ZeroAvia & Hydrogen Aviation

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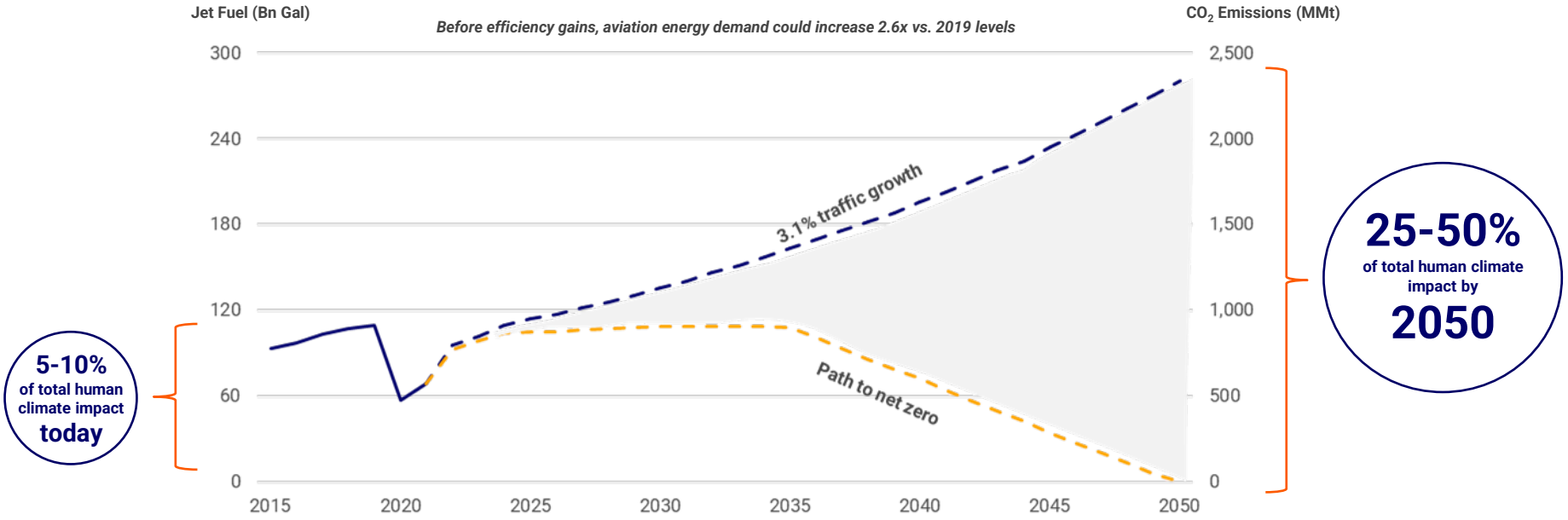
Two Problems

With GHG Emissions from Aviation Set to Soar…

Aviation has been one of the fastest growing sources of global GHG emissions… and aviation traffic is expected to more than double over the next three decades

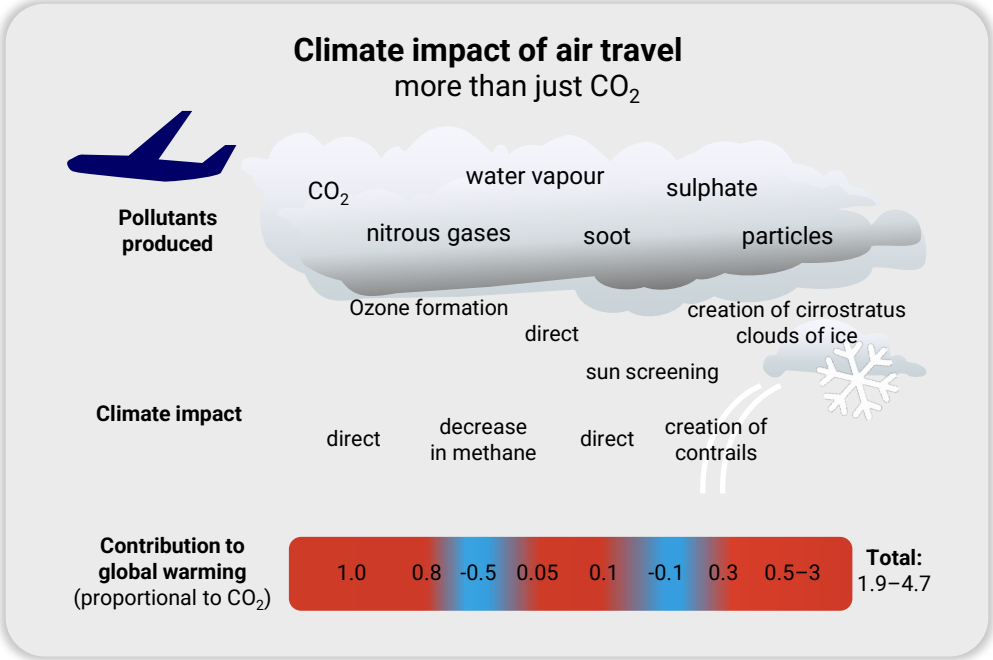


Source: Market research; analyst reports; US Energy Information Administration; Air Transport Action Group (ATAG).

The Emissions Challenge of Aviation is Not Only CO_2…

Aviation needs a solution to all emissions, not only CO_2

Two-thirds of the impact from aviation could be attributable to non-carbon dioxide emissions[1]

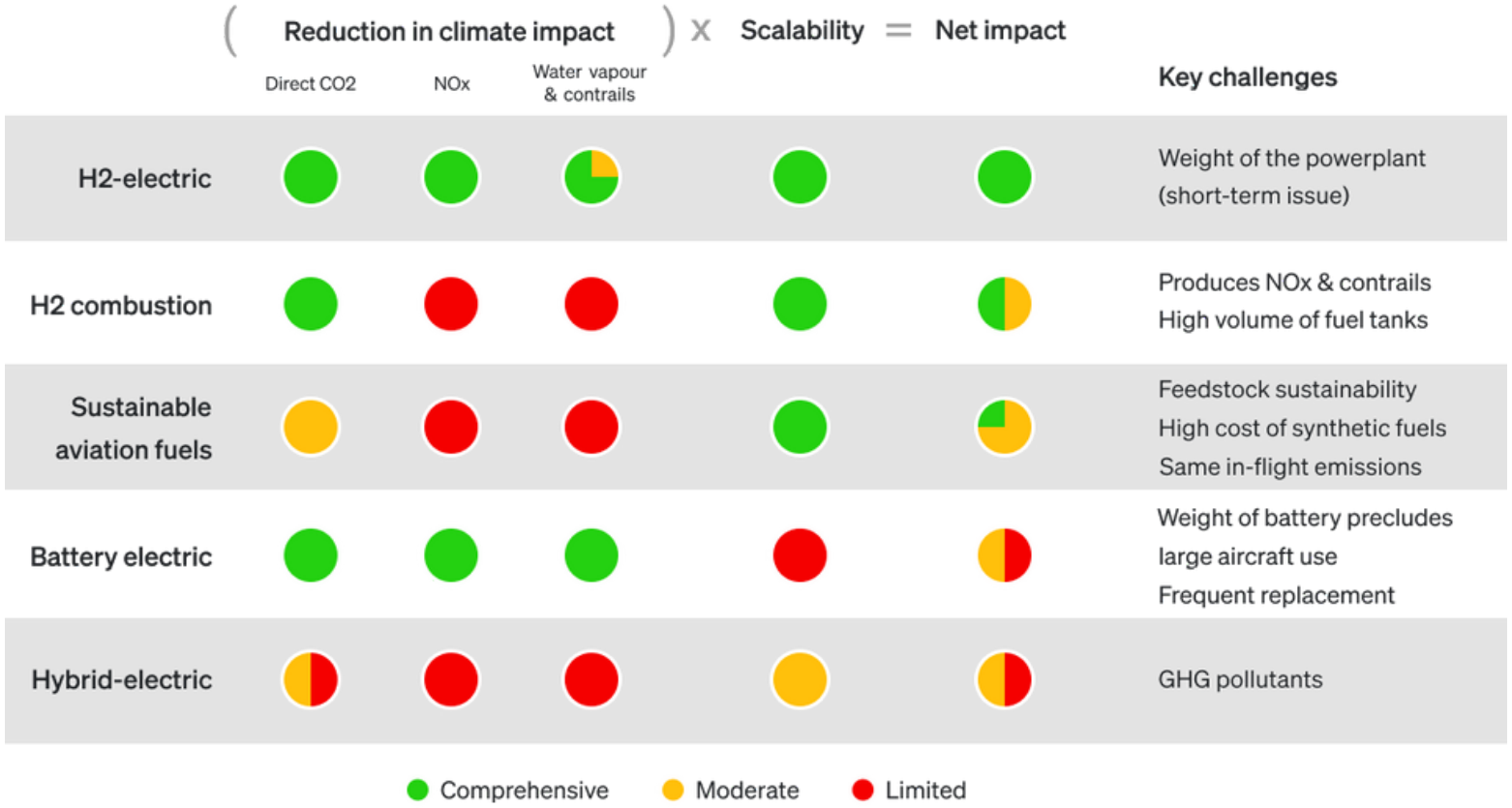


Source: The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018, Lee et al. IPCC (2007).

1. Per David Lee, Professor of Atmospheric Science at Manchester Metropolitan University and Director of its Centre for Aviation, Transport, and the Environment research group.

H_2-Electric is the Only Scalable Zero Emission Solution

ZEROAVIA



Economics reduce service to already isolated communities

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Rural America dips into its wallet as airlines drop service

At least 324 airports have seen service cuts since January 2020, and more than 14 airports have lost commercial service completely.

Lycoming County officials grapple with roots of lost airline service

Dubuque? We Don't Fly There Anymore. Airlines Say Goodbye to Regional Airports.

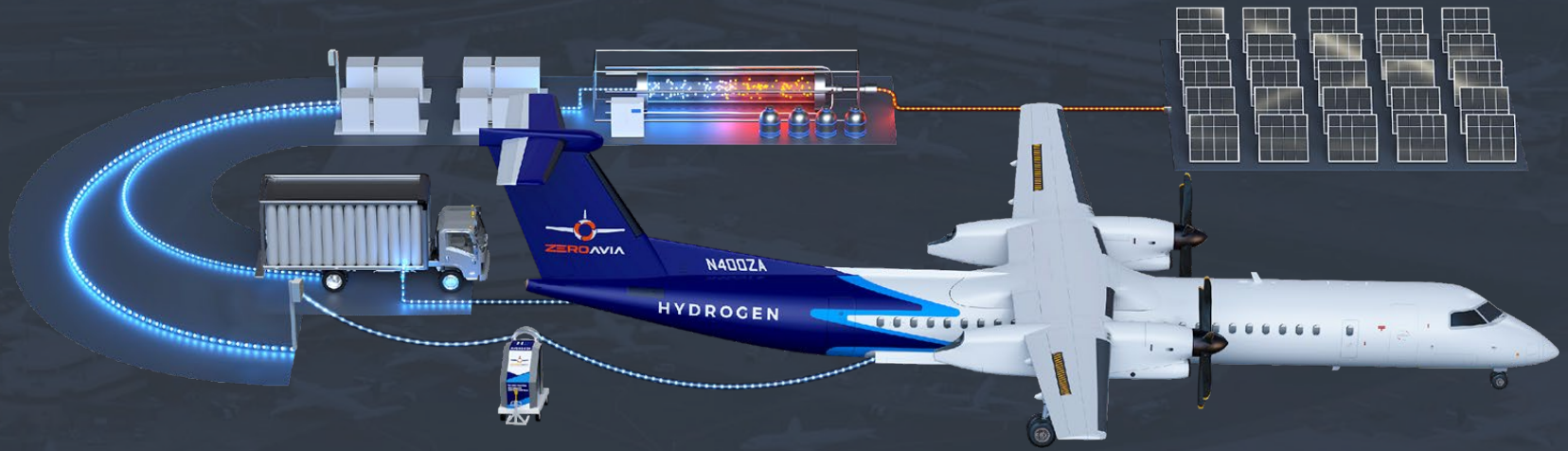
With routes slashed during pandemic, small airports are on shaky flight path

Williamsport Regional Airport boasts a new terminal and a popular cafe. What it doesn't have is commercial air service.

Our Solution

ZEROAVIA

A Hydrogen-Electric Engine in Every Aircraft

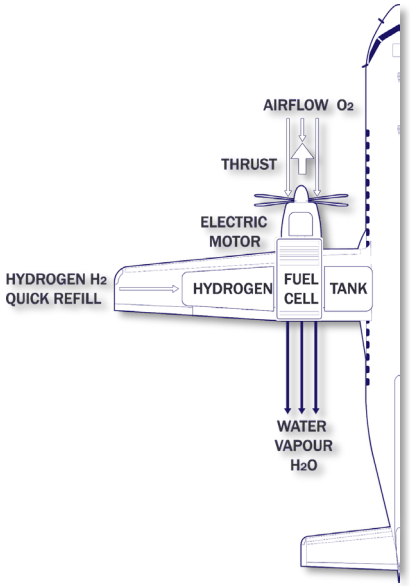


H_2-Electric Value

Replacing conventional engines with zero-emission, hydrogen-electric powertrains

H_2-Electric technology

- Fuel cell based power generation using green hydrogen and oxygen to produce electricity through a chemical reaction (no combustion)
- Electric motor for propulsion
- Water and heat are the only in-flight emissions

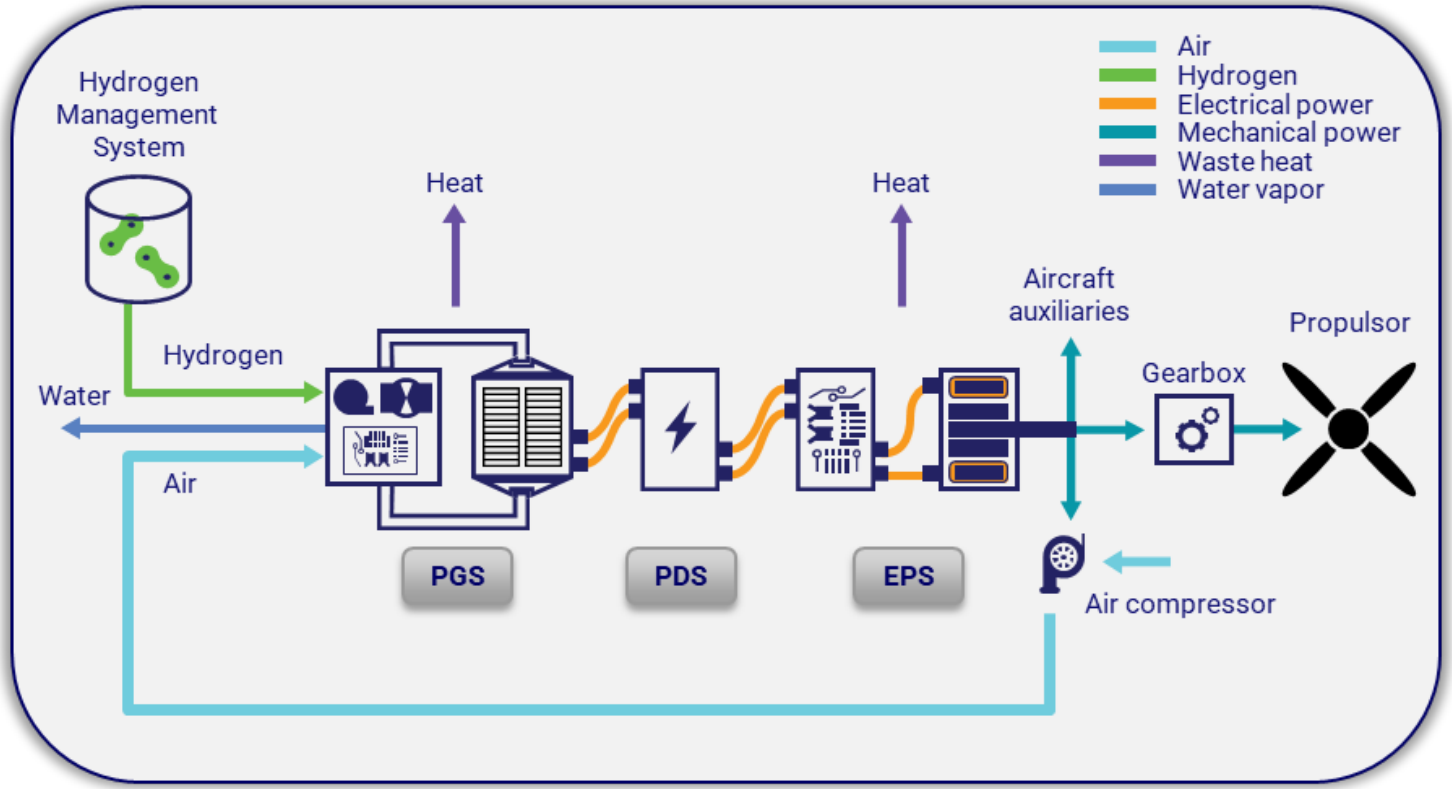


ZeroAvia's offering

- Improved economics without compromising performance or operational requirements
  - Fuel and maintenance costs reduction of up to c. 40%[1]
  - Up to 90% lower life cycle emissions[2]
- Retrofit and linefit certified airframes simplifies the certification process and reduces time to market
- Power-by-the-hour revenue and maintenance model de-risks adoption for customers

1. Note: Based on ZA600 product compared to conventional turboprop (EIS 2024). Operating cost analysis assumes a carbon tax of $100 per ton and annual utilization of 1,000 flight hours and 1,500 flight cycles.
2. Note: Based on ZA600 product compared to conventional turboprop. Life-cycle analysis includes production, use and recycling.

ZeroAvia Nose-to-Tail Hydrogen-Electric I.P.



The story so far

2018

2019

2020

2021

2022

January 2023: ZeroAvia Makes Aviation History

On Jan 19, 2023 ZeroAvia made aviation history, flying world's largest aircraft powered with an H_2-Electric engine, validating technology. Since then, we have completed our 10-flight test campaign.

Dornier-228 Test Flight Program

Q1 2023: Core Tech Development

HyperCore

- 20,000 RPM architecture to achieve record power densities
- 1->5MW modular power for regional aircraft

High Temp Fuel Cells

- World-first pressurized HTPEM FC achieving record-breaking power density
- Unlocks large turboprop, regional jet, and narrowbody aircraft

May 2023: Alaska, ZeroAvia developing largest zero-emission aircraft

ZeroAvia unveils world's most advanced electric motor technology for aviation, paving way for hydrogen-electric engines for Dash 8 and similar airframes

H2-Electric Will Work for All Types of Airframes

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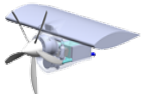
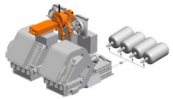
	2025	2027		2029	2032+
					
	ZA600	**ZA600b - eVTOL**	**ZA2000**	**ZA2000RJ**	**ZA10000**
Shaft power	500-750 kW	100-750 kW	2-4 MW	5+ MW	10+ MW
PAX	10 - 20 seats	2 – 15 seats	30 - 90 seats	30 - 90 seats	100 - 200 seats
Range	up to 500nm	Up to 300nm	up to 1,000nm	up to 1,000nm	up to 3,000nm
H_2 storage	Gas	Gas or Liquid	Liquid	Liquid	Liquid
Fuel cell technology	LTPEM	HTPEM	Next generation LTPEM / HTPEM	HTPEM	HTPEM
Current # of engines in circulation	78k	38k heli + 100k eVTOL	12k	8k + 46k[1]	34k
Retrofit/linefit	Retrofit & linefit	Retrofit & new design	Retrofit & linefit	Retrofit & linefit	Retrofit & linefit
Airframes (illustrative selection)	 D228  Cessna Caravan  Twin Otter  Otto 500L+	 PA-890  	 Dash 8-400  ATR 72  EMB NGTP	 CRJ700  E170	 A320  Boeing 737  A220

ZeroAvia Infrastructure Approach

We Anticipate 2 ½ Approaches to H2-Enabled Airports

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Plug and play

Hydrant method

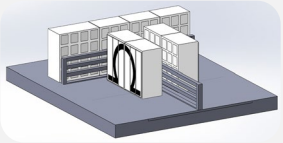
Bowser developed includes integrated storage and distribution

Some locations will be better served by large centralised hydrogen production hubs utilizing last mile delivery solutions.

Distributed production

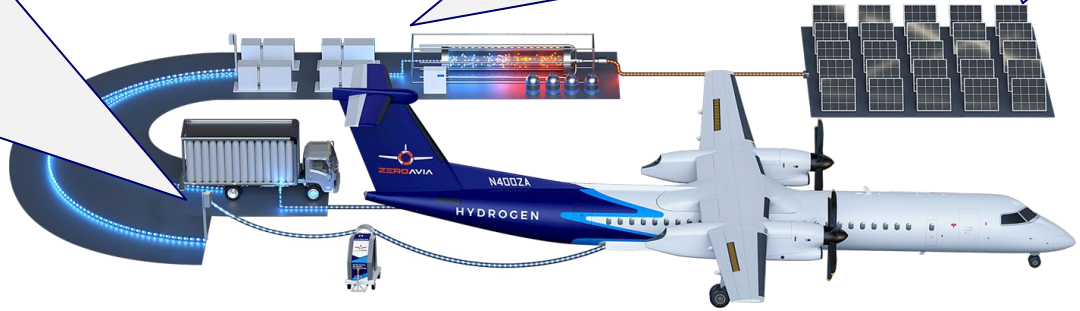
Smart power management software

Energy storage solutions



H_2 production

Onsite/near renewable power production



Significant Progress Made in 2022 with New Infrastructure Projects and Partner Developments

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Airside Refueler

Design, build and installation of a hydrogen airside refueller in Kemble

MSD UK

Mobile storage and dispensing truck to be certified for use on airports and UK roads. Sister project with Shell as technology partners in California.

Hollister H_3

The development of a full hydrogen airport refueling ecosystem (HARE) in Hollister, CA.

Protocols

Working with SAE International and EUROCAE to develop hydrogen protocols and standards for use in Aviation; member and task chair SAFSG

LH_2

Pre-feasibility work completed to develop onsite pilot for liquid hydrogen

Partners

Edmonton
Glasgow
Rotterdam
ADP
Mojave
Tees Valley
Fortun
Exolum

Shell
ZEV-Station
Enapter
Prodrive
Persee
ERM

Overview of commercial activities

H2 Aviation in Alaska

Selection of Alaska turboprop networks

Ravn Alaska

In the Southeast

Cessna Caravan Air Excursion network

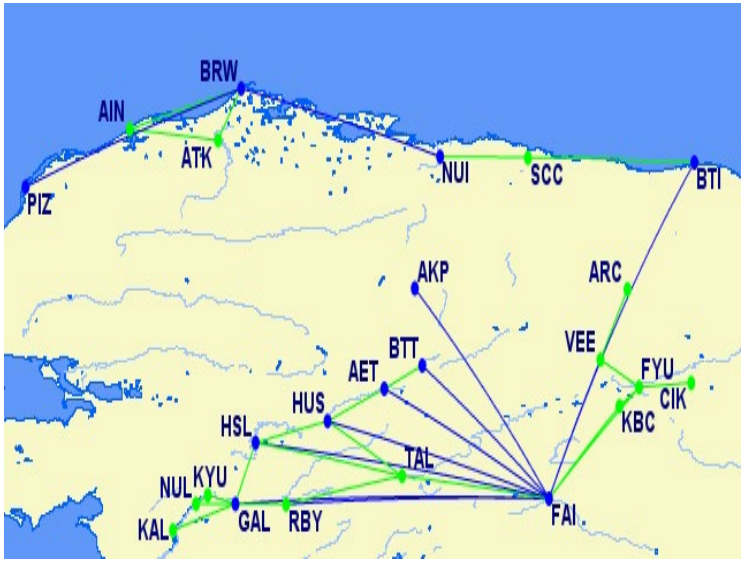
Key <125nm >125nm

Cessna Caravan Alaska Seaplane network

In the North

Cessna Caravan Bering Air network

Cessna Caravan Wright Air Service network



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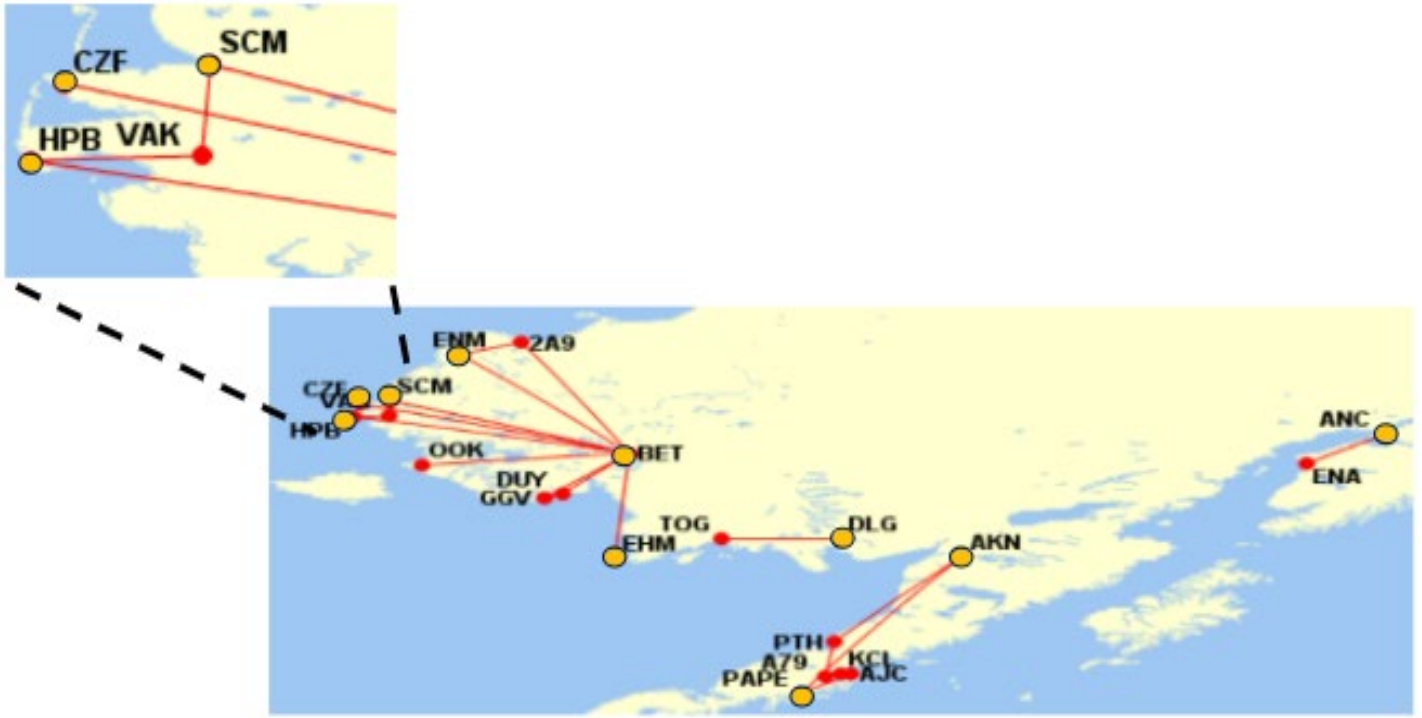
In the West

Grant Aviation Cessna Caravan network



Investors and Partners

Supported by Top Partners ($150m+ raised)

ZEROAVIA

ESG Investors

APVentures
ADVANCE & PIONEER

Breakthrough Energy

THE ECOSYSTEM INTEGRITY FUND

HorizonsVentures 维港投资

SUMMAEQUITY

SYSTEMIQ

Strategic Investors

amazon

Alaska AIRLINES

BRITISH AIRWAYS

American Airlines

UNITED

Government

Department for Business, Energy & Industrial Strategy

Department for Transport

AEROSPACE TECHNOLOGY INSTITUTE

UKRI Innovate UK

Washington State Department of Commerce

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Commercial Agreements & Partnerships

ZEROAVIA

~1,000 engines under agreement; pipeline of 2,000+ engines

Customers

American Airlines · United · Alaska Airlines · IAG International Airlines Group · Monte · ASL Airlines Ireland · Rose Cay

Airframe OEM partners

Cessna Beechcraft by Textron Aviation · MHI RJ · DH Canada · HAL

Strategic technology partners

H_2 producers	Logistics / refueling	Airports	Powertrain partners
Enapter · ohmium · Shell · octopus energy · ZEV Station	ZEV Station · Shell	Schiphol Group · EIA Edmonton International Airport · Rotterdam The Hague Airport	hypoint · HYZON · PowerCell · prodrive

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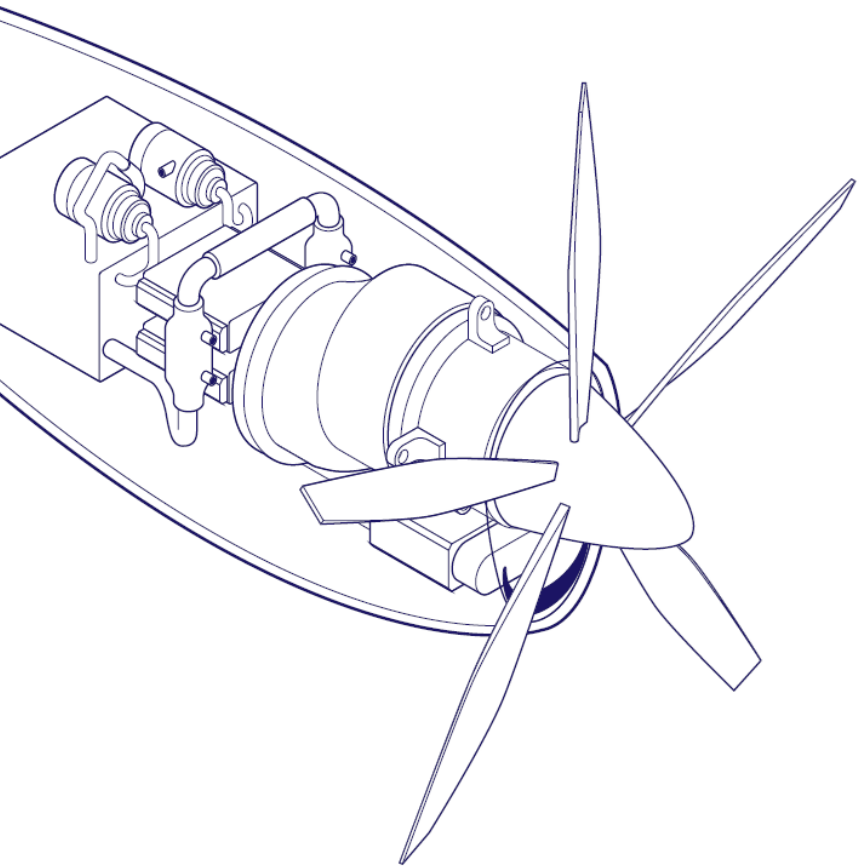

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