Cleaner Kerosene for Cleaner Air and Climate - Unite the Union Model Motion

The proposal is to 'hydrotreat' kerosene (jet fuel) during production, so that it burns more cleanly. This would address two issues caused by burning jet fuel in an aircraft engine:

1. The **health impacts** caused by ultrafine particles (UFPs) emitted by aircraft during ground operations, taxi, take-off & landing, etc., which affect workers, customers and communities.[1]
2. The **climate impacts** caused by soot (and water etc.) emitted by aircraft during cruise, which lead to contrail cirrus cloud formation and cause a significant global warming effect.[2]

By reducing certain compounds, e.g. aromatics, naphthalene and sulphur (ANS) [3], within jet fuel as it's produced at the refinery – it appears possible to quickly and substantially reduce these impacts.

The refinery process is called 'hydrotreatment' and is already used for producing diesel.[4] It would be:

- **Quick**: it can be implemented within a few years, compared to a few decades for "SAF".
- **Effective**: Measurements show that reduced ANS jet fuel can improve air quality.[5] Flight tests have shown that reduced ANS jet fuel can significantly reduce soot emissions, ice crystals and therefore should reduce contrail formation.[6] EASA has also proposed this solution.[7]
- **Cheap**: compared to "SAF" (which is several times more expensive than kerosene), hydrotreating jet fuel is very low cost [8] and increases fuel price by only a few percent.[9]

Cleaner jet fuel is likely to have many benefits and few downsides – any technical risks related to low ANS fuel need to be addressed for (low ANS) 'Sustainable Aviation Fuel' ('SAF') use and are already being mitigated. The small incremental cost of jet fuel would result in more employment for workers - e.g. installing/operating new refinery equipment, within fuel logistics and monitoring fuel & air quality.

There is currently no incentive (financial or legal), for producers to supply and for airlines to demand jet fuel with lower ANS content, so hydrotreating jet fuel isn't usually done. However, there is existing variation in ANS concentration due to regional variations in the composition of crude oil supply. It should therefore be very quick and easy to test and demonstrate the benefits of lower ANS jet fuel.

This branch/conference supports:

- The potential benefits of hydrotreated kerosene to deliver health and climate impacts.
- The position that hydrotreated kerosene appears to be a fast, cheap and practical solution.
- The principle that we should pursue this, or similar options, urgently.

This branch/conference commits to lobbying (regulators, government and industry) for:

- The ANS content in all jet fuel to be measured and monitored, as soon as possible.
- The impact of reduced ANS content in jet fuel e.g. reduced particulates (health) and reduced contrails (climate) to be determined via suitable trials and testing, as soon as possible.
- Further testing and trials related to minimising health and climate impacts through any combination of aircraft/engine technology, airline operations, and jet fuel optimisation.

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[1] K. Bendtsen et al. (2021): "A review of health effects associated with exposure to jet engine emissions in and around airports", NOS (2021): "KLM and Schiphol knew of an increased risk of cancer on platform personnel"
[2] D.S. Lee et al. (2021): "The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018", BALPA: "UK Pilots' Union Urges Government To Tackle Aviation's Non-CO2 Environmental Effects"
[3] Aromatics are a class of hydrocarbons present in jet fuels that produce more soot than other classes of hydrocarbons when burned. Naphthalene is the aromatic molecule that can produce the most soot. Sulphur produces sulphur dioxide (SO_2) which is toxic, and sulphate particles which can affect global warming (by reflecting solar radiation), when burned.
[4] AIChE (2021): "An Overview of Hydrotreating"
[5] CE Delft (2020): "Potential for reducing aviation non-CO2 emissions through cleaner jet fuel", pg. 57
[6] C. Voigt et al. (2021): "Cleaner burning aviation fuels can reduce contrail cloudiness"
[7] EASA (2020): "Updated analysis of the non-CO2 effects of aviation", p.89
[8] Mathpro (2023): "Techno-economic Assessment of Process Routes for Naphthalenes Control in Petroleum Jet Fuel"
[9] CE Delft (2020): "Potential for reducing aviation non-CO2 emissions through cleaner jet fuel", pg. 57