Sustainable Aviation – The Airbus perspective

Airbus Environmental Affairs

Presented by
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Agenda

- Background
- What is Airbus doing?
  - Role and Strategy
  - Value Chains
  - Flights
  - European Alternatives
- The future

Background

Aviation is a significant Economic Engine

$2.2 trillion
Aviation's global economic impact (including direct, indirect, induced and tourism catalytic)

3.5 %
Proportion of global gross domestic product

56.6 million
People employed worldwide by aviation and related tourism

19th
If aviation were a country, it would rank 21st in terms of the size of economy

Fuel consumption & the CO2 emissions will increase

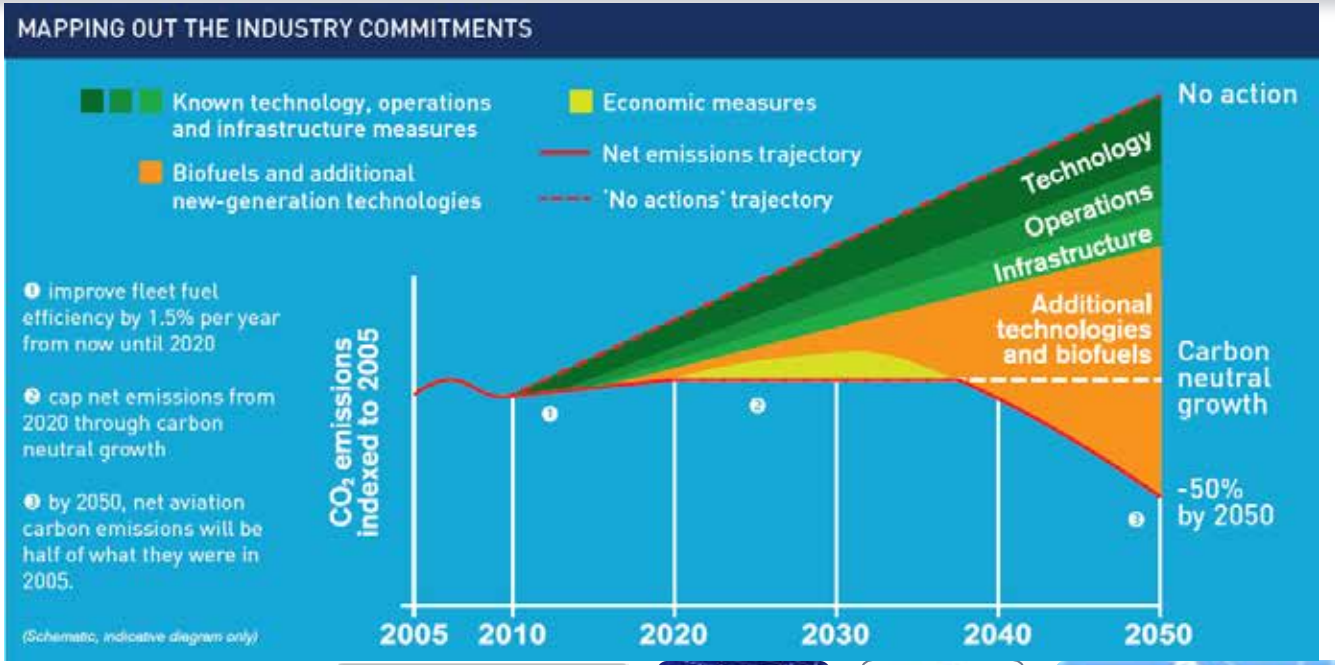
Today…..

- **2% of of global CO2 emissions….. And 10% of global fuel use for transportation**
- Fuel represents around **30% of operating costs for Airlines**

Tomorrow ?

- Aviation **Traffic will double** in the coming 15 years !
- Aviation traffic for more than 2 billion people and over 40MTonnes of cargo every year !
- **Fuel consumption & CO2 emissions** will **more than double** within the next 25 years

Background
The Challenges for Aviation



The answers?

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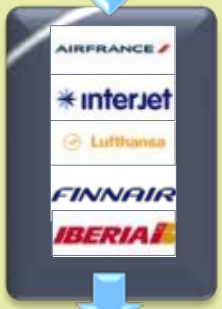
Airbus Role and Strategy

Innovation
by promoting and supporting new pathways

Policy, Standards and Sustainability
to prioritise alternative fuels for aviation & act as a benchmark for sustainability

Demonstrations → **Value Chains** → **Commercial Flights**



Qualification & Certification
to control, but also bring on line new pathways

Strategic Partnerships
to support policies, sustainability, customer and regional strategies

Optimised & Demonstration Flights
to meet customer expectations offering cross functions benefits

Role as innovator and catalyst in support of Aviation development

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Sustainable Alternative Fuels

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What is Airbus doing?

Supporting demonstration and qualification of Alternative Fuels

2008: A380 4 hour Flight test with GTL Not approved
- Performed on Airbus flight test aircraft (RR engines) under EASA Flight Test and Development regulations
- Data used to support approval of Fischer Tropsch fuels in DEF STAN 91-91 and ASTM D1655

2009: A340-600 first commercial flight with GTL by Qatar Airways
- Fuel conformed to DEF STAN 91-91
- No additional requirements imposed

2010: A320 TAM Demonstration Flight with Not approved HEFA
- Large ASTM D4054 data base already existed
- Fuel was analysed and specific testing performed
- Specific operational and maintenance tasks imposed

2011: A320 Interjet Demonstration Flight with Not approved HEFA
- Same process and restrictions as TAM

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What is Airbus doing?
Supporting commercial Flights using Alternative Fuels

2011: HEFA commercial flights performed:

- Lufthansa A321;
  - 47% Jatropha and Animal fats supplied by NESTE Oil
  - **Over 1 000 flights performed**
- Finnair A320
  - 50% recycled cooking oil supplied by SkyNRG
- Interjet A320
  - 50% Jatropha supplied by UOP/ASA
- Iberia A320
  - 25% Camelina supplied by UOP/Repsol
- Air France / Air Canada
  - 50% recycled cooking oil supplied by SkyNRG

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What is Airbus doing?

Implementing Sustainable best practices for a “Perfect Flight”...

The Perfect Flight

Up to 50% less CO2 emissions

14 October 2011: Airbus and **Air France** completed a commercial flight from Toulouse to Paris with an Airbus A321, achieving a 50% reduction in CO_2 emissions compared to a similar regular flight.

18 June 2012: Airbus and **Air Canada** made North America’s first ever Perfect Flight using an Airbus A319 and achieving over a 40% reduction in CO_2 emissions compared to a similar regular flight.

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Airbus and Air France Perfect Flight

In October 2011 Airbus, together with Air France, conducted a commercial passenger flight between Toulouse, Blagnac and Paris, Orly

Combining all levers to reduce CO2:

- Airbus A321
- Use of alternative fuels
- Optimised air traffic management (ATM)
- Efficient operations: Continuous Descent Approach (CDA)

-50% of CO2 emissions reduction compared to a normal Flight

Air Canada Perfect Flight

Air Canada – Airbus Perfect Flight 18th of June 2012

- Commercial Flight Toronto – Mexico City
- Airbus A319 – Flight AC991
- Flight duration 4h45
- Optimized ATM & Operations
- Use of Alternative Fuels - Used Cooking Oil (50%)
- Weight reduction à approx. 500kg

AIR CANADA AIRBUS AN EADS COMPANY SkyNRG

More than 40% CO2 emissions reduction compared to a normal Flight

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What is Airbus doing?

Supporting the European BioFuels Flightpath 2020

2 MTons of Aviation Alternative Fuels in 2020 = 4% of EU Annual Fuel Consumption

Cross Industry, government collaboration & consensus

By 2015

- Set-up financial mechanisms
- Secure sustainable feedstock production to feed 3 refineries
- Build-up 3 new refineries and launch Alternative Fuels production
- Manage communication strategy<

Objective è 3 Refineries
Cost è 1.300 M€

By 2018

- Regular commercial flights using bio-jet fuel blends
- Build-up 4 additional refineries
- Build-up 2 additional refineries producing algae & microbial oil based aviation Alternative Fuels

Objective è 6 Refineries
Cost è 1.700 M€

By 2020

- Full deployment of at least 2 million tons of Alternative Fuels per annum for EU aviation

9 Refineries
3.000 M€ total Cost

BRITISH AIRWAYS · Lufthansa · NESTE OIL · btg biomass technology group · AIRFRANCE · KLM · AIRBUS · UOP A Honeywell Company · CHOREN · Directorate-General for Energy

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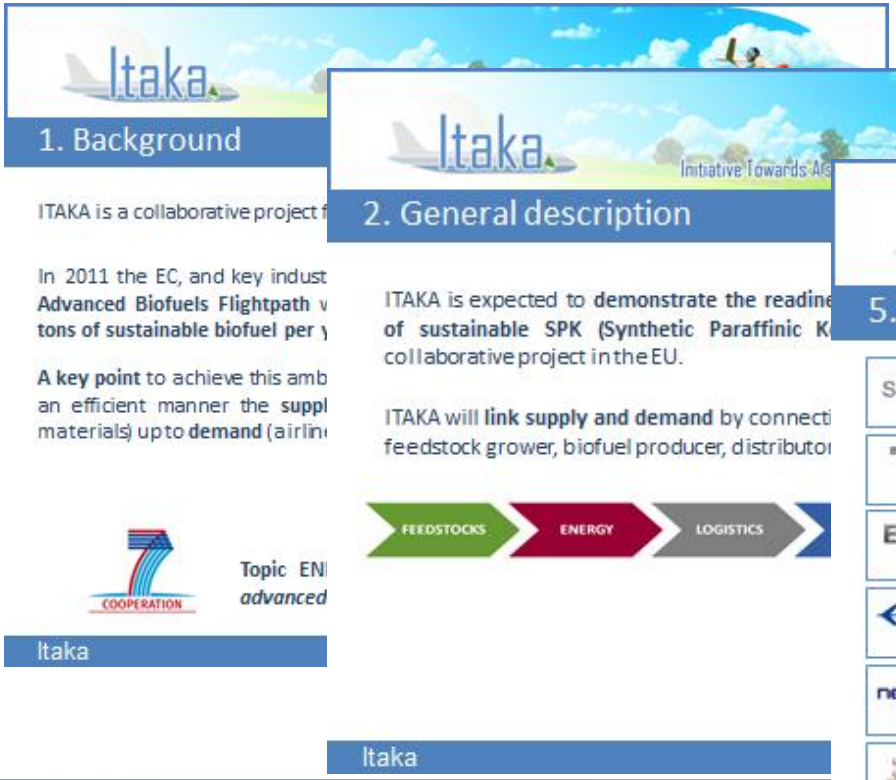
ITAKA
Initiative Towards Sustainable Kerosene For Aviation



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The future steps

- **Implement projects for a sustainable production.**

- **Increase expertise.**

- Ensure **Sustainability**.

- Transform from **demonstration to large scale use** of alternative fuels.

- **Involve Governments and investors** to develop local strategies for a sustainable aviation.

- Encourage **Innovation** for a long-term future**.**