ZEROAVIA

The First Practical Zero Emission Aviation Powertrain

Q4 2021

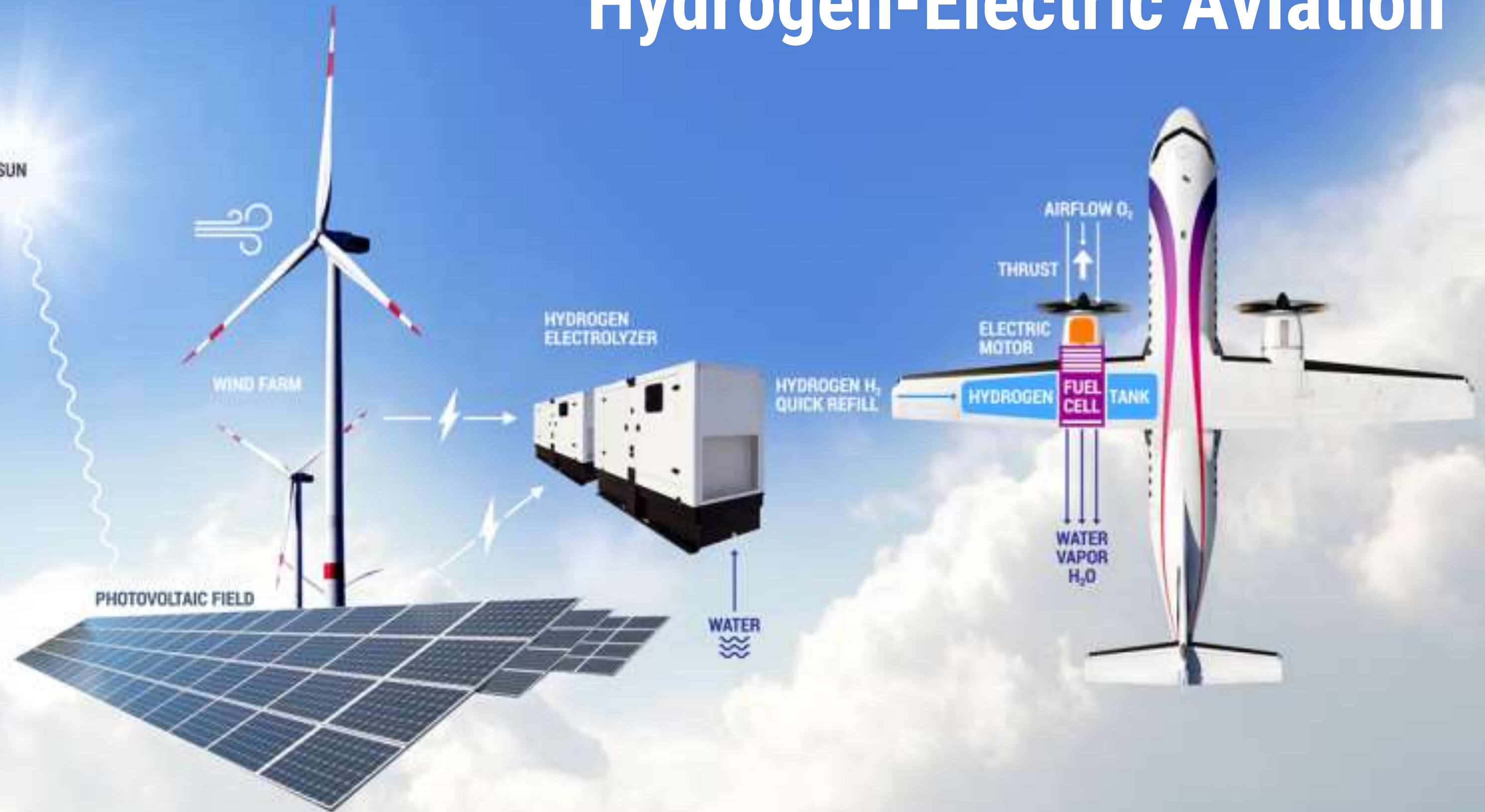
H2-Electric is the Only Scalable Zero Emission Solution

	Reduction in Climate Impact				Technology Scalability	Net Impact	Key Challenges
	Direct CO_2	NO_x	Water vapour & contrails	**Total**			
Battery Electric							• Weight of battery precludes large aircraft use • Frequent replacement
Hybrid-Electric							• GHG pollutants
Sustainable Aviation Fuels							• Feedstock sustainability • High cost of synthetic fuels • Same in-flight emissions
H_2 Combustion							• Produces NO_x & contrails • High volume of fuel tanks
H_2 Electric							• Weight of the powerplant (short-term issue)

● Complete ● Moderate ● Limited

Source: market research; analyst reports

Our Vision: Renewably-Powered Hydrogen-Electric Aviation



Long range, Lower costs & Zero Emission

Why H2-Electric Will Be Better than Jet Turbines

H2-electric powertrains will not only be clean but also a fundamentally better product for everyone

	Jet Turbine	ZeroAvia H2-Electric
Lower & stable fuel costs	$2 / gallon for large operators, up to $4 / gallon for small; hedging is a big cost item	Green H2 projects are at $3 / kg today, equivalent to $1.5 / gallon jet fuel for small planes, with path to <$1 / gallon for large planes in 15-20 years; fuel source much more secure (e.g., PV), stable prices
Lower maintenance costs	Small turbines: 1,800 - 3,600 hours to major MX / overhaul; large: 4,000 - 7,000	Electric side of the powertrain can have 10x lower MX cost; Fuel cells already at 10,000+ hours, 20,000+ achievable for HTPEM
Lower noise levels	High-speed jet exhaust major source of noise	Only propulsor noise remains; can be further tuned exploiting wider power bands of e-motors
More efficient airframes	Thermodynamics drives need for smallest number of large engines - not aero-efficient	Much lower efficiency penalty for smaller engines allows more distributed propulsion & higher aero-efficiency

All Segments, Starting With 500-mile 10-20 Seats

2024 - First commercial offering

- 10-20 seats
- 500 mile range

2026

- 50-100 seats
- UAM

2030

- 100-200 seats
- 3,000 nm

R&D roadmap

6-seater prototypes; world's first on-airport H2 fueling setup
2 aircraft - FAA and CAA experimental certificates
Secured $40M+ in UK grant programs, $30M private investment

R&D 19-seater flights & certifiable design
2021-2022

Certification of ZA600 for commercial 9-19-seat ops
2022 - 2024

Hydrogen-Electric flight in 2020

Historic flight on Sep 24, 2020

Commercial Systems in Ground and Flight Testing in 2021/2

10-20 Seat Engines

Q4 2020: design work (complete)

July 2021: 500+ kW ground tests (complete)

Q4 2021: H2 hybrid flight (one side)

2022: H2-only flights

2022-23: Certification

2024: Market introduction

40-80 Seat Engines

2H 2021: prelim design of propulsion system (complete)

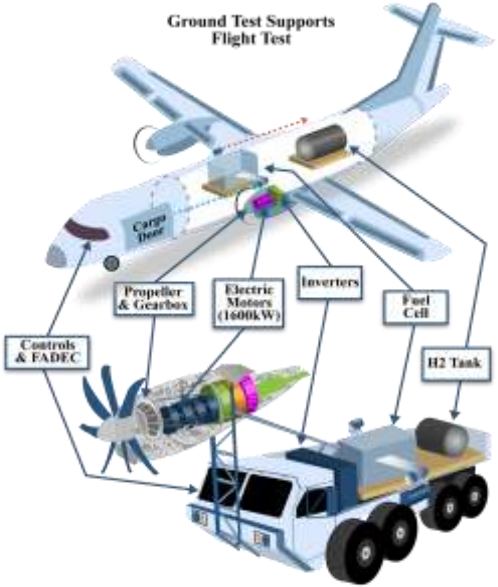
1H ‘22: full power component ground tests

2H ‘22: 1.8MW full power ground thrust tests

2023: flight tests

2024-26: Certification

2026: Market introduction



ZeroAvia HARE (H2 Airport Refueling Ecosystem)

On / Near-site Renewables

On-site Electrolysis

On-site storage & mobile airport refueling

Hydrogen fueling support for multi-modal transport

ZEROAVIA

Thank You!

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