REACT4C — Result In Brief

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Optimising flight trajectories for greener skies

Changing flight planning could lessen the impact of aircraft on the environment. An EU initiative looked into changing the flight trajectories of aircraft in order to reduce aviation fuel consumption and emissions.

Aviation plays an important role in our global mobility. However, it also alters the atmospheric composition and thereby contributes to climate change. In the light of developing sustainable aviation climate-optimized flight planning offers one possibility to mitigate aviation climate impact. The EU-funded 'Reducing emissions from aviation by changing trajectories for the benefit of climate' (REACT4C) project performed a feasibility study on climate-optimized flight planning, addressing inefficiencies of air transport with respect to fuel consumption, emissions and overall climate impact.

REACT4C combined atmospheric models, air traffic management tools for planning flight trajectories and models to calculate aircraft emissions with tools for aircraft pre-design. A modelling chain was set up that identified flight altitudes and routes that lead to an overall reduction in climate impact.

An assessment of climate-optimised flight or trajectories was performed for the adaptation required in aircraft pre-design, and the resulting pre-design structure was identified. Based on this, pre-design studies were carried out on aircraft adapted to environmentally friendly flight trajectories. Multi-model studies using aviation emissions assessed the environmental gains of simplified air traffic management measures.

The knowledge acquired by REACT4C led to recommendations on future flight planning, such as practical guidelines for the implementation of environmentally friendly flight routing.

With REACT4C, flight trajectories can be planned for a reduced burden on climate, assisting European policymakers to create policies that reduce emissions and to evaluate mitigation measures. Efficient flying with regards to fuel consumption, emissions and climate impact will enable the aviation sector to better accommodate environmental concerns in design, development and flight planning.

Related information

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