

Greener Air Traffic Operations – The GreAT Project

Addressing environmental challenges, especially global warming, is more than ever a must for the community. This matter is becoming an increasing priority at regional and global level. Europe has made commitments to reduce the aviation environment footprint; hence it is contributing to climate change, increasing noise, impacting local air quality and, consequently affecting the health and quality of life of European citizens. The air traffic in Europe is growing and expected to continue increasing significantly in the future in order to cope with the growing demand for mobility and connectivity. A long-term effect on the environment from aviation sector, mainly caused by aircraft noise and exhaust gases (especially CO₂, nitrogen oxides NO_x and methane), make it a clear target for mitigation efforts. The future growth of aviation shall go hand in hand with environment sustainability policies. Therefore, studies and research are being conducted in Europe exploring possible optimization of the aircraft technologies as well as air traffic management operations. The international project project “Greener Air Traffic Operations” (GreAT) is launched in line with this perspective. Given the close interdependency between flight routing and environment impact, optimization in flight trajectory design and ATC operations are an appropriate means to reduce the emissions in short and medium term time frames. Flight trajectories are influenced on the one hand by environmental and aircraft parameters, and on the other hand by ATC driven parameters, like route length or usable altitudes. During flight execution, re-planning on board of an aircraft using the Flight Management System (FMS) enables to compute a greener trajectory considering dynamic effects at the tactical level, like changes in the weather situation. To hence the efficiency, it is necessary that this trajectory is flown as planned, even under the actual traffic situation controlled by ATC, which is often not the case today. This project will be conducted in cooperation between Chinese and European partners. The overall objective of this cooperation is to reduce the fuel consumption and gas emissions during “gate-to-gate” flight phases. The main focus is to develop and assess environment-friendly air traffic operational concept, adaptive airspace, green trajectory optimization technologies, and supporting avionic systems. Evaluation campaigns between the European partners and in combination with the Chinese partners through cross evaluations are planned to validate the proposed concept and prove the potential of such approach in significantly reducing the aviation’s impact on climate change.