The Future of Aviation

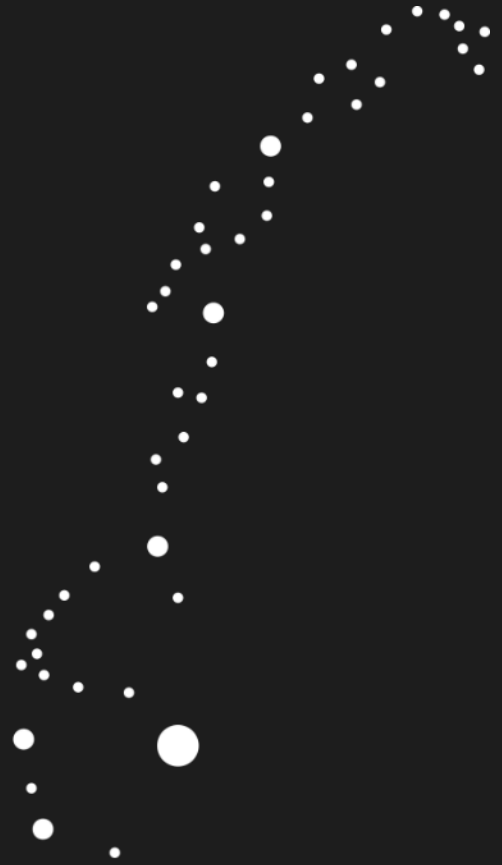
Nordic EV Summit
Oslo, 02 FEB 2018

Dag Falk-Petersen, CEO

AVINOR

45 airports

Norway’s Air Navigation Service Provider



AVINOR

Traffic-growth % > Emission reductions %

Environmental goals:

1) Reduce Avinor's environmental impact
2) Be a driving force in reducing GHG emissions from the Norwegian aviation industry

AVINOR'S GREEN HOUSE GAS EMISSIONS

2020 target:

Reduce own emissions by 50%

(2012 baseline)

- Sustainable biodiesel
- Electric vehicles
- Energy efficiency initiatives

AIRCRAFT CARBON EMISSIONS

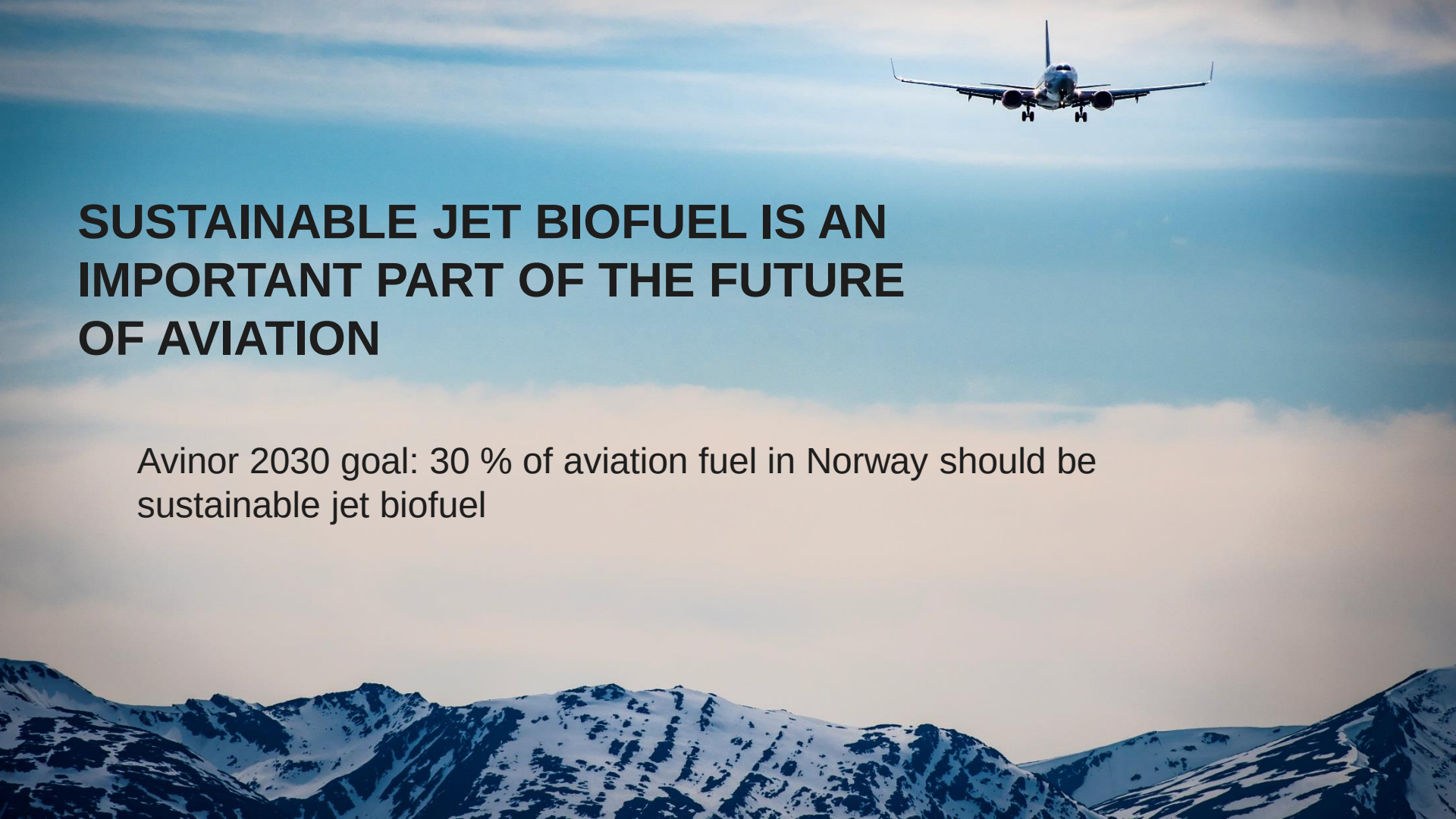
JAN 2016: OSL #1 HUB TO OFFER JET BIOFUEL TO ALL AIRLINES ON A COMMERCIAL BASIS

- Cooperation with aviation industry
- Dropped into the main fuel farm
- Distributed in the hydrant and dispenser system
- Premium cost split between the project partners

- Works very well!

- Aug 2017: Program expanded to Bergen!

air bp SkyNRG Lufthansa KLM SAS AVINOR



SUSTAINABLE JET BIOFUEL IS AN IMPORTANT PART OF THE FUTURE OF AVIATION

Avinor 2030 goal: 30 % of aviation fuel in Norway should be sustainable jet biofuel

AVINOR

Airbus E-Fan 1.1
Crossed the English Channel
in 2015

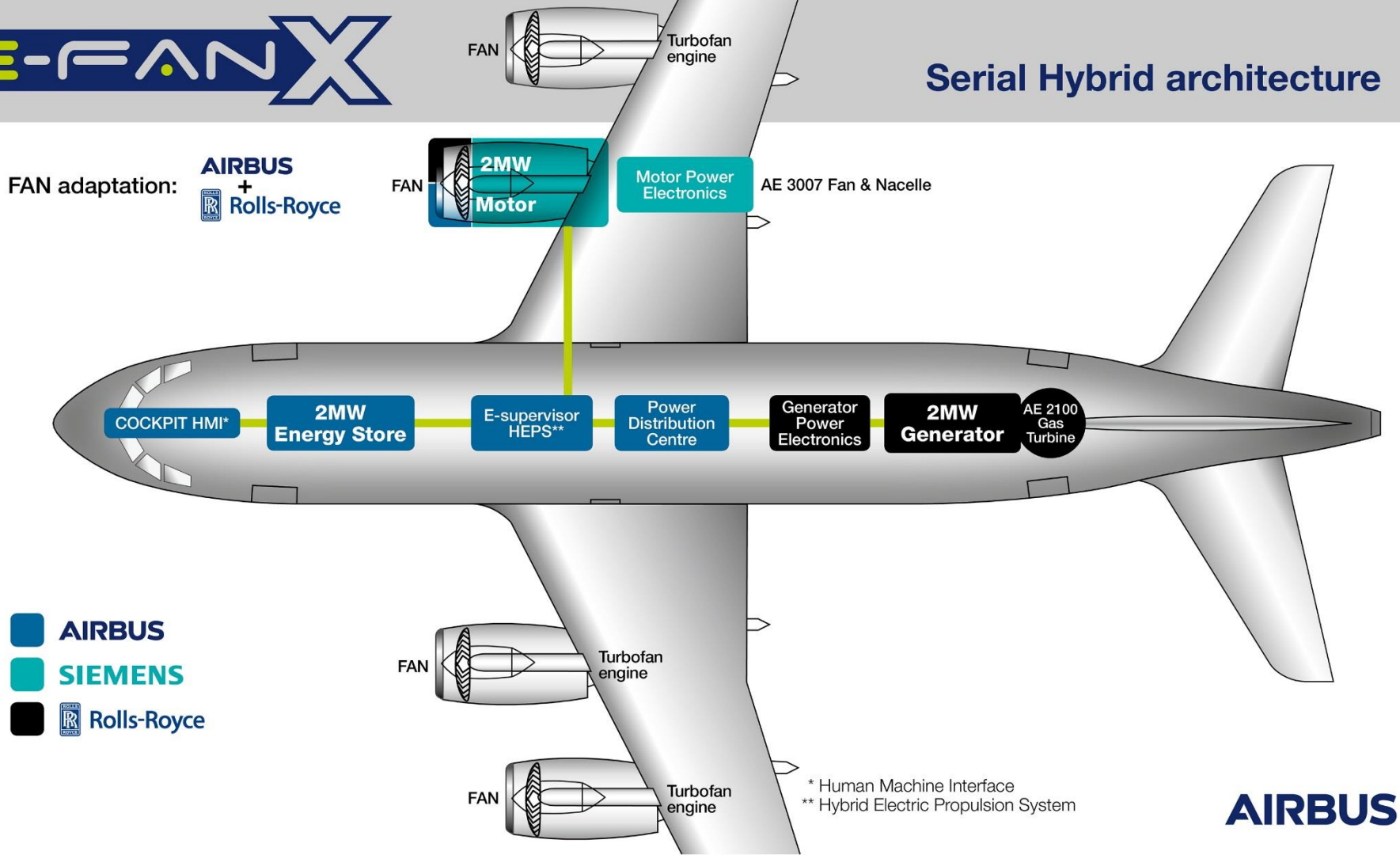
ZERO Conference NOV 2016

Project partners: AVINOR · NORGES LUFTSPORTFORBUND · ZERO · SAS · widerøe


Leknes
Svolvær
104 km
109 km
Røst
Bodø
102 km
101 km
Mo i Rana


E-FAN X
AIRBUS
SIEMENS
Rolls-Royce

Serial Hybrid architecture



Wright Electric and EasyJet

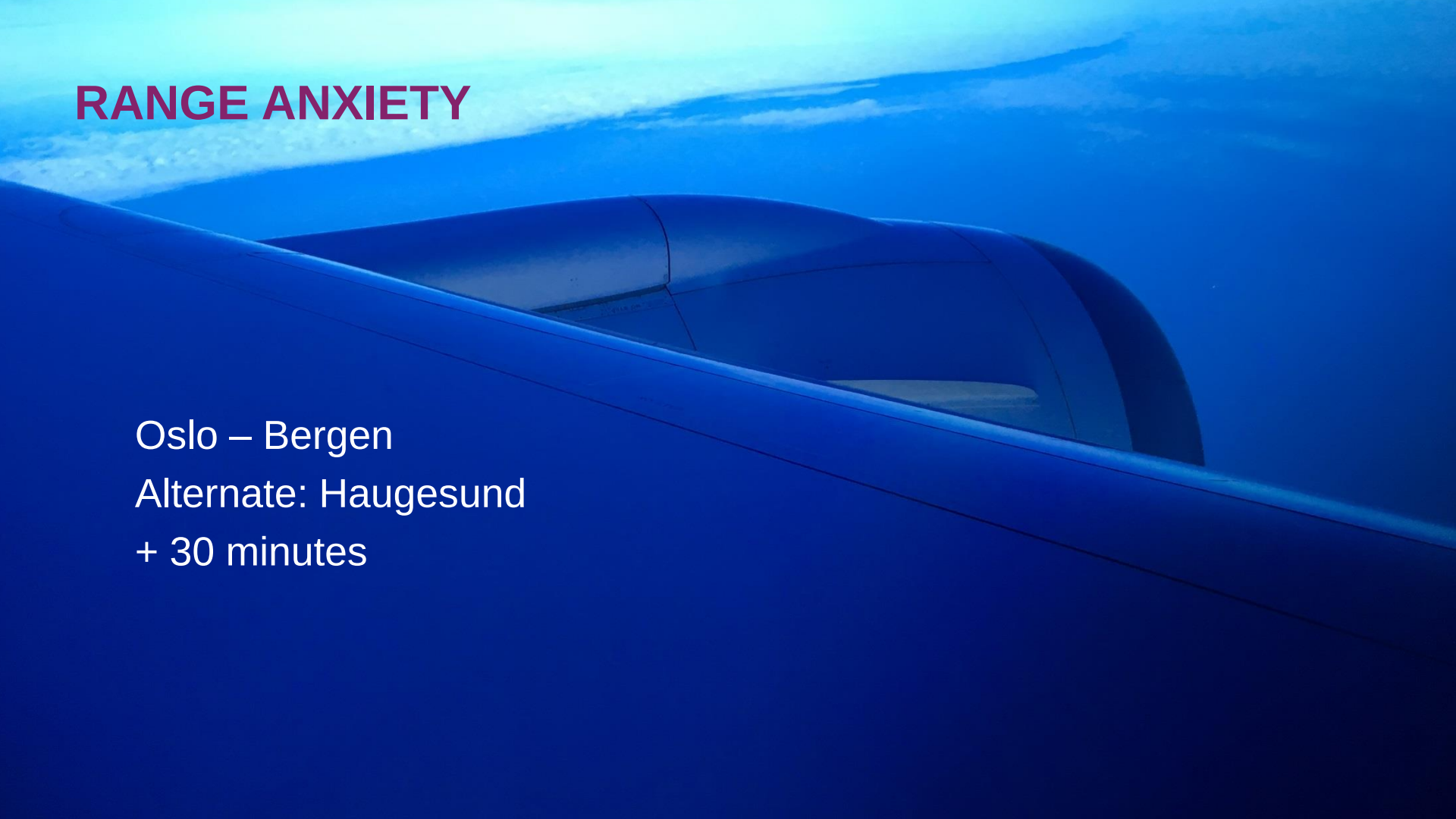
Hybrid electric aircraft
Range from Oslo in 2030: 100 pax 1000 km

SIEMENS
Ingenuity for life

SAFETY

SAFETY

RANGE ANXIETY



Oslo – Bergen

Alternate: Haugesund

+ 30 minutes

AVINOR's ELECTRIC AIRCRAFT ACTIVITIES Q1 AND Q2 2018

- Mapping electric aircraft producers and technologies
- Demonstration and testing of Norway's first electric aircraft during summer 2018

- «The Government will task Avinor with developing a program for introduction of electric aircraft in commercial aviation in Norway»

CONSEQUENCES FOR AVINOR'S INFRASTRUCTURE?

- Mapping surplus electricity capacity on Avinor's airports
- Looking into innovative and flexible charging solutions

NORWAY FIRST?

- Unique network of airports
- An established market for short flights with small aircraft (incl PSO routes)
- Broad support in Government, Parliament and other stakeholders
- 100% renewable electricity

➔ Aircraft producers are looking for a market and a customer – we have both

VISION:

ALL DOMESTIC TRAFFIC ELECTRIFIED BY 2040

AIR TRAVEL:
THE MOST ENVIRONMENTALLY FRIENDLY MODE OF TRANSPORT > 300 KM

CONCLUDING REMARKS

- Norway is totally dependent on aviation
- Green House Gas emissions must be mitigated
- Sustainable aviation fuels are an important part of the solution
- Electric passenger aircraft will be a reality