



### LESAF PROJECT

The aim of LESAF project is to propose low-profile and highly efficient electronically steerable antenna solutions for the next generation of **In-Flight Connectivity** services in the horizon 2022-2025.

This will be achieved through the definition of requirements, system analysis, technology assessment, prototyping and validation of the proposed electronically steerable antenna approach. It will be demonstrated that this type of antennas can meet the stringent requirements imposed by the aviation market while bringing superior benefits over their alternative technological solutions.



[WWW.H2020-LESAAF.EU](http://WWW.H2020-LESAAF.EU)

### PROJECT COORDINATOR

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**LOW-PROFILE/DRAW ELECTRONICALLY STEERABLE  
ANTENNAS FOR IN-FLIGHT CONNECTIVITY**

# LESAF

## CONSORTIUM

According to the structure defined in Clean Sky initiatives, LESAF consortium is comprised by TTI (project leader) & Celestia UK (project partner) with the participation of a Topic Manager (Thales UK).



## MOTIVATION

The demand for In-Flight Connectivity (IFC) market is growing, and the quality of service provision is forecast to increase. Airlines and service operators look for innovative approaches to reduce CAPEX and OPEX for the In-Flight services. On one hand, the high cost of satcom terminals and the installation procedure should be reduced with new solutions. Additionally, the running costs associated to satellite capacity loan are decreasing because of the deployment of high throughput satellites and megaconstellation. New satcom terminals should impact lowering the fuel consumption by low profile/drag systems.

LESAF project is conceived to impact by improving the EU competitiveness in several aspects, the following are highlighted:

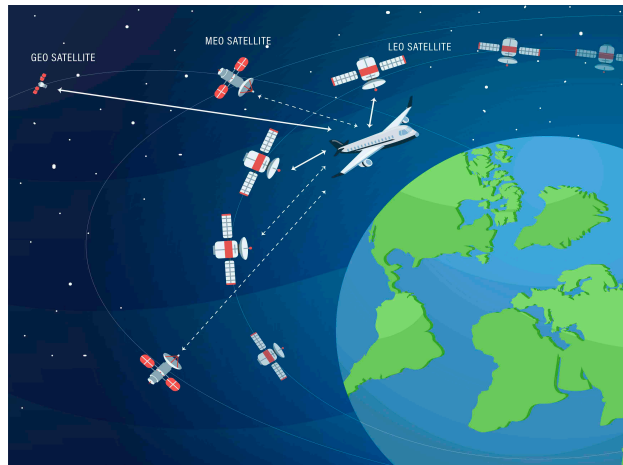
### INNOVATION CAPACITY & STRENGTHEN COMPETITIVENESS

- » Exploitation of results for strengthening the competitiveness of the SMEs companies in the Consortium
- » Position in the market and to develop business opportunities

### IMPROVING OTHER SOCIALLY IMPORTANT ASPECTS

- » Close Digital Divide
- » Competitiveness of the European Space industry
- » Qualified employment
- » Energy efficiency - lower energy use and, a result, less emissions to the environment

LESAF APPROACH IS AN ENABLER FOR THE COST REDUCTION OF CAPEX & OPEX FOR THE AIRLINE COMMUNICATION SERVICES



## TECHNOLOGIES

The electronically steerable antenna is based on a flat phased array panel with RF beamformers, where each single radiating element embeds phase and amplitude control. A modular approach is considered that enables a flexible construction of the aperture.

### Key requirements:

- » High Reliability, High Performance, High Efficiency
- » Low Drag Coefficient – Fuel Savings
- » Gate-to-Gate Operation
- » GEO/MEO/LEO scenarios
- » Multibeam, Seamless handover
- » ARINC-792 compatible (architecture and integration guidelines)
- » FCC 25.218 compliant (antenna radiating pattern)
- » RTCA DO-160G compliant (environmental conditions)

Two separated TX and RX apertures are considered to maximize the performance and mitigate the integration constraints and interferences between the electronics. For example, the transmitter antenna must observe regulatory constraints while the receiving antenna requires the multibeam capability in order to support multi-satellite tracking and seamless handover.

