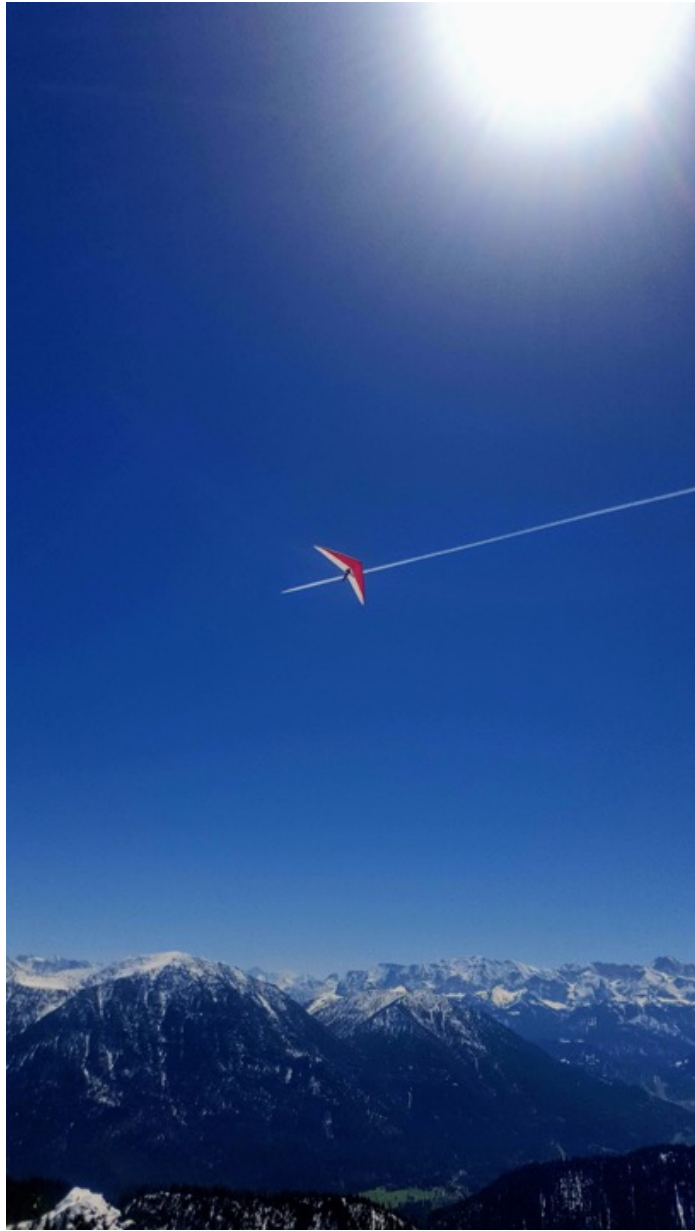




FINANCING ZERO-EMISSION AVIATION

Electric, hydrogen and the ecosystem behind them

JOINT ACI EUROPE AND ICAO EUR/NAT ENVIRONMENTAL PROTECTION

7 - 9 October 2026, Tashkent

CAPITAL ISN'T THE CONSTRAINT

Aviation finances tens of billions of dollars in new aircraft every single year. So why is financing zero-emission aircraft so hard?



Not a technology problem alone

Some zero-emission aircraft have already flown successfully



A simultaneous, multi-market problem

Financing an aircraft, a fuel supply chain, airport infrastructure and a certification pathway - all at once



A timeline mismatch

Aerospace development cycles run 10 - 15+ years. Much of the capital chasing this space expects venture-style timelines.

WHAT AVIATION ALREADY INVESTS

The industry is not short of capital

793

Airbus commercial aircraft
deliveries, 2025

EUR 52bn

Airbus commercial aircraft
revenue, 2025

8,658

Airbus order backlog, c. USD
620bn value

c. USD 600bn

Boeing backlog value, 5,500+
aircraft

Combined, Airbus and Boeing backlogs represent well over a trillion dollars in list-price terms - roughly a 12 - 14 year global production queue at current delivery rates.

The question is not whether aviation can mobilise capital. It's why that capital hasn't found its way to zero-emission aircraft at anything like the same scale.

WHO'S FUNDING ZERO-EMISSION AVIATION SO FAR

BETA Technologies	> USD 1bn (now public, NYSE 2025)	Fidelity, Amazon, TPG Rise Climate, Qatar Investment Authority, GE Aerospace
ZeroAvia	~ USD 380m	Airbus, Breakthrough Energy Ventures, British Airways, United Airlines, UK National Wealth Fund
Lilium	~ EUR 1.5bn (insolvent)	Tencent, Atomico, Baillie Gifford, Honeywell, LGT Group
Universal Hydrogen	~ USD 100m (shut down 2024)	Airbus Ventures, American Airlines, Toyota Ventures, GE Aviation, Plug Power
Vaeridion	~ EUR 18 - 19m	World Fund, Bavarian/German research grants, EIB advisory support

TRADITIONAL AVIATION FINANCE CAPITAL IS MOSTLY ABSENT. IT'S VENTURE, SOVEREIGN AND STRATEGIC MONEY - AND TWO OF THE FIVE DIDN'T MAKE IT.

UNIVERSAL HYDROGEN: IT FLEW BUT STILL FAILED

Strong technical execution, strong investor base but shut down in 2024

“Universal Hydrogen wasn't trying to build an aircraft. It was trying to build an industry.”

Financing an entire ecosystem

Propulsion, hydrogen storage, airport logistics and distribution - multiple businesses, not one

Capital needs kept expanding

Hundreds of millions more required for commercial scale, just as investors turned selective in 2023–24

The ecosystem moved slower than the aircraft

Hydrogen production, distribution and certification all lagged - “even if the aircraft works, when will the market be ready?”

Co-founder Paul Eremenko, on why private equity cooled: rising interest rates, recession fears, and worry that a 2nd Trump administration would unwind the IRA's hydrogen subsidies. In October 2025, the Trump administration cancelled billions in hydrogen hub funding - that specific fear came true.

LILIUM: EUR 1.5 BILLION WASN'T ENOUGH

When certification timelines outlast the funding cycle

Certification runs in years. Venture capital runs in rounds.

Every year of engineering, testing and certification has to be funded before any revenue appears

Aviation hardware is capital-intensive

Every delay increases cash burn - by the time certification neared, the capital required had become enormous

Investors shifted from concept to execution risk

As rates rose and venture funding slowed after 2022, backers increasingly separated “technically promising” from “commercially financeable.”

The final trigger: Germany's Budget Committee failed to approve a EUR 100m KfW-backed loan - the State of Bavaria alone couldn't cover it. A company with EUR 1.5bn in lifetime funding folded when one piece of state co-financing didn't materialise.

EVEN THE OEMs HAVE ISSUES

Multi-year delays are the industry norm - even without hydrogen or new business models

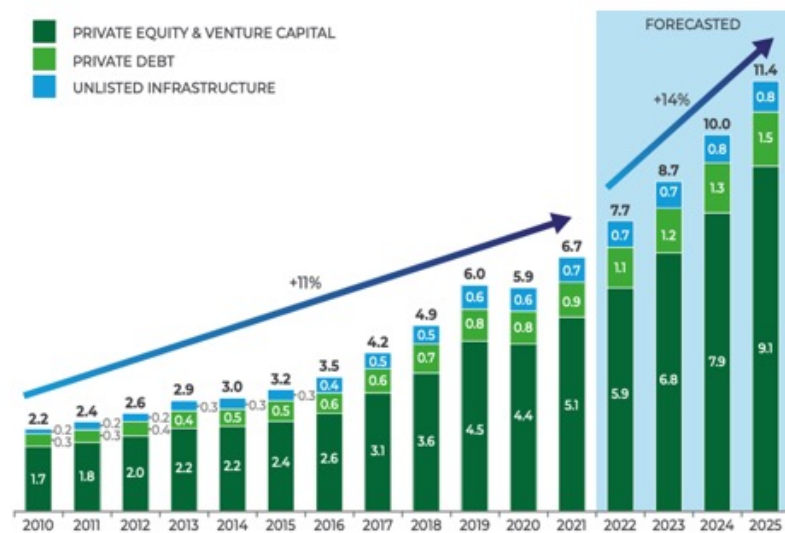
Airbus A380	~2 years	Wiring & systems integration - incompatible CAD versions across sites
Boeing 787	~3 years	Supply-chain outsourcing to 50+ suppliers; integration and testing issues
Boeing 737 MAX	20-month grounding	MCAS design and certification failures
Universal Hydrogen	Shutdown, 2024	Financing and ecosystem-readiness mismatch
Lilium	Insolvency, 2025	Capital intensity and certification-timeline risk

If Airbus and Boeing, with decades of experience, still face multi-year delays - investors in hydrogen and electric aircraft startups are taking technology, certification, manufacturing, infrastructure and financing risk simultaneously.

AVAILABILITY OF CAPITAL

What's available?

C. USD 30tn Assets Under Management expected by 2030



Source: Aerospace Technology Institute - Case-for-the-UK-to-Accelerate-Zero-Carbon-Emission Air Travel, 2022

What's the competition? Solar, wind, data centres, airports

What do competing energy-transition assets often have?

- Established technologies
- Predictable revenues
- Government support
- Proven financing structures

What's the risk profile of zero-emission aircraft?

- Technology risk - "Will the aircraft work?"
- Certification risk - "Will approval be achieved in time?"
- Infrastructure risk - "Readiness of airports?"
- Feedstock risk - "Availability of H2 and electricity? Cost?"
- Policy risk - "Will policies depict long-term stability?"
- Market adoption risk - "Will lessors/airlines buy enough aircraft"
- Residual value risk - "Will there be a secondary market?"

VENTURE RETURNS - INFRASTRUCTURE TIMELINES

VENTURE CAPITAL EXPECTS

Typical fund horizon c. 7 - 10 years

C. 25% IRR

If this becomes a real market, the winners could be worth tens of billions.

HYDROGEN & ELECTRIC AIRCRAFT REQUIRE

Typical horizon: 10 - 15 yrs

- Certification
- Supply chain scaling
- Infrastructure
- Market adoption
- Fleet deployment at scale

Aerospace development cycles resemble infrastructure projects, i.e. 10 to 15 years to meaningful returns

Much of the money chasing this space wants venture-speed outcomes. That mismatch paired with reliance on building an ecosystem involving numerous players may be the single-largest constraint.

DEMAND, GOVERNMENT SUPPORT & ECOSYSTEMS

Demand signal must become stronger

Avolon created a dedicated affiliate for USD 2bn order of up to 500 Vertical Aerospace eVTOLs. And, it took an equity stake alongside Microsoft, Rolls-Royce, Honeywell and American Airlines. A lessor order is a market-demand signal.

Government support:

Stable support mechanisms and stable policy

France - CORAC (Council for Civil Aeronautics Research)

~ EUR 1.6bn committed 2020–22, EUR300m/year since then. Supported a broad SME ecosystem - much of it fed the now-delayed Airbus ZEROe pathway (incl. Airbus partners), EUR 3bn committed by 2030

Support includes seed funding, grants, innovation loans

Financing Tools, e.g.

- Blended Finance
- PPP
- Transition Infrastructure Fund
- Loan guarantees

Ecosystems

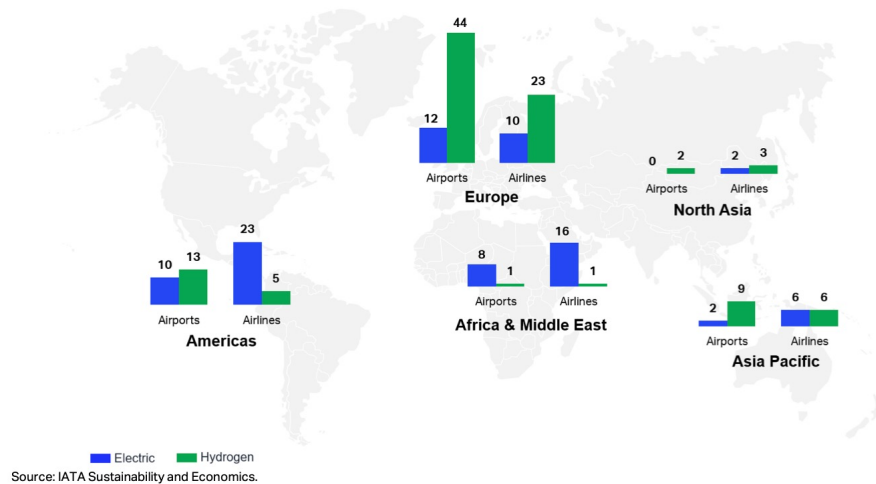
Norway's Avinor-led International Test Arena for Zero- and Low-Emission Aircraft - shared infrastructure built for multiple operators at once, not one manufacturer alone. E.g. Airport infrastructure - airspace and operational frameworks - energy access - technology readiness and learning (development of charging and support infrastructure).

DEMAND, GOVERNMENT SUPPORT & ECOSYSTEMS (cont.)

Ecosystems play a critical role

Mapping the Future of Hydrogen and Electric Aviation

New aircraft technology initiatives by regions and stakeholders



- Airports - key enablers of hydrogen aviation, helping overcome infrastructure, energy and operational barriers.
- Regional differences shaped by policy support and technologies' application potential
 - Europe (airports, energy providers, policymakers): Scale hydrogen infrastructure and airport readiness.
 - Americas (airlines, OEMs, investors): Accelerate electric regional aviation and eVTOL deployment.
- Global industry and regulators: Align investment, infrastructure and standards to enable commercial zero-emission flight.

FIVE LESSONS



1. Technology risk is no longer the only risk
2. Infrastructure risk now matters just as much
3. Certification timelines challenge venture-capital models
4. Business cases depend on coordinated ecosystem investment
5. This is primarily a capital mobilization challenge

PROVING A TECHNOLOGY IS POSSIBLE IS VERY DIFFERENT FROM PROVING AN ECOSYSTEM IS FINANCEABLE

REASONS FOR POSITIVITY



1. Multiple zero-emission aircraft have already flown. This is not merely technology question.
2. USD 30tn in alternative capital exists by 2029. Aviation's full 2050 need is a fraction of that.
3. Renewable energy crossed this exact 'valley of death' fifteen years ago - unlisted infrastructure AUM is now USD 2.4tn and growing
4. The financing playbook already exists. It just needs to be applied here.

The future of zero-emission aviation by whether investors, lessors, airports, energy providers and policymakers choose to build a financeable ecosystem together - and the precedent for doing exactly that already exists.