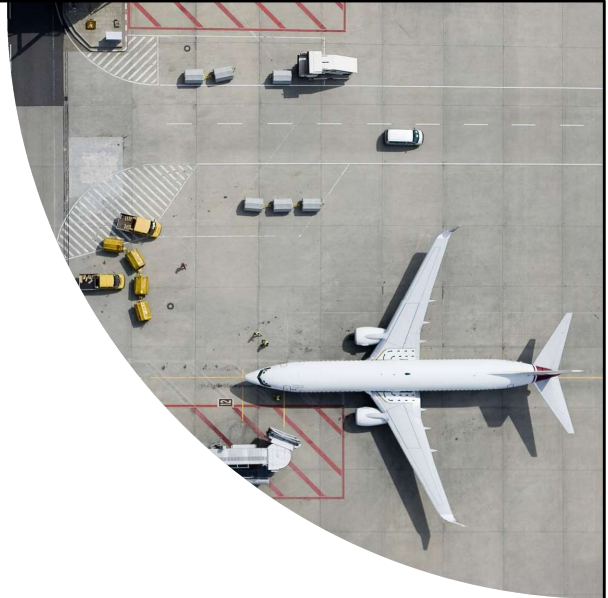


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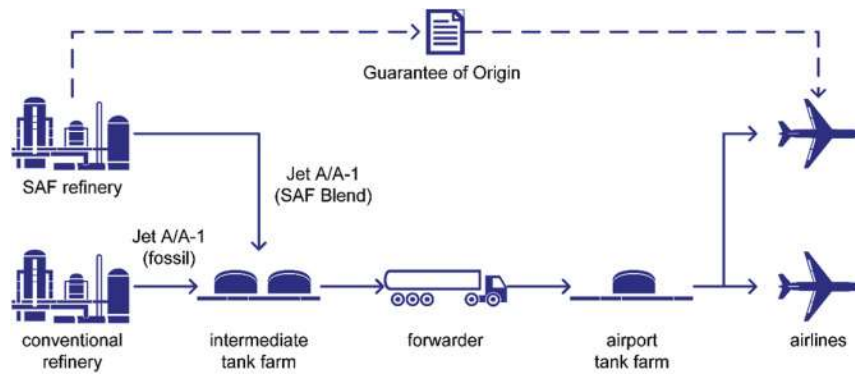
Sustainability in Air Transportation

Marie Owens-Thomsen
Chief Economist



ICAO CAAF/3 Outcome

- 5% emissions reduction in international aviation by 2030
- Strive to produce SAF “everywhere”
- Ensure that all airlines can claim SAF purchases against environmental obligations
- Necessary for achieving this outcome: a **SAF registry and accounting system**



Source: IATA Sustainability & Economics



SAF

2023 estimated share of SAF in total jet fuel consumption:

- **0.2% or 0.5 Mt**
 - HEFA

2050 minimum estimated demand for SAF:

- **500 Mt (x1000 2023 output)**
 - HEFA - Hydroprocessed Esters and Fatty Acids
 - ATJ - Alcohol to Jet
 - FT - Fischer Tropsch
 - PTL - Power to Liquid



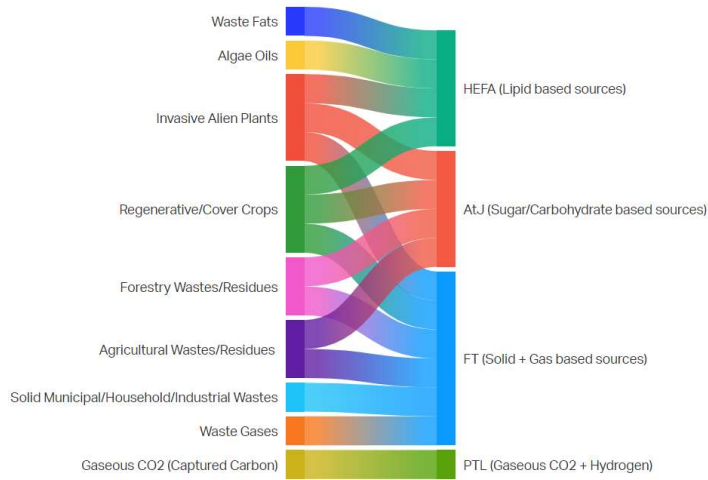
Source: IATA Sustainability & Economics, Chemistry Europe - Wiley



- According to IMF latest World Economic Outlook, world economic growth will slow from 3.5 percent in 2022 to 3 percent this year and to 2.9 percent next year, a 0.1 percentage point downgrade for 2024 from July.
- This is in spite of
 - war-disrupted energy and food markets, and
 - unprecedented monetary tightening to combat decades-high inflation.

Feedstocks to Compatible Production Technology

Feedstock Component to Pathway



Source: IATA Sustainability & Economics

Implications:

1. The feedstock informs the pathway

2. One feedstock may align with several different SAF production pathways; therefore, identifying relevant regional value chains becomes about:

a) Identifying all local viable feedstocks

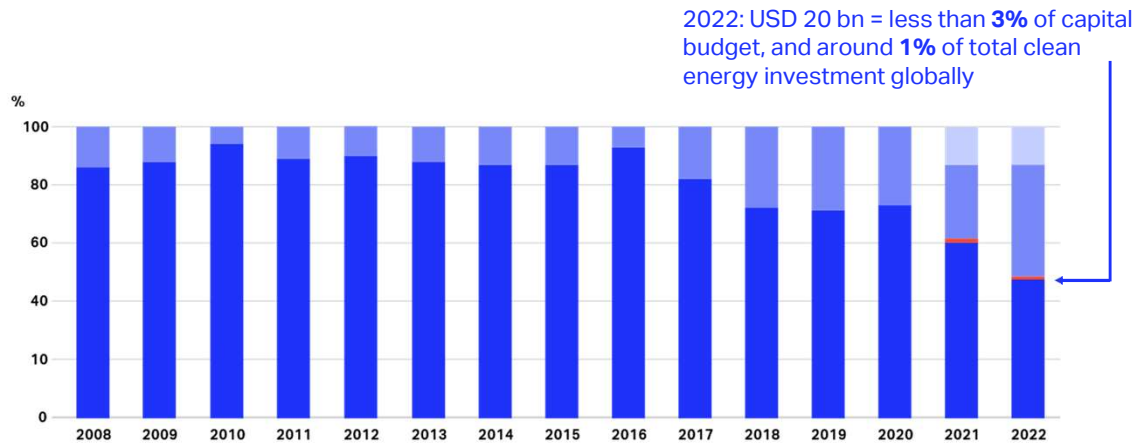
b) Assessing which pathway(s) this grouping of feedstocks align with

c) Identifying the most relevant production pathway(s) for the region, based on this combination of feedstock

d) Considering if a given SAF pathway will derive higher yields from a given feedstock, relative to another pathway using the same feedstock.



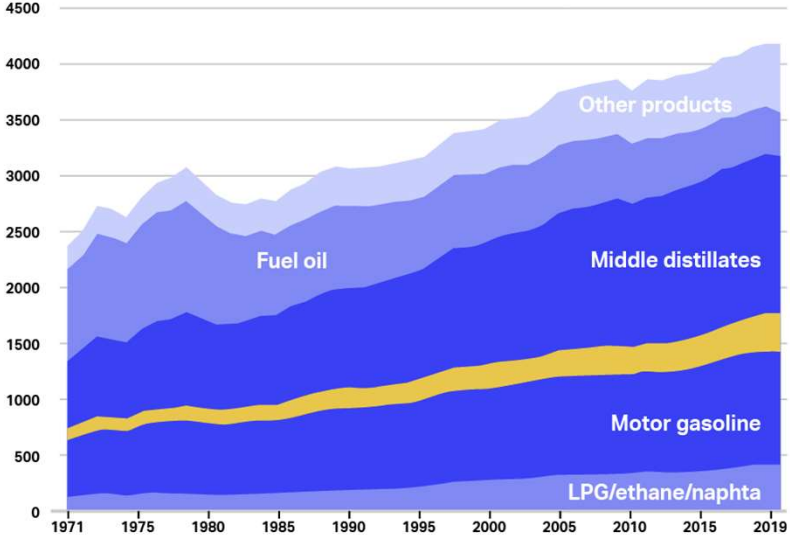
Use of revenue by oil & gas industry, 2018-2022



Source: International Energy Agency (IEA), "The Oil and Gas Industry in Net Zero Transitions", World Energy Outlook Special Report, November 2023



World refinery output by product, 1971-2019

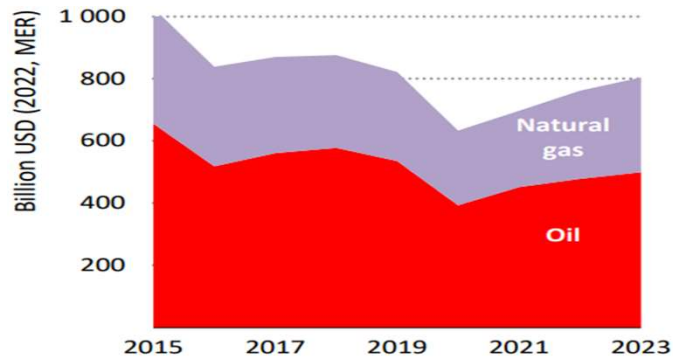


Aviation fuels

Source: IEA



Investment in oil and gas, USD billion



- USD 800 billion in oil and gas investments in 2023
- Estimated top of the range investment needs per year in air transportation's energy transition = USD 150 billion
- **One fifth or 19%** of oil and gas investments need to be redirected.

Source: International Energy Agency, "The Oil and Gas Industry in Net Zero Transitions", World Energy Outlook Special Report, December 2023.



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Questions?

