FINAVIA
for smooth travelling
Decarbonising aviation

2018 Asia Pacific Energy Leader’s Summit
Mikko Viinikainen, VP, Sustainability and Environment, Finavia Corporation, Finland
Helsinki-London 3h
Helsinki-Hong Kong 10h
# Aviation Benefits

**NEW ZEALAND**

- **Airlines**: 9
- **Airports**: 27
- **Passengers [2017]**: 19.9 million
- **Flights [2017]**: 238,000
- **Forecast Passengers [2027]**: 30 million
- **Trips per capita [2017-2036]**: 3.56 → 5.28 (48%)
- **Aviation infrastructure score**: 4.7

<table>
<thead>
<tr>
<th>Tourism % of GDP</th>
<th>Tourism spend per arrival, 2015</th>
<th>Tourism competitiveness ranking</th>
</tr>
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<tr>
<td>17.9</td>
<td>$2,977.8</td>
<td>16/136</td>
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<tr>
<th>Connectivity ranking</th>
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<td>70</td>
<td>0.52</td>
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- **CORSIA Volunteer**: ✔
- **Airport accessibility**: 99.73%

**FINLAND**

- **Airlines**: 4
- **Airports**: 17
- **Passengers [2017]**: 10.6 million
- **Flights [2017]**: 108,600
- **Forecast Passengers [2027]**: 15.7 million
- **Trips per capita [2017-2036]**: 1.52 → 2.52 (66%)
- **Aviation infrastructure score**: 4.0

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- **CORSIA Volunteer**: ✔
- **Airport accessibility**: 92.34%

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NZ: popul. 4.9 m, GDP 206 billion USD
Fin: popul. 5.5 m, GDP 252 billion USD
Contents

Finavia and Helsinki Airport – the Gateway between Europe and Asia

Decarbonising Aviation
  • Airport Operations
  • Air Transport Operation

Securing the Benefits of Aviation
Finavia Ltd

We own and maintain a network of 21 airports in Finland

Helsinki Airport

20+ Mpax 2018
3 runways
180 000 ops/a

The best connected airport in Northern Europe.

The shortest routes between Europe and Asia.

The EUR 1000+ million investment programme at Helsinki airport lasting until 2020
Helsinki Airport – The Shortest Route between Europe & Asia
Helsinki: #5 in Europe – Asia direct flights

The location of Helsinki enables to operate e.g. HEL – Asia return flights in 24 hours!
Decarbonising Aviation - Airports
Airports are the first to face criticism on environmental impacts of aviation

<table>
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<tr>
<th>Direct impacts/airports</th>
<th>In-Direct impacts/airports</th>
<th>In-direct impacts/aviation</th>
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<tbody>
<tr>
<td>• Aircraft noise</td>
<td>• Climate emissions of airport infrastructure</td>
<td></td>
</tr>
<tr>
<td>• Water pollution</td>
<td>• Regulated only in few cases</td>
<td></td>
</tr>
<tr>
<td>• Local air quality</td>
<td>• Usually no direct capacity constraints</td>
<td></td>
</tr>
<tr>
<td>• Regulated by local permits and rules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Immediate capacity constraints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Regulated by international measures, e.g. EU-ETS, CORSIA</td>
<td></td>
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<tr>
<td>• Political measures only in few countries</td>
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</table>
Opposition to airports’ expansion, introduction of taxes to cut flying, public opinion raising against air transport…

Munich votes against third runway

The people of Munich voted against a referendum held on Sunday. The parties in the Bavarian capital.

Sweden is making flying more expensive as of today – and Norwegian has already cancelled its first route

"Stop for Flying" Loppu lentämiselle
Rea Peltoja päätti teini-ikäisenä, ettei makusta lentäen. Kösän moni innon ei ajattele kuitenkaan lentämisestä vain yleisty.
Airports are taking very seriously the direct and in-direct impacts and acting as front-runners in environmental responsibility in the air transport industry.

Airports undertake voluntary measures to reduce in-direct environmental impacts to show leadership and have an influence on:

a) regulations regarding airports’ direct impacts and
b) political measures regarding aviation
Finavia’s vision on environmental responsibility in 2020

Finavia is a carbon-neutral airport operator undertaking environmentally responsible measures acknowledged by customers, neighbours and competent authorities.

In-direct impacts + direct impacts
Airport Carbon Accreditation –
The Global Voluntary Carbon Management Standard for Airports

- **Level 3+**: Offsetting own Scope 1 & 2 emissions
- **Level 3**: Engaging others and measuring their emissions
- **Level 2**: Managing and reducing footprint
- **Level 1**: Carbon footprint

Launched in 2009 by Airports Council/ EUROPE

Twofold objective
- technical guidance for airport carbon management
- framework for public recognition

Approx. 250 airports accredited
Emission scopes

**Scope 1**: Direct emissions the airport can control (e.g. airport’s own vehicles)

**Scope 2**: Indirect emissions the airport can control (e.g. electricity supply)

**Scope 3**: Indirect emissions the airport can guide (e.g. third party Ground Support Equipment, use of Auxiliary Power Units (APUs))

**Scope 3**: Indirect emissions the airport can influence (e.g. LTO, surface access)

Which emissions can occur at an airport?
Recent emission reduction measures at Helsinki Airport:

Renewable diesel (Neste MY) made of 100% wastes and residues used in Finavia’s apron busses and other diesel vehicles.

“Sauna theme-bus”
Recent emission reduction measures at Helsinki Airport:

Solar electricity, to cover 10% of demand in new terminals in 2020

Under construction, solar panels will be installed on the wall and the roof.
Electricity sourced from wind power and compensation of residual emissions with voluntary carbon credits

Certificate of origin / Electricity
- 55 000 MWh wind power
- 10 100 t CO₂

Carbon credits
- 9 200 t CO₂
- Biogas and wind power projects in India
Decarbonising Aviation – Air Transport Operations
Aircraft emissions have a warming effect via several pathways

Aircraft CO₂ emissions equals the same as from maritime – around 2 % of man-made emissions
Warming impact is around 3-4% without “contrail cirrus”

- Direct impact of CO₂
- Oxides of nitrogen (NOₓ) produce ozone (O₃), which is a warming gas
- Induced cloudiness – the impact is not scientifically quantified
- “No hole in the ozone layer”

“Contrail cirrus” seen from space

Figure 1 – Contrails and contrail cirrus cloudiness over Europe as viewed by the NOAA-12 AVHRR satellite on 4 May 1996 (IPCC, 1999).
Air Transport Industry set three goals in 2009

1.5% Improvement in fuel efficiency per year

Stabilise net CO₂ emissions from the sector at 2020 levels through carbon-neutral growth

-50% CO₂ emissions from aviation by 2050 (2005 baseline)
CONTRIBUTION OF MEASURES FOR REDUCING INTERNATIONAL AVIATION NET CO₂ EMISSIONS

- Operational Improvements
- Aircraft Technology
- Sustainable Aviation Fuels and CORSIA

Carbon Neutral Growth from 2020

International Aviation Net CO₂ Emissions (MT)

Basket of Measures
Management of aircraft emissions

1 TECHNOLOGY (including SUSTAINABLE ALTERNATIVE FUELS)

New engine and airframe technology (energy efficiency +20% /aircraft generation)
Sustainable Aviation Fuels (SAF) – products exist but the cost is an issue
Electric aircraft – turboprops replaced as soon as by 2040?

2 OPERATIONS

Better flight procedures supported by navigation technology – e.g. Continuous Descent Operations (CDO)

3 INFRA-STRUCTURE

Efficient use of airspace – reduction of flight distance
Efficient operations at airports – e.g. Collaborative Decision Making (CDM) to optimise taxiing time

4 A GLOBAL MARKET-BASED MEASURE

Global Carbon Offsetting and Reduction Scheme of International Aviation (CORSIA) starting 1.1.2019
Electric aircraft – The future?

“Air New Zealand partners with Zephyr Airworks to bring air taxis to New Zealanders”
News, 16 Oct 2018
Sustainable Aviation Fuel (SAF)

Characteristics
• Chemically identical to JET A/A1, but made from renewable materials
• Drop-in fuel, blending up to 50%, no modifications to engine or fuel infrastructure required

Raw materials
• Varied range of non-fossil raw materials, such as waste animal tallow (fat), used cooking oil, crop based such as palm or corn and even municipal solid waste

Neste-company is one of the active developers of SAF
The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is the world’s first market mechanism for dealing with climate change from any industrial sector. CORSIA is agreed via ICAO (International Civil Aviation Organization), a UN agency.

The Scheme will enable carbon neutral growth (CNG) of international aviation from 2020 onwards. Airlines shall purchase carbon credits to offset emissions above the baseline 2019-2020. Quantity of emissions to be offset is approx. 160Mt in 2025 to 520Mt in 2035.

- Aviation will have to offset 2.6 billion tonnes of CO₂ between 2021 and 2035. This is more than ever traded in the voluntary carbon market.

Eligibility criteria for offsets under discussion in ICAO.
Securing the Benefits of Aviation
Securing the Benefits of Aviation

Direct economic impacts

Catalytic impacts on economic activities

Benefits for equal rights to movement

Benefits for tourism

Connectivity

“Every flight begins at the airport”

The airline industry needs global solutions for managing the climate challenge

Airports are acting responsibly to gain support from regulators and neighbours to bring the local benefits

Mikko Viinikainen, Finavia, Finland
Thank you!

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