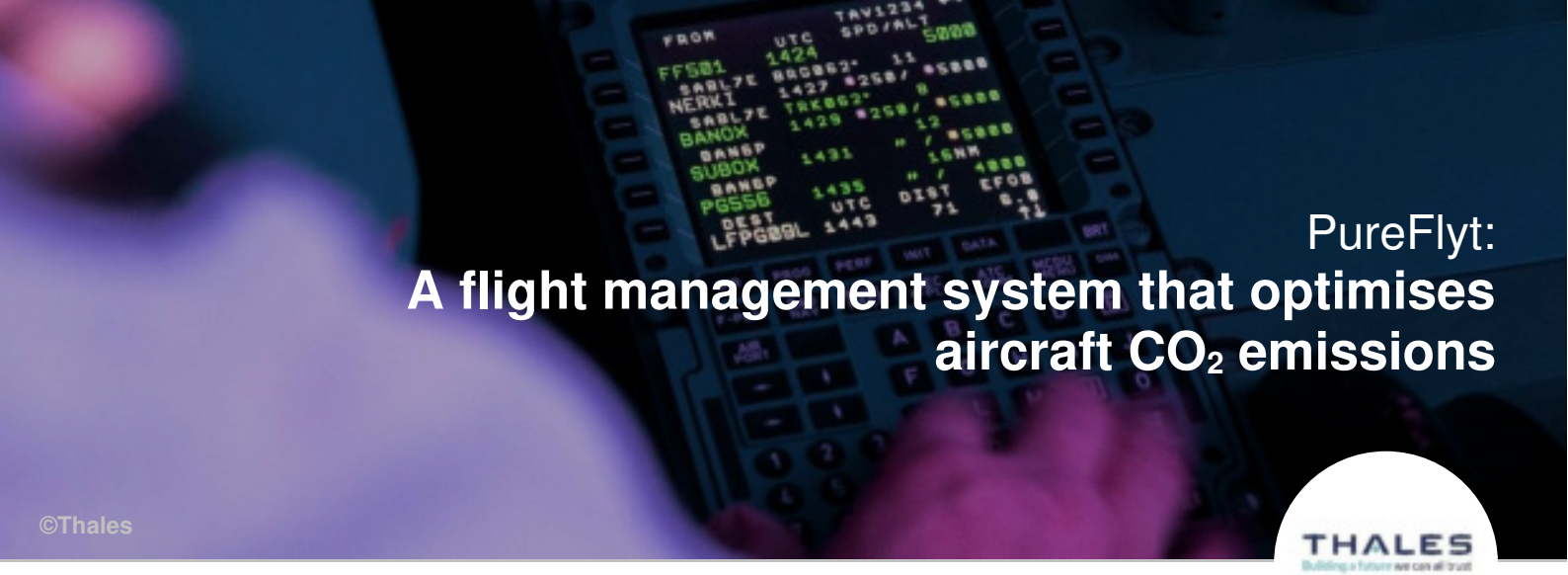


PureFlyt:
A flight management system that optimises aircraft CO_2 emissions

The PureFlyt Flight Management System solution to be deployed by Thales will make it possible to optimise an aircraft's flight path to reduce fuel consumption and CO_2 and NO_x emissions.

Starting date of the project	Preliminary design phase: 2014 - 2018 Start of development: 2019 Market launch planned for 2025
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Development by teams from Thales's aerospace business. Installation of the PureFlyt Flight Management System on new or retrofitted aircraft.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Improve aircraft flight path optimisation and reduce jet fuel consumption.
Detailed project description	The PureFlyt Flight Management System solution optimises the aircraft's trajectory for each flight phase, thereby reducing fuel consumption and emissions of CO_2 and NO_x. PureFlyt relies on bidirectional communications with open platforms to continuously calculate new trajectories based on the latest data, which is permanently updated to reflect changing weather patterns and air traffic control requirements. The aircraft's flight path can be monitored, adapted and optimised at all times, making flights shorter and reducing fuel consumption. PureFlyt improves situational awareness and provides effective decision support to air crews. The system calculates the complete flight path, including all the different flight phases, with significantly greater precision than earlier fight management systems, and offers a range of advanced functions, including: • Real-time flight plan convergence • Selection of best descent profiles • Optimised cruise profile • Improved energy management PureFlyt is designed for civil airliners, military aircraft and business jets.
Main project's drivers for reducing the greenhouse gas emissions	

Reduction levers	**Details on the aspects of the project**
☒ Energy and resource efficiency (including behaviour)	Optimisation of flight paths and fuel consumption
☐ Energy Decarbonisation	
☐ Energy efficiency improvements	
☐ Improving efficiency in non-energy resources	
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	
☐ Financing low-carbon producers or disinvestment from carbon assets	

	☐ Reduction of other greenhouse gases emission
Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope	

	Aspects of the project contributing to the reduction of emissions by emission category	**Quantification of associated GHG emissions by emission category** *Please follow the quantification methodology used in the Afep guidelines.*
Reduction of the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's activities.*		
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*		
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*		
Increase of carbon sinks		
Absorption of emissions *Carbon sinks creation, (BECCS, CCU/S, …)*		
GHG emissions avoided by the company at third parties		
Emissions avoided *Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.*	Optimisation of aircraft fuel consumption	650 tCO_2eq per aircraft per year

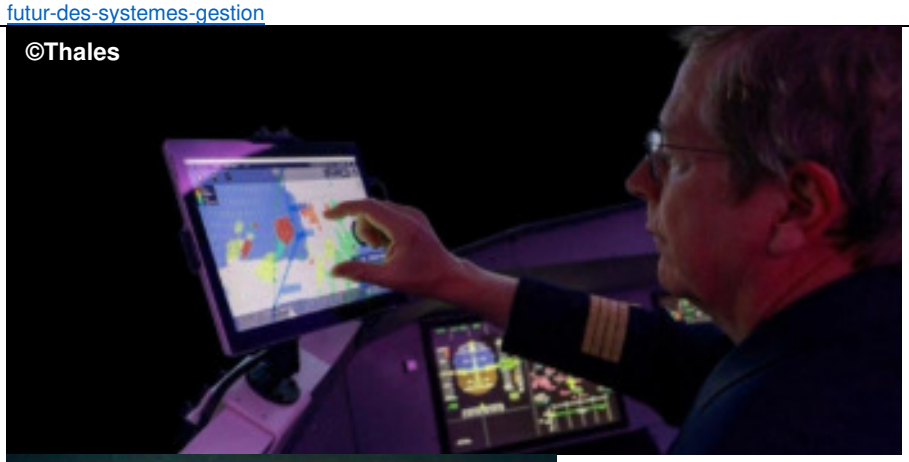
Clarification on the calculation or other remarks:

The PureFlyt system will reduce fuel consumption by an estimated 3-4% compared to the previous generation of flight management systems, saving an average of 170 tonnes of fuel per aircraft per year (cf. Eurocontrol data).

Based on an emission factor of approximately 3.82 $kgCO_2/kg$, this represents close to 650 tCO_2eq per aircraft per year, all other things being equal.

This analysis is based on Eurocontrol data, in particular, with 1,600 flight cycles per year, an average flight time of 2 hours and a rate of fuel consumption of 2,300 kg/h.

Modality of verification of the quantification	**Calculation standard used (ADEME base, GHG protocol, etc.):** The calculations are based on an "average" usage profile and the hypotheses issued by Eurocontrol. The emission factor of jet fuel is taken from the Base Carbone published by Ademe. **Verification of calculation (internal or external):** Internal verification
Other environmental and social benefits of the project	PureFlyt reduces CO_2 emissions during all flight phases and thus contributes to SDG 13 (Climate Action). It also cuts down noise pollution in the approach phase.
Project maturity level	☐ Prototype laboratory test (TRL 7) ☐ Real life testing (TRL 7-8) ☒ Pre-commercial prototype (TRL 9) ☐ Small-scale implementation ☐ Medium to large scale implementation **Remarks :** Commercial launch in progress with in-service date of 2025 (for both new aircraft and retrofit programmes).
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	All eligible aircraft fleets.
Amount invested (in €)	The project draws on 30 years of experience in the development of algorithms and operation of flight management systems.

Economic profitability of the project (ROI)	☒ ST (0-3 years) for the end user ☐ MT (4-10 years) ☐ LT (> 10 years) **Remarks :** This solution offers several economic benefits: • **For the project lead:** competitive advantage of user value proposition (reduced operating costs), which helps to reduce operational CO_2 emissions. • **For users:** lower operating costs and improved image of air transport.
Engaged partnerships	Implementation of trajectory management concepts and methods being developed by SESAR (Single European Sky ATM Research) in Europe and NextGen in the United States. PureFlyt is designed to meet the future requirements of Cleansky, SESAR and NextGen.
Open comments from the project owner	/
For more information about the project	
Contact the company carrying the project	Product Manager: pierre.bayle@fr.thalesgroup.com Thales: avionics@fr.thalesgroup.com
Project URL links	https://www.thalesgroup.com/fr/marches/aeronautique/cockpit-equipements-fonctions-avioniques/entrez-le-futur-des-systemes-gestion
Illustrations of the project	©Thales  ©Thales 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