European Commission

RESEARCH & INNOVATION FOR AVIATION

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With the European Green Deal, the EU has set the target to become the **first climate neutral continent** by 2050. Research and innovation (R&I) activities are essential to accelerate the different objectives under the Green Deal, among which the full decarbonisation of the aviation sector by 2050. Aircraft technology cycles are very long: this is why many technologies that will be used in 2035 aircraft are already taking shape now. At the same time, EU R&I focusses also on a more limited number of transformative demonstrators that can be deployed as soon as possible.

These disruptive technologies are key to obtain the ambitious goal of decarbonisation of the aviation sector. While the first European aviation research program started 35 years ago, FP7 and H2020 have also paid adequate attention, for the first time, to aviation safety research, non-CO2 climate impact and the development of new sustainable aviation fuels. Altogether, EU R&I in aviation contributes to **significantly reducing aircraft noise, greenhouse gas emissions and fuel consumption, thus improving safety, local air quality and minimising our dependency on imported fossil fuels**.

More than €1.4 billion has been invested in the European collaborative aviation research in **FP7 and Horizon 2020**, in the period 2007-2020, for priorities in line with Flighpath2050 – Europe's vision for aviation. Beyond the delivered breakthrough technologies, clusters of FP7 and H2020 projects have also **laid the foundation** of the large-scale demonstration and integration activities (e.g. Breakthrough Laminar Aircraft Demonstrator in Europe (BLADE) and Open-Rotor), that were performed in the Clean Sky partnership and national programs.

"The EU has set the world-leading ambition to become climate-neutral by 2050. 35 years of aviation collaborative research are paying off. They have not only delivered breakthrough technologies and spinoffs to many other sectors, but also laid the foundation for most demonstration projects in Clean Sky as well as connected European academia, research establishments and the aviation supply chain. We are fully committed to achieving climate-neutral aviation by 2050, exploiting all synergies in transport, energy and industrial technologies in Horizon Europe and national R&I programmes."

***Mariya Gabriel**, EU Commissioner for Innovation, Research, Culture, Education and Youth*

Research and Innovation

Today, **Horizon Europe** (2021-2027) aviation collaborative research is aligned with the Commission's political priorities (i.e. European Green Deal and making Europe fit for the Digital Age) and represents an investment of €330 million over the period 2021-2027. An additional €1.7 billion is foreseen from the public side for the Clean Aviation institutionalised partnership, on top of the contribution of the same amount from Horizon Europe, which focusses mainly on disruptive technologies for the decarbonisation of EU aviation. This partnership therefore perfectly complements the collaborative research on aviation under Horizon Europe. These projects will develop and deliver new flying testbeds, advanced design and manufacturing technologies, as well as a holistic aviation impact assessment toolbox with assessments for European aviation research policy.

SELECTION OF FP7 & HORIZON 2020 AVIATION PROJECTS

ENABLEH2 tackles key challenges to introduce critical technologies for aircraft propulsion systems based on **liquid hydrogen**. This includes experimental and analytical work. As a result, **a roadmap is developed** addressing the key enabling technologies and the integrated aircraft and propulsion systems to reach technological readiness level (TRL) 6 by 2030-2035.

FUTPRINT50 will accelerate electrification technologies for aviation focussing on **energy storage and harvesting and thermal management**. The new technologies will be applied to an up to 50-seat class hybrid-electric aircraft that will enter into service by 2035/2040.

The **HYPSTAIR** project is a concrete example from the aviation industry about how to implement the more efficient use of energy. The main scope is to **design and validate serial hybrid drive components for the use in light aircraft** and moreover to develop a human-machine interface to simplify operation of a complex hybrid system.

Targeting a year entry-into-service of 2035, **DISPURSAL** investigated aircraft concepts employing distributed propulsion. Aspects addressed include **aircraft design and optimisation, airframe-propulsion integration, power-train system design and advanced flow field simulation**.

Aircraft noise continues to cause adverse effects on quality of life and public health in airports' neighbourhood. To address this challenge and ensure airports will have the capability to respond to the growing traffic demand, **ANIMA** aims to develop **new methodologies and tools to manage and mitigate the impact of aviation noise**, improving the quality of life near airports while facilitating airports growth and competitiveness of the EU aviation sector.

The overall objective of **MAHEPA** is to bridge the gap between the research and product stage of a low emission propulsion technology to **meet the environmental goals for aviation towards the year 2050**. The core value of the project is to build-up technological know-how and use flight test data to **validate performance, efficiency and emission reduction capabilities** of above hybrid-electric propulsion powertrains.

Air travel accounts for 5% of global carbon emissions and flying is responsible for a number of negative external effects that are not neutral to the environment. **ClimOP** project will **detect, evaluate, develop and propose to aviation stakeholders and policymakers** a set of most promising and integrated mitigation strategies aiming to **restrict the aviation sector's climate impact**.

More information on the projects funded by Horizon 2020 is available at ***cordis.europa.eu***

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