

# Deep transition through innovation

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## ZEROe – paving the way to large scale decarbonization in the aviation industry

"Flygskam" or Flight shaming' is a Swedish-born movement that calls for curbs to air travel due to its environmental impact. And the movement is gaining traction. The number of passengers who flew through Swedish airports dropped by four percent in 2019 due to a notable decline in domestic traffic according to Swedish state-owned airport operator Swedavia. This movement which has spread across Europe in line with the Friday for Future movement, might be seen as anecdotal, but it highlights how consumer behavior impacts global warming. Consumers are becoming more and more climate conscious and we believe that sustainability will play an increasing role in user behaviour.

Whilst globally, transport of all sorts, including road travel, contributes to around one fifth of all emissions, the aviation industry represented a total of 1Gt of CO<sub>2</sub> emissions worldwide, the equivalent of about 3% of total global CO<sub>2</sub> emissions from fossil fuel combustion<sup>1</sup>. However, due to evolving consumer habits and increasing intercontinental mobility, emissions from air travel have grown rapidly over the past decades.

Currently, climate conscious travelers have only two choices: fly or not fly (and use an alternative means of travel). However there have been interesting initiatives in the airplane construction industry over the past decade which have led to the first developments of electric planes, mostly focused on relatively small carriers and so far allowing for only very short distances.



Harbour Air's Seaplane to e-plane initiative made its commercial maiden flight last December. Equipped with a magniX 750-horsepower fully electric propulsion system, this 6 passenger Havilland Beaver marks the start of a new era in aviation: the electric age. However, the weight of the batteries and the long charging times make battery driven planes unsuitable for larger range flights or passenger numbers over ten.

With electric aviation still decades away from becoming mainstream, Airbus has been working for years on a hydrogen / fuel cell powered propulsion system, more suitable for larger capacities. In February 2020, La Française's equities investment team had the opportunity to talk to Guillaume Faury, CEO of Airbus, at an Industrial Conference about opportunities for large scale decarbonization in the aviation industry.

<sup>1</sup> Source International Energy Agency, 2019

Earlier this week, Airbus finally revealed the details of three concept aircrafts, named ZEROe, bringing the world one step closer to zero flight emissions. Grazia Vittadini, Chief Technology Officer at Airbus said that the development plan would yield its first results by the end of S1 2021 and that a definitive concept, selected by 2025, would be developed and certified to enter service by 2035. Even though 2035 might seem far away, Airbus has been improving emissions per passenger per kilometer of its aircrafts and will continue to do so until the ZEROe is ready to fly (2.1% annual improvement in fuel efficiency between 2009 and 2020).

Highly disruptive, each of the three below concepts presents an innovative approach to aviation engineering and illustrates how technology and aerodynamics could lead to zero-emission commercial flights:



The first concept, a turbofan aircraft with a range of around 2,000 nautical miles (3,700 km).

This aircraft would be powered by a modified gas-turbine engine, fully operating on hydrogen, with a capacity of 120 to 200 seats, which would make it perfectly suited for transcontinental travels.



The second concept, a turboprop aircraft is targeted for regional travel, with a capacity of around 100 passengers.

While the aircraft would be relatively small, it would have a capacity of 1,000 nautical miles (1,800 km) and highly suitable for regional flights for so-called City-Hoppers.

The third concept steers away from the typical aircraft look, looking more like a Manta Ray given its “blended wing body”, meaning its body is merged with the wings. This aircraft, with a potential capacity of up to 200 passengers, was unveiled in February 2020.

Its wide fuselage presents more options for hydrogen storage and passenger seating but requires further product development before we can imagine what travelling might look like in 2050 and beyond.



A well-known low-cost airline group, who has been working for a few years on low-carbon flight solutions has already announced that it might be highly interested in one of the concepts.

Airbus, which has a large market share in the commercial aircraft manufacturing market, is leading the transition to a greener and more sustainable economy.

Given the rapid increase of the aviation industry’s CO<sub>2</sub> emissions over the last decade, the development of alternative solutions using hydrogen might allow the avoidance of more than 1Gt of CO<sub>2</sub> per year.

The lengthy development cycle of a new airplane, which is around 15 years, leaves time for hydrogen technologies to improve, and to contemplate the use of only green or blue hydrogen by the time the ZEROe airplanes are ready to be commercialized.

With reference to La Française's Carbon Impact strategy, Airbus fits well in the "transitioners" category. Transitioning companies are one of the three targeted investment categories which also include "enablers" and "solution providers/cleantech". As opposed to the latter two categories, "transitioners" are companies with a relatively high current CO<sub>2</sub> footprint with a credible plan to reduce it drastically. Typically, they are market leaders having a large impact across their industry.

As such, Airbus has committed to carbon-neutral growth as of 2020 and moving forward. The company has joined forces with other industry players and collectively, committed to a reduction of 50% in total CO<sub>2</sub> emissions by 2050.

With the development of the ZEROe, the company is sending a clear message: reducing their CO<sub>2</sub> emissions has become a priority. Guillaume Faury declared:

*"This is a historic moment for the commercial aviation sector as a whole and we intend to play a leading role in the most important transition this industry has ever seen. The concepts we unveil today offer the world a glimpse of our ambition to drive a bold vision for the future of zero-emission flight."*

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Main risks associated with the carbon investment strategy – equities: capital loss, currency risk, equity risk, liquidity risk, potential risk of a conflict of interests.

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