



FACING THE CHALLENGE: DECISIONS, VISIONS AND PROJECTS IN NORWAY

SAF Workshop

Copenhagen, 20 NOV 2018



45 airports



Norway's Air Navigation Service
Provider

Norway is totally dependent on aviation





SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



Traffic
growth %

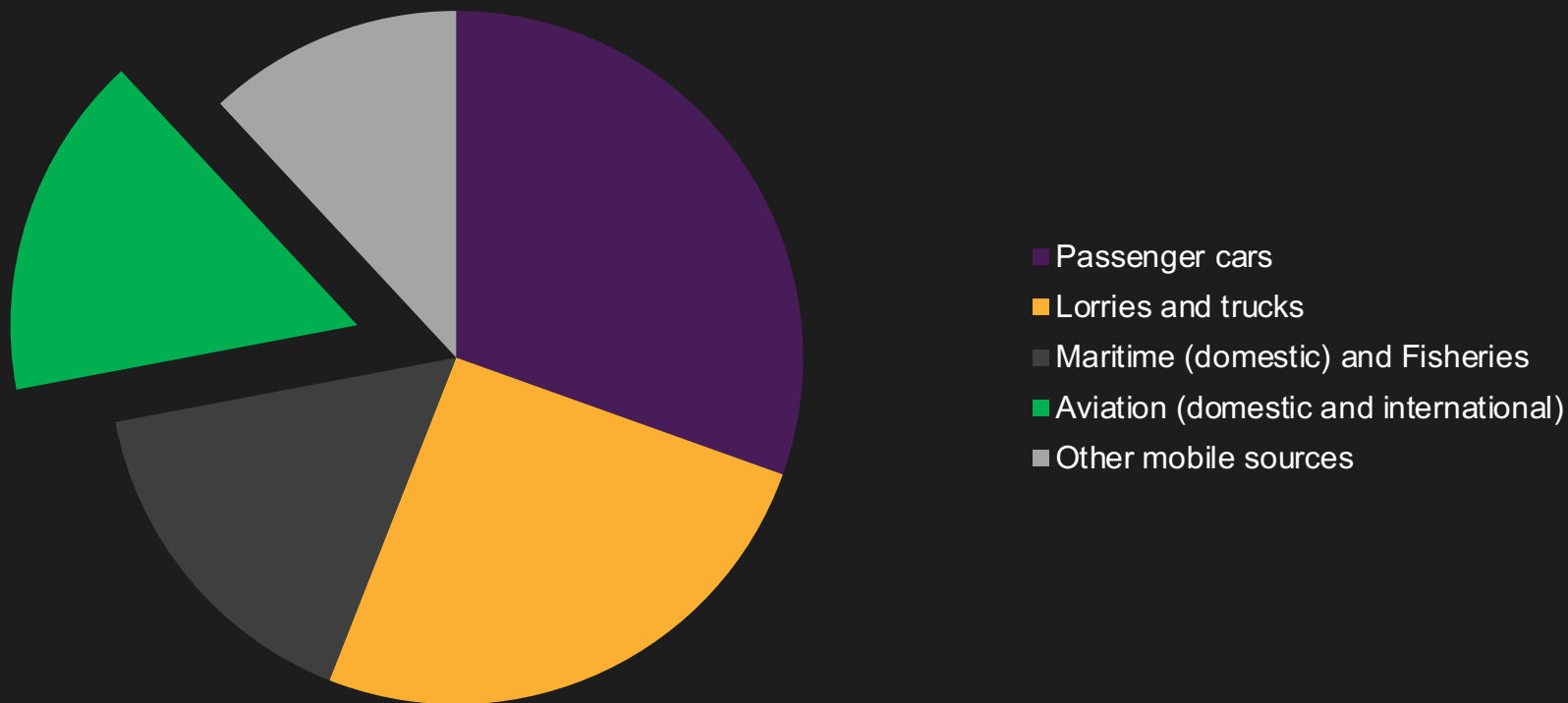


Emission
reductions %

IPCC | 1.5°C




CARBON EMISSIONS FROM TRANSPORT IN NORWAY 2016



NIGHTMARE SCENARIO



- Passenger cars
- Lorries and trucks
- Maritime (domestic) and Fisheries
- Aviation (domestic and international)
- Other mobile sources



**THE RIGHT THING TO DO
MAKES BUSINESS SENSE**



AVINOR 2022 GOAL:
Reduce own emissions
by 50%

(2012 baseline)

A photograph taken from the perspective of someone inside an airplane, looking out the window. The wing of the aircraft is visible in the lower-left foreground, and a large engine is mounted on the wing. The sky is a mix of blue and orange, suggesting a sunset or sunrise. A thick layer of clouds is visible below the aircraft, illuminated by the low sun. The text "AIRCRAFT CARBON EMISSIONS" is overlaid in white, bold, sans-serif font in the bottom-left corner.

AIRCRAFT CARBON EMISSIONS

AIRLINES INVESTING IN MORE ENERGY EFFICIENT AIRCRAFT



ELECTRIC AIRCRAFT





SUSTAINABLE AVIATION FUEL

- Avinor monitoring the development since 2007
- Several projects
- Cooperation with industry and stakeholders

2014: CONFERENCE AND DEMO FLIGHTS



FØRSTE FLYGNINGER
MED BIODRIVSTOFF
I NORGE

11.11.2014



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!



Lufthansa





WHAT'S UP?

- A few industrial initiatives
 - A drop in mandate

SILVA GREEN FUEL

- 500 MNOK
- 25 people
- Hydrofaction technology (Steeper Energy)
- First: Diesel
- Later: SAF



Demo plant for
**2ND GENERATION
BIO FUEL**



Made from
**FOREST
FEEDSTOCK**



TOFTE
in Norway




Test period
2019 - 2020



OWNERSHIP
Statkraft 51%
Södra 49%



Can produce
4000 LITER
of bio fuel per day

- 
- Currently producing fuel from plastics
 - Looking into a project to test their technological ideas on forestry biomass
 - Aim to produce SAF



BIOZIN

- Plan to produce bio condensate from forestry residues
- Owner: Bergene Holm AS
- Technology: IH2® developed by CRI
- (Cooperation with Preem AB)

FOLLUM INDUSTRIAL SITE

- St1 – Bio ethanol?
- Elkem – Pyrolysis?
- Others?

- www.treklyngen.no



QUOTA OBLIGATION (DROP IN REQUIREMENT)

- On the agenda since 2015
- The White Paper on the National Transport Plan 2018-2029: «*The Government will implement a drop in requirement of 1 % sustainable aviation biofuel from 2019 with a target of 30 % in 2030.*»
- *[In addition to CO2 tax, ETS, CORSIA and Passenger duty]*



DECISION

- 0.5 % Advanced Biofuel from 1 JAN 2020
- Fuel suppliers responsible
- All civil traffic
- Domestic and international
- Approx 6 mill litres annually
- Scaling up not yet decided
- Only formalities remaining for the decision to be implemented in our legal system



CONCLUDING REMARKS

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

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