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Environmental Policy of a Global Airline




AGENDA

- Introduction
- Aviation and Gaseous Emissions in Context
- Political background
- The Carbon Neutral Growth Concept
- The 4-Pillars Strategy: Carbon Reduction Potential
- Summary

Intro: Environmental Policy Focus

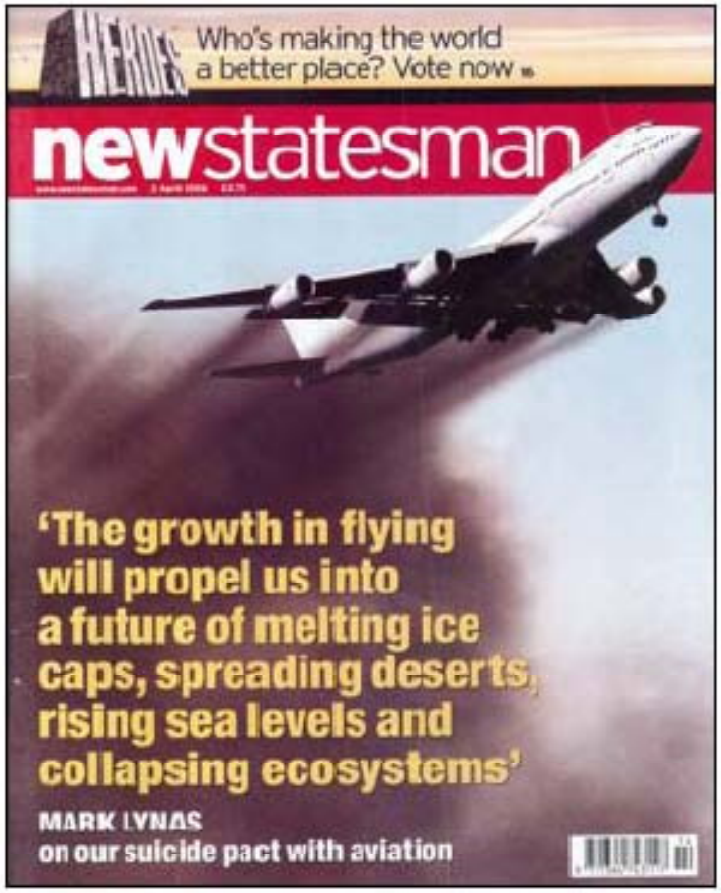
▪ Gaseous Emissions		
▪ CO2,	=> global	aircraft
▪ Contrails,…	=> global	aircraft
▪ NOx	=> global/local	aircraft
▪ Noise	=> local	aircraft
▪ Waste	=> local	ground
▪ Energy/Water consumption	=> local	ground

Major environmental impacts are aircraft related.

The major aircraft related environmental impacts on a global level are gaseous emissions.

=> **Focus of this presentation is aircraft related gaseous emission mitigation policy, especially CO2**

Intro: Aviation Industry Under Threat



- Despite a strong track record:
  - Best performance on fuel efficiency
  - Best performance on noise
  - Removal of Soot and Sulphur
- Perceptions of Aviation are:
  - Heavy polluter
  - Emissions growing fast
  - Only one energy source: kerosene
  - Industry has nowhere to go
- Intuitive Policy Response
  - Limit demand / growth
  - Apply taxation
  - Use revenues to fund emissions reductions in other sectors

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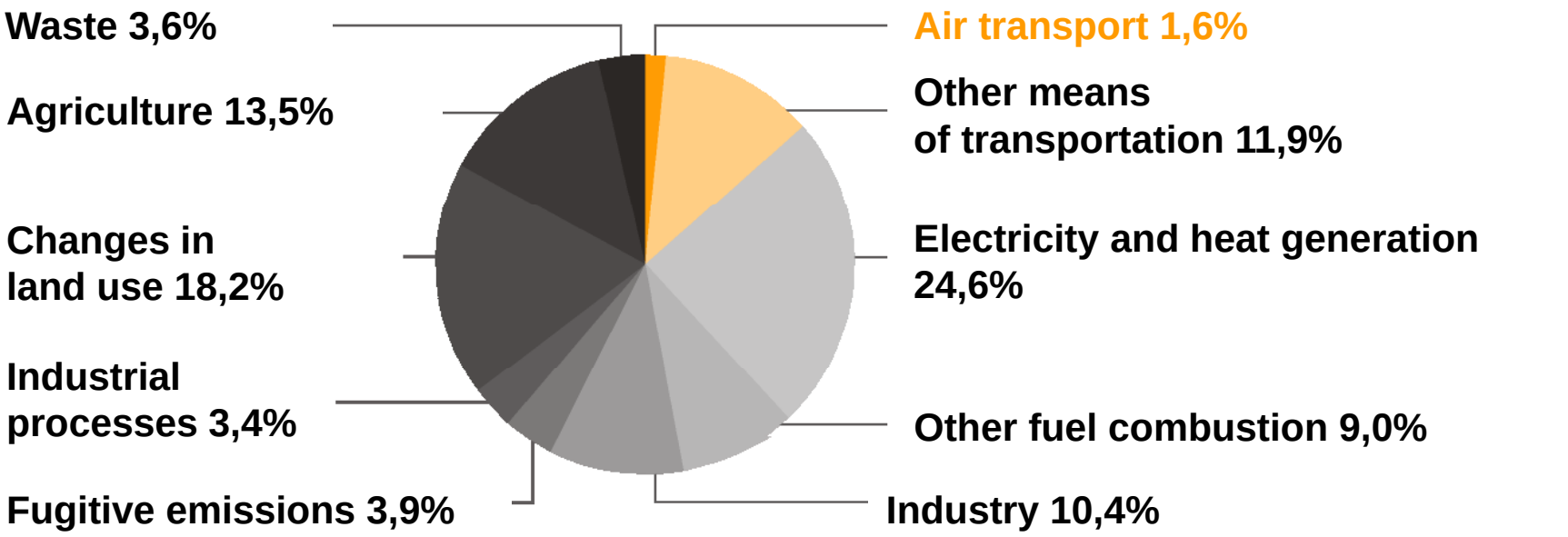
Aviation and Gaseous Emissions in Context (1)

- **80% of aviation's GHG emissions are related to passenger flights exceeding 1,500 km/900 miles**
  - … for which there is no practical alternative.
- **Aviation has >70% occupancy rates**
  - …more than double those of road and rail transportation.

Aviation and Gaseous Emissions in Context (2)

"Being a small part of a serious problem, there is still a serious challenge to do even better." (IATA)



Source: **World Resource Institute** (WRI)
Worldwide emitted greenhouse gases (CO_2-Aquivalents) according to different sectors (Kyoto-Gases)

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Political background (1)

- The Kyoto-Protocol has excluded aviation and shipping because emissions can not be allocated to states.
- A larger number of states, which have a mature aviation market, has not signed the Kyoto-Protocol.
- ICAO has a task derived from Kyoto-Protocol to develop solutions for aviation but some ICAO-states that have not signed Kyoto do not feel bound to that task.
- ICAO has done its best and has defined mid term efficiency goals for aviation.

Political background (2)

- We find an increasing number of individual approaches and different instruments to deal with emissions mitigation.
- We see a spectrum from doing nothing up to various regional uncoordinated emission-trading systems, tax- and charging systems growing, resulting in “carbon and job leakage risks”.
- This is not an appropriate approach to deal with a global problem.
- This is not an appropriate approach for a global industry like aviation; individual and different system have impact on competition.

- The Copenhagen Conference in December 2009 is envisaged to be the key for the Post-Kyoto Process.

=> Aviation industry has developed the concept of **Carbon Neutral Growth** based on a **Global Sectoral Approach** for the sector and **the 4-Pillars Strategy** to contribute in mitigation of climate change

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The Concept of Carbon Neutral Growth from 2020

- **It demonstrates aviation is seriously willing to act, it shows the sector has carefully analyzed the situation and has drawn conclusion**
- **Goals: Carbon neutral growth in 2020 and 1.5 % efficiency improvement up to 2020**
  is challenging but achievable (realistic)
- Longterm goal: 50 % net carbon reduction
- Only achievable if all stakeholders cooperate and contribute (airlines, manufacturers, airports ,ANSPs).
- Political support is prerequisite

Adopted by IATA General Assembly 2009

Airlines are the first global industry to make such a commitment !!

http://www.iata.org/whatwedo/environment/

The Concept of Carbon Neutral Growth from 2020 and the Global Sectoral Approach

- Kyoto has shown that aviation emissions can not be treated by national states.
- Majority of aviation emissions occur in international airspace, which is not under control of national legislation.
- Aviation is „per definition“ international or global.
- Aviation is a highly competitive sector, any regional regulation has impact on competition risking carbon leakage and job leakage - see European Emission Trading System.

=> The most appropriate approach is **one** for the complete sector

The Concept of Carbon Neutral Growth - Key principles (1)

- **Gobal sectoral approach:** accounting for emissions at a global level, not by state.
- **Full integration in UNFCCC framework ,** global access to carbon markets
- **Equal treatment vs. differentiated responsibilities,** open issue
- **ICAO leadership in the UNFCCC process,** ICAO is the appropriate United Nations body for making aviation-specific recommendations

The Concept of Carbon Neutral Growth - Key principles (2)

- **Cost-effective economic measures** like emissions trading, carbon funds, offsets etc. are accepted as long as they are implemented globally (basket of measures)
- **Revenues** to be clearly earmarked for environmental purposes and to be re-invested to directly improve the emissions profile of aviation,
- **Government action** prerequisite to modernize air traffic management, improve airport infrastructure and increase investment in low carbon sustainable alternative jet fuels,
- **Manufacturers action**, technology improvement, CO2-standards

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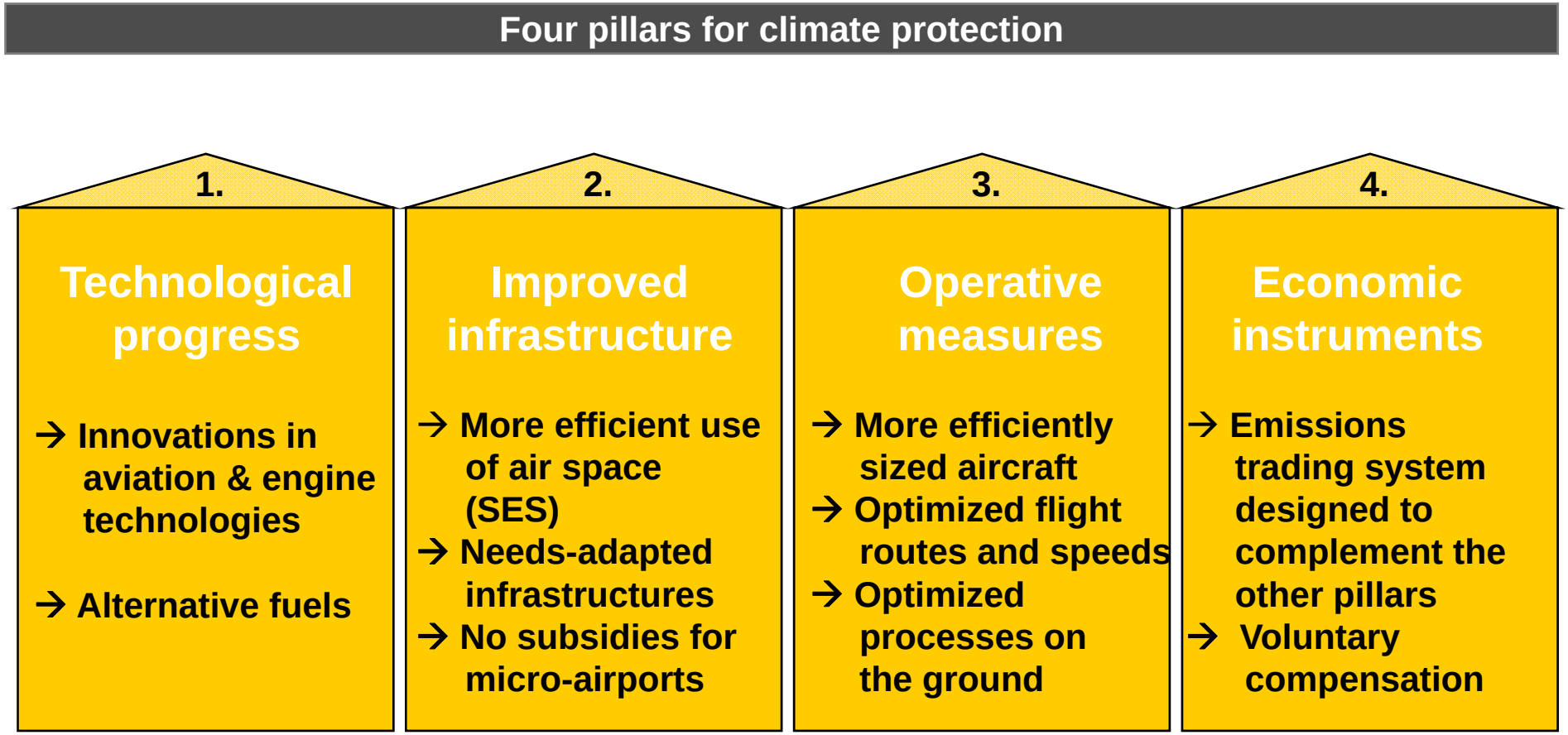
The 4-Pillars Strategy

The 4-Pillar Strategy describes the options and measures to reduce emissions. It is based on the following findings:

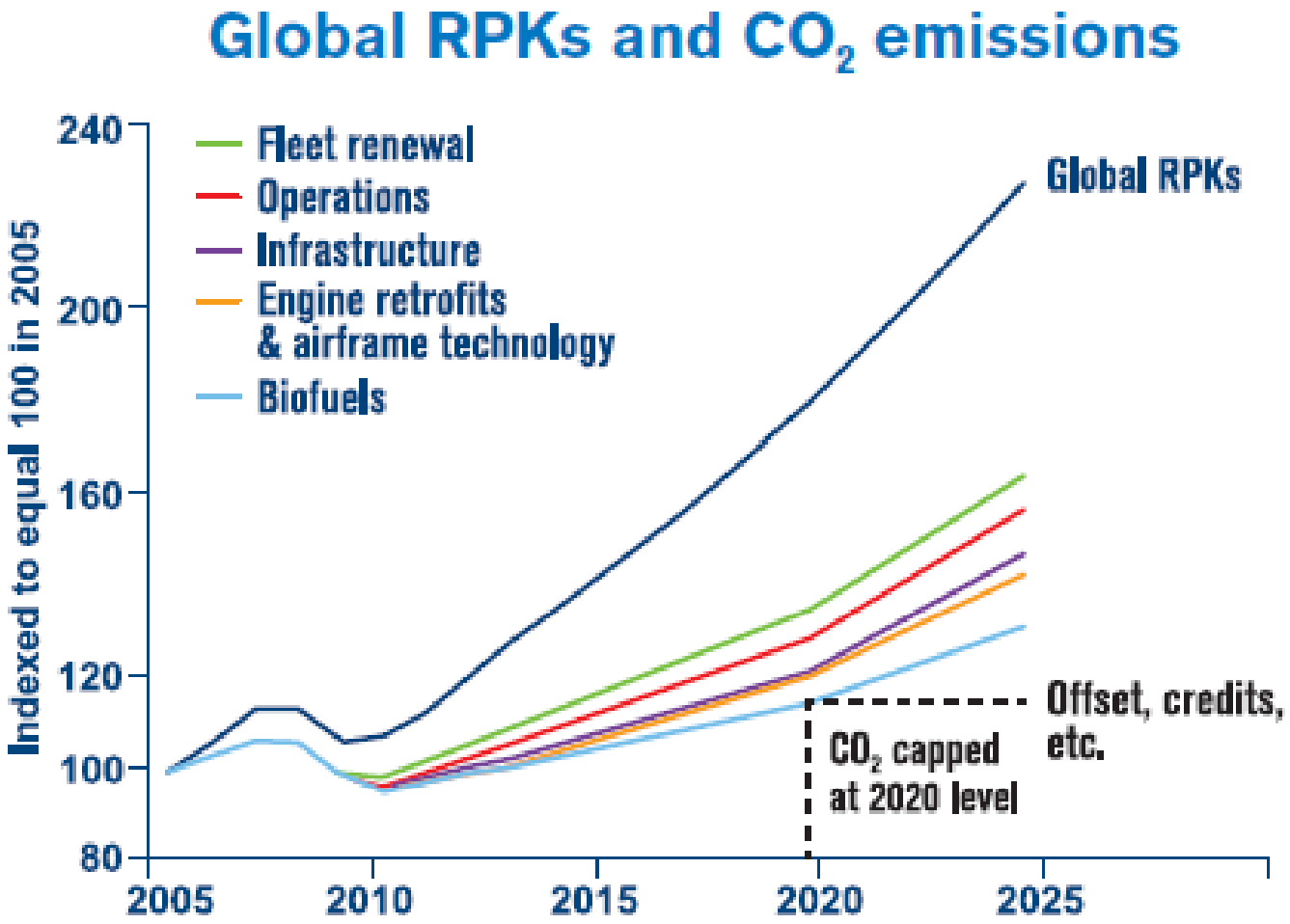
- The aviation system consists of many different stakeholders.
- Each of them can influence the efficiency of the system.
- Each of them then consequently has responsibility.
- Each of them is active in a dedicated part of the system.

=> To cover all options and to achieve a maximized output a coordinated approach is necessary – 4-Pillars Strategy is the result

The 4-Pillars Strategy:



The 4-Pillars Strategy:



The 4-Pillars Strategy

Conclusions

- **Aircraft- and engine-technology**
- **Operations**
- **Infrastructure improvements**

> - prerequisite
> - not sufficient to achieve carbon neutral growth from 2020

- **Biofuel**

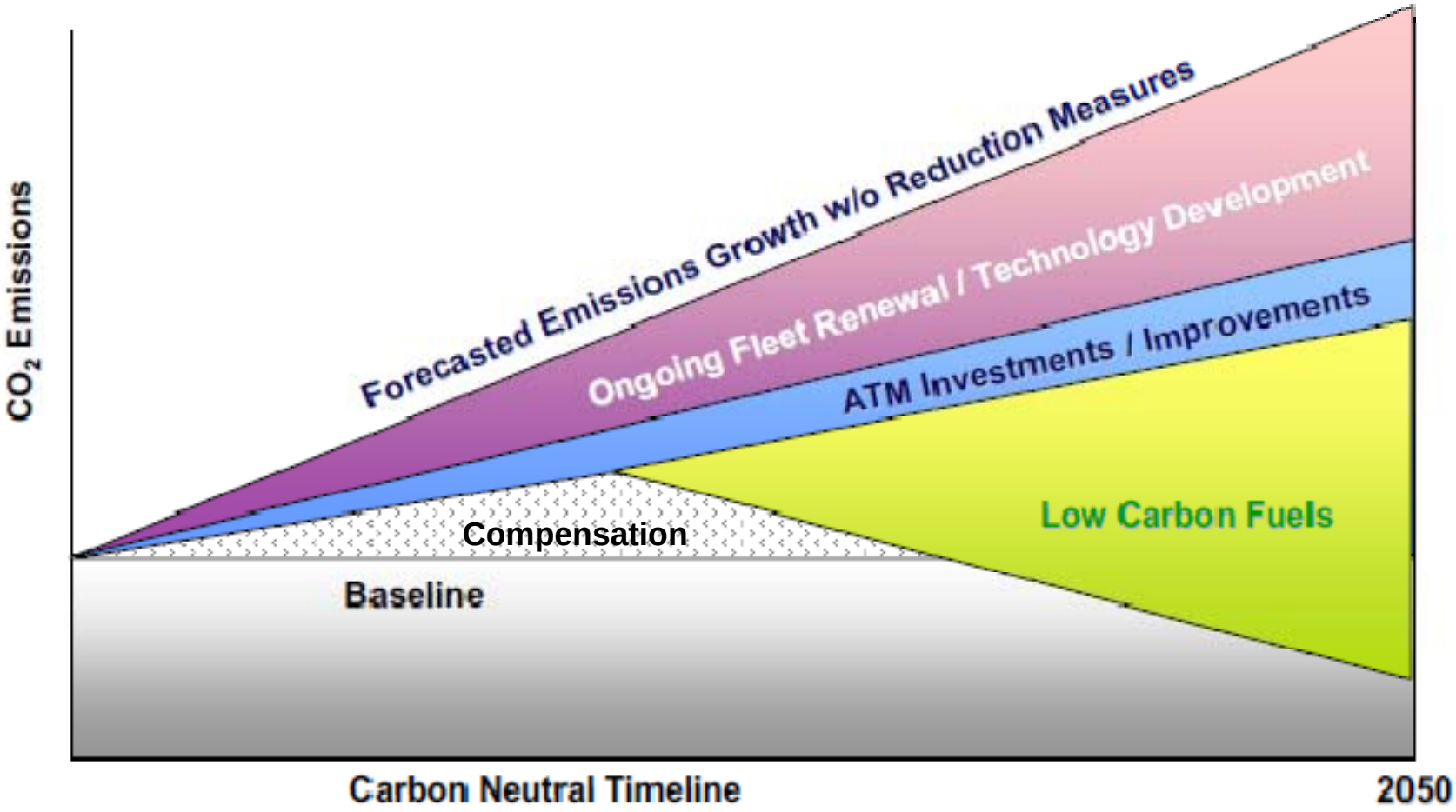
> Very promising option to achieve carbon neutral growth long term

- **CO2-Compensation / Carbon Offsetting**
- **Emissions trading**

> Can close a gap, but potentially risky :
> - compliance
> - costs not predictable
> - competitive distortion possible

The 4-Pillars Strategy

Three Key drivers for Carbon Neutral Growth



Innovative Aircraft Technology – Examples

Aerodynamics

Sharkskin

Fuel savings: up to 3%

Adaptive Wing

Fuel savings: 5 - 15%

Weight

Compound Material

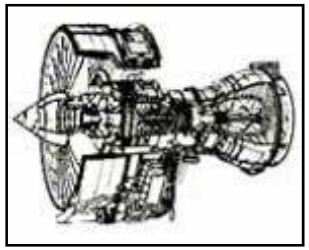
Fuel savings: up to 3%

Engine Design

High-Bypass-Engine

Fuel savings: about 8%

Intercooled Recuperated Aero-Engine (IRA)



Fuel savings: 15 - 20%

Optimized Energy Supply

Fuel savings: up to 3%

Fleet Modernization Programme at Lufthansa

10 Airbus A 330-300
In the Lufthansa fleet since 2004

24 Airbus A 340-600
In the Lufthansa fleet since October 2003

20 Boeing 747-800
In the Lufthansa fleet as of 2011

15 Airbus A 380-800
In the Lufthansa fleet as of 2010

170 aircrafts with list-order prize of 16 bn €

Alternative Fuels

- **Kerosene is an excellent fuel, no alternative for the time being available**
- **Any alternative should be like kerosene (drop-in)**
- **Hydrogen is questionable (production, infrastructure)**
- **Bio-fuel specs in preparation**
- **Open questions to be anwered:** availability, prize, Certification, risk of partial crowding out of food production, environmental benefit
- **Different Technology paths possible, FT-Process, HTV, Algae with different potential, Algae seem to have high productivity.**

LH is active in promoting alternative fuels

Darrin Morgan, Boeing's Director of Environmental Strategy (31.10.2008):
"We are thinking that within three to five years we are going to see approval for commercial use of biofuels – and possibly sooner."

Improvements in Operations

Engine Water Wash (saves 80.000 l fuel/day)

Winglets (save up 5% fuel)

Optimized watercapacity saves 5.000 l fuel a day

Lighter seats save 13.000 l fuel a day

- **Flightmanagementsystem „Lido OC“ saves up to 3,7% fuel a flight**
- **flexible flightspeed saves 89.000 l fuel/day**
- **Paperless Cockpit saves 4.000 l fuel/day**

A/C Cleaning saves up to 2% fuel

Summary

- The Aviation sector needs a **global** approach to solve a **global** problem for a **global** industry

- The Aviation Sector Industry is willing to act, has committed to binding goals and has developed a strategy

- There are various options available but compensation is necessary

- The concept of Carbon Neutral Growth can only be successful if all other stakeholders contribute.

- We hope/expect that concept of Carbon Neutral Growth with a global sectoral approach to be recognized in Copenhagen

Lufthansa Airbus A340-200 beim Start

Thank you for your attention!

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