



How to meet the challenges of COVID 19 and carbon neutrality in the world of aviation?

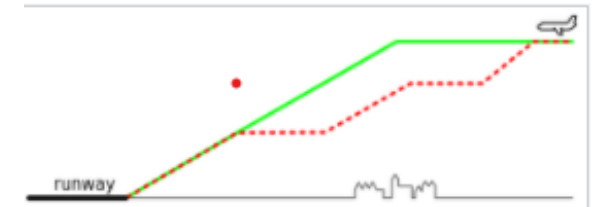


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Introduction

Reduction CO₂ of 80% / passenger during the last 70 years



2020 : aviation accounts for no more than 3.5% of global warming linked to human activity worldwide

How to reduce aviation's share of the world's total carbon footprint in the near to medium term ?

Replacement of old aeroplanes

(> 25 years) by new, much more energy-efficient ones. Aircraft produced today are 70% more fuel-efficient than 40 years ago.





How to reduce aviation's share of the world's total carbon footprint in the near to medium term ?

Changing the fuel source (use of **biofuel** and/or **synthetic kerosene**)

- First flight in 2008 (biofuel 1st generation)
- In 2020 :
 - all modern aeroplanes certified with 50% biofuel
 - biofuel 2nd gen (sustainable aviation fuels)
 - but only 5 airports ready : Bergen, Oslo, Stockholm, LA, Brisbane



How to reduce aviation's share of the world's total carbon footprint in the near to medium term ?

Changing the fuel source



March 2017 report

“using biofuels reduces particle emissions in the exhaust by as much as 50 to 70 percent”.



How to reduce aviation's share of the world's total carbon emissions in the near to medium term ?

Implementation of carbon offsetting



Carbon Offsetting and Reduction Scheme for International Aviation

Adopted in 2016 with 81 volunteer ICAO members states representing 77% of international flights

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Implementation of carbon offsetting

CORSIA objective: carbon-neutral growth from 2021, using 2019 emissions as a reference.



How to reduce aviation's share of the world's total carbon emissions in the long term ?

Alternative energy aeroplanes

Hydrogen aeroplanes ? Major aircraft manufacturers are working on it : expected around 2035.

BUT :

Hydrogen used shall be fully decarbonated (electrolysis of water powered by decarbonated / renewable electrical power, use of new methods issued from research,...)





How to reduce aviation's share of the world's total carbon emissions in the long term ?

Alternative energy aeroplanes

Electrical aeroplanes ?

- batteries : currently limited to light aeroplanes (Velis Electro - Pipistrel, hybrid Cassio - Voltaero)
- fuel cells : envisaged use to power certain aircraft systems (de-icing, anti-icing, APU, air conditioning, engine startings, ground operations,...).





Conclusion

- Fully decarbonated aviation is possible.
- We are at the beginning of a new chapter in the history of aviation that will take probably 15 to 20 years to write itself with a technological breakthrough and the introduction of alternative-powered aircraft.
- During this transition period, use of alternative fuels (biofuel 3rd generation, synthetic kerosene) and carbon offsetting are some possible solutions.
- Nowadays, the aeronautical industry is facing a dual ecological and technological challenge that it is fully capable of meeting as it has always been very competitive and innovative since the beginnings of aviation.



**Thank you
for your attention**