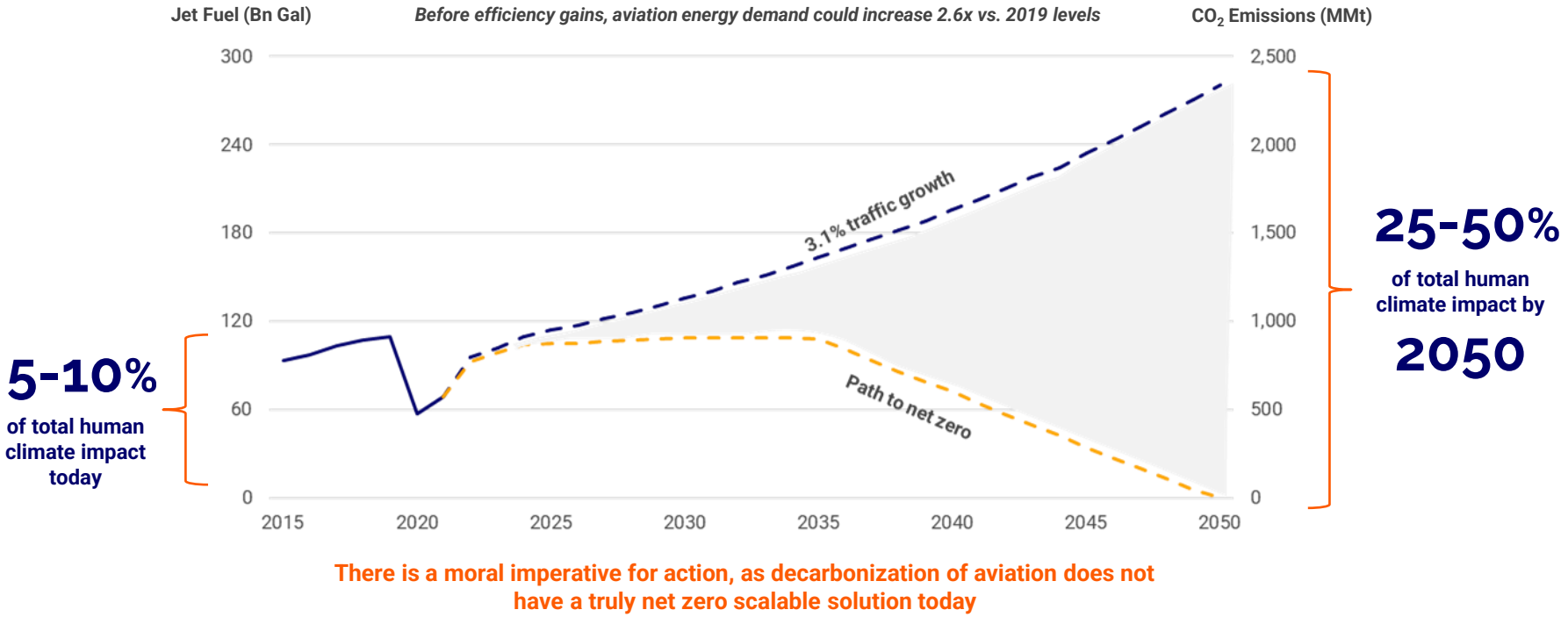
The Greenprint for a Clean Future of Flight

Dominic Weeks
Head of External Affairs, ZeroAvia July 11th, 2024

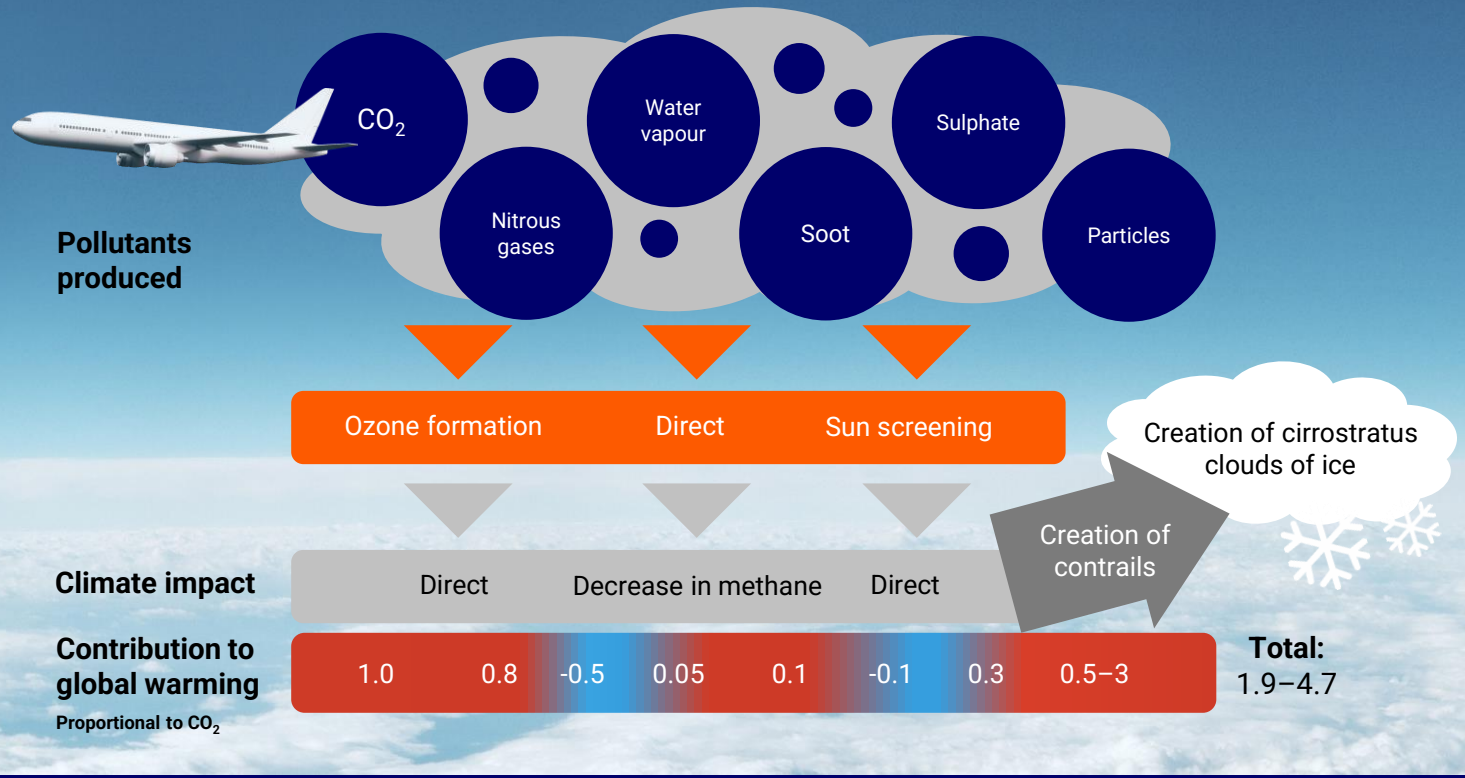


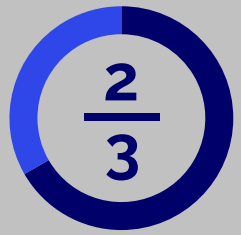
There is a moral imperative for action, as decarbonization of aviation does not have a truly net zero scalable solution today

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).





Two-thirds of the impact from aviation is attributed to non-carbon dioxide emissions[1]

Climate impact of air travel more than just CO_2

Aviation needs a solution to all emissions, not only CO_2

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.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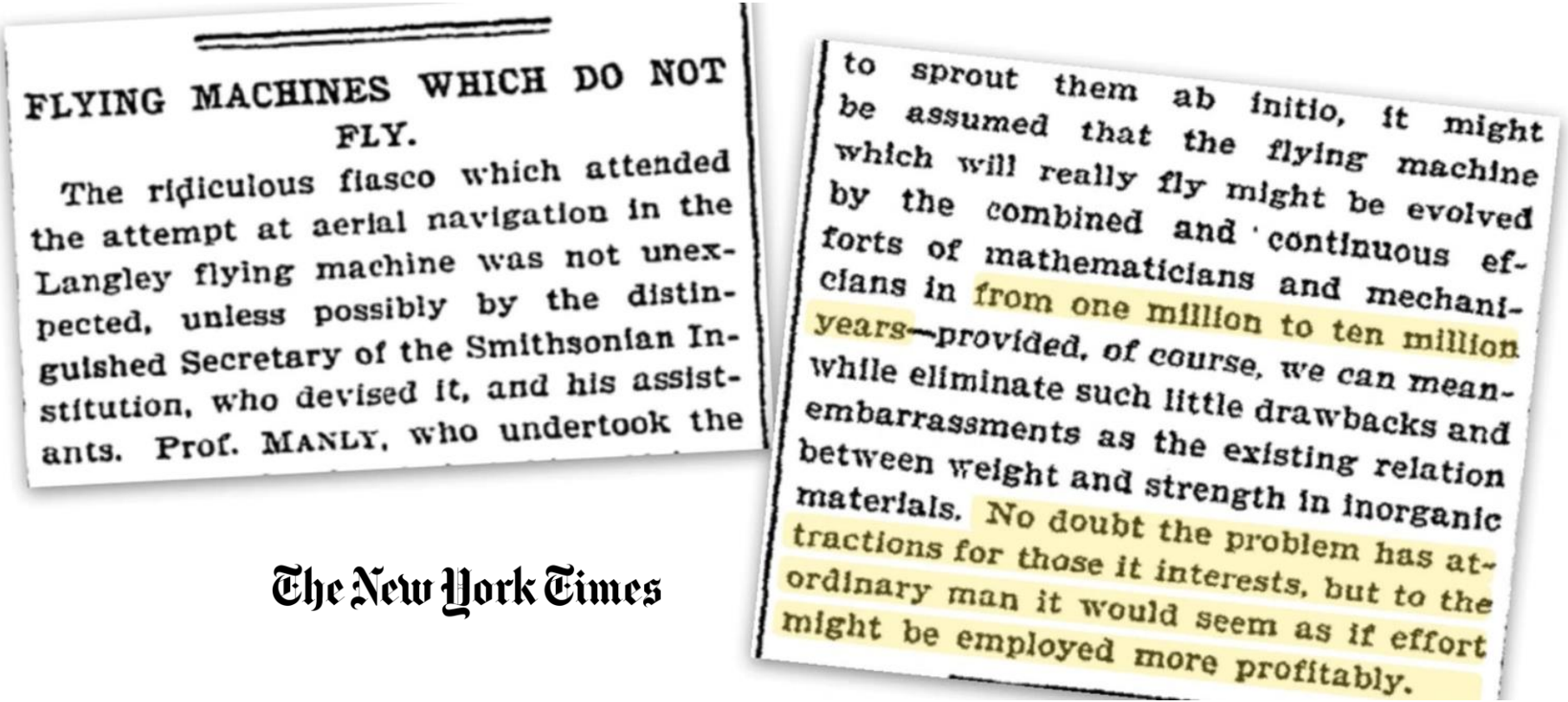
The Impossible Dream?



FLYING MACHINES WHICH DO NOT FLY.

The ridiculous fiasco which attended the attempt at aerial navigation in the Langley flying machine was not unexpected, unless possibly by the distinguished Secretary of the Smithsonian Institution, who devised it, and his assistants. Prof. MANLY, who undertook the

The New York Times

to sprout them ab initio, it might be assumed that the flying machine which will really fly might be evolved by the combined and continuous efforts of mathematicians and mechanicians in from one million to ten million years—provided, of course, we can meanwhile eliminate such little drawbacks and embarrassments as the existing relation between weight and strength in inorganic materials. No doubt the problem has attractions for those it interests, but to the ordinary man it would seem as if effort might be employed more profitably.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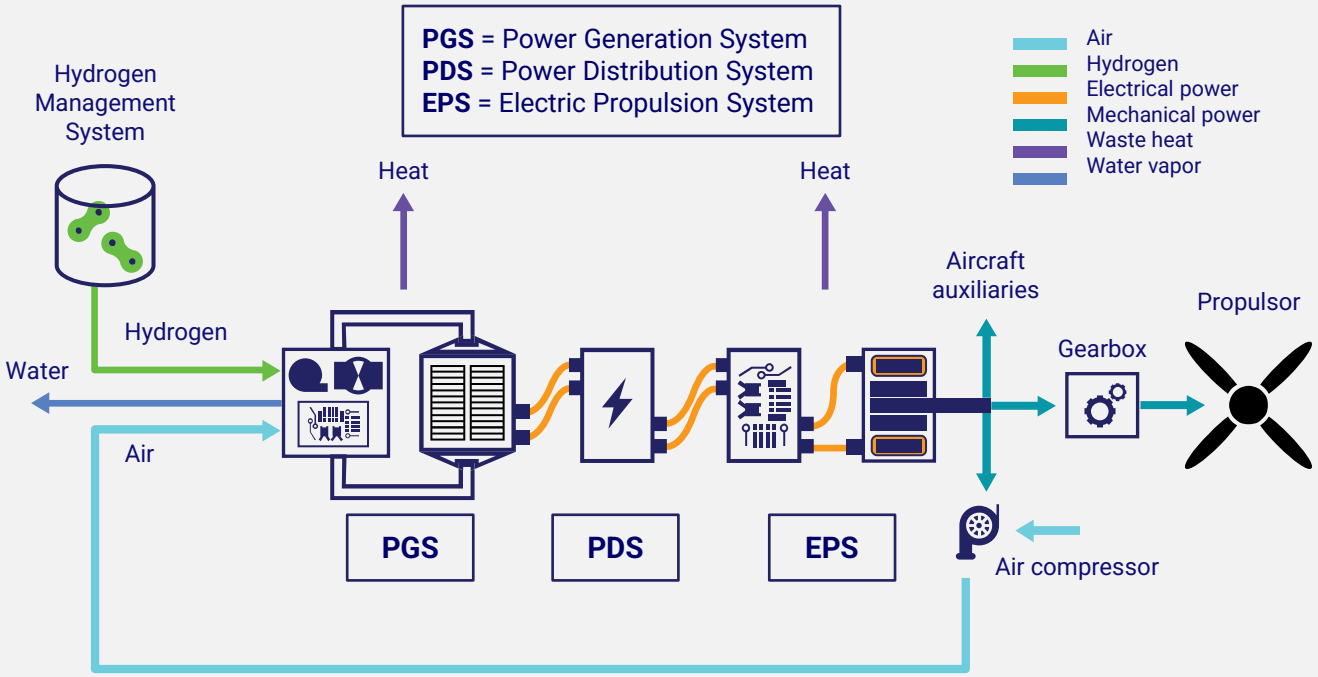
The Solution

Hydrogen-electric propulsion – the most environmentally friendly and economically attractive solution to aviation's growing climate change impact

	Climate impact	Technology scalability	Operating cost	Solution Viability	Key challenges
H_2-Electric					• Weight of the powertrain • Higher volume fuel tanks
H_2 Combustion					• Higher non-CO_2 climate impact than fossil fuels • Even higher volume fuel tanks required
Battery-Electric					• Battery weight limits to small aircraft / ranges • Aircraft cycles leads replacements • Long recharging times
Sustainable Aviation Fuels (SAF)					• Bio feedstock sustainability • High cost of synthetic fuels • Same in-flight emissions
Hybrid-Electric					• Small incremental impact (10-20% max) on both economics and climate

H2-Electric is the Only Scalable Zero Emission Solution

Source: Market research; analyst reports.



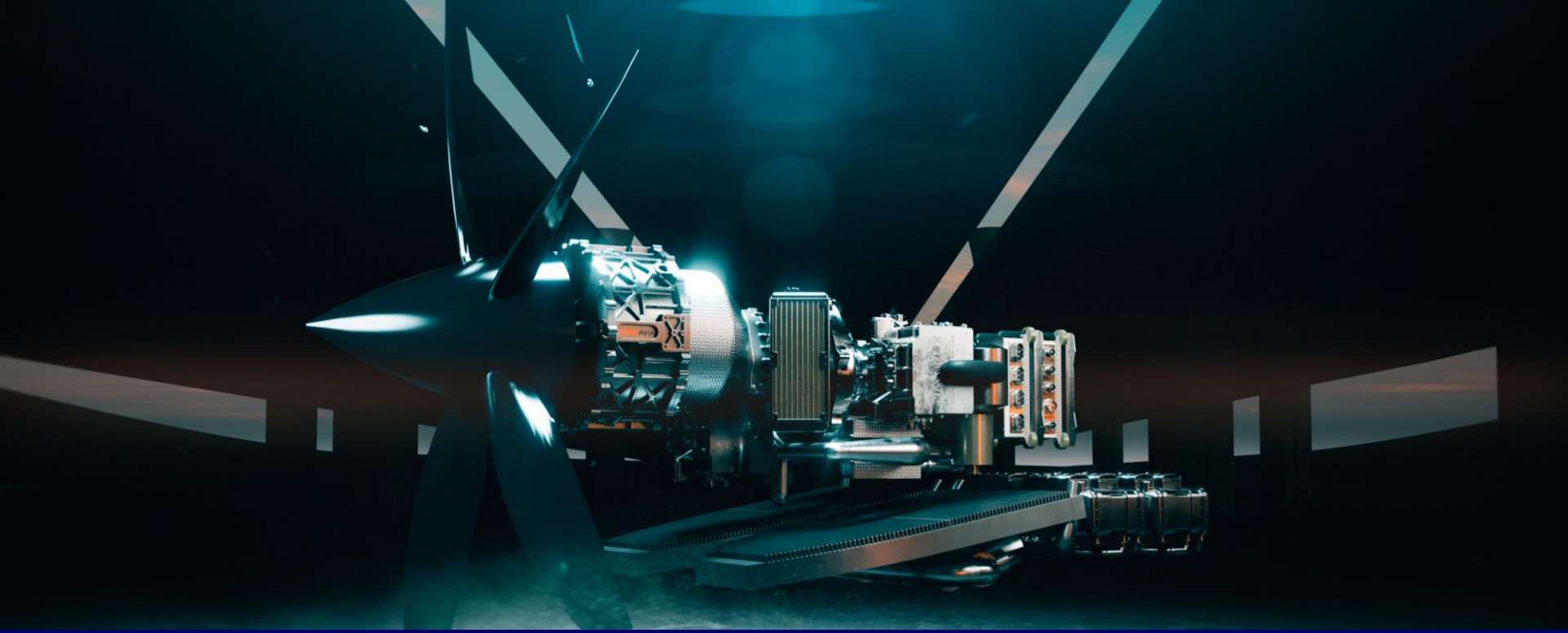
Vertical integration of key technologies essential to solving powertrain challenges.

Modularity and commonality of powertrain maximizes scalability and economics.

ZeroAvia is working with top technology partners and directly with aircraft OEMs.

H2E Engines

- The Hydrogen-Electric engine architecture will deliver cleaner, more efficient flight and advance electrification
- ZeroAvia has around ~20 patents granted 180+ patents granted and 180+ applications



ZA600 Hydrogen-Electric Powertrain

Zero-emission engine for 9-19 seat aircraft by 2025

600kW powertrain designed for aircraft including the Cessna Caravan, Twin Otter & Dornier 228

Offering zero-emission operations, lower maintenance and fuel costs and reduced noise and air pollution

MIT Technology Review

CLIMATE CHANGE

Hydrogen-powered planes take off with startup's test flight

FINACIAL TIMES

Anglo-US group completes test flight of propeller aircraft powered by hydrogen

TIME

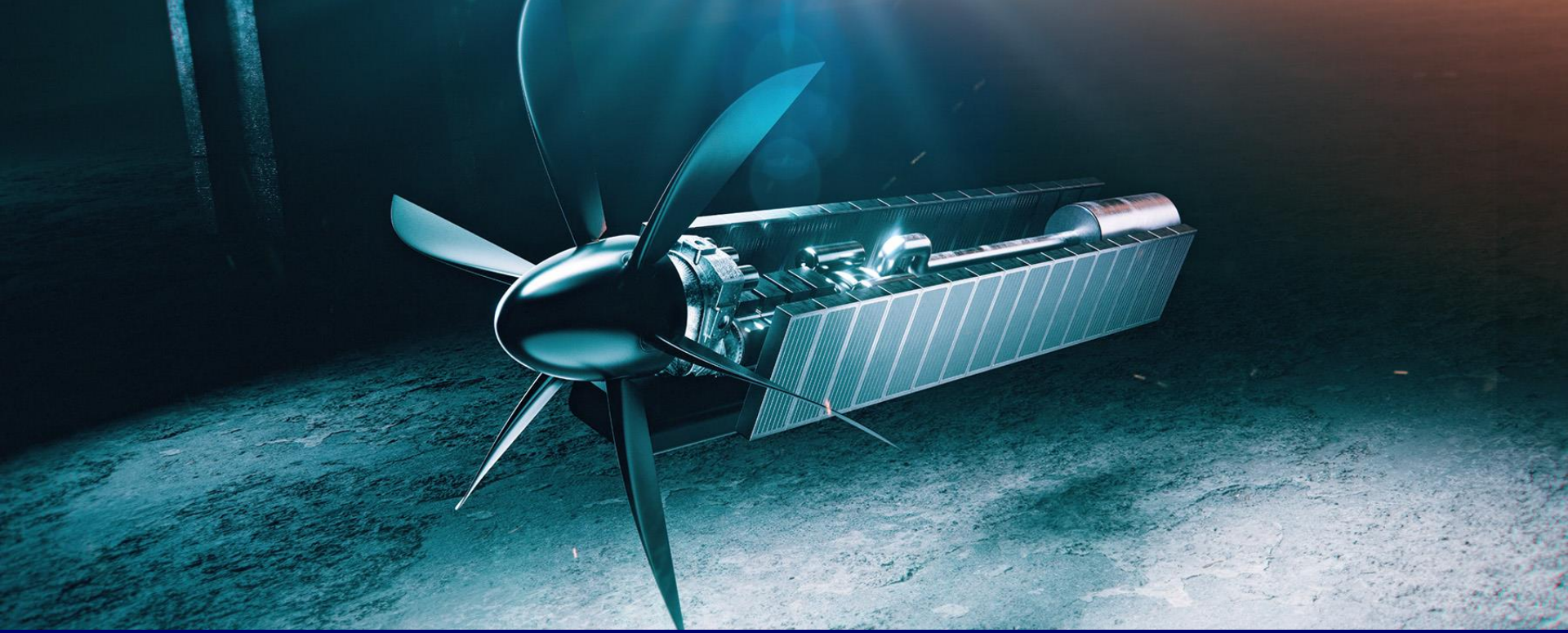
Hydrogen-Powered Planes Could be the Best Bet For Greener Air Travel

Dornier-228 Test Flight Program

2023: ZeroAvia Takes Giant Leaps Forward

On Jan 19, 2023 ZeroAvia made aviation history, flying world's largest aircraft powered with a H2-Electric engine, validating technology and industry-leading position.

We have since completed a 10 flight test program, with the prototype ZA600 fuel cell propulsion system showing high performance.



ZA2000 Hydrogen-Electric Powertrain

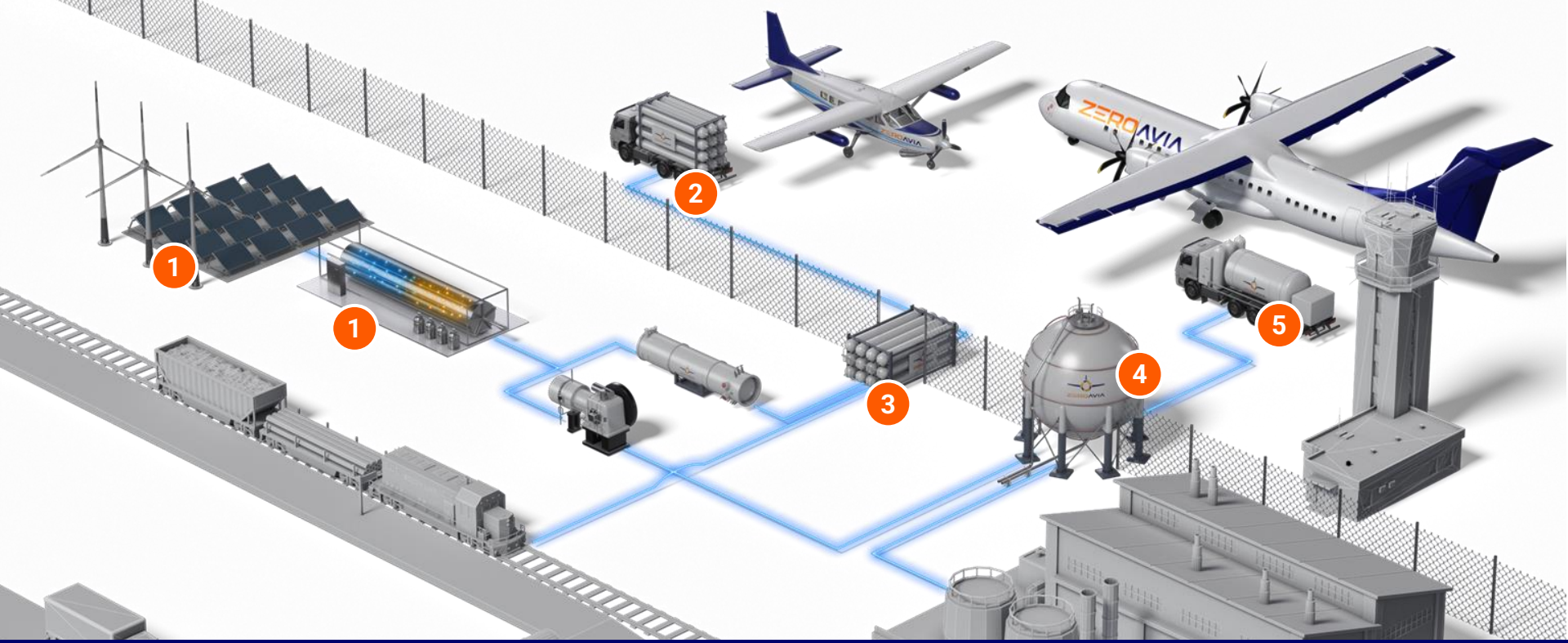
Zero-emission engine for 30-90 seat aircraft by 2027

2-5.4MW powertrain designed for aircraft including the Dash 8 and ATR series.

Offering zero-emission operations, lower maintenance and fuel costs and reduced noise and air pollution

2023: ZeroAvia Takes Giant Leaps Forward

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



Hydrogen Airport Infrastructure

Deliver low cost, low carbon reliable H2 to decarbonize airport ecosystems and provision hydrogen electric powertrains.

1 H2 production- renewable generation or PPA + electrolysis
2 Gaseous Mobile Storage and Dispensing
3 Fixed Gaseous Storage
4 Fixed Liquid Storage
5 Liquid Mobile Storage and Dispensing

Commercial Progress

2000+ engine pre-orders with leading airlines, infrastucture partnershis with airports, $250m+ investment, manufacturing underway – the clean future of flight is coming

Customers

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

Airframe OEM partners

Textron · MHIRJ · Airbus · DH Canada · HAL · Natilus · Piasecki Aircraft Corporation

Strategic technology partners

H_2 producers

NEOM · Masdar · Enapter · ohmium · Shell · ScottishPower · fortum · exolum

Logistics / refueling

ZEV Station · GenH2 Discover Hydrogen · Shell · Absolut Hydrogen · prodrive

Airports

Schiphol Group · YUL · Toronto Pearson · YVR · EIA Edmonton International Airport · ags · Birmingham Airport · Paris Aéroport

Powertrain partners

PowerCell · BASF · DHX machines

Commercial Agreements and Partnerships

~2,000 engines under agreement

Financial Investors

Strategic Investors

Government

Supported by Top Partners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