

## ALTERNATIVE AVIATION FUELS - LIFECYCLE EMISSION AND ENERGY PROFILES

Laura Lonza  
*European Commission*

**Abstract.** The results are presented of a study carried out at the European Commission's Joint Research Centre providing insights on the GHG emissions profiles and the energy efficiency of representative options for the supply of alternative aviation fuels. Such insights are expected to be of interest to and – ideally – use by decision-makers when considering investment options.

When assessing alternative options – not a simple task due to varied levels of technology maturity – it is important to consider whether the energy efficiency of each alternative fuel option is justified by the benefits in terms of emissions' reductions within a reasonable timeframe.

The energy and GHG savings of drop-in biofuels for aviation are critically dependent on manufacturing processes and the fate of co-products. Methodology choices are therefore crucial to determine results. For purposes of reporting or accounting, emissions from combustion biofuels are often considered as being zero as the fuels are produced from biomass (i.e., the emissions are biogenic). However, non-biogenic emissions associated with biofuels result from the cultivation, harvesting and transport of the biomass, as well as from its conversion into biofuel. The scope of the analysis is focussed on alternative drop-in jet fuels.

The results indicate that fuels made from wastes and residues exhibit much lower GHG emissions per MJ of final fuel when compared to aviation fuels produced from the range of vegetable oils analysed. Of the vegetable oils investigated, a large effect on emissions was seen in palm oil pathways due to two factors; namely the type of land used for cultivation and whether or not methane capture was employed at the oil mill.