A STAR ALLIANCE MEMBER ☆

# WIND ENERGY DENMARK 2019 – POWER TO X

## **1 OCTOBER 2019**



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### The aviation industry's environmental impact

# Shared global industry goals to reduce emissions

Aviation account for about 2.2% of the total global  $CO_2$ emissions. Consumption of fuels create other greenhouse gases on high altitude which often are converted to  $CO_2$  emissions by multiplying with 2 to estimate a climate effect. SAS disclose each greenhouse gas separately until there is a broader scientific consensus on how to measure the total climate effect.

Along with economic and demographic growth, air travel is anticipated to grow.

In order to curb the associated growth of emissions the airline industry has set up joint targets to reduce total  $CO_2$  emissions with 50% by 2050 compared to 2005.

All domestic flights in Norway account for about

2.4%

of Norways's total CO<sub>2</sub> emissions

All domestic flights in Sweden account for about

1%

of Sweden's total CO<sub>2</sub> emissions

All domestic flights in Denmark account for about

# 0.5%

of Denmark's total CO<sub>2</sub> emissions

## Sustainability is an integral part of our business model

We believe that aviation plays an important role in society by connecting communities, cultures and people in a time-efficient way. This is why we need to make air travel more sustainable.

To achieve this, we've set a new goal to reduce our total carbon emissions by 25% by 2030. We expect to be able to reduce half of these emissions by renewing our fleet and making other improvements and the rest by transitioning to biofuels. Our goal is for 17% of our flights to use biofuel by 2030 – that's about equal to our total domestic air travel in Scandinavia today. 1.4%

REDUCTION IN CO2 EMISSION PER PASSENGER KILOMETER SINCE FY2017

# 13.3%

REDUCTION IN CO2 EMISSION PER PASSENGER KILOMETER SINCE 2010



## Sustainability goals

Reduced CO<sub>2</sub> 25% by 2030 VS 2005

# 50%

noise reduction in 2030 VS 2010

# 100%

recycling where applicable in 2030

# >50%

lower CO2 emissions in 2050 compared to 2005

# 17%

biofuel used – equivalent to the total SAS domestic production by 2030

# 100%

sustainable materials in the SAS customer offering by 2030

# INCREASED ENERGY EFFICIENCY

BIOFUEL AND EMERGING TECHNOLOGY SUSTAINABLE PRODUCTS AND SERVICES

## FLEET RENEWAL REDUCE EMISSIONS

Continuous fleet renewal is a vital part of our efforts to reduce greenhouse gas emissions from our aviation operations. SAS' strategy is to ensure long-term profitability through a well-balanced fleet plan.

As we are phasing out the 737-fleet, the aircraft is either returned to the owner, sold for spare-part or sent to recycling. Most of the parts of an aircraft can be used for recycling and the share increases for each generation.



#### LONG HAUL - A350 AND A321LR (NEO)

A350 reduces fuel consumption with more than

## 30%

compared to the A340 it replaces. 8 aircraft ordered with first delivery in the end of 2019.



A321LR (neo) is expected to reduce fuel consumption with

### 15-18%

compared to similar aircraft of the previous generation. 3 aircraft is ordered with first delivery in summer 2020.

MORE EFFICIENT AERODYNAMICS winglets reduce fuel consumption

Management & Management & gf

MORE OUIET

50% reduction in

noise footprint

#### LIGHT-WEIGHT CABIN INTERIOR

With modern feel, better materials and lower weight makes the aircraft more fuel efficient

MODERN AND MORE EFFICIENT ENGINES REDUCE EMISSIONS 15-20% less CO<sub>2</sub> and 40% less

NOX emissions compared to aircraft of previous generation.

#### **UPGRADING OF EXISTING FLEET**

SAS has continuous upgraded the B737-fleet, with new engines and interior to reduce emissions. The interior is also upgraded on the existing 320-fleet. An example of the upgraded interior is replacing the carpet, where the old carpet weighed 1,695g/sqm, and the lighter ones weigh 1,250g/sqm. For a single A320, this means that the carpet is approximately 38kg lighter. AIRBUS 320NEO Reduces emissions with 15-18% compared to aircraft of previous generation

# **INCREASED USE OF BIOFUEL**

Sustainable Aviation Fuels, SAF

### WHAT IS BIOFUEL?

Biofuel is a renewable source of energy, solid or liquid fuels made from renewable sources. It produces up to 80% lower carbon emissions than regular jet fuels used today. The biofuels SAS use come from waste products, primarily from food production, eg. recycled frying oil. Within shortly, agriculture and forestry waste such as sawdust will be the main raw material. The production of the biofuel SAS use does not compete with food production, land use or access to drinking water, nor does it have a negative impact on biodiversity.

#### **BIOFUEL – AN EXPENSIVE** SOURCE OF ENERGY

The high cost of biofuel is an effect of it being a scarce resource, the market being very small and a demand that exceeds the quantity of biofuel that is produced. Stimulating biofuel production in Scandinavia will help reduce prices over time, which we will do in our partnership with Preem.



#### BIOFUEL AS AN ANCILLARY PRODUCT

Customers will soon be able to buy Biofuel in the booking flow to reduce the environmental impact of their flight.

### **COLLABORATION WITH PREEM**

As of today, SAS uses small amounts of biofuel, mostly from AirBP and smaller amounts from Shell.

From 2023 and going forth, SAS plan to receive biofuel deliveries from Preem, ensuring the future supply of biofuel for SAS. Preem is currently getting it's largescale production is in place. The goal is that Preem should be able to deliver considerable amounts of biofuel from 2023.



# **ELECTRIC AIRCRAFT**

There are several electric aircraft initiatives ongoing and SAS support multiple of these initiatives.

Most of the concepts initially targets aircraft with 15-20 seats and a flight range of approximately one to two hours. All concepts includes stretched versions of aircraft that could fit SAS needs of a 50 to 100 seater.

Besides the aircraft and engine development a new energy infrastructure has to be developed at airports. SAS supports multiple initiatives within this area with knowledge and defining prerequisites for potential future commercial operation.



SAS and Airbus have signed a joint Memorandum of Understanding for hybrid and electric aircraft eco-system and infrastructure requirements research.

This is a unique cooperation to establish the requirements for the next generation of sustainable aircraft. The project aims to gain an understanding of the introduction of hybrid-electric aircraft for large-scale commercial use.

Airbus have the ambition to bring hybrid or fully electric technology to aircraft with up to 100 seats in the 2030s.

## **EMERGING AND AVAILABLE TECHNOLOGY – ELECTRO FUELS**

### WE HAVE THE GREEN POWER – WHAT ABOUT THE X?

- Well known technology
- Know-how is available
- A lot of talk amongst stakeholders
- A lot of public debate/demand
- Political commitment/action is imminent
- Industry is ready
- Demand is there
- It is urgent





- Investors
- All stakeholders in partnerships
- Airlines to participate
- Full-scale projects
- Commercially attractive
- Convince the politicians of opportunity
- Regulation to incentivize
- Government funding?



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## **WELCOME TOWARDS A SUSTAINABLE JOURNEY**

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