

# LANZAJET

ASAFA and World Bioenergy Association

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# Decarbonizing aviation to net zero

Industry consensus views  
SAF as the key driver for net  
zero aviation



Operational  
efficiency



Offsets & market  
based measures

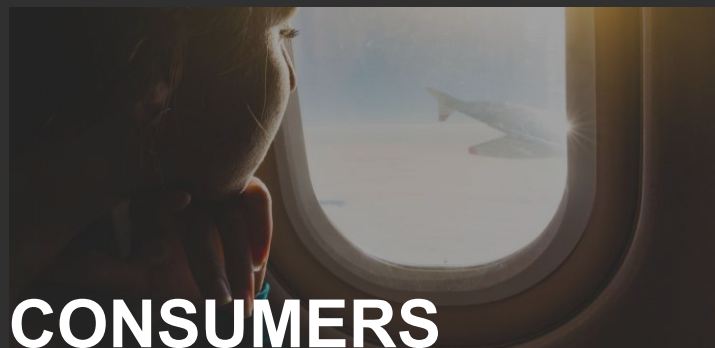
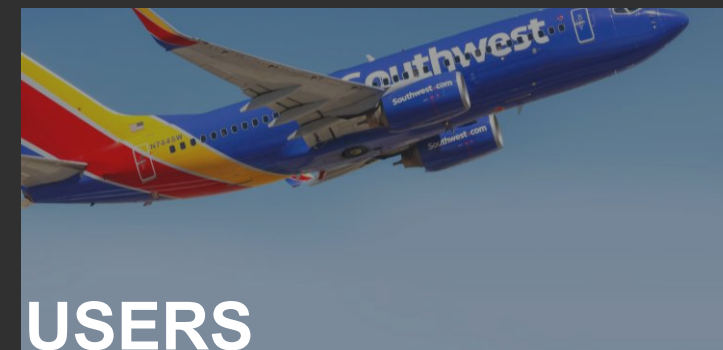
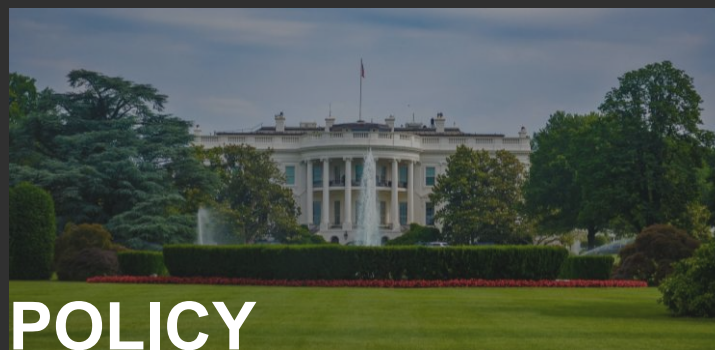


Advanced  
technology



**SAF**

# The infrastructure is developing, but there is still more to do



Unifying efforts across the value chain **will fuel a thriving SAF industry!**

# A history of leadership in SAF

## 1<sup>st</sup> TO MARKET

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Received ASTM approval in 2018 using LanzaJet ATJ data, followed by commercial flights

## BEST TECH

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14+ years of technology development now being deployed commercially

## INDUSTRY LEADERS

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Industry-leading shareholders, supporters and partners

## WORLD'S 1<sup>st</sup>

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The world's first Ethanol-to-SAF plant – fully funded, committed offtake in place for the next 10 years

## 1 BILLION+ GPY

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Projects around the world: US, EU, UK, Japan, India, Australia, New Zealand, and beyond.

## EXCELLENT ATTRIBUTES

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Significant reduction in GHG emissions, 95% reduction in particulates, increase in energy density

## WORLD-CLASS

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Building for growth and scalability with a world-class team of leaders, engineers, and innovators



# World-class funders and supporters



## Commitments from our partners

- ✓ Funding
- ✓ Commercial-scale projects
- ✓ Offtake
- ✓ Knowledge, support, and secondees
- ✓ Feedstock supply flexibility
- ✓ Technical and business innovation

# Developed over 15 years to enable commercial deployment

2010–2015



Lab Bench & Pilot

2016–2020



ASTM Approval &  
Commercial Flights

2025+



Global Technology  
Deployment

Lab Demo



2014–2016

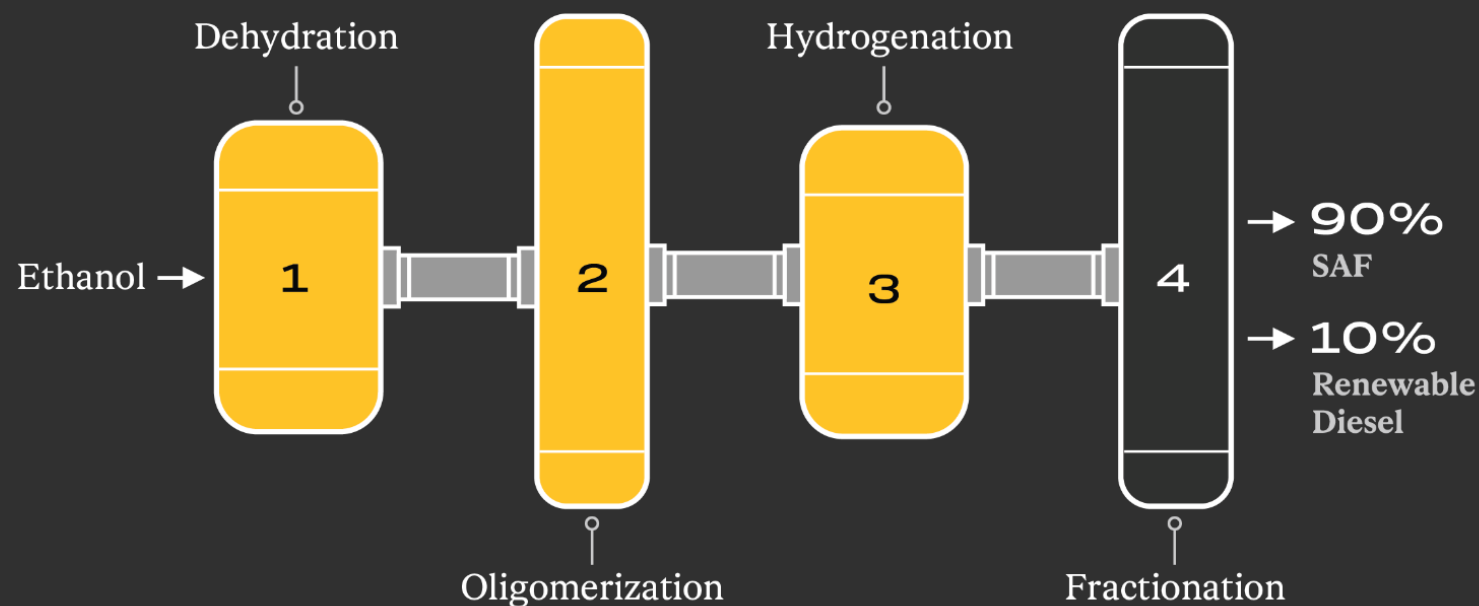
Commercial Plant



2020–2024

# Ethanol Alcohol-to-Jet (ATJ) technology

High selectivity to SAF, high  
carbon conversion, abundant  
feedstock, and platform versatility



**30B gallons of ethanol available today  
(140 million MTA)**

Leveraging & transitioning existing ethanol supply

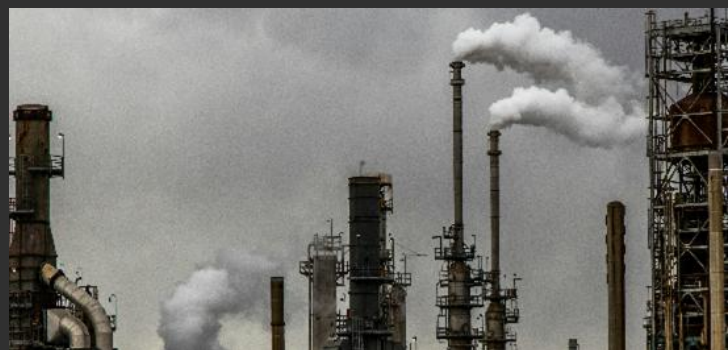
- Existing low-CI ethanol production
- Cellulosic ethanol
- Waste-based ethanol

**Unlimited potential**

Building new waste-based ethanol supply

- Industrial / landfill off-gasses
- Agricultural waste and residues
- Municipal Solid Waste (MSW)
- Corn fiber cellulose / sugarcane bagasse
- Direct Air Capture (DAC) – CO<sub>2</sub> + H<sub>2</sub>

# Powerful versatility in feedstock

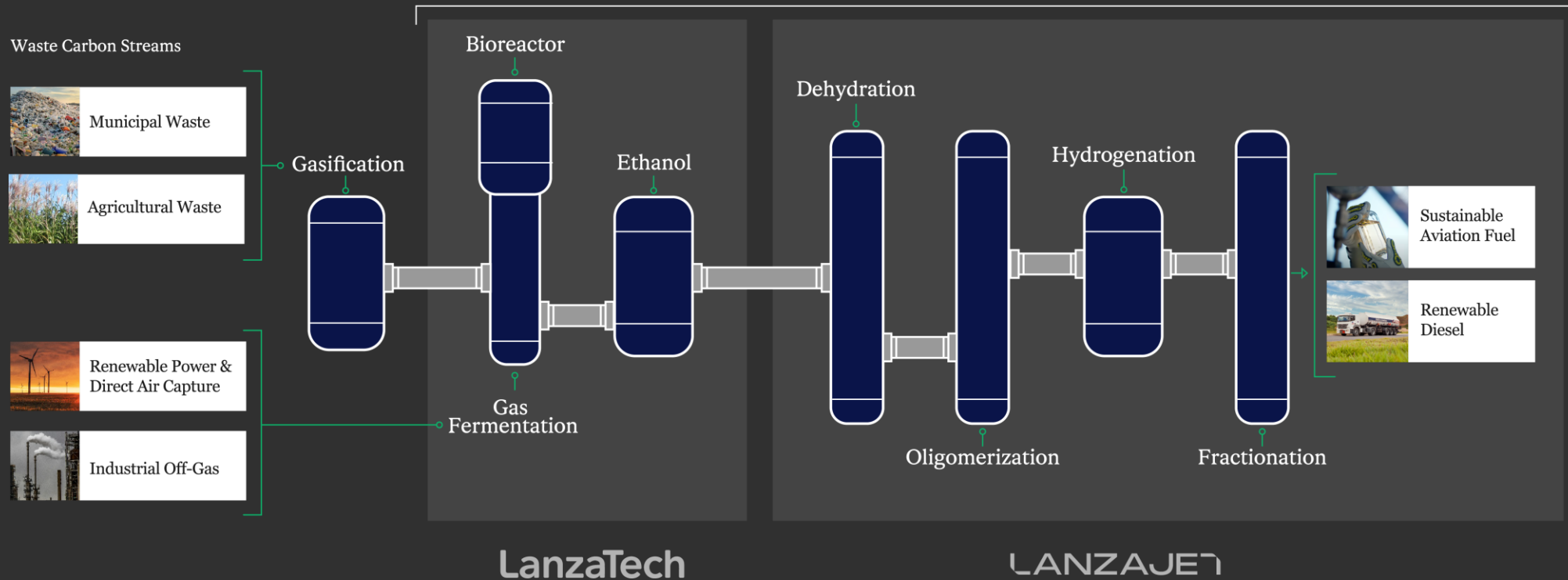


Unifying efforts across the value chain will fuel a thriving SAF industry!



# The widest range of carbon sources become drop in SAF & Renewable Diesel

## CIRCULAIR™



# ATJ has the significant potential for supply growth as others hit capacity limits

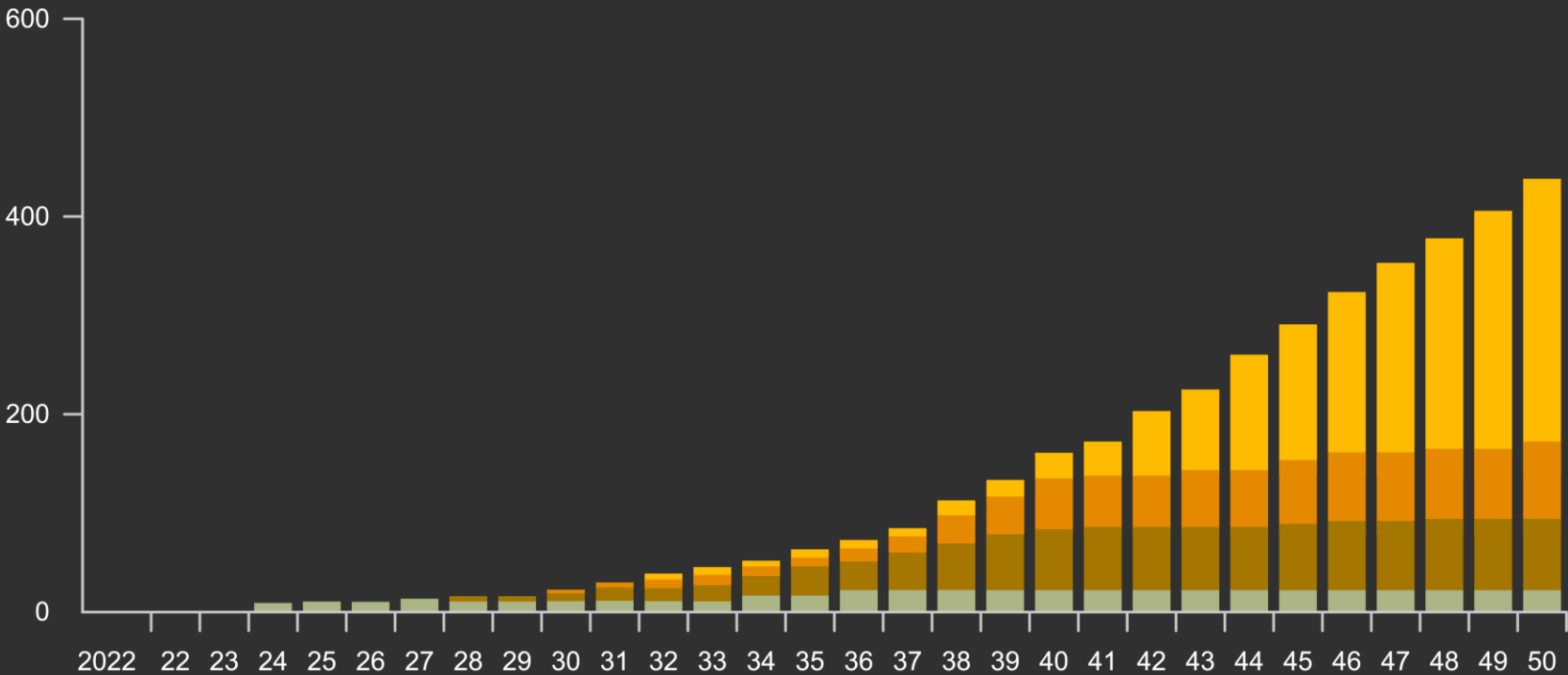
Significant portion of forecasted Gasification and PTL & DAC met with ATJ as enabling technology

## SAF PRODUCTION BY TECHNOLOGY PATHWAY (2022-2050)

MILLIONS OF TONNES

LANZAJET ILLUSTRATION

- POWER-TO-LIQUID & DIRECT AIR CAPTURE
- GASIFICATION
- ATJ
- HEFA



Source: LEK report Fueling the future of aviation (2023) with sources from Bergero et al. (2023), IATA, ATAG (2020), WEF (2021).

# Technology and execution partnership

# LANZAJET



- 15,000 employees globally
- Operates in 35 countries
- 65+ years of operation

# World's first commercial-scale demonstration ethanol-to-SAF plant



**Freedom Pines Fuels**

Soperton, GA



- The first and only SAF company to have funded and constructed a **commercial ethanol-to-SAF biorefinery**
- Located in Soperton, GA – 100 miles west of Savannah, GA
- Total SAF / RD production of 10M GPY (90% SAF / 10% RD)
- Multiple ethanol feedstocks including sugarcane ethanol, cellulosic ethanol, and waste-based ethanol



# World's first ATJ facility fully erected



**2022 DECEMBER**



**2023 MARCH**



**2024 JANUARY**

# Advancing SAF projects globally



26  
Countries

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5  
Continents

# Projects and services

● LANZAJET  
ENGAGEMENT  
GLOBALLY



# Global interest in ATJ





# Publicly announced projects



Australian Projects

## Jet Zero – North QLD

**Technology:** ATJ

**Capacity:** 113 MLPY

**Location:** Townsville, Australia

**Project Partners:** Qantas, Airbus, Queensland Government

**Enablers:** Recipient of Australian Renewable Energy Agency (ARENA) funding from the Queensland Government.

## Wagner Sustainable Fuels

**Technology:** CirculAir

**Capacity:** 113 MLPY

**Location:** Brisbane, Australia

**Project Partners:** Boeing, LanzaTech, Queensland Government

**Enablers:** ARENA Funding funding from the Queensland Government.

# Publicly announced projects



## Speedbird, UK

**Technology:** ATJ

**Capacity:** 113 MLPY

**Location:** Teesside, Wilton International

**Project Partners:** Sembcorp Utilities, British Airways

**Enablers:** Recipient of Advanced Fuel Fund from the UK Gov. SAF blending mandate and revenue certainty mechanism.

## Pūrākau, Aotearoa (NZ)

**Technology:** CirculAir

**Capacity:** 113 MLPY

**Location:** North Island, NZ

**Project Partners:** LanzaTech, Air New Zealand, New Zealand Government

**Enablers:** NZ SAF Policy will be key

# Publicly announced projects

## Indian Oil Corporation Ltd

**50:50 JV between IOCL and LanzaJet**

**Technology:** ATJ

**Capacity:** 113 MLPY

**Location:** Panipat, Haryana, India

**Project Partners:** Indian Oil Corp

**Enablers:** India considering SAF mandate



## Cosmo Oil

**Technology:** ATJ

**Capacity:** 150 MLPY

**Location:** Sakaide, Japan

**Project Partners:** Mitsui & Co.

**Enablers:** Japan's SAF target (10% by 2030).  
CapEx subsidy of 50%. OpEx subsidy of ¥30 per litre.



## Homestead

**Technology:** ATJ

**Capacity:** Larger capacity

**Location:** United States

**Project Partners:** Southwest Airlines,  
Saffire Renewables

**Enablers:** State and Federal production incentives



# With CirculAir, LanzaTech and LanzaJet's combined technologies have the greatest potential for deploying next-gen SAF, globally



Reduces greenhouse gases by at least 70% and up to carbon negative based on the type of ethanol used



Reduces sulfur emissions by 95% and significantly reduces contrail formation



Execution experience: LanzaJet is the only company in the world with a commercial ATJ plant



More efficient and targeted (fewer end products – just SAF + RD) and a high selectivity to SAF (90%)



Out joint solutions are independently proven





LanzaJet is best positioned to enable aviation's current and future needs to meet carbon reduction goals

The LanzaJet logo is displayed in a bold, white, sans-serif typeface. The letters are closely spaced, and the 'J' features a distinctive hook. The logo is centered horizontally in the upper half of the image, set against a dark gray background. To the left of the logo, a large, curved, mustard-yellow shape partially enters the frame from the top-left corner.

# LANZAJET

Someday is now.

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