

The banner features a stylized green and blue background with a white airplane flying over a globe. Yellow wavy arrows point downwards from the sun on the left, and green leaves are on the right.

ICAO Symposium on Non-CO₂ Aviation Emissions

16 — 18 September 2024
Montréal, Canada

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Speaker

Session 3: Mitigating Non-CO₂ Aviation Emissions –
What is possible
Part III - Sustainable Aviation Fuels (SAF), Lower Carbon
Aviation Fuels (LCAF), and Cleaner Energy

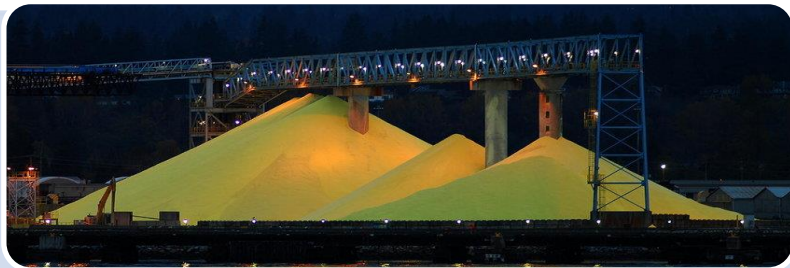
Fuel impact on non-CO₂ effects: An OEM point of view

Valérie Guénon

ICAO non-CO₂ symposium
17 September 2024



Fuel aromatic and sulfur reduction can bring benefits



Sulfur reduction

- **Environmental side**
 - Reduction of particles mass
 - Climate impact (sulfates)
 - Acid rains
 - Sulfur compounds (H_2S , SO_2)
 - Local air quality around airports
 - Odors (strong impact on exhaust gases odor)
- **Engine side**
 - Potential reduction of corrosion of hot parts

energy



Aromatic reduction

- **Environmental side**
 - Reduction of particles mass, number and diameter
 - (Small) reduction of CO_2 emissions
- **Engine side**
 - Reduction of carbon deposits (injector...)
 - Increase of fuel H/C ratio → increase of mass energetic content

Aromatic / sulfur level reduction

- A quick and massive deployment of SAF with currently certified pathways (up to 50%) allows a reduction of aromatic and sulfur content with strong additional benefits
- For future 100% SAF formulation
 - What is the optimal 100%SAF fuel formulation, taking into account all parameters (environment, feasibility, safety...):

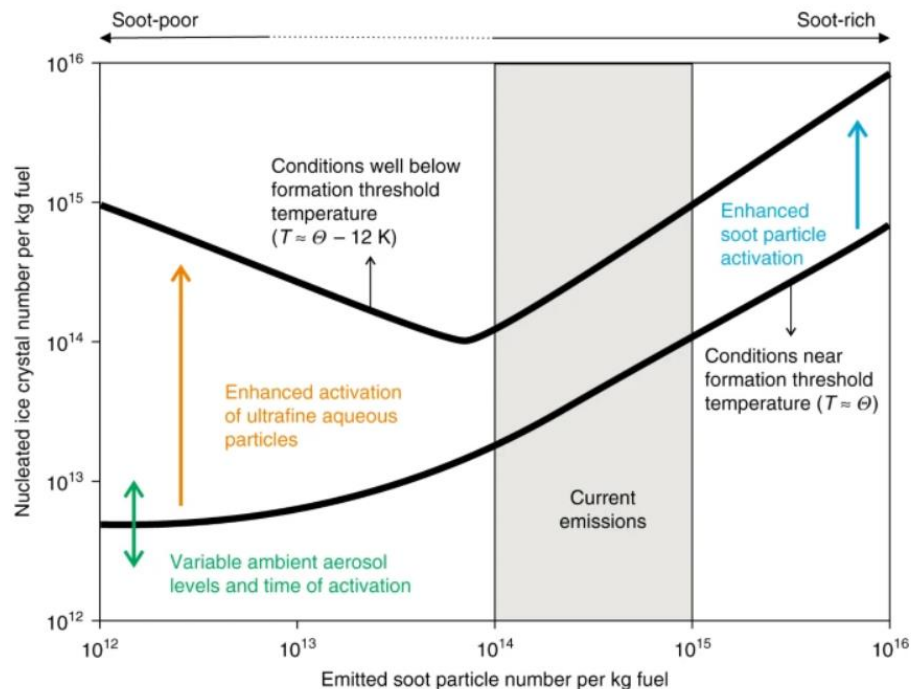


Is an aromatic & sulfur reduction

Efficient

for environment & climate?

- Local air quality : yes
- Global warming : yes,
 - Slight CO₂ reduction
 - Less aromatic lead to less PM emissions
- but...
 - Link between PM emissions and contrails formation to be clarified
 - Potential side effects
 - Higher H/C ratio → higher exhaust water content
 - Effect on NO_x ?
- Need to reduce uncertainties and assess the full picture
 - To set clear regulations on fuel properties / chemical composition
 - For engine manufacturers to set technology strategy and trade-offs (NO_x / Particles / CO₂ / operability ...)



Policy and standards

- **For quality and safety**
 - International coordination between all actors
 - International harmonization of fuel properties

- **Needed R&T**
 - Pursue understanding of non-CO₂ climate effects, nucleation phenomena, role of all emissions, etc.
 - On the compatibility limits of current and future technologies with especially low aromatic fuels
 - On the impact of low aromatic fuels on environment (non-CO₂ effects) but also on fuel production (impact on investment, fuel cost, life cycle...)

- **Ensure a unique fuel standard for aerospace community through ASTM**

Thank You

