Resource demand of a GHG-neutral aviation sector in Europe: a study on e-kerosene

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CO2 and non-CO2 effects generated by emissions in the aviation sector are responsible of about 3% of the worldwide global warming. To date, kerosene remains the only viable aviation fuel for the vast majority of national and international flights. As appointed by the RefuelEU Aviation regulation aiming at defossilizing the aviation sector, alongside biofuels, a relevant share of fuels in Europe must be replaced by sustainable, power-based synthetic kerosene (e-kerosene). Different ways of producing e-kerosene exist, each characterized by a different material footprint. The future demand of all materials in the sector based on climate targets, blending quotas, traffic scenarios and PtL production systems is still unclear. In the Project "Resource demand and availability for a GHG neutral aviation sector", the PtX Lab Lausitz and Dechema are investigating the raw material footprint of the e-kerosene production chain through combining the different technological alternatives available at each process or production components (e.g., RE generation system, electrolyzers technology, etc.). The aim is to identify the impact that different production routes – i.e., combinations of the different available processes components – have on the resource demand side, so to integrate and deepen existing resource forecasts (e.g., the RESCUE Project)[1]. The study also wants to elucidate unknowns in the field of future sustainable e-kerosene production systems under the perspectives of raw material availability, and provides guidelines for a rapid kick-off of an efficient, viable and long-lasting production industry.

[1] RESCUE – Resource-Efficient Pathways to Greenhouse-Gas-Neutrality. Available at: https://www.umweltbundesamt.de/en/topics/climate-energy/climate-protection-energy-policy-in-germany/rescue-resource-efficient-pathways-to-greenhouse#background