IATA
WINGS OF CHANGE
EUROPE

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LUFTANSA GROUP
Master of ceremony

Bill Morrison
Author, trainer, consultant
Sandler

IATA Wings of Change Europe, Berlin, 19-20 November 2019
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IAI
WIFI

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- **Password:** WOCE19

Social Media

- Please use #WOCE19 to share your posts, tweets, etc.
Slido

- Access [www.slido.com](http://www.slido.com) on your mobile, tablet or laptop
- Join the meeting by entering: #WOCE19
- Access the “Questions” tab
A strategic roadmap for Aviation

Carsten Spohr
Chairman of the Executive Board & CEO / Chair of the Board of Governors
Lufthansa Group / IATA
Welcome Address

Steffen Bilger
Parliamentary State Secretary
Federal Ministry of Transport and Digital Infrastructure, Germany
The new European Commission’s vision for a sustainable air transport industry

Filip Cornelis
Director for Aviation (DG Move Directorate E)
European Commission

IATA Wings of Change Europe, Berlin, 19-20 November 2019
Sustainable Growth, the only way forward

Alexandre de Juniac
Director General and CEO
IATA

IATA Wings of Change Europe, Berlin, 19-20 November 2019
What role for Europe in an ever more global and shifting economy?

Brian Pearce
Chief Economist
IATA

IATA Wings of Change Europe, Berlin, 19-20 November 2019
Challenges for European air transport

Brian Pearce
Chief Economist

19th November 2019
Europe’s air cargo is shrinking and travel is stalling

Source: IATA Economics using data from IATA Statistics

[Graph showing RPKs and FTKs carried by European airlines, billion per month, seasonally adjusted]

Source: IATA Economics using data from IATA Statistics
The trade war is causing serious damage

Source: IATA Economics using data from Netherlands CPB and Oxford Economics
European business and consumers less confident

Source: Markit PMI composite, EU DG ECFIN consumer survey
Central bank extraordinary support resumes

Central bank assets

US Federal Reserve Bank
European Central Bank

Source: Refinitive Datastream
But no support from fiscal policy

Source: IMF World Economic Outlook, October 2019
Economic growth forecasts could well be cut

IMF forecasts of EU28 economic growth

Dates show the revision of EU28 GDP forecasts by the IMF

Source: IMF World Economic Outlook, various
The weak economy should keep oil prices low

Brent crude oil price and oil future curve

Source: IATA Economics using data from Refinitiv Datastream
Airlines will need strong balance sheets

Source: IATA Economics using data from The Airline Analyst
Long tail of weaker airlines in Europe

EBIT for individual European airlines, $ million, 2008 versus 2018

Source: IATA Economics using data from The Airline Analyst
Competition remains strong

Revenue share of intra-EU routes served by 1, 2, 3 or more airlines

- 1 airline
- 2 airlines
- 3 or more airlines

% of total base fare revenues

Source: IATA Economics using data from DDS
Climate change one of the key structural challenges

Frequency climate issue discussed at earnings calls with investors

Source: HSBC 'The Second Frontier: Climate is changing for airlines', September 2019
Will ‘Flygskam’ change Business as Usual?

Passenger departures per head of population vs living standards

Size of bubbles proportionate to number of passengers

Source: IATA Economics using data from PaxIS and Datastream
Aviation centre of gravity shifting away from Europe

Source: IATA/Tourism Economics Air Passenger Forecasts, October 2019
Emerging market passenger flows grow rapidly

Incremental annual passenger numbers by 2038, billion

- Return to globalization
- Current trends
- Protectionism deepens

China
United States
India
Indonesia
Thailand
Vietnam

Source: IATA/Tourism Economics Air Passenger Forecasts, April 2019
Need to eliminate costly and wasteful congestion

Cost of en-route ATFM delays in Europe, Euro billions

- **Consumer loss**
- **Airline loss**

Source: IATA Economics using airline losses estimated by PRC and average value for Eurocontrol value of time for passengers
Productivity vital given Europe’s poor demographics

Average annual % growth (CAGR)

Source: IATA Economics using data from Oxford Economics, November 2019 forecast
This is aviation’s critical role for Europe

Source: SRS Analyser, November 2019, Europe to all airports, scheduled flights
Airlines connect Europe better than other regions

International connectivity relative to the population size

Source: IATA Economics
Generating key ingredients for economic success

Facilitating flows of:

- Investment
- Trade
- Skilled labour
- Competition
- Innovation
- Tourism

Boosting European productivity
(i.e. doing more with less)
Thank you
economics@iata.org
www.iata.org/economics
NETWORKING COFFEE BREAK
Largescale electric aircraft – myth or reality?

Andreas Kloeckner
Coordinator Electric Flying Program
Strategy Aeronautics
DLR
Contact: **German Aerospace Center (DLR e.V.)**
Programme Strategy Aeronautics
D-51147 Köln-Porz

Dr.-Ing. Andreas KLOSEKNER
Andreas.Kloeckner@dlr.de
IATA Diversity & Inclusion 25 by 2025

An industry pledge to work towards shifting key Diversity & Inclusion Metrics across the industry by 25%, or up to a minimum of 25% by 2025.

Results will be shared annually at the AGM.

A forum to share best practices and ideas for the airline to use and implement.
25by2025
Wings Of Change Signatories

AEGEAN  airBaltic  AirDolomiti  AIR CORSICA  AIRFRANCE  ATLANTIC AIRWAYS  Austrian

Blue Air  brussels airlines  Bulgaria Air  Carpatair  edelweiss air

Atlantic  Eurowings  FINNAIR  flybe  Georgian Airways  Hahn Air

HiFly  ICELANDAIR  Lufthansa  Lufthansa Cargo  Lufthansa CityLine

norwegian  PEGASUS  SAS  SOMON AIR  SWISS  UIA  IATA
Airline CEOs on the spot – interviews

Barbara Scherle
Journalist and German TV Anchor

Benjamin Smith
Chief Executive Officer
Air France-KLM

Oana Petrescu
Director General
Blue Air

Bjørn Kjos
President and Founder
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ANNOUNCEMENT
Environment, a sine qua non condition to aviation sustainability – Fire-side chats

**Anita Mendiratta**
Founder & Managing Director
ANITA MENDIRATTA & Associates

**Jonathon Counsell**
Group Head of Sustainability

**Ricardo Entz**
COO
XO Airbus Demonstrators

**Maurice Georges**
Director
DSNA

**Maarten van Dijk**
CEO
SkyNRG

**Tim Johnson**
Director
Aviation Environment Federation

**David Antonioli**
CEO
Verra
ENVIRONMENT: A Sine Qua Non Condition to Aviation Sustainability

NOVEMBER 19TH 2019
Berlin
THE SCOPE OF GLOBAL AVIATION

- 4.4 billion passengers
- 3,759 airports
- 31,717 aircraft
- 45,091 routes
- 170 ANSPs
- 1,303 airlines

www.aviationbenefits.org
## OUR GLOBAL SUPPORT FOR EMPLOYMENT & ECONOMIC ACTIVITY

<table>
<thead>
<tr>
<th>EMPLOYMENT</th>
<th>ECONOMIC BENEFIT (GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.7 million</td>
<td>$896.9 billion</td>
</tr>
<tr>
<td>7.8 million</td>
<td>$454 billion</td>
</tr>
<tr>
<td>10.8 million</td>
<td>$637.8 billion</td>
</tr>
<tr>
<td>10.2 million</td>
<td>$704.4 billion</td>
</tr>
</tbody>
</table>

**65.5 million**

**$2.7 trillion**

[www.aviationbenefits.org](http://www.aviationbenefits.org)
AVIATION IN CONTEXT

- **2%** (global)
- **1.3%** (international only)

- **WWW** (the internet)
- **Shipping**
- **Indonesia**
- **Canada**

**Buildings** (10%)
- **Road transport** (17%)
- **Other industrial** (9%)
- **Iron & steel** (5%)
- **Cement** (4%)
- **Shipping** (3%)
- **Heat and electricity** (7%)

**Aviation** (2%)

**Electricity** (44%)

CO₂ only, does not include forestry
AVIATION TRACK RECORD ON IMPROVING EFFICIENCY

- **Global economy (2014):** 29% improvement in CO₂ per $ GDP
- **Global aviation (2014):** 51% improvement in CO₂ per RTK

80% Improvement in aircraft CO₂ emissions per seat since 1990

IATA and World Resources Institute data

www.aviationbenefits.org
SETTING THE STRATEGIC DIRECTION

**GOAL 1**
PRE-2020 AMBITION
1.5% ANNUAL AVERAGE FUEL EFFICIENCY IMPROVEMENT FROM 2009 TO 2020.

**GOAL 2**
IN LINE WITH THE NEXT UNFCCC COMMITMENT PERIOD
STABILISE NET AVIATION CO₂ EMISSIONS AT 2020 LEVELS WITH CARBON-NEUTRAL GROWTH.

**GOAL 3**
ON THE 2°C PATHWAY
REDUCE AVIATION’S NET CO₂ EMISSIONS TO 50% OF WHAT THEY WERE IN 2005, BY 2050.
CORSIA: STATES INCL. IN FIRST (VOLUNTARY) PHASES

CORSIA OFFSETTING
CURRENT AS OF 19 MARCH 2019
IATA RESEARCH - 2019: ‘WHAT THE PUBLIC IS TELLING US’

Environmental concerns are not deterring travellers from flying at present

Statement: In the past I have chosen not to fly because of environmental concerns (e.g. carbon emissions)

© IATA - International Air Transport Association

www.aviationbenefits.org
FLYERS ARE UNSURE ABOUT WHETHER THE INDUSTRY HAS BEEN MAKING STRONG EFFORTS TO MEET ITS ENVIRONMENTAL GOALS

Statement: The industry has been taking impressive collaborative efforts to meet these goals, with representatives from airlines, airports, air traffic management and the manufacturing sector all taking part in the process.
Environment, a sine qua non condition to aviation sustainability – Fire-side chats

Anita Mendiratta
Founder & Managing Director
ANITA MENDIRATTA & Associates

Jonathon Counsell
Group Head of Sustainability
IAG
IAG pathway to net zero CO₂ by 2050

We will proactively work with partners to ensure successful delivery our 2050 goal.

**4Cs for Combatting Climate Change**

1. Climate Science
2. Convince your CEO
3. Commit to targets
4. Create incentives
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Capacity – Accommodating growth today & tomorrow

Sylviane Lust
Director General
AIRE

Eamonn Brennan
Director General
Eurocontrol

Dick Benschop
President & CEO
Royal Schiphol Group

Tanja Grobotek
Director Europe Affairs
CANSO

Janusz Janiszewski
President
PANSA

Rafał Milczarski
CEO
LOT
IATA Wings of Change

Capacity – Accommodating growth today & tomorrow

Eamonn Brennan
Director General

19 November 2019
Our story begins......

Creating Regulatory framework

To modernise European ATC and deal with....

<table>
<thead>
<tr>
<th>Fragmentation</th>
<th>Capacity / Delays</th>
<th>Cost</th>
</tr>
</thead>
</table>
...our story continued...

Single European Sky II (2008)

<table>
<thead>
<tr>
<th>Performance Scheme</th>
<th>NM Function</th>
</tr>
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...and they lived happily ever after
...BUT.....our story still continues.....

84% worse than 2017
STILL IN CRISIS SITUATION

“WE CANNOT SOLVE OUR PROBLEMS WITH THE SAME THINKING WE USED WHEN WE CREATED THEM”
SES Success

Performance Scheme – cost stability

SESAR

Network Management

EASA Oversight

Industrial partnerships

Operational Stakeholders
2019 - Improved Predictability
But NOT Long-term Solution

Share of total en-route ATFM delay(%)
January-October 2019

16.1 million
minutes en-route
ATFM delay
(−10.8% vs. 2018)

Source: EUROCONTROL/PRU
@ https://ansperformance.eu
...and the airports?

27% of the Delay Problem

Source: EUROCONTROL/PRU @ https://ansperformance.eu
IFR TRAFFIC IN EUROPE
Resistance to Change

- Ignore the Problem
- Crisis forces Proposals
- Accept the Proposal "in Principle"
- Nit pick the proposal to death
- Use Process Delays
- Start again
- Problem hopefully goes away

"Insanity: doing the same thing over and over again and expecting different results."

-Albert Einstein
Are ANSP Business’s or Government Utilities?

- They are very **safe**
- They **talk like business’s** – customers
- They make **very good returns** (average 22%)
- They provide a **service**
- Staff - positive service ethos

**So what’s the problem?**

- Nearly all **Government controlled**:
  - States appoint Boards
  - States get Dividends
  - States own the shares
  - States regulate (NSAs etc)

- **What happens if you don’t perform?**
  - When things get tough:
    - Question the assumptions
    - Blame Europe!

**Ownership V Independence**
How does it work in reality?

If the facts don’t fit the theory, change the facts
We have a great **Opportunity Now**  
— to help our citizens and the environment

**2 x IMPLEMENT**

Stay away from negative people. They have a problem for every solution.
"I am afraid of that day when people will post quotes with my name which I never said"

-Albert Einstein
Thank you
Eamonn Brennan, Director General
@eurocontrolDG
Capacity – Accommodating growth today & tomorrow

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Director General
AIRE

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NETWORKING COFFEE BREAK
Safety first, or when compromise is not an option

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Technical Affairs Director  
ECA

Chris Kempis  
Director of Flight Operations  
Cathay Pacific

Patrick Ky  
Executive Director  
EASA

Michael Romanowski  
Aircraft Certification Service Policy & Innovation Division Director  
FAA

Yannick Malinge  
Head of Product Safety  
Airbus

IATA Wings of Change Europe, Berlin, 19-20 November 2019
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IATA Wings of Change Europe, Berlin, 19-20 November 2019
Cybersecurity – Are you prepared?

Esti Peshin
VP & General Manager Cyber Division
Israel Aerospace Industries

IATA Wings of Change Europe, Berlin, 19-20 November 2019
Where Courage Meets Technology

WINGS OF CHANGE
A Blueprint for Civil Aviation Cyber Security
2015-2019: Main Cyber Events
Cyber Aviation Landscape
Cyber - A Strategic Threat

Strategic Trends

- State & Super Power Level Threat
- Cyber crime
- Cyber Attacks On Critical Infrastructure
- Large Scale Industrial Espionage
- CNI (Influence & Disinformation Campaigns)
- Use of publicly available malware by threat actors

Weaponization of the cyber domain
Lack of attribution and accountability
The widening skills gap, and less trained experts to fill security roles
Attackers eyeing “New Technologies” - the cloud, IoT,..
National Grade Challenges Require National Grade Solutions

- Technology
- Methodology
- Constant Innovation
- Cooperation (national and international)
- Capacity Build-up and Maintenance
Aviation Cyber Security

Airlines, Operators and Airports

• All possible Tech domains and Risk domains combined
• A growing connectivity and interoperability
• Global compliance regulations
• High valued target
• Need to balance: safety, customers, regulation ....

Now, just (try to) add Cyber...
The Threat Landscape

- Navigation System Spoofing
- Tampering – On Board Hacking
- On board Tampering / Sabotage
- Equipment / Data Theft
- Missiles / UAV
- Explosives
- Hijacking / Terror
- Unauthenticated Inputs (Data / Voice), Message Spoofing
- Disruptive Passengers
- Tampering – Insider and Supply Chain Threats
- Tampering – Ground Maintenance Systems
- Denial of Service (DoS)
- Tampering – Air Traffic Control Computers
- Replay
- Remote Spying and Data Theft or Data Manipulation
E-enabled aircraft

- Uploading and downloading large amounts of flight and system data
- In-flight entertainment
- Wireless technology
- Remote maintenance testing and diagnostic
- Equipping engines with “call home” functions
- Wireless communications
- Software updates

Typical Applications and Services:

- Flight Ops
  - Weather
  - Electronic Manuals/Charts
  - Cabin Surveillance
  - Surface Moving Maps
  - Flight Papers/Data

- Onboard/Passenger
  - Rebooking/RROPS
  - Customer Profiles
  - Buy On Board
  - Live Audio
  - Email/WAP Browsing

- Maintenance
  - “FIX
  - Flight Data Downloads
  - Electronic Logbook
  - Maintenance Data Collection
  - Electronic MEL

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The Challenge
Multiple Interconnected Cyber Environments

- Air Traffic Control
- Aircraft On-board Systems
- Police and Border Control
- Ticketing Systems
- Baggage Handling Systems
- Passenger Screening
- Airport IT Systems
- Radar Systems
- Ground Transportation System
- Passenger Wi-Fi Systems (Bring Your Own Device)

A large number of “Cyber Environments” that affect airport security and operations
The Challenge II
Interconnectivity Between Systems

- More systems are being connected
- Passengers may see their gate information, flight delays etc. from the smartphones
- Pilots may upload navigation information from their tablets to their aircraft
- Cargo system may be accessible to airport personnel via the airport IT system

“Even if you think your system is not connected to the Internet – It usually is!”
The Challenge II
Protecting Mission Critical Systems

Critical National Infrastructure

Mission Critical Systems (MCS)

Airports are a Critical National Infrastructure with a proliferation of Mission Critical Systems

IT Security is Simply Not Enough!
IAI – Israel Aerospace Industries

- Largest Defense and Aerospace company in Israel
- Government owned
- Established in 1953
- Cutting edge technologies and solutions for: Space, Air, Land, Sea and Cyber

- Employees: ~15,000
- Sales 2018: ~$3.7B
- Export: 80% of total sales
- Backlog: ~$13.5B
- Registered company - Tel Aviv Stock Exchange

- Develops & manufactures advanced systems for the Israel Defense Forces and foreign customers worldwide
- Active in both the defense and commercial markets
- Active in over 90 countries

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IAI - a Gate to Israel’s Cyber Eco-System and Innovation

- IAI leads the best and finest of Israel’s cyber eco-system & Innovation
- Reducing the risk of choosing novel technology and dealing with start-ups
- Israeli Cyber Companies Consortium (IC3)
IAC3 – Israeli Aviation Cyber Companies Consortium

- ELTA leads a diverse group of Israel's leading cyber & aviation companies
- Integration of knowledge and experience of technological leaders in aviation industry
- Providing holistic, end to end, cyber solutions for commercial aviation
A Hybrid Full Scale Solution

IT Security is not enough

• Hardening - end to end cyber hardening process
• Monitoring - a Cyber Security Early Warning Centre including unique cyber threat intelligence
• Forensics and multiple source data analysis (SOC of SOCS)
• Collaboration - A-ISAC connectivity
• Intelligence - Cyber Intelligence Capabilities, augmenting the physical security
• Awareness and Training – tech teams, ops teams and managers/commanders
Cyber Eco-System

- Resilience
- Awareness
- Information sharing

- Integration
- Methodology
- Domain Expertise
- Development Lab
- Fusion
- Automation
- Tailor made
- Risk reduction

- Resilience
- Awareness
- Information sharing

- Organizational structure
- Operational tools
- Legislation & regulation
- National level tools and capabilities

- Cyber professions
- Cyber education
End to End Cyber Center

**Pro-Active Defense Layer**

- Forensics Lab
- Cyber Operations Center: CERT, Situational Awareness, MSS
- Training
- Threat Fusion

**NG Monitoring Systems**

- Cyber Threat Intelligence: Portal and Call Center, Collection Management
- Ad Hock Sources: Web, Threat Feeds, Sector SOCs & Monitored Organizations

Pro-Active array & tools
IAI - Unique Value Proposition

- Specialized, Industry (sector) specific NG SoC
- Aviation Ecosystem Hardening
- Aviation Cyber Range & Training
- Aviation Cyber Risk Analysis

- Aviation Cyber Lab
  - Forensics
  - R&D
THANK YOU
Master of ceremony

Bill Morrison
Author, trainer, consultant
Sandler

IATA Wings of Change Europe, Berlin, 19-20 November 2019
Networking Gala Dinner

Sponsored by LUFTHANSA GROUP

AT WASSERWERK
Buses from 18:30 to 18:45
Grand Hyatt Lobby
THANK YOU