

Appendix 2. Analysis from Lipow Oil Associates on Projected Renewable Fuel Capacity, 2023-2025.

Company	Location	Feedstock	Dec 2019 Capacity	Dec 2020 Capacity	2021	2022	2023	2024	2025	Other	Cost	Comments
			MMG/YR	MMG/YR	MMG/YR	MMG/YR	MMG/YR	MMG/YR	MMG/YR	Proposed	\$/gallon	
Alabama												
Vertex	Saraland	soybean oil, corn oil, tallow, yellow wax, grease and UCO					215	215	215		0.55	Announced May 27, 2021 an \$85 MM hydrocracker conversion to 10 MBD by 4Q 2022 and 14 MBD by mid 2023. As of November 8, 2022, mechanical completion is 1Q 2023, start up is 2Q 2023 Cost now \$90-\$100MM. Idemitsu to take all of the RD product for 5 years. Pretreatment unit planned for Myrtle Grove LA
California												
Aemetis	Riverbank						45	45	90			Received CA Tax exemption Jan 2019 for cellulosic ethanol plant. Now RD and SAF. Plans to construct 90 MMG/yr plant in two phases: first phase in early 2023, second phase in 2025
Chevron	El Segundo				30	30	153	153	153			Announced March 3, 2020 plans to co-process bio-feed in the FCC later in 2020. Sept 26, 2022 Letter From EPA states 10%, not to exceed 20% which is about 7.5/15.0 MBD. As of August 2, 2021, plan to co process 10 MBD by end of 2021. As of Feb 28, 2022 presentation, plan to convert diesel hydrotreater by end 2022 <a href="https://chevroncorp.gcs-web.com/static-files/20c2a7dc-e42f-4ada-991e-b36a5e224556">https://chevroncorp.gcs-web.com/static-files/20c2a7dc-e42f-4ada-991e-b36a5e224556</a>
Global Clean Energy Holdings	Bakersfield	Veg Oil					150	220	220		2.70	Purchased the Delek refinery for \$40MM in May 2020 expected Jan 2022 start up. Retooling Cost of \$365 MM Offtake to multi national of 85 + 20 at buyers option. Backed by Orion Energy Partners, GCM Grosvener, Voya Investment Management. Delek has option to buy 33%. Exxon to take 5000 MB/yr for 5 years announced April 22, 2021. In April 2021 XOM said it will take 5000 MB per year. Capacity per website is 15 MBD. As of Novmber 14, 2022 SEC Filing, start up now delayed to 1H 2023 and may be limited to 12 MBD by hydrogen availability



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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 Transition 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 successful RD production at Wynnewood. RD 125, SAF 25. As of Jan 2022 Board approved completing process design
East Kansas Agri Energy	Garnett		3	3	3	3	3	3	3			Came on line in 2017
WB Services/Green Energy Products	Sedgwick											Operated a 3 MMG plant until they declared bankruptcy in 2016.
Seaboard Energy (High Plains Bioenergy)	Hugoton	animal fats, veg oils				85	85	85	85		4.12	Announced end April 2021 plans to convert idled cellulosic ethanol site by end 2021 to produce 85 RD and 8.5 naphtha. Equipment shipped to site in July 2021. Cost \$350 MM per englobal.com website Dec 2021 video. On stream Feb 2022

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Louisiana												
Diamond Green Diesel(Valero/Darling International)	Norco	Tallow, UCO, Corn Oil	275	290	690	690	690	690	690		2.75	began construction Oct 2011. Project cost \$330MM with a \$241MM DOE Loan Guarantee. Makes Renewable Diesel thru a UOP process. 125 MMG, \$190 MM.Expansion on stream Aug 2018. Approved 400 MMG RD plus 30 MMG renew naphtha expansion Nov 5, 2018 at a cost of \$1100M. began start up Oct 2021.
Emerald Biofuels	Plaquemine									85		Announced May 2012 to construct RD plant at Dow Chemical Plaquemine location. UOP Process
Greentech Materials, LLC	Baton Rouge	Soybean/Palm Oil								336-378	1.32-1.49	Announced January 17, 2020 for possible \$500 MM plant on 164 acres in the Port of BR located west of the Genesis Energy terminal.
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





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AIC Energy	Trenton	soybean and canola oil								100		Announced June 2021 to construct plant near Savage Trenton rail port. Filed conditional use application permit April 2021
Marathon	Dickinson	Refined Soybean oil 80%, corn oil 20%		185	185	185	185	185	185		2.53	Announced Aug 2018 Converting refinery to 12 MBD renewable diesel expected on line late 2020. Capital Cost = \$455 MM. Starting up Nov 2020. Achieved 90% of design capacity in 1Q 2021. achieved full capacity in 2Q 2021
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.







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Total End of Year USA Capacity MMG/yr			<b>543</b>	<b>796</b>	<b>1346</b>	<b>2461</b>	<b>4238</b>	<b>5591</b>	<b>6340</b>	<b>2272</b>		
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			<b>940</b>	<b>940</b>	<b>940</b>	<b>1040</b>	<b>1430</b>	<b>1430</b>	<b>1430</b>			
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
	Dunmore (Medicine Hat)									23.1	4.30	Announced Nov 2019. JV with Renewable U Medicine Hat at a cost of CAD \$50 MM to produce 8.6 MMG/yr. In Nov 2020 announced expanding to 10,000 liters per hour



