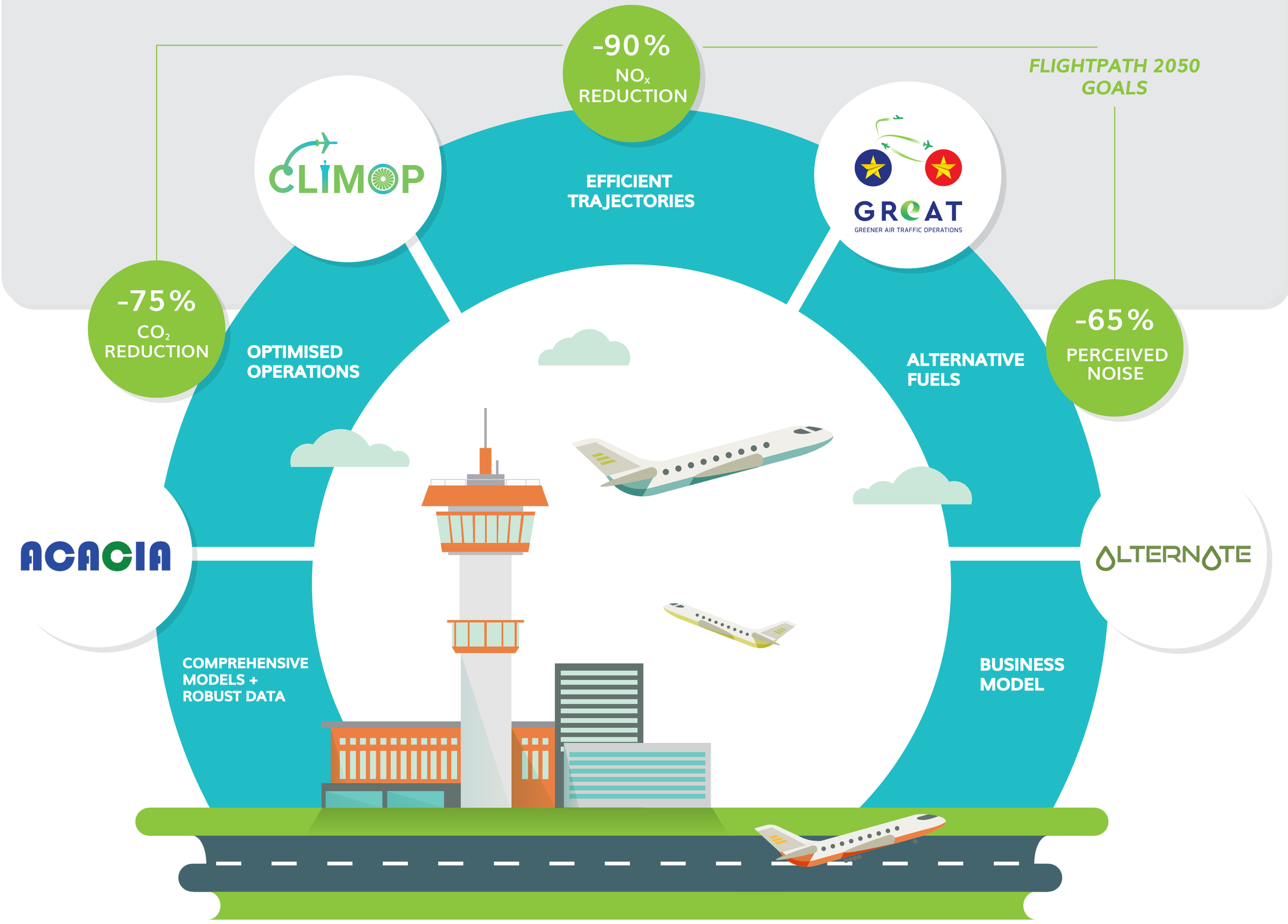
FIRST RESULTS OF EU-FUNDED AERONAUTIC PROJECTS

The ACGA Cluster consists of four EU-funded research projects aiming to reduce the impact of aviation operations on climate change: ACACIA, ClimOp, GreAT and ALTERNATE. The ACGA Cluster addresses mitigation strategies that will minimise negative effects by aviation on climate in the short-medium term and that are relevant for greener flight trajectories and operations. The ACGA projects also support the FlightPath 2050 goals for COMPETITIVE and SUSTAINABLE AVIATION by reducing CO_2, NO_x and noise.



ACACIA targets the non-CO_2 effects of aviation that impact climate as much as aviation's carbon dioxide (CO_2) emissions. However, non-CO_2 effects are associated with much larger uncertainties. Using a global aerosol model, numerical simulations have been performed to assess the sensitivity of the aviation soot-cirrus effect. This resulted in a radiative forcing in the range of -35 to +13 mW m^{-2}, but partly with a confidence level below 95 %.

ClimOP investigates a set of operational improvements (OIs) to combine them into harmonized mitigation strategies to reduce the climate impact of aviation. One of these solutions, Strategic Network Planning, indicates that swapping cost-optimized with climate-optimized routes will reduce the aviation climate impact by 15 % in the short term, increasing the average flight time only by 2.2 %. This improvement will be combined with others to produce harmonized regulations that reduce the climate impact of the en-route phase.

Busy terminal airspaces pose the risk of flight inefficiencies resulting in additional but avoidable exhaust emissions. **GreAT** investigates and develops innovative airspace structures to ensure greener flight trajectories with continuous climb and descent operations by design. Through the integration of advanced supporting systems (e.g. Surface and Arrival Manager), GreAT strives to reduce the climate impact of aviation by improving taxiing, departing, and arriving traffic sequencing at hub and medium airports.

ALTERNATE develops ways to increase the use of Sustainable Aviation Fuel (SAF) in air transport. The use of SAF is among the most promising short-term options to mitigate the climate impact of aviation. However, there are still significant uncertainties about the actual environmental impacts and economic viability of SAF. For example, an attributional Life Cycle Analysis of greenhouse gas emissions has been performed including the impact on direct land-use change (DLUC). Results show that the uncertainty from DLUC scenarios plays an important role in deciding the mitigation potential of SAF.

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