

Air Carbon Recycling for Aviation Fuel Technology

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- **Funding Programme:** H2020-EU.3.3.3. – Alternative fuels and mobile energy sources
- **Topic:** LC-SC3-RES25-2020- International cooperation with Japan for Research and Innovation on advanced biofuels and alternative renewable fuels
- **Duration:** 3 years project (Starting date: 1 May 2021)
- **Research and Innovation Action (→TRL 3)**



4AirCRAFT Partners



Advisory Panel group
Sustainable fuels producers
Refineries
Chemical industry
CO2 producers
Large consumers of long-chain hydroc
Logistics, Ports, etc.

Challenge

- Risk of not reaching the objective
- Reduction rate too slow



*In addition to substantially reducing CO₂ emissions, this will require reaching an **artificial carbon cycle**, which balance anthropogenic emissions by removing an equal amount from the atmosphere.*

Climate change & environmental degradation: an existing threat to Europe and the world

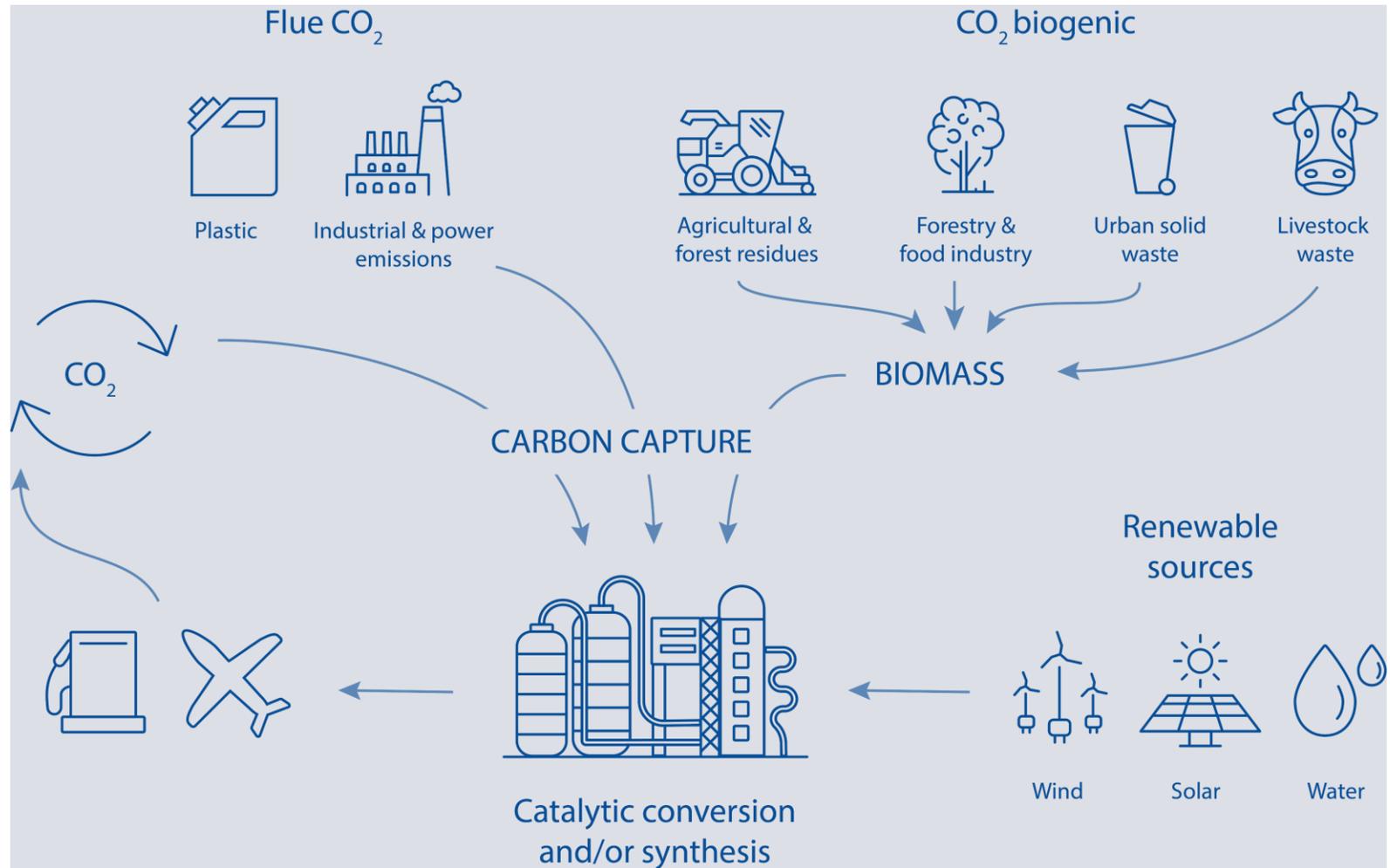
1. EU Green Deal target: carbon neutral by 2050.
2. Aviation: difficult to decarbonize -→ Worldwide strategic sector
3. Capital-intensive industry – (GHG) emissions (900 millions tons CO₂/year)
4. Air Transport Action Group (ATAG), independent coalition of members organisations and companies throughout the global air transport industry, GHG emissions reduction of at least 50% by 2050 (compared to 2005).

EU-JAPAN-BRAZIL cooperation is well positioned to lead an innovative and sustainable market, where the envisioned future growth of aviation goes hand in hand with the development of **better high energy density fuels with low or net-zero carbon footprint and low production costs.**

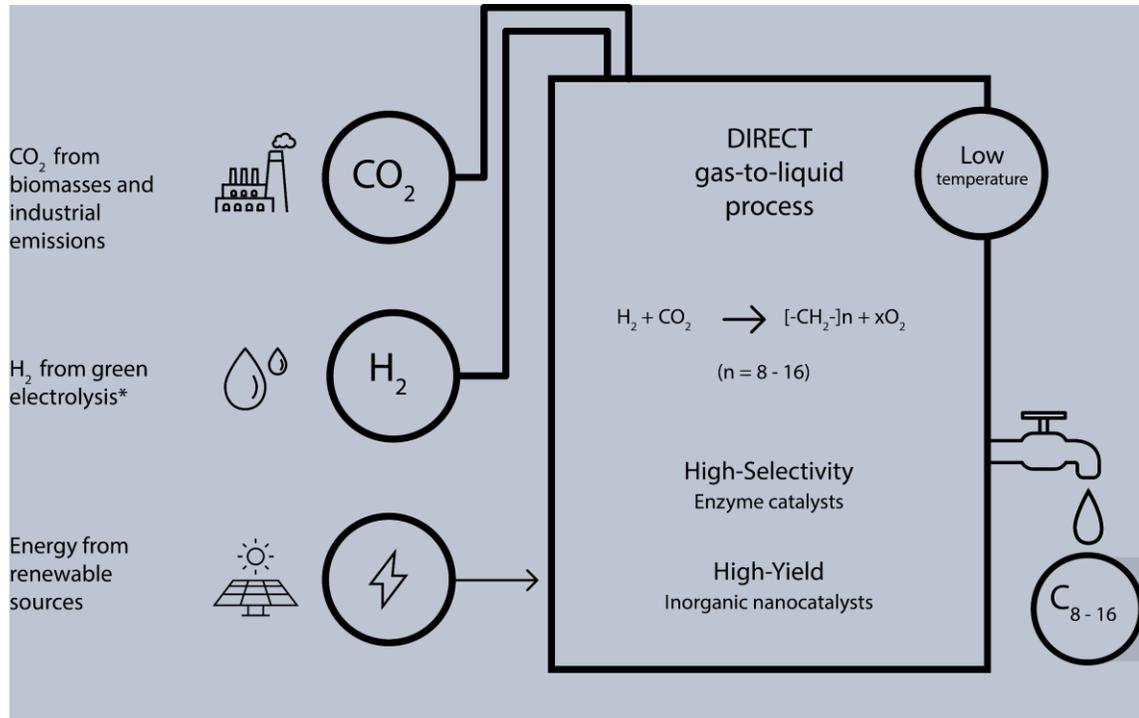
-->Opportunities: Aiming for carbon neutral production of liquid fuels



Alternative renewable fuels:
International cooperation
with Japan for Research
and Innovation



Direct CO₂ conversion into C₈-C₁₆ liquid fuels at mild conditions



- Next generation of stable and selective catalysts enabling the synthesis of sustainable jet fuel
- Process intensification
- High CO₂ conversion and selectivity towards jet fuels
- Proof-of-concept validation

Expected Impacts



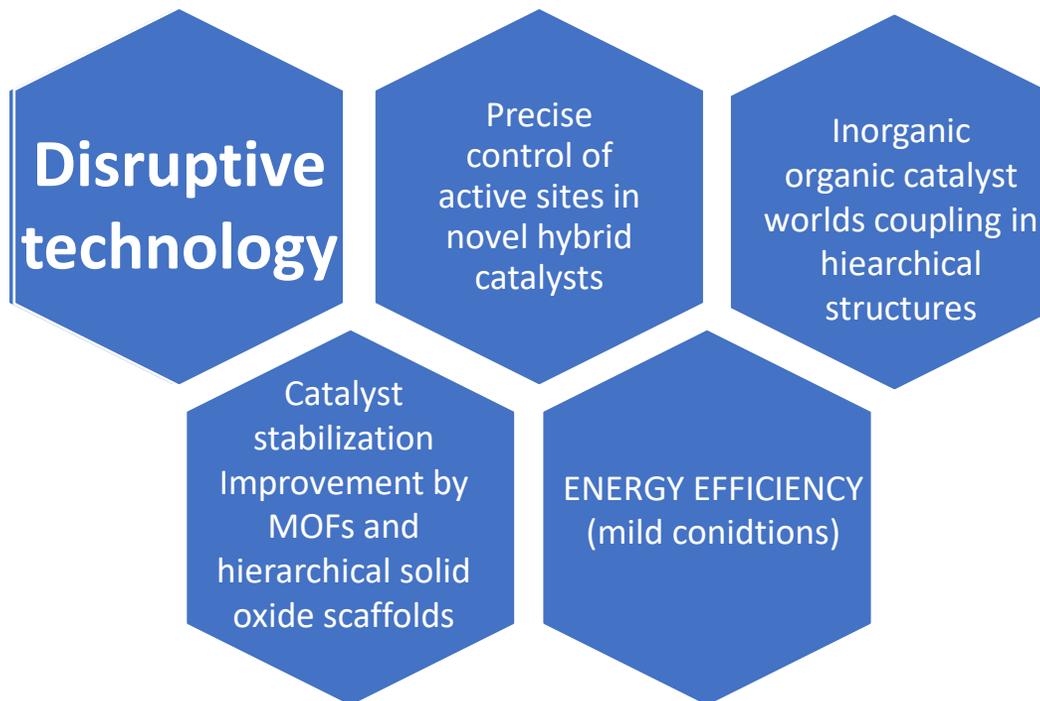
Climate targets:

40%

By 2030, 40% cut in greenhouse gas emissions compared to 1990 levels and at least 27% share of renewable energy consumption.

50%

By 2050, net aviation carbon emissions will be half of what they were in 2005.



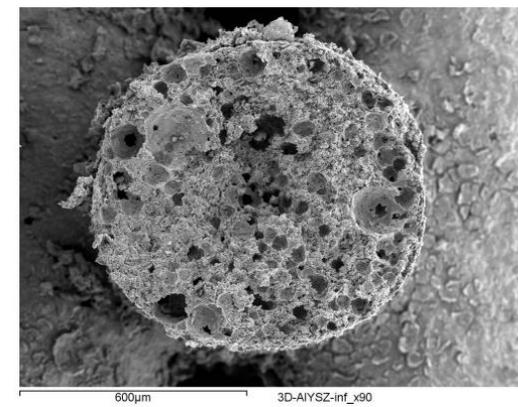
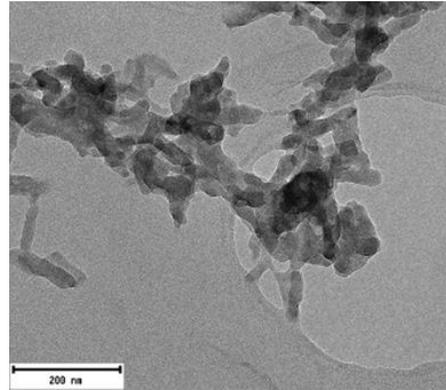
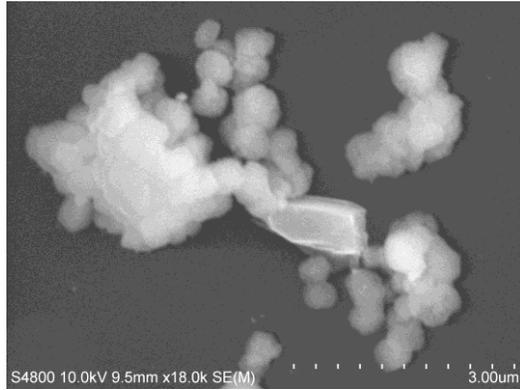
- **Scientific Workshop** (Spring 2023) – rational design and manufacturing of catalytic materials for sustainable synthesis of high density hydrocarbons.
- **Technical Workshop** (Spring 2024) – next generation of catalysts for the direct CO₂ conversion into renewable liquid fuels.

- **External advisory board! – OPEN TO NEWCOMERS!!**

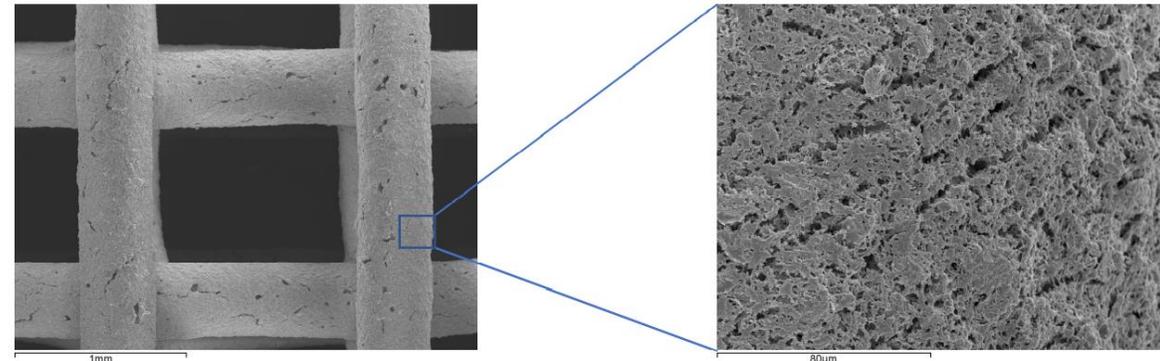
If you are part of hard-to-abate sectors, fuel certicators, CO₂ emitters, large consumers of long-chain hydrocarbons, chemical industry and sustainable fuels producers, etc...

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4AirCRAFT - Objectives



- Novel catalysts and Advanced Catalysts Carriers
- Meso-macro-structured reactors
- Structural and mechanistic investigations
- Proof of concept and Impact (LCA)



Acknowledgement



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*... and all our
Researchers and
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