
+AAMi
THE ADVANCED
AIR MOBILITY
INSTITUTE
25/26 April 2023,
Dublin.
revolution
.aero

Patrick Raftery is the founder and CEO of Innovation Aviation.

With over 34 years worldwide aviation and Board-level business experience including start-ups, Patrick has worked with, supported, consulted and advised a variety of airlines, operators, financiers, corporations, individuals and aircraft manufacturers.

These include British Airways – 13 years, JetMagic – 3 years, NetJets Europe – 3 years, JetBird/Claret Capital, advisory engagements with JetSuite (now JSX), ICON Aircraft, Imperial Holdings and ANAP Trust as well as negotiating private aircraft transactions and deliveries with/from Embraer, Dassault, Gulfstream and Bombardier.

Having successfully closed multiple multi-aircraft Purchase Agreement transactions and long-term aircraft lease deals, Patrick and his advisors specialize in private jet transaction closing and aircraft deliveries, aerospace strategic planning models and aviation start-ups.

Patrick is the founder of the Advanced Air Mobility institute, designed to support funding for PhD-level and Masters-level research and development into the environmental, energy, ecosystem and enabling technology potential of true-zero emissions, future air mobility.

Patrick holds an MSc. Degree in Air Transport Management from Cranfield University, an MA Degree in International Relations from Dublin City University, a Certificate in Global Strategy Studies from Harvard Business School, a Certificate in Commercial Contracts from the Law Society of Ireland and has completed multiple Post-Graduate professional courses in Aviation Finance and Aircraft Operating/Finance Leases.

Patrick has been an External Examiner for the BA (Honours) in International Business Studies with Aviation and BSc (Honours) in Global Business and Pilot Studies at Munster Technological University. He is currently finalising his LLM Dissertation (Masters in Law) at University College Cork, researching how uncompromising strategic EU legislation, potentially coming into force by 2035, could reduce and eliminate global GHG emissions generated by aircraft currently powered by fossil fuels.

Patrick has been an AOC Accountable Manager Post Holder at CEO level and has successfully completed the EASA Private Pilots Licence course requirements by flying Cessna 172s.

Patrick is 58 and is married with one daughter.

Problem Statement

Aviation generates ~3.5% of climate warming GHG emissions annually through CO_2, NO_x, water vapour contrails and soot particles from aircraft engine exhausts powered by fossil fuels.

https://youtu.be/jJYQDv1r2-0

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Purpose + Opportunity

Decarbonise aviation through sponsored PhD/Masters-level research and development on four AAM-related work streams via Ireland's best academic R&D institutions.

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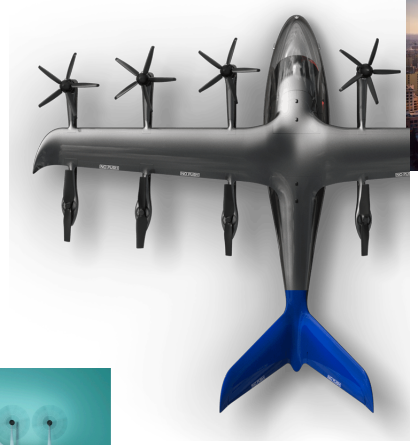
AAM Trajectory – our view.

2026

eCTOL – Electric Hydrogen

eCTOL – Electric Hybrid

eSTOL – Electric > Blown-Lift



eVTOL – Electric

Medium-Long Haul Zero Emissions – 2035

2023

CTOL - BioFuels + SAF

drones

https://youtu.be/esMV-T1T6ug

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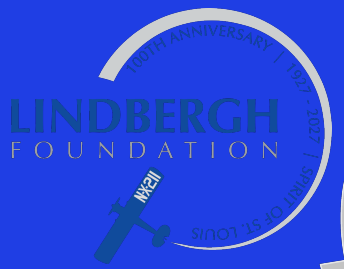
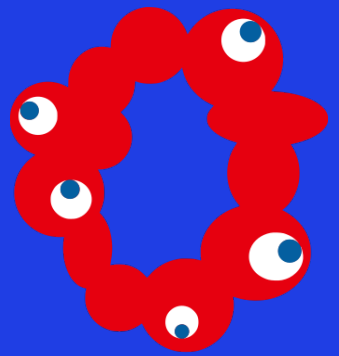
Trigger events on the AAM roadmap



ADARE MANOR
IRELAND



Compelling Reasons. "Forcing Function…"

Compelling Reason. "Forcing Function…"

https://youtu.be/NIlldsn7h60

https://youtu.be/Sjz4hFErlw8

Our Vision:

To Pioneer True Zero Emissions Air Mobility on the Island of Ireland.

Full length: ~486 kms.

Our Moon-Shot:

True Zero Emissions, virtually silent, autonomous, Non-stop all-island airspace.

eVTOL…

With passengers…

and wireless charging…

…from 100% renewable energy sources…

by 1 September 2027.

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True Zero emissions.

Belfast-Dublin.
73 NM/136 KM.

26 Minutes.

(Road/Rail – 2 hours)

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100k+ cruise line visitors forecast in 2023…

True Zero emissions.

Cork-Belfast.
188 Nautical Miles/348 kms.

68 minutes.

Road/Rail – 6 hours

850K visitors in 2018…84% from outside NI.

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True Zero Emissions.

Cork-Belfast.
188 Nautical Miles/348 kms.
66 minutes.

Road/Rail – 6 hours

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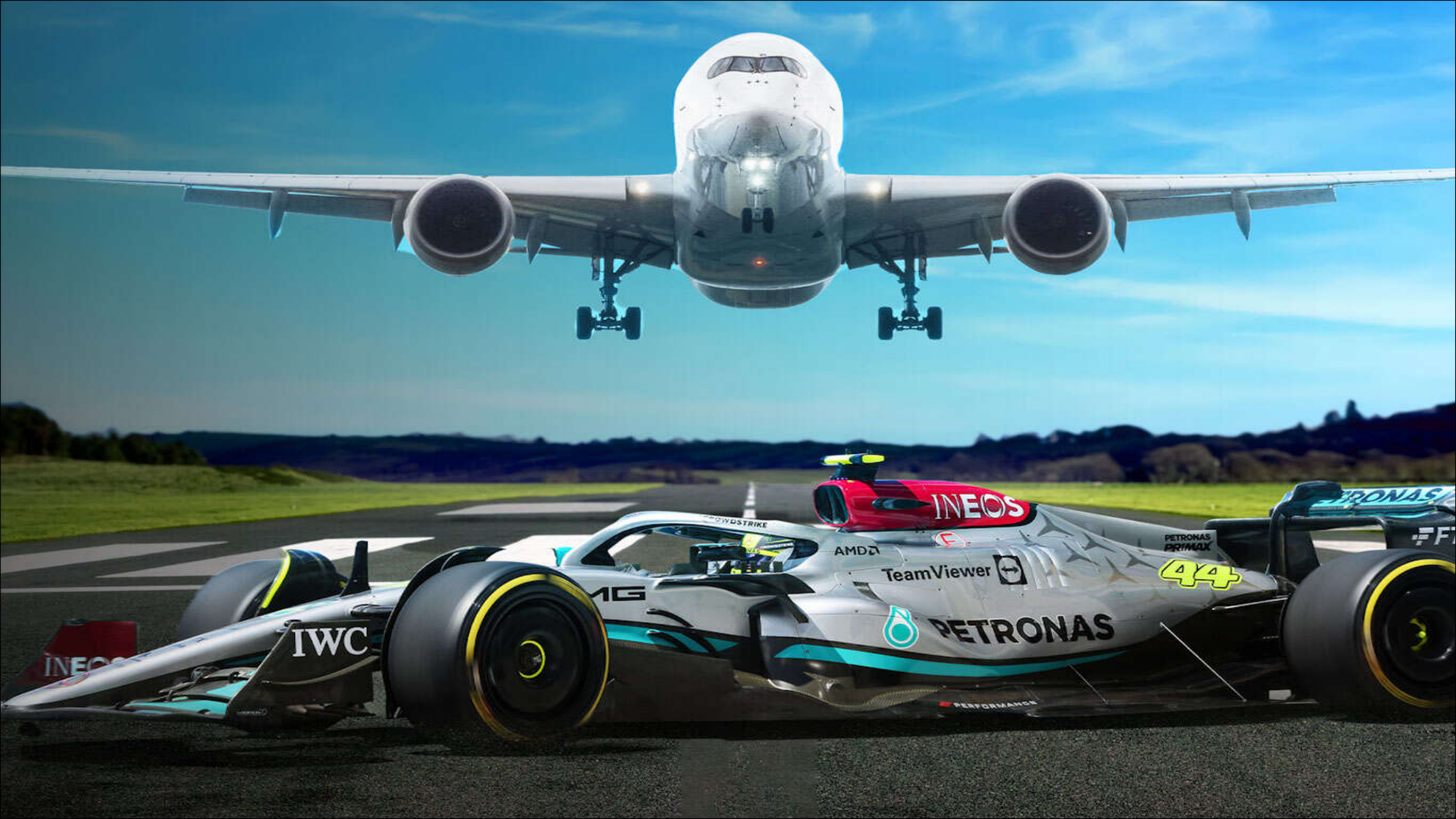
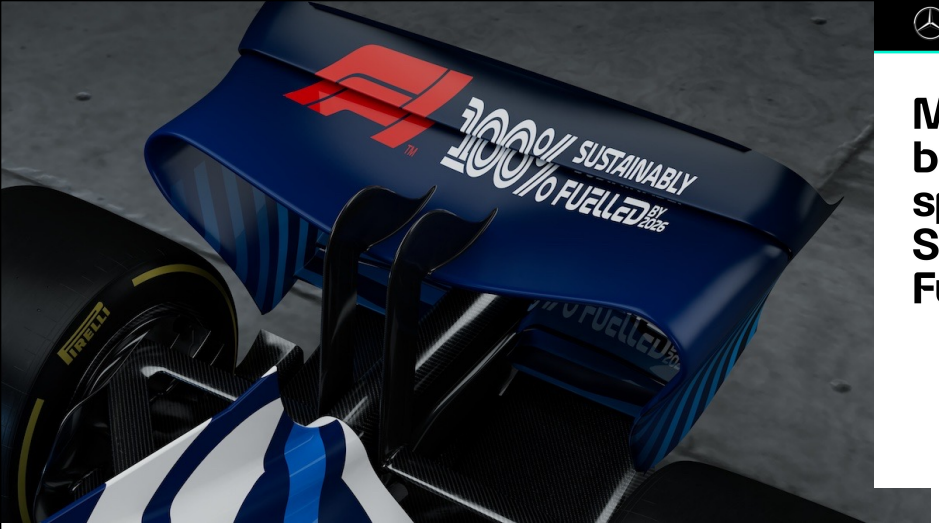
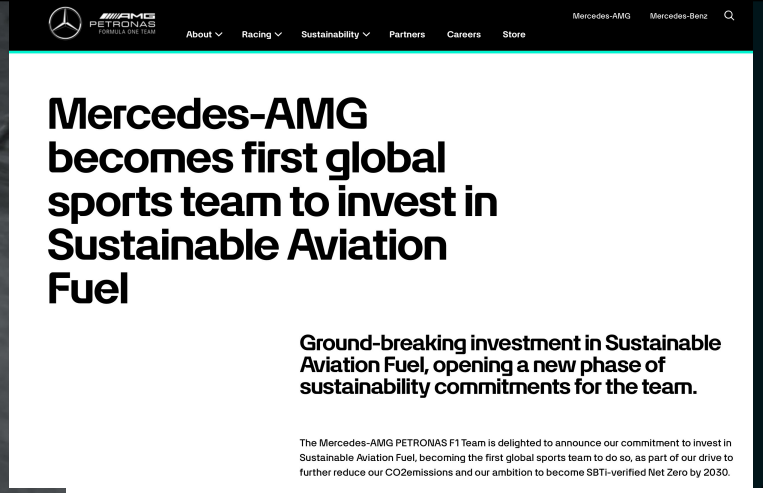
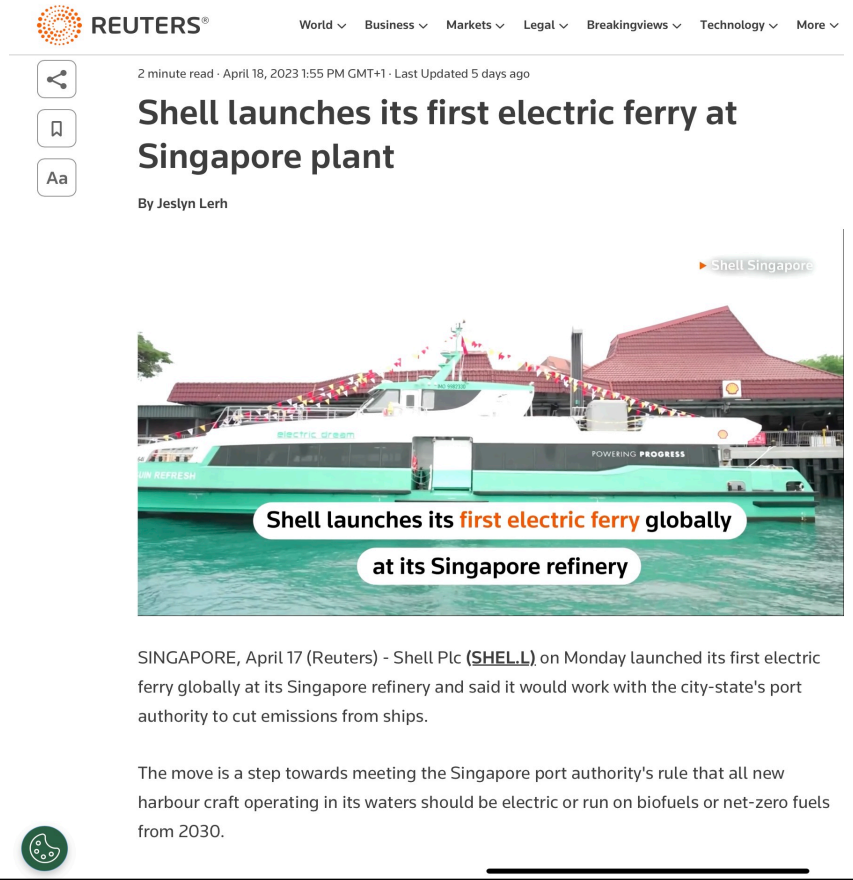
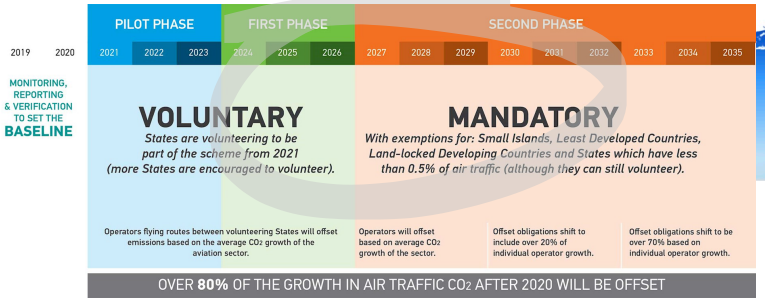

INEOS
AMD
TeamViewer
PETRONAS
PETRONAS PRIMAX
44
IWC
PETRONAS







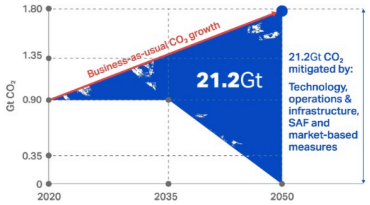


Net Zero Resolution

Fact sheet

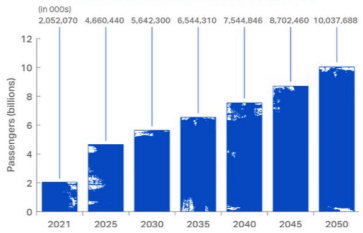
At the 77th IATA Annual General Meeting in Boston, USA, on October 4th 2021, a resolution was passed by IATA member airlines committing them to achieving net-zero carbon emissions from their operations by 2050. This pledge brings air transport into line with the objectives of the Paris agreement to limit global warming to 1.5°C. Having agreed to a Long Term Aspirational Goal (LTAG) on climate at the 41st Assembly of the International Civil Aviation Organization (ICAO) in October 2022, governments now share the same target for aviation's decarbonization.

Net Zero: Aviation carbon emissions to be abated by 2050



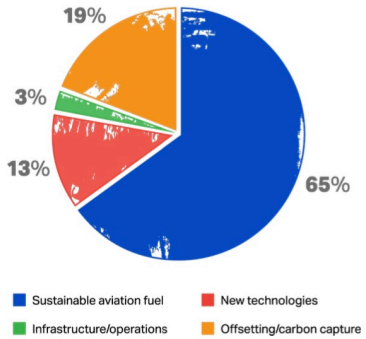
Current projections estimate that demand for individual air passenger journeys in 2050 could exceed 10 billion.

Forecasted evolution of air transport passenger traffic



The expected carbon emissions on a 'business as usual' trajectory over the 2021-2050 period is approximately 21.2 gigatons of CO2. Mitigating that amount of carbon will be an enormous technological challenge.

Contribution to achieving Net Zero Carbon in 2050



Success will require the coordinated combined efforts of the entire industry (airlines, airports, air navigation service providers, manufacturers) and significant government support.

The net-zero objective will be met through a combination of maximum elimination of emissions at source and the use of approved offsetting and carbon capture technologies. The key elements of the emissions reduction strategy are:

- The use of Sustainable Aviation Fuel (SAF), sourced from feedstocks that do not degrade the environment or compete with food or water
- Investment in new aircraft technology, including radical new aerodynamic and alternative propulsion (electric or hydrogen) solutions
- Continued improvement in infrastructure and operational efficiency, with a particular focus on improved air traffic management
- The use of approved offsets including carbon capture and storage technology

Milestones towards net zero

The below table illustrates a **potential set of estimated** milestones towards net-zero, including the mix of abatement measures ('pathways') and some noteworthy actions envisaged.

DATE	AMOUNT OF CO_2 ABATEMENT	PATHWAY	ACTION
2025	**381 megatonnes (Mt)** (2021-2025)	97% offsets, 2% SAF, 1% improvements above business as usual (BAU)	ICAO agree long-term goal for international aviation (2022); energy sector commits to at least 6 million tonnes SAF production; agreement of full implementation of Article of Paris Agreement
2030	**979 Mt** (2026-2030)	93% offsets; 5% SAF, 2% Improvements above BAU	Use of 100% SAF on aircraft, ANSPs fully implement ICAO Aviation System Block upgrades to deliver fuel efficiency improvements of 0.3% by 2030
2035	**1,703 Mt** (2031–2035)	77.5% offsets, 17.5% SAF, 3% improvements above BAU, 2% Carbon Capture Utilization and Storage (CCUS)	Evolutionary technology achieving 30% reduction in fuel burn, electric/hydrogen aircraft for regional markets (50-100 seats, 30-90 min flights) become available
2040	**3,824 Mt** (2036-2040)	44.5% offsets, 40% SAF, 7.5% non drop-in fuel (new propulsion technologies), 5% CCUS, 3% improvements above BAU	Feasibility of new aircraft such as blended-wing bodies demonstrated with full-scale working prototypes, electric/hydrogen for short-haul markets (100-150 seats, 45-120 min flights) become available.
2045	**6,153 Mt** (2041-2045)	55% SAF, 24% offsets, 10% non drop-in fuel, 8% CCUS, 3% improvements above BAU	Necessary infrastructure for new energy requirements (low carbon electricity/hydrogen) becomes available
2050	**8,164 Mt** (2046-2050)	**65% SAF**, 13% non drop-in fuel, 11% CCUS, 8% offsets, 3% improvements above BAU	Commercially viable annual SAF production of 449 billion litres available

Links

Text of net-zero resolution
Factsheets on SAF, Offsetting/Carbon Capture, New Technology, Operational/Infrastructure improvements
ATAG Waypoint 2050 report

www.iata.org/flynetzero June 2022

Pie in the Sky

How IATA's Fly Net Zero 2050
does nothing to save the climate

"Come on, stop calling us polluters!"

Alexandre de Juniac
Director General of IATA 2016–2021

newweather.org
newweather.se
info@newweather.se
Photo page 1: Laura Vinck

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Purpose + Opportunity

"Access to some of the finest minds and best R&D facilities in the world…"

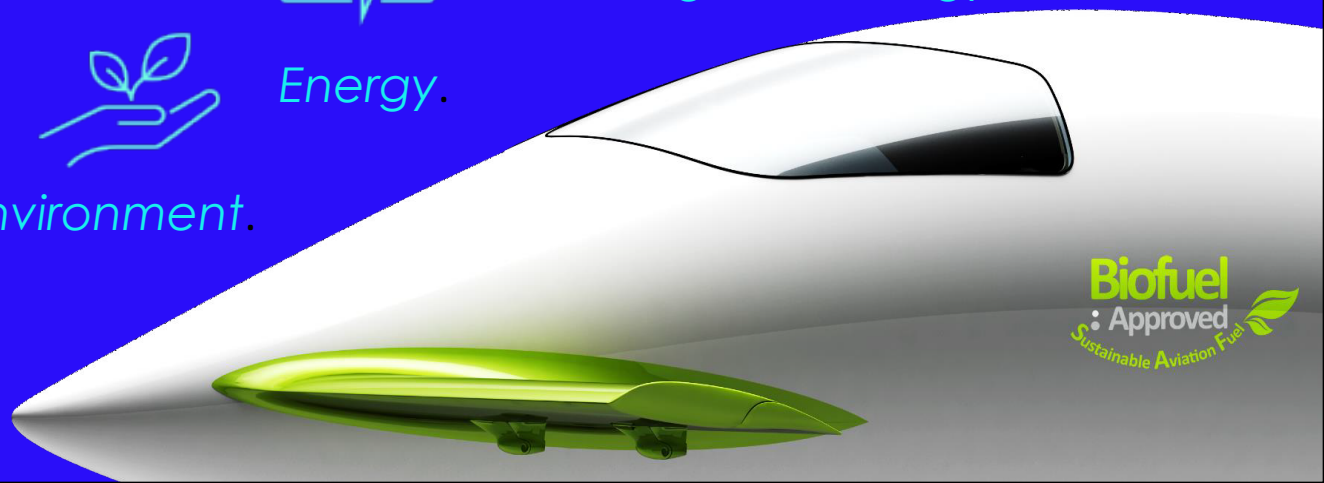
- *36 brilliant minds…*
- *8 x Masters Annually (32 in total)*
- *4 x PhD*
- *Cohort System – 4 R&D streams*
- *Quarterly Reviews/Updates*
- *Host Institutions – academic lead*
- *Potential tie-ups with other global research institutions & corporations*

Ecosystem

Enabling Technology

Energy.

Environment.



John Tyndall
(1820-1893)

12 x universities in total RoI offering Research platforms, (5 TU's)
All in top 3% of World Rankings…
34 x 3rd Level Colleges in total (RoI)
53,000+ post-graduate students annually*
2021 students: 1,535 PhDs, 17,470 Taught Masters, 540 Masters by Research

* Source HEA

Tyndall
National Institute
Institiúid Náisiúnta

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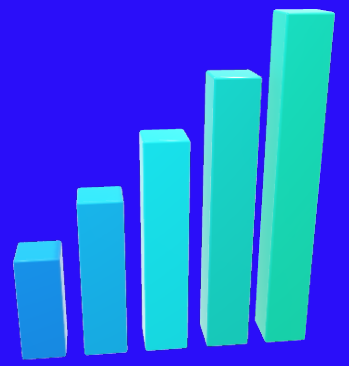
Funding Target.

€896k budget - 4 years

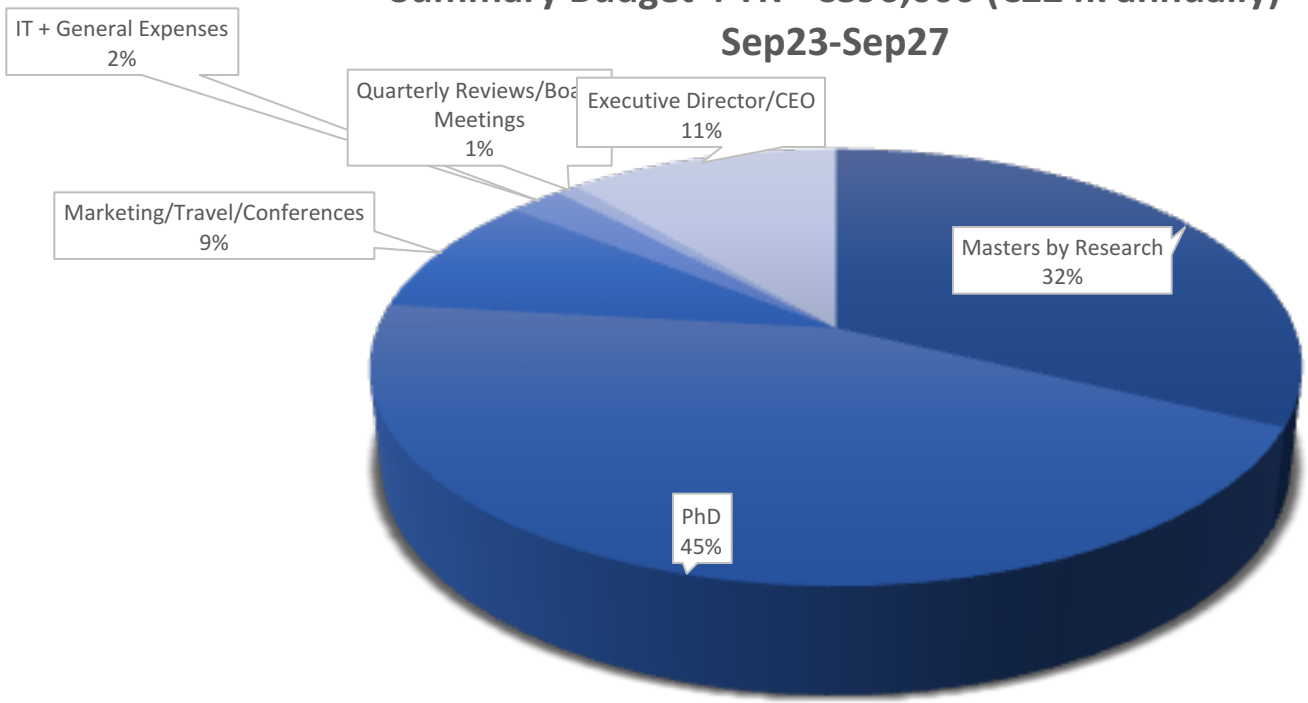
(€224k annually)

€1m.

- Industry launch – Revolution.Aero – 25 April 2023
- Public launch – Paris Air Show – 19-25 June 2023
- Fully Subscribed by 18 August 2024 – if not earlier
- 8 x Masters by Research annually - 32 in total by 2027
- 4 x PhD over 4 years
- 36 brilliant minds + academic leaders in world-class R&D facilities
  - focused on a single purpose with a compelling reason
- €1m funding target includes €104k contingency + opportunity capital investment cash
- ZERO Capital Expenditure – Host Institutions to cover
- Not for Profit entity



Summary Budget 4 YR - €896,000 (€224k annually)
Sep23-Sep27



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Sponsor/Investor Benefits:

- Access to talent pipeline
- Spin-Out collaboration
- Strategic engagement with AAM industry
- Early/Shared knowledge from research
- Investment ROI
- 'Save the planet' CSR/ESG
- Pioneer partner marketing
- Naming rights
- Worldwide replication opportunity

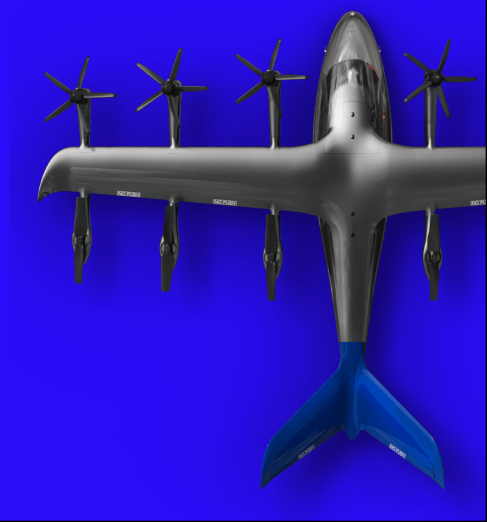
Sponsor Options:

- Support Set-Up/Launch
- Sponsor specific research
  - Masters, Cohort or PhD
- Academic Industry Partner
- Investor in SPC or Spin-Out

Student Benefits:

- 100% sponsorship of Tuition Fees
- Access to global companies
- Career Path
- Spin-Out collaboration
- Strategic engagement with AAM industry
- Early/Shared knowledge from research
- 'Save the planet'
- Access to multiple locations
- Avoid unnecessary modules
- PhD pathway

And broader industry and environmental applications e.g. AI, autonomy, marine, automotive…



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Summary

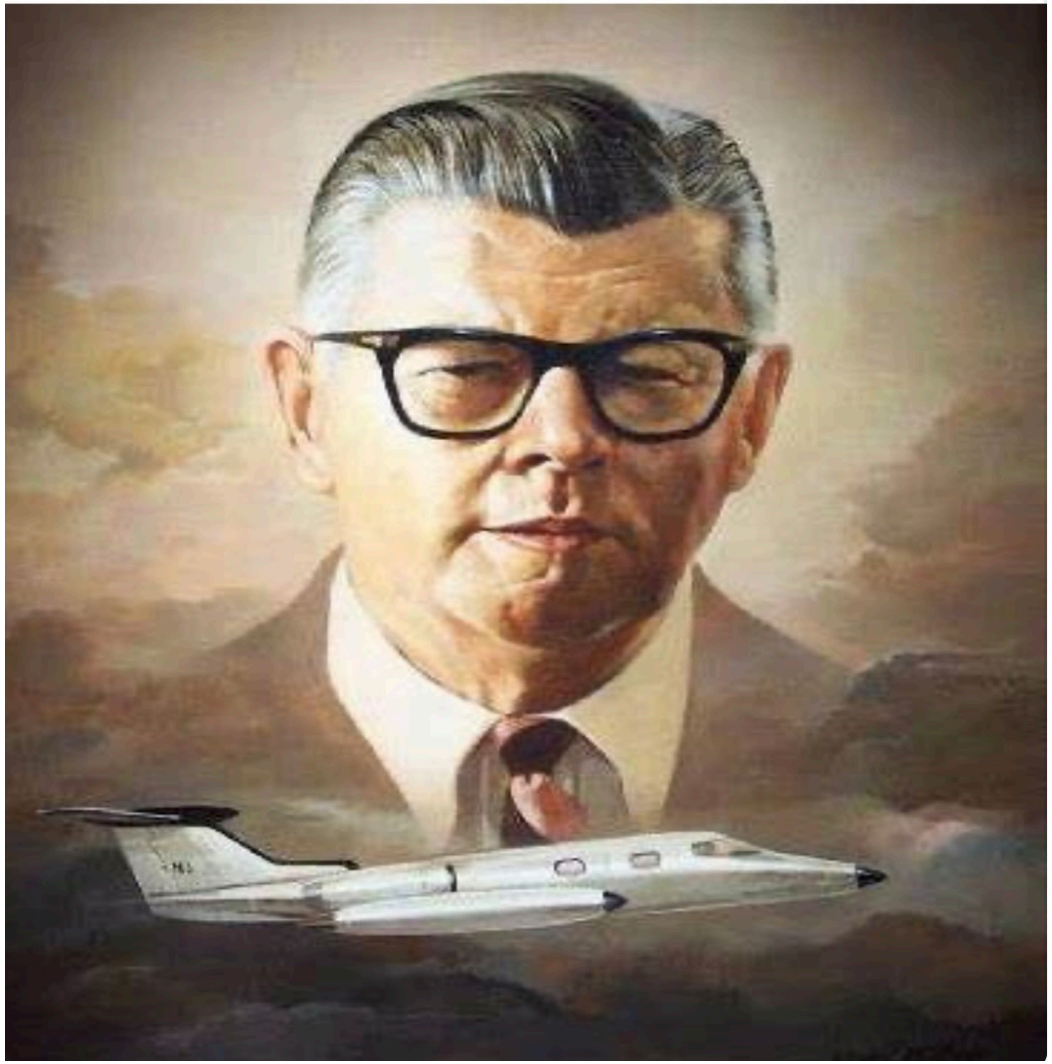
Decarbonise aviation through sponsored PhD/Masters-level research and development on four AAM-related work streams.

€1m over 4 years to fund 36 brilliant minds - all with a shared purpose

AAM R&D is the cutting edge enabler for wider aviation and breakthroughs and broader industry applications

tAAMi is a win-win-win for sponsors, students and universities…and the AAM industry.

"They said I'd never build it, that if I built it, it wouldn't fly; that if it flew, I couldn't sell it. Well, I did and it did and I could."
-Bill Lear



One More Thing…

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