

# Aerospace Europe Conference 2023

## Joint 10<sup>th</sup> EUCASS – 9<sup>th</sup> CEAS Conference

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Abstract #XXX (to be filled by the organizers)

Preferred Topics: CLINAVE, SUSTAV

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Type: Oral

Status of corresponding author: Regular

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### Title

## Techno-economic Analysis of Sustainable Aviation Fuels: e-fuels

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### Abstract

As the aviation sector continues its growing trend exhibited up to the COVID-19 pandemic, aircraft carbon emissions remain more relevant than ever. In order to meet emission requirements agreed upon as recently as in the United Nations COP 27 conference, the use of Sustainable Aviation Fuels (SAFs), in particular synthetic aviation fuels, commonly referred to as e-fuels, offers an opportunity to decrease dependency on carbon-based fuels. Nevertheless, several factors must be considered before e-fuels can become a solution to the decarbonization of the aeronautical sector—these range from the challenges associated with their implementation and the associated cost to evaluate their environmental footprint. [1,2]

E-fuels have the advantage of being compatible with most propulsive systems broadly encountered in the operation of commercial aircraft [3], which would render them an attractive alternative from a purely commercial standpoint since other alternatives usually require substantial changes to the airport infrastructure and supply chain. In the proposed manuscript, we intend to conduct a techno-economic and life-cycle analysis of several SAFs, particularly e-fuels, and compare it to traditional fuels used in commercial aircraft. The focus will be given to the production method, including the feedstock and conversion technology, of each e-fuel and how that can impact its life-cycle emissions to understand how sustainable these fuels are compared to the carbon-ridden alternatives currently in use.

### References

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