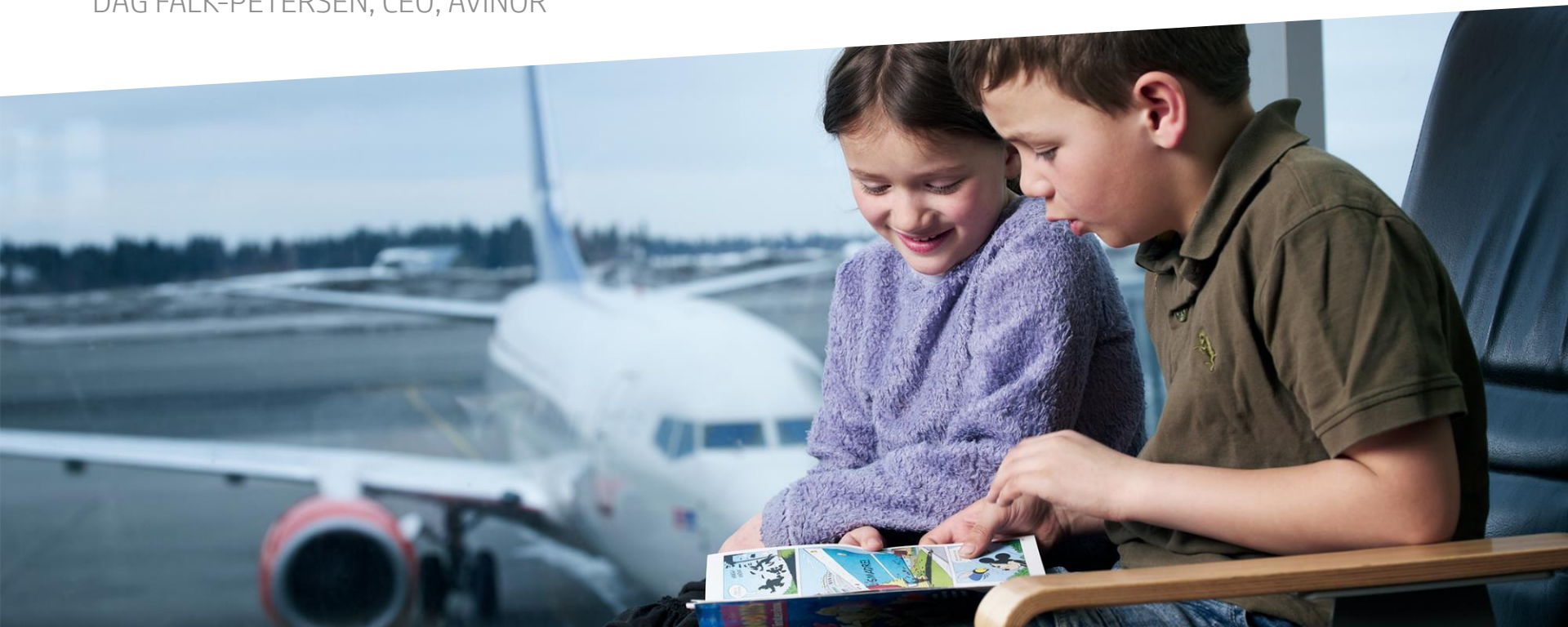
Solakonferansen 2019

DAG FALK-PETERSEN, CEO, AVINOR



- Helicopter noise – stricter regulations expected
- Drones
- Reducing carbon emissions

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From Environmental Strategy to Environmental Factor

Aircraft and helicopter noise is defined as a significant environmental factor.

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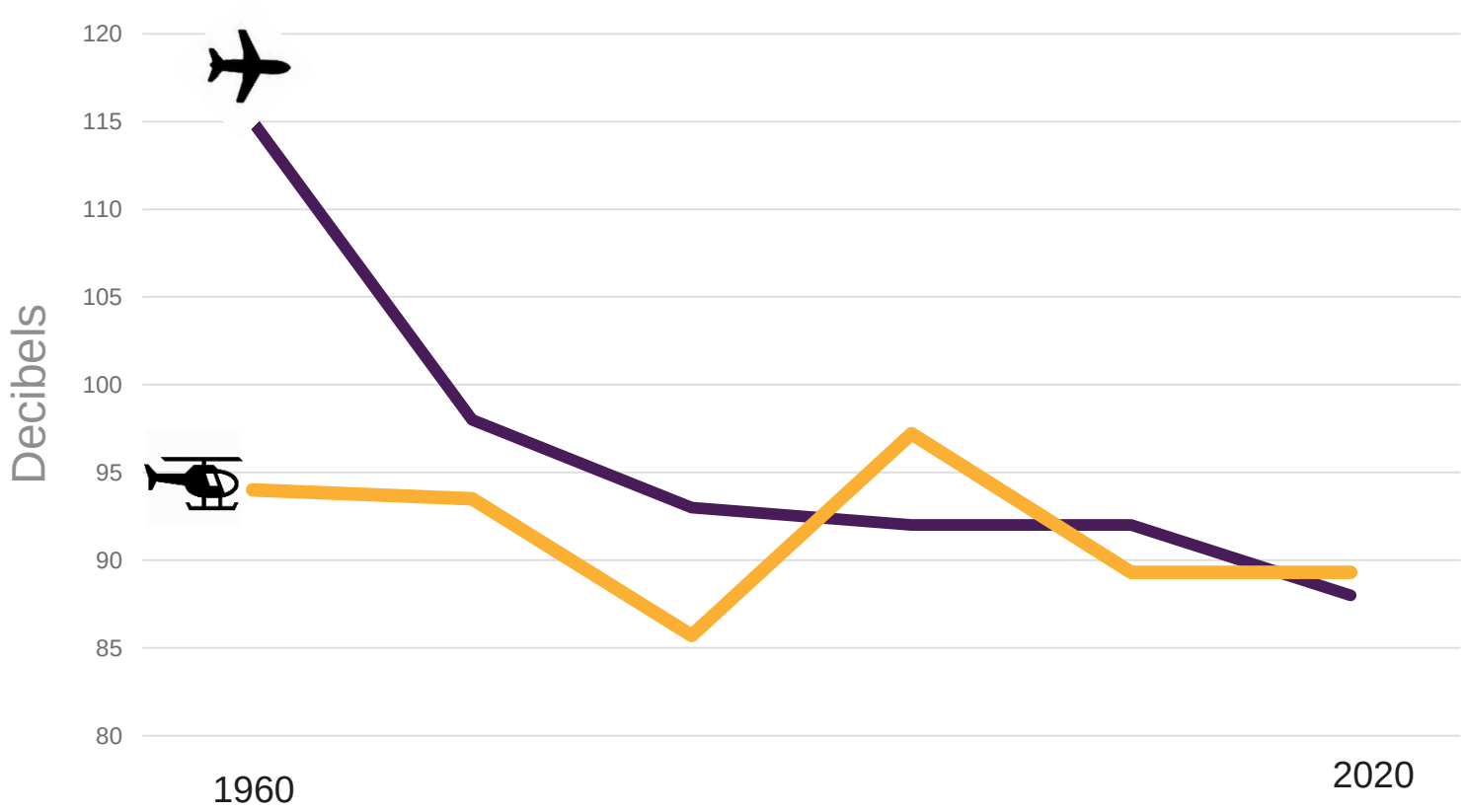
NOISE LEVEL DEVELOPMENT - FIXED WING AND HELICOPTERS (Low frequency noise excluded)



* Average based on helicopters and aircrafts operating in Norwegian airspace

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LOW FREQUENCY NOISE

- At the moment: Only ground-based transport covered by national regulation.
- Without significant improvements – this will change!
    - Pressure from other sectors, eg rail: Unfair competitive advantage for aviation
- Stricter regulation = Increased costs
- Unfair to let fix-wing operators cover costs caused by helicopter traffic

Offshore activities and noise

- Noise has not traditionally been an issue for offshore helicopters, whereas it has for some of the small helicopter and aircraft segments
- The development of heavy helicopters seems to have been in the opposite direction to aircraft
  - Operational pattern – no or limited requirements to the surroundings
  - Requirements for safety increase the their weight
  - Low frequency noise gives the greatest challenge
- Technology/purchasing processes
  - All honours to the Norwegian oil and gas association operators,

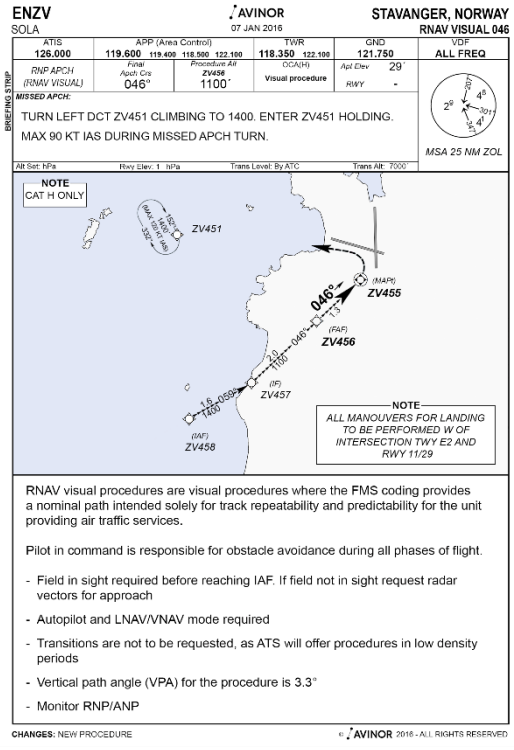
  «066 – Norwegian oil and gas associations guidelines for flights to petroleum installations»
- The industry must be encouraged to set requirements when developing new heavy helicopters

Tools

- Establishing "environmentally optimized" approach and takeoff procedures using PBN for helicopter and aircraft is an effective tool.
  - Reduces the number of noise exposed and/or the emissions (location dependent)
- *Special challenges* associated with offshore transport (S-92) has caused this part of the flight operations to be prioritized at Flesland and Sola.

Noise reduction measures heli. SVG RWY29

RNAV visual 082/046



ENZV
SOLA

AVINOR
07 JAN 2016

STAVANGER, NORWAY
RNAV VISUAL 046

ATIS	APP (Area Control)	TWR	GND	VDF
126.000	119.600 119.400 118.500 122.100	118.350 122.100	121.750	ALL FREQ

RNP APCH (RNAV VISUAL)	Final Apch Crs	Procedure Alt	OCA(H)	Apt Elev 29'
	046°	ZV456 1100'	Visual procedure	RWY -

BRIEFING STRIP

MISSED APCH:

TURN LEFT DCT ZV451 CLIMBING TO 1400. ENTER ZV451 HOLDING.
MAX 90 KT IAS DURING MISSED APCH TURN.

MSA 25 NM ZOL

Alt Set: hPa | Rwy Elev: 1 hPa | Trans Level: By ATC | Trans Alt: 7000'

NOTE
CAT H ONLY

ZV451
ESC (MAX 180KT) (MAX 330KT)
(MAPt) ZV455
046°
1.5
(FAF) ZV456
3.0
1100
046°
(IF) ZV457
1.6
1400
059°
(IAF) ZV458

NOTE
ALL MANOUVERS FOR LANDING TO BE PERFORMED W OF INTERSECTION TWY E2 AND RWY 11/29

RNAV visual procedures are visual procedures where the FMS coding provides a nominal path intended solely for track repeatability and predictability for the unit providing air traffic services.

Pilot in command is responsible for obstacle avoidance during all phases of flight.

- Field in sight required before reaching IAF. If field not in sight request radar vectors for approach
- Autopilot and LNAV/VNAV mode required
- Transitions are not to be requested, as ATS will offer procedures in low density periods
- Vertical path angle (VPA) for the procedure is 3.3°
- Monitor RNP/ANP

CHANGES: NEW PROCEDURE

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INLAND HELICOPTER OPERATIONS HAVE IMPROVED, BUT WE STILL FACE MAJOR CHALLENGES

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THE FUTURE IS
HERE NOW!

THREAT

- Only the military can actively stop drones
- Military systems developed at a high cost level

- Stavanger airport only airport with drone detection

- Close cooperation with the police, military and others

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OPPORTUNITY

- Significant growth, and more complex operations
- Drones integrated and will co-exist with manned aircrafts
- Different usage
- Increased digitalization required
- Will airports still be hubs, or will the traffic move to other logistics hubs?
- Consequences for the traditional helicopter business?

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Greenhouse gas emissions from aviation

- 95 per cent of emissions in aviation come from aviation fuel.
- 2.1 per cent of total CO_2 emissions in Norway came from domestic civil aviation in 2017.
- Total aviation-related greenhouse gas emissions, including to the first destination abroad, were 5 per cent of Norway's total emissions.
- Emissions from global aviation amounted to 859 million tonnes in 2017 – 2 per cent of overall global CO_2 emissions.

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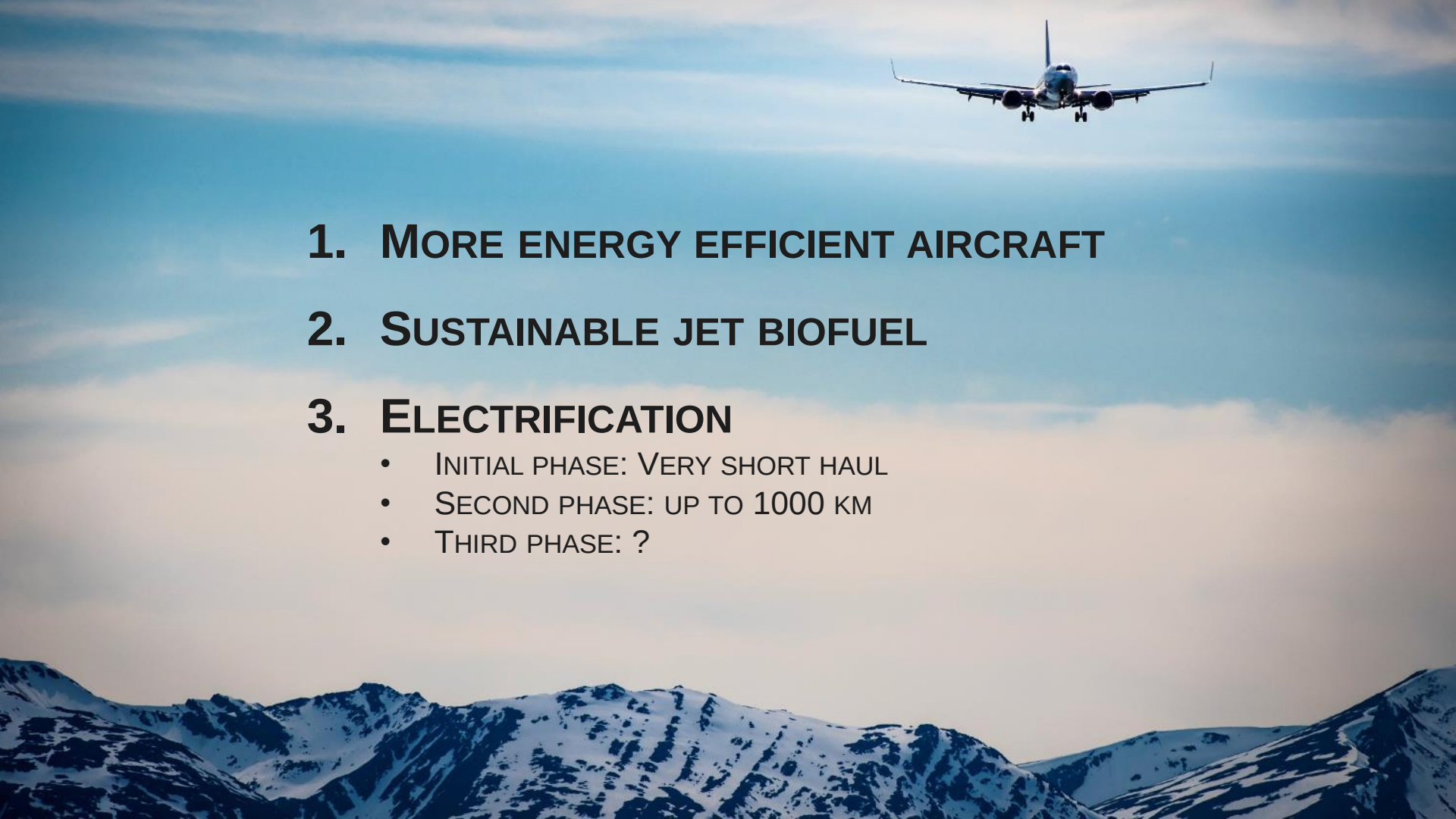

1. **More energy efficient aircraft**
2. **Sustainable jet biofuel**
3. **Electrification**
   - Initial phase: Very short haul
   - Second phase: up to 1000 km
   - Third phase: ?

ELECTRIFYING AVIATION

PIPISTREL ALPHA ELECTRO

- No of seats: 2
- Max weight pilot and passenger: 177.5 kg
- Max engine power: 60 kW
- Cruising speed: 85 Kts (157 km/h)
- **Range: 70 NM (130 km) + 20 % reserve**
- Battery: 21 kWh
- Take-off ground roll: <200 metres
- Landing ground roll: <150 metres
- Charging: up to 400V/32A

www.avinor.no/elfly


EVIATION


HEART


easyJet

COST REDUCTION = BETTER CONNECTIVITY

- Shorter runways?
- Smaller aircraft with new business cases?
- New routes?
- Increased frequency?

AVINOR'S ROLE AND CONSEQUENCES FOR OUR INFRASTRUCTURE

- Mapping surplus electricity capacity on Avinor's airports
- Looking into innovative and flexible charging solutions
- Or will fuel cells/H2 be the preferred solution?

NORWAY FIRST?

- Unique network of airports
- An established market for short flights with small aircraft
- Broad support from Government, Parliament and other stakeholders
- 99.8% renewable electricity

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

ARENDALSUKA 2019

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100%
ELECTRIC

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