use and production and, more specifically, a result of global demand for food and feed. In addition, as noted in the states information slide package, the amount of crushing capacity is increasing significantly to meet the new demand for food in this market.

We also represent Global Clean Energy who specializes in ultra-low carbon renewable fuels from our patented nonfood camelina feedstock, a crop that offers benefits commonly referred to as "regenerative agriculture" as well as providing a low carbon fuel solution to help California meet its ambitious clean air targets. Camelina is a lipid-based feedstock that is nonfood, grows between traditional crop cycles on dryland farms, and does not contribute to land use change. Indeed, our patented camelina varieties were issued a first-of-its kind LCFS pathway by CARB in 2015. Further, camelina has the potential to be the lowest carbon intensity renewable fuel feedstock on the market. Camelina-based renewable fuels produced by Global Clean Energy have the potential to go to a zero or below carbon intensity score in the coming years.

Intermediate crops can play a major role as a new sustainable source for biofuels in California and throughout the nation. We should not be taking away California's options to meet our carbon reduction objectives, rather we ought to enhance these options by incentivizing the use of crops that provide climate benefits throughout their lifecycle – by positively contributing to the land as they are grown and generating ultra-low carbon renewable fuels that reduce air emissions when they are used - all while not contributing


to land use change. These and other options add to the growing feedstock availability which will reach record highs in the next three years.

In response to the war in Ukraine, energy markets around the world have been adversely affected. The price of oil has risen significantly and many of global supply and distribution chains have reordered. This has had a significant impact on the amount of available feedstocks in the fat and oil markets, which follow the price of crude. In order to effectively represent our members and engage with governments, we wanted to have accurate data to represent these market changes. Therefore, ABFA recently commissioned a global expert in this space, LMC International, to conduct and prepare a study on the global supply and demand of fats, oils and greases from 2023-2025, the proposed timetable for the proposed Renewable Fuel Standard (RFS) Program volume obligations. We have included the executive summary results of this study that clearly demonstrates feedstock availability for food, feed, *and* fuels can amply supply feedstocks to all markets. We would be happy to coordinate a meeting to present this directly to the State. Additionally, ABFA engaged Lipow & Associates, a respected oil and gas analyst, to conduct a review of likely renewable diesel production capacity by 2025. We also include this as part of our comments. This analysis demonstrates that by 2025 the U.S. capacity for renewable diesel (RD) will exceed 6 billion gallons a year.

As you well know, your program's progressive approach to reward fuels that deliver greater carbon reduction has successfully brought cleaner fuels to the state of California. Many facilities that produce RD are seeking a market home in California. California is the one market in the country that could potentially become 100% RD and Biodiesel fuel pool, delivering a minimum of a 50% GHG reduction across all gallons. If you were to restrict the use of crop-based feedstocks, there are very few if *any* facilities that could replace those lower carbon gallons with non-waste and crop based fuels. The facilities capable of processing other feedstocks at present simply do not exist and would require significant capital cost to convert or build. This will take years, and likely decades, particularly given greater uncertainty in the investment community. Reducing or eliminating these feedstocks would be a tremendous setback to CARB's overall efforts to bring new lower carbon fuels, such as SAF and RD, into the state. In the end it would increase the state's overall carbon footprint in the short- to medium-term and significantly slow the market's ability to achieve your goals in the intended timeline, all contrary to CARB's mission statement.

California has been a national and global leader on air quality policy and carbon reduction. Eliminating the use of crop-based fuels would be a significant step backward and a long wait to return to the current carbon reductions you are enjoying now. ABFA believes that between now and 2030, the crop-based feedstocks will provide the bulk of the contribution to carbon reduction in the liquid transportation fuel sector. As time moves forward, we are hoping new innovative technology will be proven in the gaseous conversions sector as well as the thermochemical sector. We will simply have to build these new facilities and infrastructure to utilize some of these new low carbon fuels. We encourage you to adopt a phased approach to technology evolution over appropriate timeframes and not let the goal of the perfect get in the way of delivering good. To not continue to utilize what is available today would simply move in the opposite direction of available carbon reduction and have lasting negative bio-accumulative effects. In short, there is nothing wrong with one step at a time.

Sincerely,



Michael McAdams
President
Advanced Biofuels Association

LMC Outlook for Lipid Feedstocks to 2025

Rationale for the Study

In December 2021, LMC International¹ submitted a report to EPA assessing the lipid feedstock outlook to 2030 with the goal of answering the critical question: *Will there be enough lipid feedstock to meet Advanced Biofuels Association goals for biomass-based diesel (BBD)?* The results of that study indicated that lipid feedstock for at least 9 billion gallons of BBD would be available to the U.S.²

Here we examine the ways in which short-term lipid supply to 2025, and in particular the supply of RFS-approved feedstocks, has been affected by external factors. We explain how they change our forecast for 2025 compared to the forecast in the 2021 report. In this analysis we have concluded that forecast supplies of lipid feedstocks in 2025 will be higher than forecast in the 2021 report.

Key conclusions

SUPPLY:

- **Contrary to some expectations, market factors of the last year have *increased*, not reduced, our forecast of the global supply of all lipid feedstocks³ in 2025.** *(This conclusion is the result of extensive, in-depth analysis of the impact of many market factors, outlined below.)*
- The revised total forecast of supply for all uses is 290 million metric tons – up by 3.7 million metric tons compared to our 2021 forecast, equivalent to over 1 billion gallons RD⁴.
- Of this total, global supply of RFS-approved lipid feedstocks has risen to 149 million metric tons in 2025 – up by 10.3 million metric tons from the previous report, equivalent to almost 3 billion gallons RD.

DEMAND:

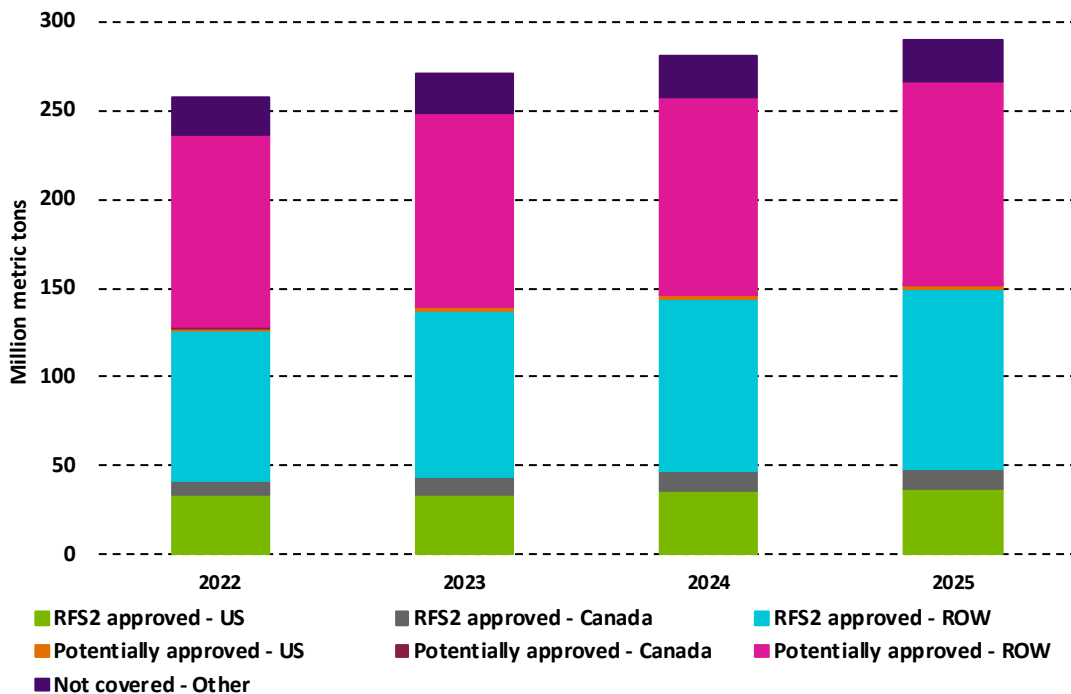
- First, we forecast global demand for lipids for foods and industrial uses, then the demand for biofuels in four countries other than the U.S. with strong environmental biofuel policies⁵. The resulting forecast: Global demand for lipids for these uses in 2025 is projected at 222 million metric tons.
- **From the 290 million metric tons of total global lipid supply, this leaves 68 million metric tons available for use in biofuels in the U.S. and elsewhere (other than the four countries) – equivalent to over 19 billion gallons of RD.**

CONCLUSION:

- **Based on LMC's forecasts of supply and demand to 2025, feedstock supplies available for use in the U.S. are more than enough to meet ABFA's target for BBD demand, after accounting for food.**

We include all lipid sources in our analysis to form a full picture of the global market^{3,4}, separating RFS-approved and other feedstocks. Diagram 1 presents LMC's latest forecasts.

Diagram 1: Global oils and fats supply forecasts, 2022-2025



Key influences on lipid supply in 2022

- The most important development was **Russia's invasion of Ukraine**. Immediately it cut sunflower oil supplies from Ukraine, the world largest exporter, and the effects will linger beyond 2025, but it is not approved as a feedstock in the RFS; therefore, sunflower oil does not feature in the supply-demand balance for U.S. BBD.
- Other major negative consequences of Putin's war include forcing up diesel and fertilizer prices. In the case of diesel, that cloud has a silver lining in that **high diesel prices** support the prices of BBD, and these feed into BBD feedstock prices, stimulating their supply.
- The **leap in fertilizer prices** also has a silver lining. Higher fertilizer prices increase the attractions of soybean's nitrogen-fixing properties, and this promotes the planting of soybeans at the expense of grains.
- **On balance, Russia's invasion has increased the prices of oils and fats, which support their production, and boosted the planting of soybeans as a nitrogen-fixing crop.**
- A significant factor behind a generally disappointing 2022 crop was the persistence of **La Niña**. This reduced oil crop yields through a combination of droughts in the Americas and excessive rainfall in eastern Asia.

- Looking ahead, the **Oceanic Niño Index cycle** is now turning. **The return of U.S. soybean yields to their long-run trend will add 4.5% to production.** There will be further upside potential if an **El Niño** appears, lifting yields further. **Canola will benefit similarly.**
- The use of canola as a feedstock for RD has now been approved by the EPA. This opens a significant source of supply to meet growing U.S. capacity.
- Among the other vegetable oils approved as RFS feedstocks, very little has happened to change the forecasts from the volumes estimated in 2021.
- The world's largest source of vegetable oils is palm oil, which is not an RFS-approved feedstock. Palm oil production has been held back by difficulties in recruiting labor for harvesting and, more generally, by a sharp slowdown in new plantings. However, as with sunflower oil, problems with palm oil production do not affect the supply-demand balance for RFS-approved feedstocks.
- **The biggest single boost to the supply of feedstocks approved in the RFS arises from fats and greases that are not used significantly for food.** The output of most fats and greases has not been affected by the turmoil caused by Russia. Animal fats are a by-product of meat rendering and their availability changes very gradually. Distillers' corn oil supply is a function of North American corn ethanol output, which is governed by mandates.
- The non-food lipid that responded strongly to higher vegetable oil prices has been used cooking oil. The **collection and export of UCO** in Asia, led by China, have grown rapidly, even though Chinese catering establishments have struggled with repeated lockdowns. As pandemic restrictions continue to be lifted this should allow further growth in the coming years.

Lipid supply outlook to 2025

Taking these factors into account leads to these results for supply:

- The key contributors to the increases in forecasts of RFS-approved worldwide supply were those affecting soybean oil, canola oil, and used cooking oil (UCO). The two oils whose 2025 estimates were lowered were sunflower and palm oils, which are not RFS-approved.
- Focusing on the RFS-approved feedstocks, the primary reason for the higher soybean and canola projections in 2025 was the end of La Niña, which will enable yields to regain their long-run trends. A further influence for soybeans is its benefit as a nitrogen-fixing crop. For UCO, rising fats prices promoted higher collection rates, with China leading the way.
- The latest forecasts of the supply of the three RFS2-approved lipids, which drive the increase in forecasts for 2025, add a combined 4.6 million metric tons to U.S. and Canadian supply and 10.1 million metric tons to world supply that year.
- Sunflower oil output is the victim of Putin's war, while palm oil is suffering labor shortages.

- **Our forecast of global lipid supply has increased from 286 million metric tons in our 2021 report, to 290 million metric tons in 2025, up by 3.7 million metric tons, equivalent to over 1 billion gallons RD.**
- **Of this total, RFS-approved lipid feedstock supply has risen to 149 million metric tons in 2025, up by 10.3 million metric tons, from 139 million metric tons in our 2021 report, equivalent to almost 3 billion gallons RD.**

Key influences on lipid demand in 2022

Since 2021, there have been a number of changes to global biofuels policy that could impact demand for lipids over the next three years.

We focus on biofuel demand in Canada, Brazil, the EU and UK, outside of the U.S., as this demand is seen as strong as it is primarily based on lowering carbon emissions rather than supporting domestic agriculture.

- Both Canada and Brazil have increased targets in the last year. Canada delayed the implementation of their Clean Fuel Standard, but increased the goals for 2030, which is expected to lead to higher biomass-based diesel demand by 2025.
- In Brazil, the planned increase to biodiesel blending mandates has been brought forward. The nationwide blend will rise from 10% to 15% in March 2023, increasing demand for lipid-based fuels in the short term.
- The EU on the other hand has seen several countries roll back mandates in 2022 and 2023 in response to high prices and food scarcity concerns driven by the war in Ukraine.

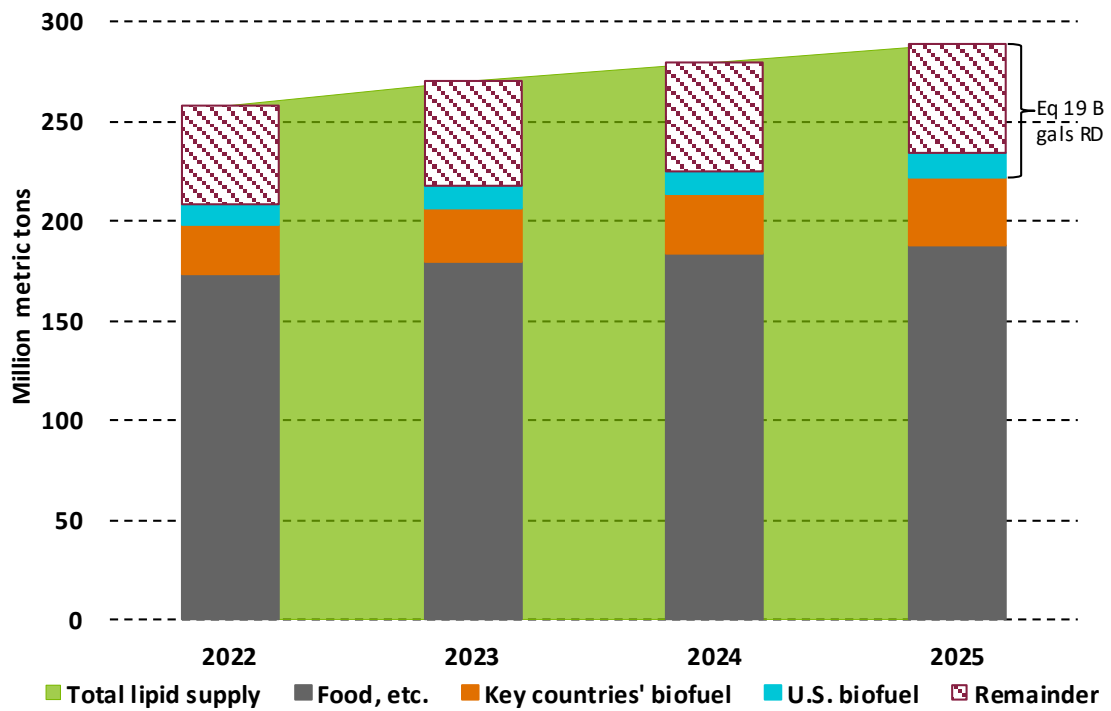
Lipid demand outlook to 2025

Taking these factors into account leads to these results for demand:

- Total demand for lipids from biofuels in the four key countries is forecast to reach 33.3 million metric tons in 2025, 1.6 million metric tons higher than our previous forecast.
- Global demand for non-biofuel end uses (food, feed, and chemicals) is forecast to reach 188 million metric tons in 2025 – this is unchanged from last year.
- **Accounting for global demand for lipids from food as well as industrial uses globally and biofuels in four countries⁵ other than the U.S. with strong environmental biofuel policies, global demand for lipids is in 2025 estimated at 221 million metric tons.**
- **This leaves 68 million metric tons of lipid supply available for use in biofuels in the U.S. and elsewhere, equivalent to over 19 billion gallons of RD. (This includes the current outlook for BBD use in the U.S. in 2025). This is an additional 2.5 billion gallons of RD compared the same calculation for 2022 lipid supply.**

➤ Based on LMC’s forecasts of supply and demand to 2025, feedstock supplies available for use in the U.S. are more than enough to meet ABFA’s target BBD demand, after accounting for food.

Diagram 2: Global lipid market forecast to 2025, supply vs. demand



Note: U.S. biofuel lipid demand is LMC base case forecast, based on current policy outlook.

¹ LMC International specializes in global economic and market analysis of agricultural feedstocks and their major end products, with a focus on biofuels.

² Available lipid supplies are considered after taking into account the global demand for lipids for foods and industrial uses, and also the demand for lipids in biofuels in four countries other than the U.S. that have a high demand for biofuels⁵.

³ We include all oils, even if not approved for the RFS or other biofuel policies, such as palm, because they are a significant source of vegetable oil for a range of end uses around the world. Therefore, it is essential to include all oils when evaluating total global demand.

⁴ The exact amount of lipids required for biomass-based diesel will depend on the type produced, the feedstock, and the technology used, as conversions vary with each factor. To put everything on a comparable basis, we present volumes of biofuel per volume of lipids in renewable diesel (RD) equivalents.

⁵ We assess the requirement for lipid feedstocks to fulfill biofuel policies in four other markets, the EU, UK, Brazil, and Canada. These markets all have strong biofuel policies based on environmental targets that do not get amended easily. Given their policies and incentives, they represent competition for lipid feedstocks for the U.S., and bidding supplies away from them will be costly.

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Vallery Green Fuels	Kern County									230		Company organized December 30, 2019. Plan was to be on stream 1H 2023
World Energy (Alt Air)	Paramount	Tallow/small amts of veg oil and animal fat	45	45	45	45	45	45	45	261	1.34	Announced Oct 24, 2018 plans to spend \$350 MM to expand to 306 MMG of which 150 MMG will be SAF. Permits out for public comment Sep 2021. Construction is expected to take about 2 years. Secured permits April 2022.
Illinois												
St Joseph Renewable Fuels	Newton									0	1.00	Proposed as early as Sept 2018 Announced May 12, 2020 plans to build \$400 MM plant. Backed by Lance Capital
Iowa												
HOBO Renewable Diesel LLC (Multifuels 50%)	Waterloo								120			Website indicates 9.3 MBD Midwest project by 2Q 2025. HOBO has filing with Iowa Sec of State with Waterloo Registered Agent. Stonepeak (Evolve Transiition Infrastructure) investing \$600 MM in HOBO in Nov 2021 subject to tolling agreement
Readi-Fuels (Applied Research Associates/C&N Biofuels)	Hull	UCO/Corn Oil								34	1.71	Announced Feb 21, 2019 to construct new \$58 MM plant also producing renewable naphtha. Originally expected to begin construction in 2019 and be on stream 2021. Technology contract awarded to Chevron Lummus and ARA June 2021. Seeking \$80 MM fund raise as of Aug 2022
Kansas												
CVR	Coffeyville									125		Announced Nov 3, 2020 that it could convert a high pressure hydrotreater, pending succesful RD production

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Gron Fuels/Fidelis New Energy	Baton Rouge	Soybean, Corn oil, Tallow								920	1.36	Announced Nov 10, 2020 to spend up to \$9.2 billion. First phase of 60 MBD for \$1.25 B on stream in 2025. FID expected in 2021. Received Air Permit April 2021. On Oct 25, 2021 was going to spend \$2.1 B to produce 46 MBD SAF, 14MBD RD. FID expected 1H 2022.
Louisiana Green Fuels/Strategic Biofuels	Port of Colombia, Caldwell Parish									32	87.50	Announced April 2021 to spend \$700 MM. Moving into engineering phase August 2021. FID planned for late 2022 would come on stream in 2025. Received LA approval Sept 2022 to issue \$1.1 B bonds. Total cost now \$2.8 B
PBF	Chalmette	Soybean oil, corn oil, fats					307	307	307		1.80	Announced Feb 11, 2021 potential project to convert idled hydrocracker and produce 15-20 MBD. On June 24, 2021 said it would cost \$550 MM. Selected Honeywell UOP Ecofining process. On April 28, 2022 said they had completed engineering and permitting, securced some long lead time equipment, expect 1H 23 start up
Chevron REGI Geismar	Geismar	High and Low Fatty acid feedstocks	75	90	90	90	90	340	340		3.30	Broke ground Oct 2008. Came on stream November 2010. In May 2018 REG said considering spending \$660 MM to expand. On Oct 6, 2020 announced they would proceed with 250 MMG expansion with mechanical completion end 2023 and on line in 2024 at a cost of \$825 MM. Broke ground Oct 2021.
Shell	Convent	Veg Oil, Animal Fat							584		2.53	Per OPIS Story October 15, 2021, Shell considering repurposing refinery. Confirmed by Shell Feb 24, 2022 in The Advocate. Filed Title V Air Permit modification August 31, 2022. Will produce RD, SAF and naphtha. Will process up to 6,000 tons per day= 584 MMG/yr. Cost \$1.48 B
Mississippi												
JaxOn Energy	Jackson	Corn Oil		38	38	38	38	38	38			Constructed 2500 B/D plant in 2019

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Missouri												
Indaba Renewable Fuels California		Veg Oil, greases, animal fat								100		Announced Jan 15, 2022 in planning stages
Montana												
Calumet	Great Falls	tallow, soybean oil				77	185	276	276		0.93	Announced February 16, 2021 potential project to convert hydrocracker to process 10 to 12 MBD feedstock. Began production Nov 5, 2022. Adding pretreater in 1Q 2023. Capacity is 15 MBD, will operate at 12 MBD. (9 RD, 2 SAF, 1 Naphtha). Can expand to 20 MBD capacity, 18 MBD (12 RD, 4 SAF, 1.5 RN) run rate in July 2024 increasing hydraulic capacity. Cost \$200MM Opex including transportation is 62 cpg from March 2021 presentation. Oaktree investing \$300 MM. Rail to PNW and CA is 8-12 cpg. Started up Sep 2022
Nebraska												
Heartwell Renewables (Cargill/Musket JV)	Hastings	UCO, tallow, animal fat						80	80			Announced April 20, 2021 to come on stream Spring 2023. Let contract to Worley May 2022. Broke ground Nov 3, 2022 now expected on line summer 2024
Nevada												
Golden Gate Petroleum	McCarran									???		Announced Dec 17, 2018 5 MBD plant (there is a ULSD hydrotreater at this site built in 2016)

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Ohio												
SG Preston	Van Wert									120	3.33	Announced August 2014 a \$400 MM RD project to be completed 2017. As of Feb 2022, still not constructed
Oklahoma												
CVR	Wynnewood	soybean oil, corn oil				100	100	100	100		1.10	Announced May 7, 2020 looking at potential project at its refineries utilizing excess hydrogen and equipment. Project approved Dec 2020 to spend \$110MM. On stream April 20, 2022. Converting hydrocracker. As of August 8, 2022 \$60 MM pre treater to be in service 2H 2023. July 3.6 MBD, 3Q 4.65 MBD
Oregon												
Red Rock Biofuels	Lakeview	wood waste cellulosic process					16	16	16		20.00	Broke ground July 2018 with completion expected April 2021. As of June 2021 construction halted due to lack of funds and may not recommence until 2023. Produces jet and dsl. Shell will take the product and market it. Cost is \$320 MM
Next Renewable Fuels (Waterside Energy Development)	Clatskanie (Port Westward)	UCO. Tallow, seed oil, soy oil, fish oil								575 up to 750	3.33	Announced \$1100 MM project in 2016. Announced Feb 2019 will sell volumes to Shell and others. Plant to come on line in 2021. BP to supply feedstock. Raising \$1.5 Billion as of April 2020. Cost estimate rose to \$2 B in June 2021. As of Sept 2021, Oregon DEQ held a public engagement session for comments on the permit. As of Sept 28, 2022, cost is \$2.5B. Expected permitting to complete in 2023 and on stream 2025.
												https://www.oregon.gov/deq/Programs/Pages/NEXT-Renewable-Fuels.aspx
Riverside Renewables	Clatskanie											Project moved from Cowlitz County, Washington

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Pennsylvania												
Delta	Trainer					24	24	24	24			Co-Processing in a distillate hydrotreater beginning August 2022 per June 2022 DEP letter
Texas												
Diamond Green Diesel(Valero/Darling International)	Port Arthur					470	470	470	470		3.09	Announced Sept 9, 2019 cost study for 400 MMG/yr plant coming on line in 2024. Project approved at a cost of \$1.45 B Jan 28, 2021 to come on line 1H 2023. Will produce 50 MMG renew naphtha. On stream Nov 2022
Emerald Biofuels	Port Arthur	Veg Oil, greases, animal fat								105	3.15	Filed TCEQ Permit 134821 in 2015 updated July 2021. Location is at GT Omniport 1998 highway 73. so may be the same as Steamboat. Will produce 105 RD and 20 other. Cost of \$315 MM. UOP Ecofining process. As of Jan 2022 construction start pushed back to summer 2022
Steamboat Biofuels	Port Arthur	corn oil, soyoil, grease								80		Filed TCEQ Permit 157861 Sept 2019. Location at GT Omniport 1998 Highway 73. Feedstock Capacity is 6500 B/D, assumed 80% renewable diesel. . Haldor Topsoe technology
Steamboat Fuels	La Porte									80		Filed TCEQ Permit April 2020 for new facility. RN 111029104 Permit 161051. Feedstock capacity = 6500 B/D assumed 80% renewable diesel
Washington												
BP	Cherry Point	tallow, soybean oil	44	44	44	109	109	109	109		0.52	Production based on Whatcom County June 3, 2021 letter. Hydrotreater #3 DHDS coprocessing. Announced Oct 4, 2021 project to increase production to 109

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
Total End of Year USA Capacity MMG/yr			543	796	1346	2461	4238	5591	6340	2272		
Neste	Singapore	UCO/Waste Residue	325	325	325	325	715	715	715			Announced Dec 12, 2017 expansion from 1.3 to 2.6 MMT/yr to come on line in mid 2022. Announced Aug 2020 expansion delayed to 1Q 2023. As of Dec 15, 2022 new start up date March 2023
	Rotterdam	UCO/Waste Residue	325	325	325	325	325	325	325			Announced June 27, 2022 expansion from 1.4 to 2.7 MMT/yr to come on line 1H 2026 at a cost of EUR 1.9 billion. Of the 2.7 capacity, 1.2 will be SAF
	Porvoo	UCO/Waste Residue	190	190	190	190	190	190	190			
	Debottleneck		100	100	100	200	200	200	200			Announced further de-bottlenecking project expected on stream in 2022
Total End of Year Neste Capacity MMG/yr			940	940	940	1040	1430	1430	1430			
Canada												
Cielo Waste Solutions	Aldershyde, AB	Wood Waste		0.4	0.4	0.4	0.4	0.4				On Stream as of Jan 2020
Cielo Waste Solutions	Halifax, NS										4.17	Announced Jan 9, 2020 to construct approx 9 MMG/yr at a cost of \$50MM
	Grande Paririe											Announced Jan 2020 JV with Renewable U Energy

