

GRIMES CARBONTECH (GCT)

Use Case: Faster, Cheaper Supply of Sustainable Aviation Fuel (SAF)

The challenge: In 2021, the U.S. Department of Transportation issued the Sustainable Aviation Fuel (SAF) Grand Challenge to produce 3 billion gallons of SAF per year by 2030, with a minimum 50% reduction in greenhouse gas emissions from conventional aviation fuel. The international aviation industry went further, setting a goal to achieve zero emissions by 2050.

Most major airlines agreed to international target; however, they have had to cut back on their projections because SAF supplies are limited. Although current SAF production is expected to triple in 2024, the supply will not come close to meeting current demand, falling short of 2030 targets by 60-70%, according to the World Economic Forum (WEF).

Further inhibiting the world's ability to achieve the zero emissions target is the cost and available resources to produce SAF. Current costs for SAF produced from waste are 2-3 times that of conventional jet fuels, and supplies of the waste material used as feedstocks are extremely limited. Fuels derived from CO₂ are even more expensive – at 6-10 times the cost to produce conventional jet fuel.

GCT's proprietary carbon capture and reuse (CCR) technology is a game changer. We can convert carbon dioxide into SAF at the current cost of conventional (Jet A) aviation fuel, without the need for government subsidies.

GCT has the only economic pathway to SAF production at scale. Our proprietary production process:

- Integrates with all commercial CO₂ capture systems
- Eliminates shortage of SAF feedstock problem by using universally available CO₂
- Processes 11 tons of CO₂ per day in a single shipping-container sized unit, producing twenty barrels of SAF per day.
- Is easily scalable, with fast, modular 'plug and play' systems that can stack containers to create as much fuel capacity as is needed.
- Provides an Incredible opportunity for the US and emerging markets to produce cost-competitive, accessible fuel, with intermittent renewable electricity and without the need for grid connections
- Reduces need for hedging volatile fuel prices



Modular, flexible and distributed: GCT's carbon capture and reuse process converts captured carbon in modular, factory-built shipping containers that eliminate the need for CO₂ pipelines. The carbon capture and reuse (CCR) can be operated alone or integrated with an electrochemical process, known as Caustic Aqueous-Phase Electrochemical Reforming (or CAPER) to achieve zero-cost carbon capture.



Using waste CO₂: The CAPER system can transform emissions from the burning of fossil fuels to produce SAF that will reduce the airplane emissions by 99% per flight – or to zero when using biomass or in combination with carbon sequestration.

Low energy, liquid phase: Our carbon capture and reuse process operates at low temperatures (<90°C) and lower pressure than conventional production methods for creating the synthetic gasoline (syngas), eliminating the need for the gas-phase compression (an energy intensive process and a major cost in producing conventional syngas).

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