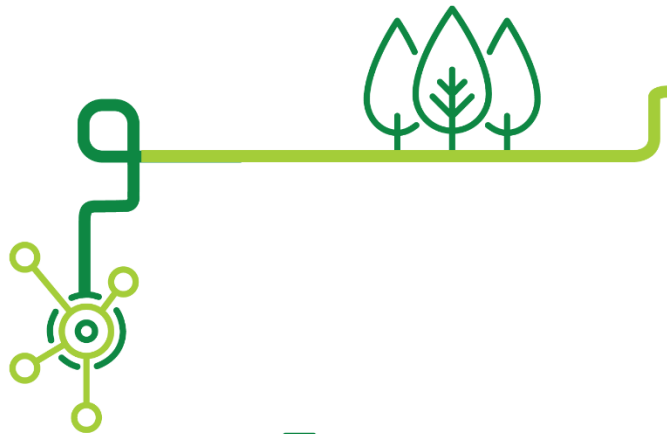
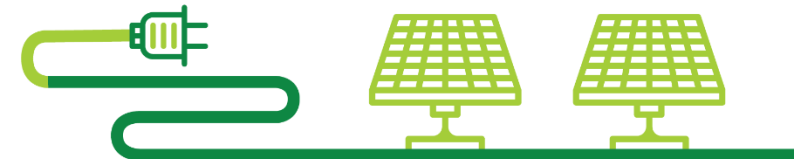


AVIATION CO₂ REDUCTIONS



STOCKTAKING SEMINAR

TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS





Sustainable Aviation Fuels (SAF)

Jocelyn Goodwin

Organic Chemist

Applied Research Associates



Catalytic Hydrothermolysis Jet (CHJ)





Annex 6 to ASTM D7566

Aviation Fuels

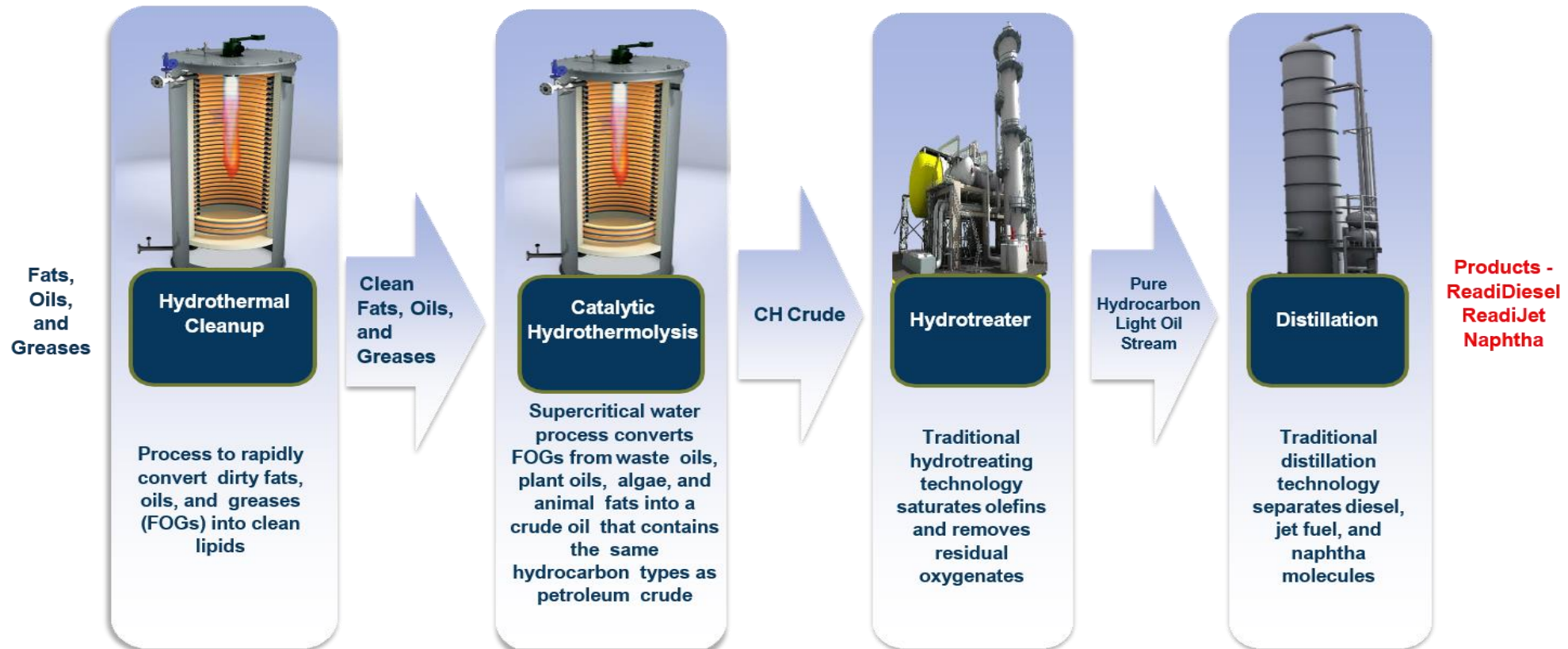
Feedstock type	Conversion process
Fats, Oils, and Greases	Biofuels ISOCONVERSION

100% Drop-In Fuel from waste fats, oils, and greases or energy crops. Contains similar distribution of paraffins, isoparaffins, cycloparaffins, and aromatic compounds to petroleum jet fuel.



- 
CO₂ reductions per flight **80%**
- 
Level of finance required **\$170M**
- 
Timeframe **2022**
- 
Main challenges **First of its kind technology**

Hydrothermal Cleanup and Biofuels ISOCONVERSION



Feedstocks

Any fat, oil, grease, or Free Fatty Acids (FFA) can be used as a feedstock

Hydrothermal Clean Up (HCU) can be used to reduce contaminants in highly contaminated feedstocks.

Brown grease, yellow grease, used cooking oil, packer's tallow, distiller's corn oil, soap stocks, other waste oils, algal oils, and crude plant oils can all have metals reduced adequately for use in catalytic hydrothermolysis.

Most refined plant oils are low enough in metals to use in CH without pretreatment, such as soybean, corn, carinata, camelina, peanut, and other plant oils.

Free fatty acids recovered from other processes can be used in CH.

	P (ppm)	Ca (ppm)	Mg (ppm)	Na (ppm)	K (ppm)
Distillers Corn Oil Feed	3.7	1.3	0.1	4.3	3.8
HCU Product	0.2	0.1	0.0	0.0	0.0
Used Cooking Oil Feed	41.2	1.5	10.8	14.2	33.9
Product	1.4	0.3	0.0	0.0	0.0
Brown Grease Feed	323.6	636.6	24.9	198.5	67.8
Product	7.1	10.2	0.1	0.0	0.3
Packers Tallow Feed	37.7	46.9	7.3	76.9	7.5
Product	1.2	0.3	0.1	0.0	0.1

Hydrothermal Clean Up and Biofuels ISOCONVERSION

Commercialization Efforts

Facility	Technology	Scale	Stage	Anticipated Operation
Licensee 1	HCU, BIC	2,650 BPD	Engineering Complete	2022
Licensee 2	HCU, BIC	3,000 BPD	FEL3	2022
Licensee 3	HCU, BIC	5,300 BPD	FEL2	2023

Thank You



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Montréal

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North Atlantic
(EUR/NAT) Office
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