



Bringing zero-emission technologies to aviation

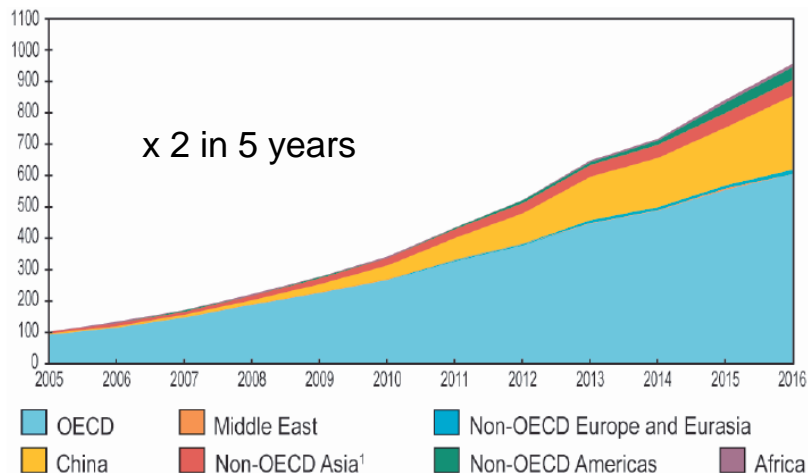
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VP, Zero Emissions Technology

AIRBUS

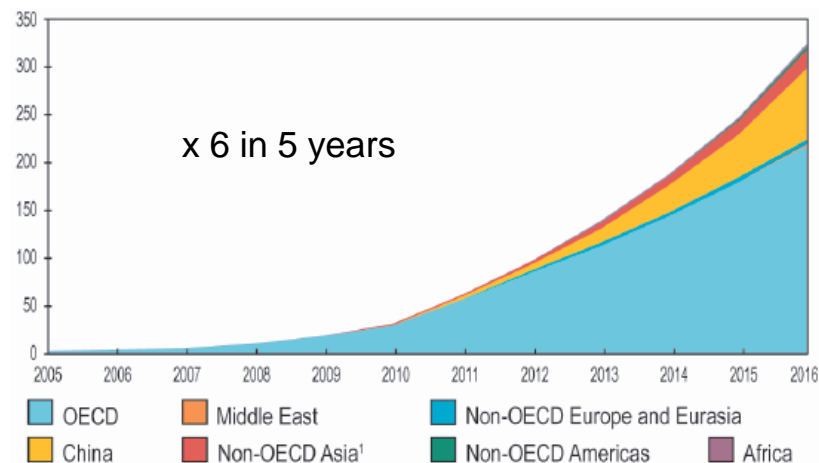
ELECTRIFICATION OF FLIGHT

Exponential growth in renewable electricity

World wind electricity production from 2005 to 2016 by region (TWh)



World solar PV electricity production from 2005 to 2016 by region (TWh)



ELECTRIFICATION OF FLIGHT

Airbus E-Fan 1.0 crossed English Channel in 2015



AIRBUS



Vahana

First Flight: Jan 2018

>100 flights completed

Hover plus full transition
flight completed

Vahana is an all-electric, single-seat, tilt-wing vehicle demonstrator that focuses on advancing self-piloted, electric vertical take-off and landing (eVTOL) flight.

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ELECTRIFICATION OF FLIGHT

CityAirbus 4-seat eVTOL

First Take-Off: 3 May 2019



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E-FAN X

2 MW Electrical Motor
2 MW Battery Power
2 MW Generation System

AIRBUS

ELECTRIFICATION OF FLIGHT

**Airbus is at the forefront of
electric-propulsion technology**



ELECTRIFICATION OF FLIGHT

Airbus 20 Megawatt Test Facility Opened in 2019



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Airbus & SAS Airlines partner on electric a/c operations and infrastructure requirements

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Press Release

Airbus and SAS Scandinavian Airlines sign hybrid and electric aircraft research agreement

@SAS #Hybrid #ElectricAircraft #Decarbonisation #zeroemissiontech

Toulouse, 22 May 2019 – Airbus has signed a Memorandum of Understanding (MoU) with SAS Scandinavian Airlines for hybrid and electric aircraft eco-system and infrastructure requirements research.

The MoU was signed by Grazia Vittadini, Chief Technology Officer, Airbus and Göran Jansson, Deputy President EVP Strategy & Ventures, Scandinavian Airlines. Collaboration will start in June 2019 and will continue until the end of 2020.

Under the MoU, Airbus and SAS Scandinavian Airlines will cooperate on a joint research project to enhance understanding of the operational and infrastructure opportunities and challenges involved with the large-scale introduction of hybrid and full electric aircraft to airlines modus operandi. The project scope includes five work packages, which focus on analysing the impact of ground infrastructure and charging on range, resources, time and availability at airports.

The collaboration also includes a plan to involve a renewable energy supplier to ensure genuine zero CO2 emissions operations are assessed. This multidisciplinary approach—from energy to infrastructure—aims to address the entire aircraft operations ecosystem in order to better support the aviation industry's transition to sustainable energy.

Aircraft are roughly 80% more fuel efficient per passenger kilometer than they were 50 years ago. However, with air traffic growth estimated to more than double over the next 20 years, reducing aviation's impact on the environment remains the aim of the industry.

To overcome this challenge, the Global Aviation Industry (ATAG) including Airbus and SAS Scandinavian Airlines have committed to achieving carbon-neutral growth for the aviation industry as a whole from 2020 onwards, cutting aviation net emissions by 50% by 2050 (compared to 2005).

This agreement further strengthens Airbus' position in a field where it is already investing in and focusing its research efforts on developing hybrid-electric and electric propulsion technologies that promise significant environmental benefits. Airbus has already started to build a portfolio of technology demonstrators and is currently testing innovative hybrid propulsion systems, subsystems and components in order to address long-term efficiency goals for building and operating electric aircraft.

About Airbus

Airbus is a global leader in aeronautics, space and related services. In 2018 it generated revenues of € 64 billion and employed a workforce of around 134,000. Airbus offers the most comprehensive range of passenger airliners. Airbus is also a European leader providing tanker, combat, transport and mission aircraft, as well as one of the world's leading space companies. In helicopters, Airbus provides the most efficient civil and military rotorcraft solutions worldwide.

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Thank you