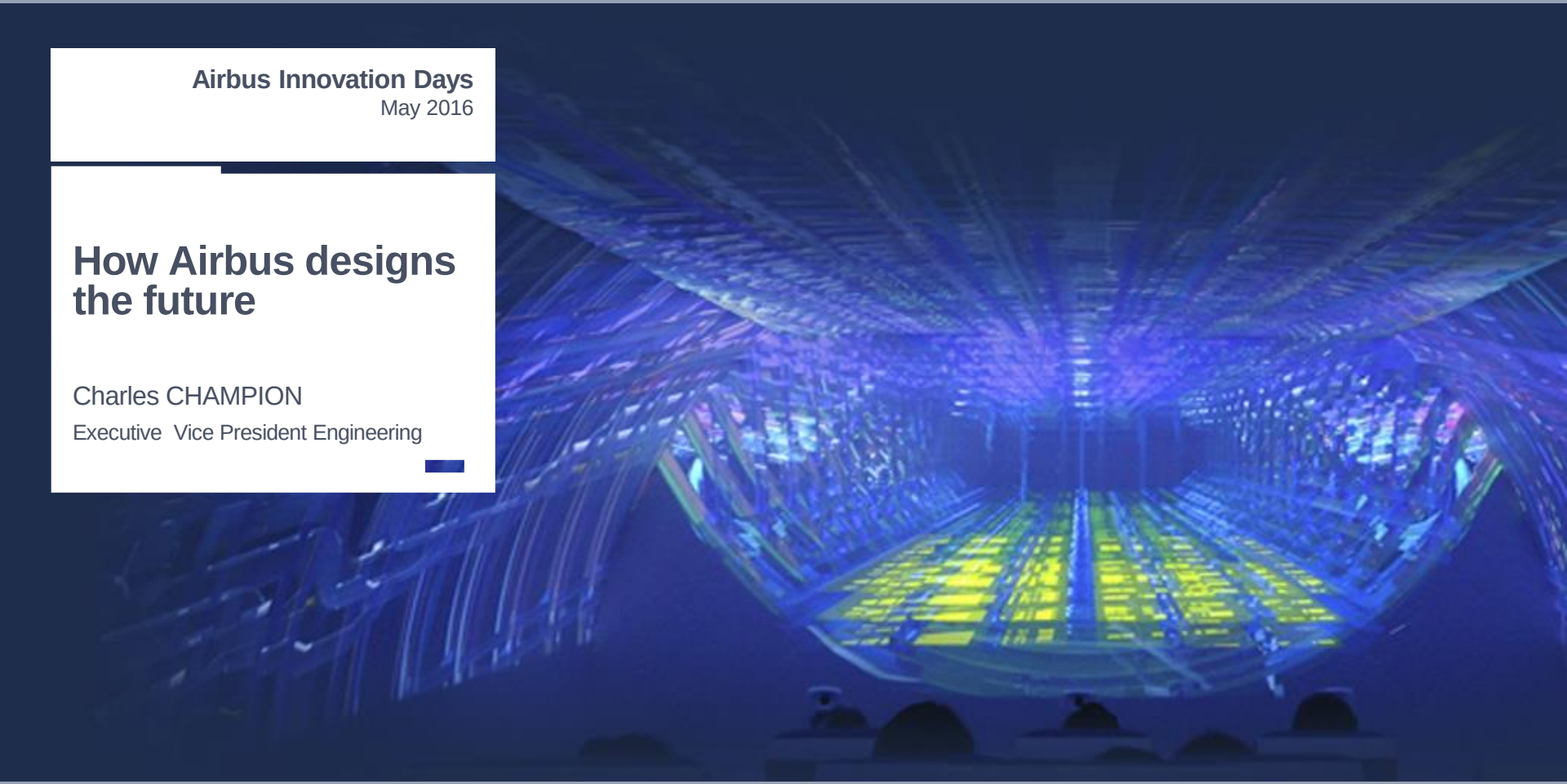


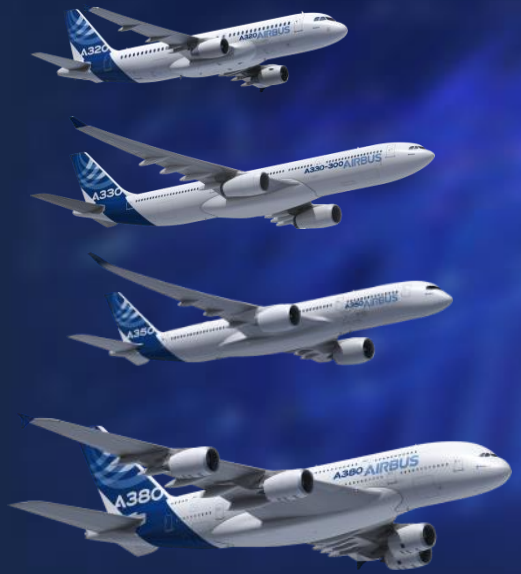
Airbus Innovation Days
May 2016

How Airbus designs the future

Charles CHAMPION
Executive Vice President Engineering

We leverage **incremental & breakthrough innovations** to design our future aircraft

State of the art
Airbus aircraft family



Incremental Developments

New Concepts

Airbus R&D

Over **2 bn€** each year
to enhance aircraft efficiency,
new technologies & architectures

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

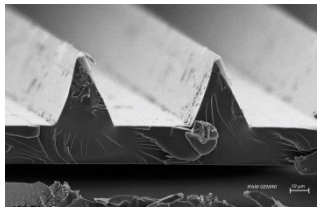
Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

AIRBUS

Enhance Aircraft Performance

With application of riblets to reduce turbulent drag in cruise

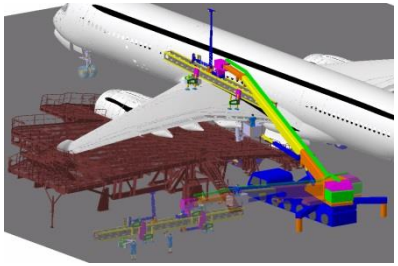


Technology development of riblet application

2013

Implementation & Testing in near-industrial environment

2015



“Full Scale System” demonstrator in industrial environment

2017

Expected Benefits

-1.5% fuel burn

dependent on aircraft type, mission, area applied and riblet efficiency

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

AIRBUS

Boost our Customer Competitiveness

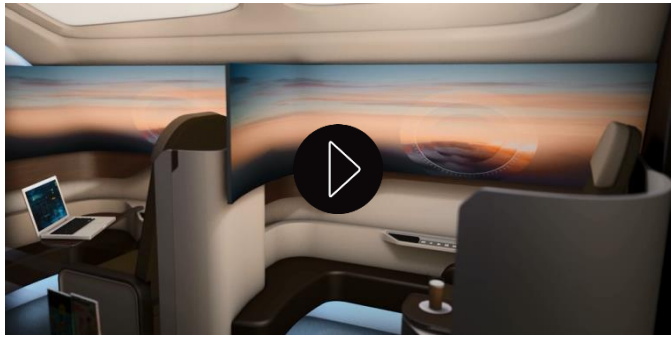
With enhanced passenger outside view

Interactive displays
virtual outside view,
in special areas

Big interactive surfaces
virtual outside view,
in cabin segments

Entire cabin
equipped with
interactive surfaces
& virtual outside view

Short term → **Mid term** → **Long term**



Expected Benefits

- **New customer experience**
  & ancillary revenue generation
- **Extra comfort**
- **Higher flexibility**
  & reduced customization efforts

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

AIRBUS

Improve overall Air Traffic Management

With maximized air transportation safety, efficiency, and growth

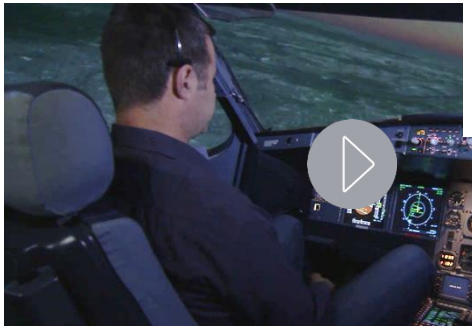
Closure of SESAR 1
R&D phase
e.g. initial 4D

Data Collection
on real flights

SESAR 2020
R&D phase
e.g. mature use of aircraft trajectories in ATM

Very Large Demonstrations
on revenue flights
e.g. more than 100 equipped aircraft flying over core Europe

2016 → 2016-2019 → 2017-2020



SESAR

Expected Benefits

- **Reduce aircraft delays**
- **Reduce fuel burn, CO_2/NOx emissions & noise**
- **Enable increased capacity while maintaining safety**

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

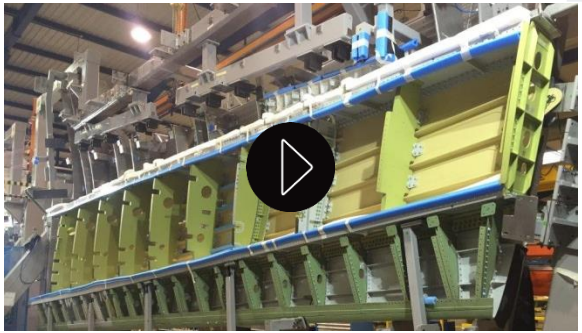
Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

Demonstrate environmental benefits at aircraft level

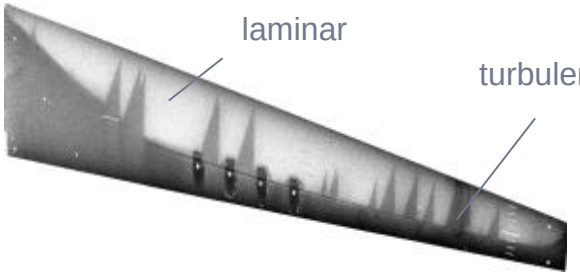
Breakthrough Laminar Aircraft Demonstrator in Europe - BLADE

2014 – 2015
Wind tunnel tests. Laminar wing & Krueger flap demonstrator



2016
First aircraft parts

2017
Flight tests on Airbus A340



Expected Benefits

Minimise drag with laminar flow

-5% fuel burn saving
compared to current aircraft generation

Clean Sky

AIRBUS

Our **key drivers** to design the aviation of tomorrow

Enhance
Aircraft Performance

Boost our
Customer Competitiveness

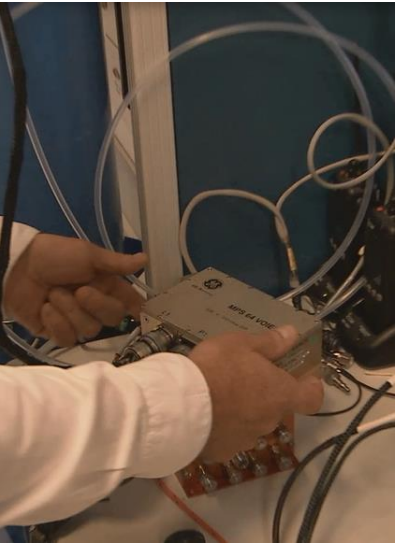
New **Ways of Working** by
Leveraging new **Technologies**
Inspiring & Connecting **People**

Improve overall
Air Traffic Management

Contribute to
Sustainable Aviation

AIRBUS

Leverage new Technologies
Using low-cost smart sensors in our tests



Until 2014
Classical sensors used on Airbus flight test aircraft

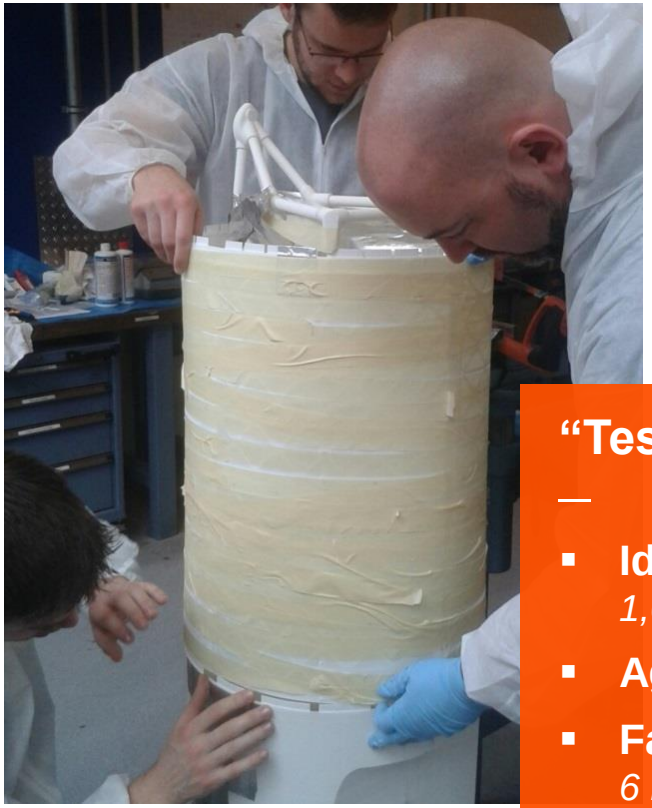
2015
First “off the shelf” sensors on A350 XWB flight tests

A350-1000
Fully equipped with smart sensors

Proven Benefits

- **Simplifying flight test system** architecture & installation
- **Cost efficient**
- **Delivering new kinds of data**

Inspire & Connect People
To innovate faster



“Test fast, fail fast, adjust fast”

—

- **IdeaSpace**
  1,000+ ideas posted (2015)
- **Agile methods, Design thinking**
- **Fast prototyping**
  6 ProtoSpace open

AIRBUS