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Bioenergy Retrofits for Europe's Industry

Co-processing in refineries – options and experiences

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BIOFIT – Fossil refineries

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Fossil refineries are large industrial complexes producing transport fuels and other products from crude oil.

94 refineries in Europe, producing 13% of world refining capacity

The European refineries see the need for a transition towards a low carbon economy through i.a.:

- CCS/CCU
- Renewable hydrogen
- Sustainable biofuels

High interest and rapid world-wide deployment

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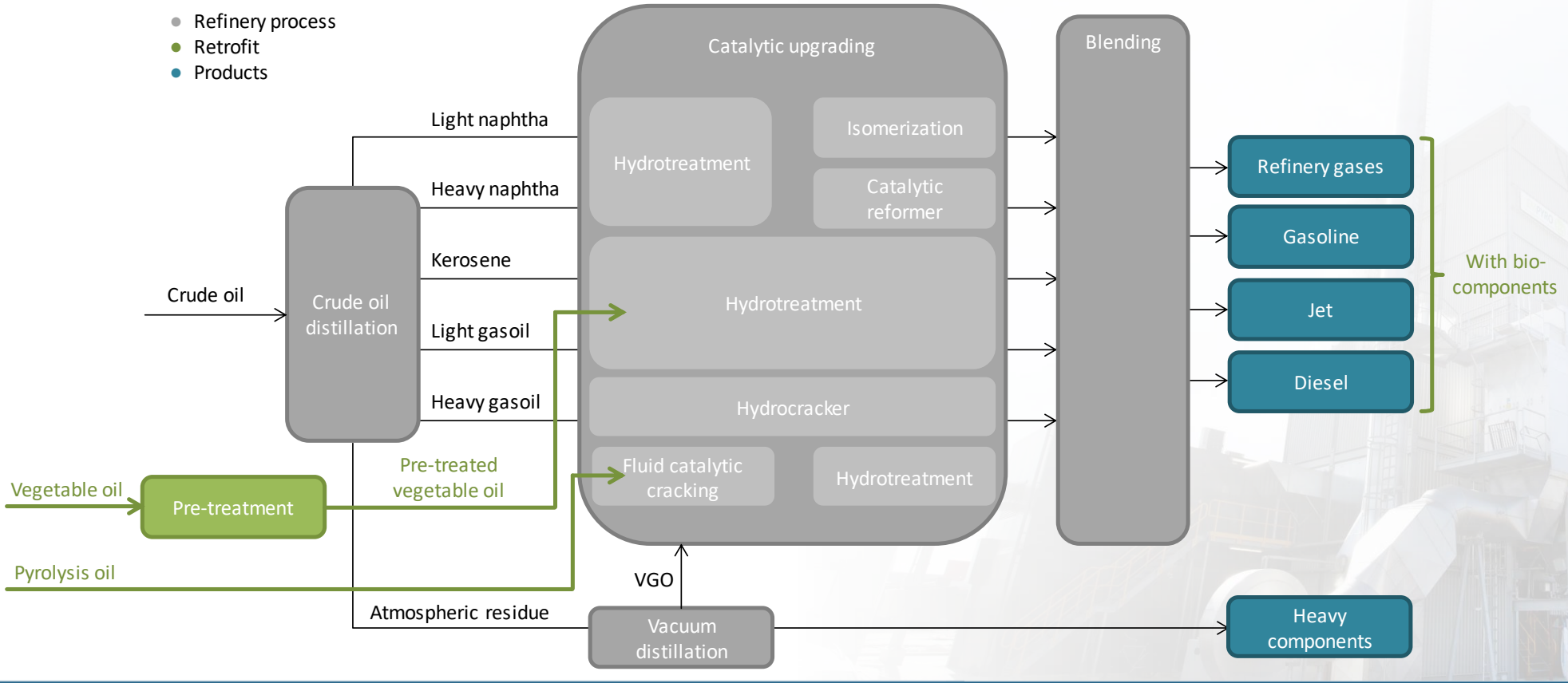
Options for retrofitting:
- HVO production – hydrogenation of renewable liquid oils such as used
- Co-feeding of intermediate bioenergy carriers such as pyrolysis oil or HTL oil



Status HVO/HEFA production in EU

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Operator	Location	Type	Status	Capacity (t/year)
PREEM	Gothenburg (Sweden)	stand-alone	Operational	100,000
ST1	Gothenburg (Sweden)	stand-alone	Planning	100,000
Sunpine	Pitea (Sweden)	stand-alone	Operational	100,000
UPM	Lappeenranta	stand-alone	Operational	100,000
UPM	Kotka (Finland)	stand-alone	planning	500,000
Neste	Porvoo (Finland)	stand-alone	Operational	580,000
Neste	Rotterdam (Netherlands)	stand-alone	Operational	1,000,000
Galp	Sines (Portugal)	stand-alone	Operational	72,000
Total operational stand-alone production				1,952,000
BP	Castellon (Spain)	Retrofit	Operational	80,000
Repsol	various (Spain)	Retrofit	Operational	200,000
Cepsa	La Rabida (Spain)	Retrofit	Operational	43,000
Cepsa	San Roque (Spain	Retrofit	Operational	43,000
ENI	Venice (Italy)	Retrofit	Operational	300,000
ENI	Gela (Italy)	Retrofit	planning	600,000
Total	La Mede (France)	Retrofit	Operational	500,000
Total operational production in refineries				666,000
Total operational capacity				2,618,000
Total operational and planned capacity				4,318,000

Status pyrolysis oil co-feeding

Preem AB has announced that production is now underway at its joint venture subsidiary Pyrocell AB's novel biomass pyrolysis plant in Gävle. Using pyrolysis technology, the pioneering plant converts sawdust into bio-oil which is then used as a bio-crude for processing into renewable fuels at Preem's Lysekil refinery (photo courtesy Preem).

Source: https://bioenergyinternational.com/biofuels-oils/pyrocell-begins-pyrolysis-oil-production

Agenda

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15:15 (1:15)	**Industry session: Refineries** - **Co-processing of biomass in refineries – options and experiences** – *Patrick Reumerman (Senior Consultant, BTG)* - **Techno-economic analysis for co-processing fast pyrolysis liquid in fossil refineries** – *Michael Talmadge (Senior research engineer, NREL)* - **Integration of HVO production in the Thessaloniki refinery of Hellenic Petroleum in Greece** – *Evanthia Nanaki (New Technologies and Innovation Researcher, Hellenic Petroleum) and Dimitris Kourkoumpas (Research Associate, CERTH)* - **Pyrolysis co-feeding to produce green transport fuel** – *Gaelle Jousset or Klaas Minsk (TOTAL Energies)* - **BIOFIT recommendations for co-feeding in refineries** – *Patrick Reumerman (Senior Consultant, BTG)*
16:30 (0:30)	**Discussion and Q&A: Refineries** – *Moderated by Patrick Reumerman (BTG)*
17:00	**End**

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Thank you!