Mikko Viinikainen
VP Sustainability & Environment
Finavia Corporation

Annual Safety Conference 2022
EASA Airport Safety & Environmental Sustainability through Innovation

Your safety is our mission
Flash Talk: Sustainable Airport Operations

EASA Annual Safety Conference, 30 Nov – 1 Dec, 2022, Prague

Mikko Viinikainen, VP Sustainability and Environment, Finavia Corporations
Sustainable Airport Operations - Topics

An overview on airport stakeholders

Airports’ measures contributing to energy-efficient aircraft operations

Airports are getting ready for alternative power sources for aircraft

- Brussels
- Copenhagen
- Paris
- Amsterdam
- Swedavia

European airports’ Net Zero Carbon roadmaps

The Way Forward
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?
## Airports’ measures contributing to energy-efficient operations

### Enable and/or Deliver

<table>
<thead>
<tr>
<th>General Aircraft Issues</th>
<th>Flight Phase “at Gate”</th>
<th>Flight Phase “on Ground”</th>
<th>Flight Phase “in Air”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Plane" /></td>
<td><img src="image" alt="Plane" /></td>
<td><img src="image" alt="Plane" /></td>
</tr>
<tr>
<td>- Fleet renewal and retrofit of in-service aircraft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- New aircraft propulsion and energy systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- SAF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>APU substitution by FEGP/PCA</td>
<td>Operational towing</td>
<td>Continuous Descent Operations</td>
</tr>
<tr>
<td></td>
<td>Low emissions GSE and vehicles</td>
<td>Integrated electric taxiing</td>
<td>Continuous Climb Operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced engine taxi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced taxi times</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optimised GSE logistics and movements of ground vehicles</td>
<td></td>
</tr>
</tbody>
</table>
Note: The presented list of possible emissions sources at the airport is not exhaustive. Furthermore, the operational status of every airport is different. Therefore, the depicted emissions sources may not be present at every airport.
Airports Are Getting Ready for Alternative Power Sources for Aircraft

Many airport-driven research and piloting programmes on-going, e.g.

- **Stargate** – Brussels + Budapest, Athens, Toulouse Blagnac
- **TULIPS** – Schiphol + Oslo, Turin, Larnaka
- **OLGA** – ADP (Paris) + Cluj, Milan, Zagreb
- **ALIGHT** – Copenhagen + Rome, Vilnius, Warsaw (STH)
- Electric aviation projects – Swedavia + Nordic partners
Stargate projects on Sustainable Aviation Fuel

High blend ratio SAF on-site blending (up to 50%)

Electric taxiing (wheeltug, taxibot)

Electric cargo ground handling equipment

Hydrogen cargo ground handling equipment

.getenv()

2023: Assessment current & future handling infrastructure for hydrogen flights
**WP2: Energy supply future aircraft**
- Feasibility study incl. energy demand forecast (link with WP3)
- Demonstrate:
  - Unattended charging
  - Modular charging system
  - Airport-facilitated hydrogen flight

**WP3: Smart energy hub**
- Implementing:
  - Improved Airside electricity traffic incl. storage and direct PV charging
  - Fully integrated heat storage systems into existing hotel infrastructure

**WP4: Zero emissions airside operations**
- Development & operation of:
  - H2 GPU with a hydrogen fuel cell (H-GPU)
  - Large size H2 tow tractor (able to move A380, B777 aircraft) which uses hydrogen powered fuel cells

**WP5: SAF infrastructure**
- Scale-up of SAF market
  - Set up EU Clearing house
  - Enable airports to support the scale-up of SAF supply
  - Demonstrate:
    - Large scale SAF supply
    - Incentives for airports to increase SAF usage
OLGA - Holistic environmental performance at airports

Transport landside, access & multimodal
- Decision support tool for planning city bus transport electrification
- Transport decision support platform: new tools and traffic optimization mechanisms
- Usage of waste as biofuel for NGV buses

Transport airside
- Decarbonised solutions on airside
- Energy transition of ground handling
- Installation of charging infrastructures
- Alternative fuels
- Environmental monitoring of aircraft apron

Terminal area
- Tool to monitor and manage biodiversity
- Environmental innovations in lighting in a terminal, on aircraft stands, and in pre-boarding bridges
- Methodologies to achieve environmentally friendly construction and deconstruction processes

Energy, Hydrogen
- Guidelines to turn the airport in H2 Hub for aircraft
- Green H2 production and use through the installation of a green H2 plant
- SAF promotion, showcasing their use on AF flights
- Biomethane pilot system to refuel local buses

Cross-cutting aspects
- Real-time emissions and air quality assessment with a fully integrated monitoring and modelling platform
- Contribution of airport related emission sources to local urban air quality including improvement of knowledge for UFP
The ALIGHT mission

Copenhagen Airport is the lighthouse for the H2020 Smart Airports project ALIGHT. CPH will showcase the way to the sustainable airport of the future. The mission is to give best practice recommendations that can be replicated by other airports.

A best practice guide for Sustainable Energy Fuel handling and logistics will be developed. An innovative concept for a cost-effective fuel supply chain will be demonstrated at CPH.

Solutions for renewable energy for ground activities and vehicles within the airport will also be found. This includes own production of sustainable energy, energy storage and electrification.

‘Aircraft stand of the future’
The design will be one of ALIGHT’s contributions towards a bold vision for Smart Airports of 2050.
Electric Aviation Projects – Swedavia and partners

European projects:

- Nordic Network for Electric Aviation
- Avinor
- Green Flyway
- Saab
- Heart Aerospace
- RISE
- Fossil Free
- Gothenburg Landvetter Airport
- Stockholm Arlanda Airport
- Bromma Stockholm Airport
- Visby Airport
- Ronneby Airport
- Malmo Airport
- Kiruna Airport
- Lulea Airport
- Umea Airport
- Skelleftea Airport
- Are Ostersund Airport

Simulated charging power demand in UME
Placement of electric aircraft in UME
1 MW charging station in VBY, solar power included
Heart Aerospace ES30
Airport Carbon Accreditation –
The Global Voluntary Carbon Management Standard for Airports

Launched in 2009 by Airports Council/ EUROPE

Twofold objective

• technical guidance for airport carbon management

• framework for public recognition

Approx. 425 airports accredited, in 86 countries across the world, welcoming 4,5 billion passenger a year
Dozens of airport operators have committed to Net Zero Carbon emissions by 2030.

Airports have published concrete roadmaps on their journey to Net Zero Carbon emissions on www.aci-europe.org/netzero
Airports Have Concrete Plans on Achieving Net Zero in Scope 1&2 Emissions

Main measures per category *(Developing an Airport Net Zero Carbon Roadmap, Summary of existing roadmaps, June 2022)*
The Way Forward

Continuous investments will be needed at airports for Net Zero including enabling alternative power sources for aircraft

Airports are calling for
• A true enabling regulatory framework
• A streamline infrastructure funding

Access to renewable and green energy is vital

Emission reductions shall be reached throughout all the airport stakeholders
"Every Sustainable Flight Begins At The Airport"

Thank you!

www.finavia.fi/ymparisto
mikko.viinikainen@finavia.fi
Twitter: @MSViinikainen