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Annual Safety Conference 2022

EASA Airport Safety & Environmental
Sustainability through Innovation

EU2022.CZ | EASA European Union Aviation Safety Agency | 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

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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

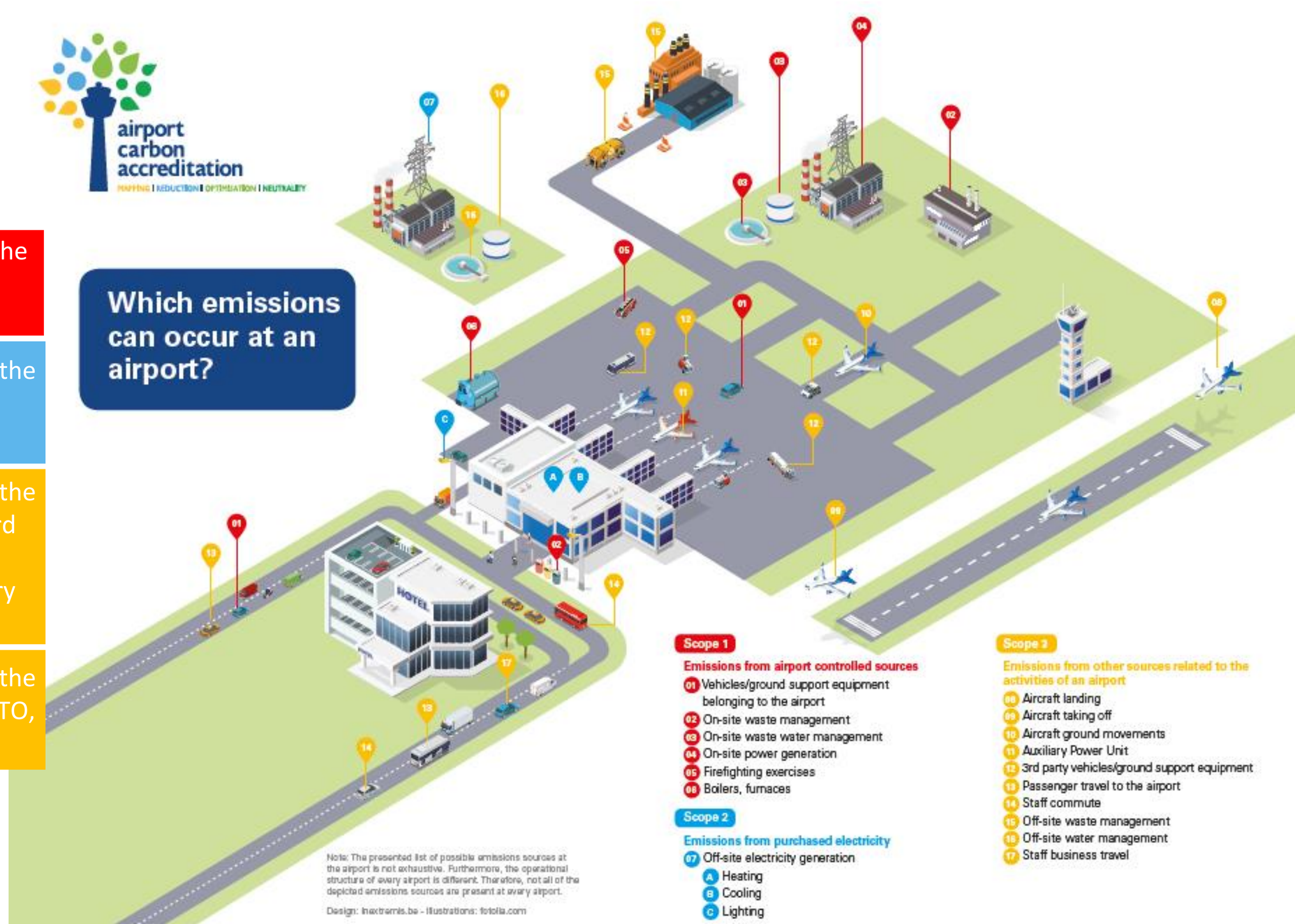
Emission scopes

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)

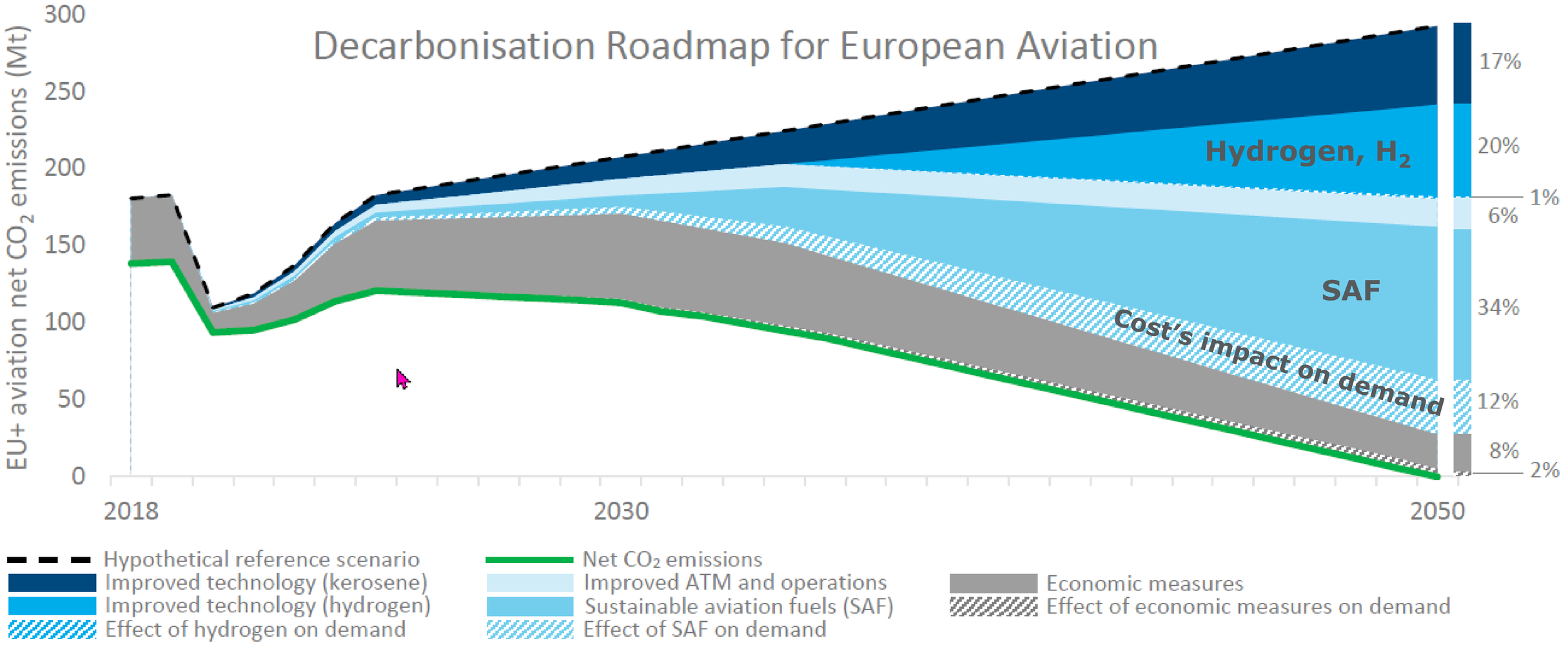


Airports’ measures contributing to energy-efficient operations

Enable and/or Deliver

General Aircraft Issues	Flight Phase “at Gate”	Flight Phase “on Ground”	Flight Phase “in Air”
			
• Fleet renewal and retrofit of in-service aircraft • New aircraft propulsion and energy systems • SAF	• APU substitution by FEGP/PCA • Low emissions GSE and vehicles	• Operational towing • Integrated electric taxiing • Reduced engine taxi • Reduced taxi times • Optimised GSE logistics and movements of ground vehicles	• Continuous Descent Operations • Continuous Climb Operations

www.destination2050.eu



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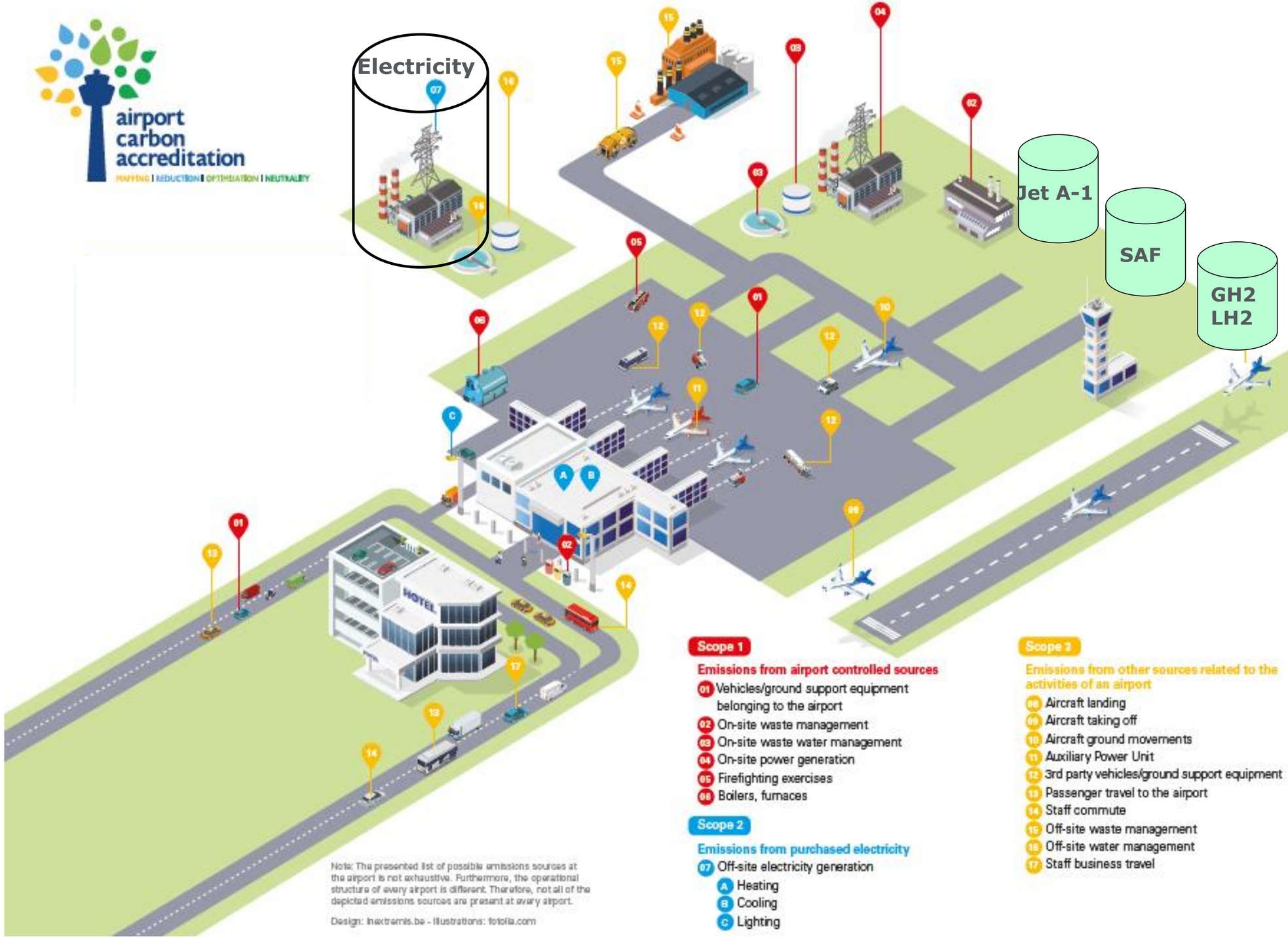
airport carbon accreditation

MAPPING | REDUCTION | OPTIMISATION | NEUTRALITY



Note: The presented list of possible emissions sources at the airport is not exhaustive. Furthermore, the operational structure of every airport is different. Therefore, not all of the depicted emissions sources are present at every airport.

Design: Inextremis.be - Illustrations: fotolia.com

Scope 1

Emissions from airport controlled sources

- 01 Vehicles/ground support equipment belonging to the airport
- 02 On-site waste management
- 03 On-site waste water management
- 04 On-site power generation
- 05 Firefighting exercises
- 06 Boilers, furnaces

Scope 2

Emissions from purchased electricity

- 07 Off-site electricity generation
  - A Heating
  - B Cooling
  - C Lighting

Scope 3

Emissions from other sources related to the activities of an airport

- 08 Aircraft landing
- 09 Aircraft taking off
- 10 Aircraft ground movements
- 11 Auxiliary Power Unit
- 12 3rd party vehicles/ground support equipment
- 13 Passenger travel to the airport
- 14 Staff commute
- 15 Off-site waste management
- 16 Off-site water management
- 17 Staff business travel

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

2023: Assessment current & future handling infrastructure for hydrogen flights

brussels airport
the heart of Europe

TULIPS

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

hOListic Green Airport

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

Horizon 2020
Grant Agreement n° 101036871

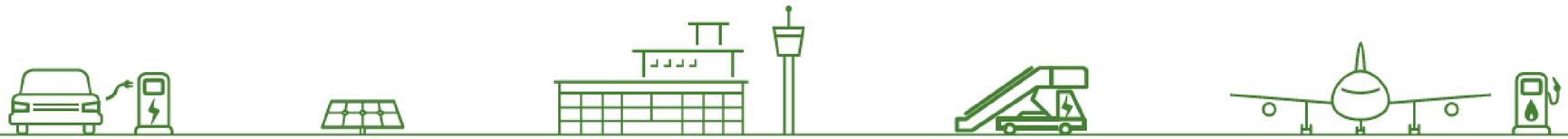
The ALIGHT mission

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.

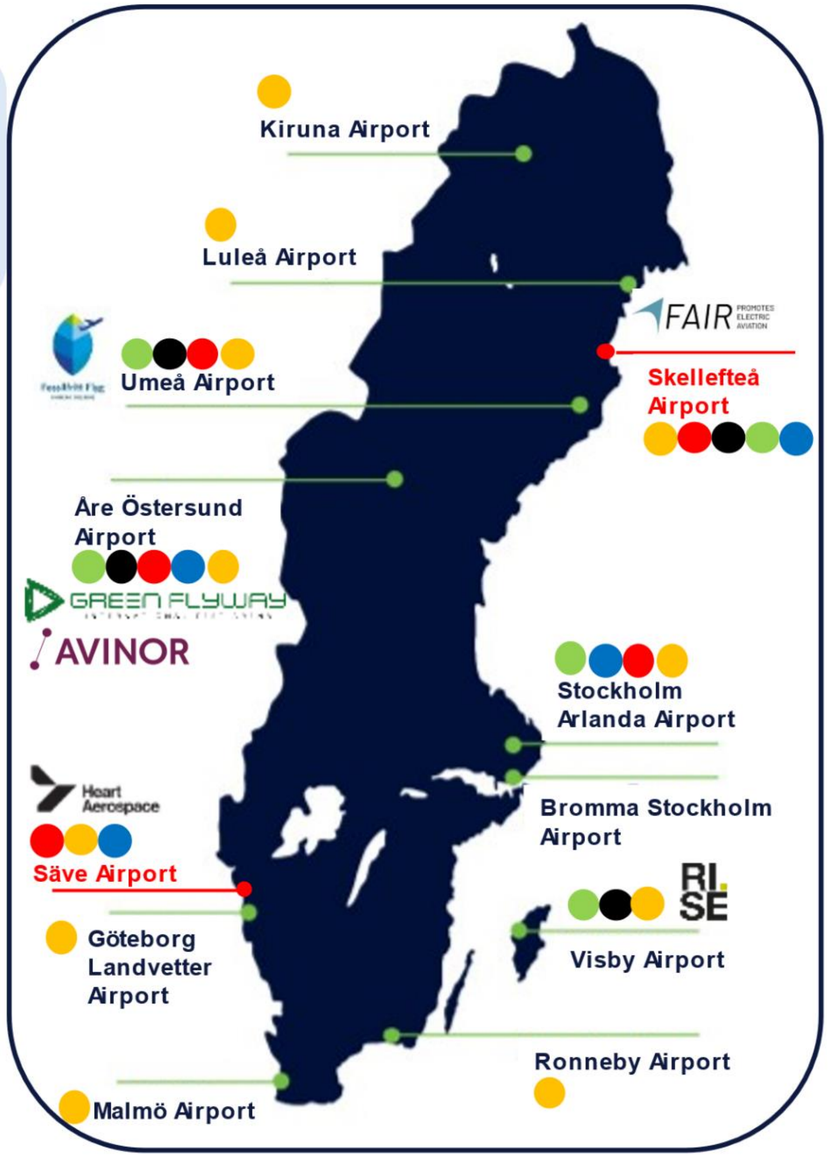
Solutions for renewable energy for ground activities and vehicles within the airport will also be found. This includes own production of sustainable energy, energy storage and electrification.

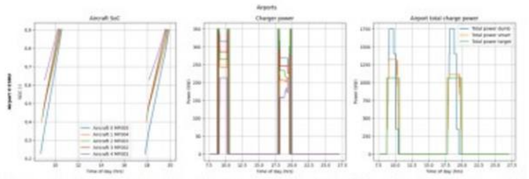
'Aircraft stand of the future'
The design will be one of ALIGHT's contributions towards a bold vision for Smart Airports of 2050



Electric Aviation Projects – Swedavia and partners

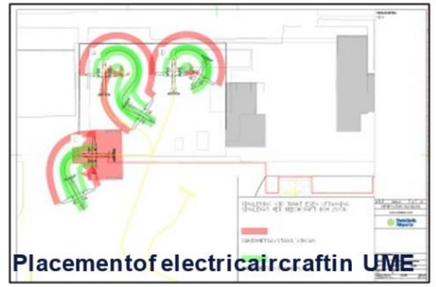
- Academia
- Public sector
- Industry
- Other airport operator
- Swedavia





Figur 32: Resulterande laddning på Umeå Airport med laddtid-prioriterad schemaläggning. Elflygplanens SoC från ankomst till avgång (t.v.), effektuttag från laddare (i mitten), samt summerad effektlast på flygplatsen från laddning av elflygplanen (t.h.).

Simulated charging power demand in UME



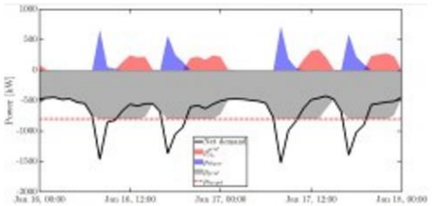
Placement of electric aircraft in UME

European projects:

NORDIC NETWORK FOR ELECTRIC AVIATION

Alliance for Zero-Emission Aviation

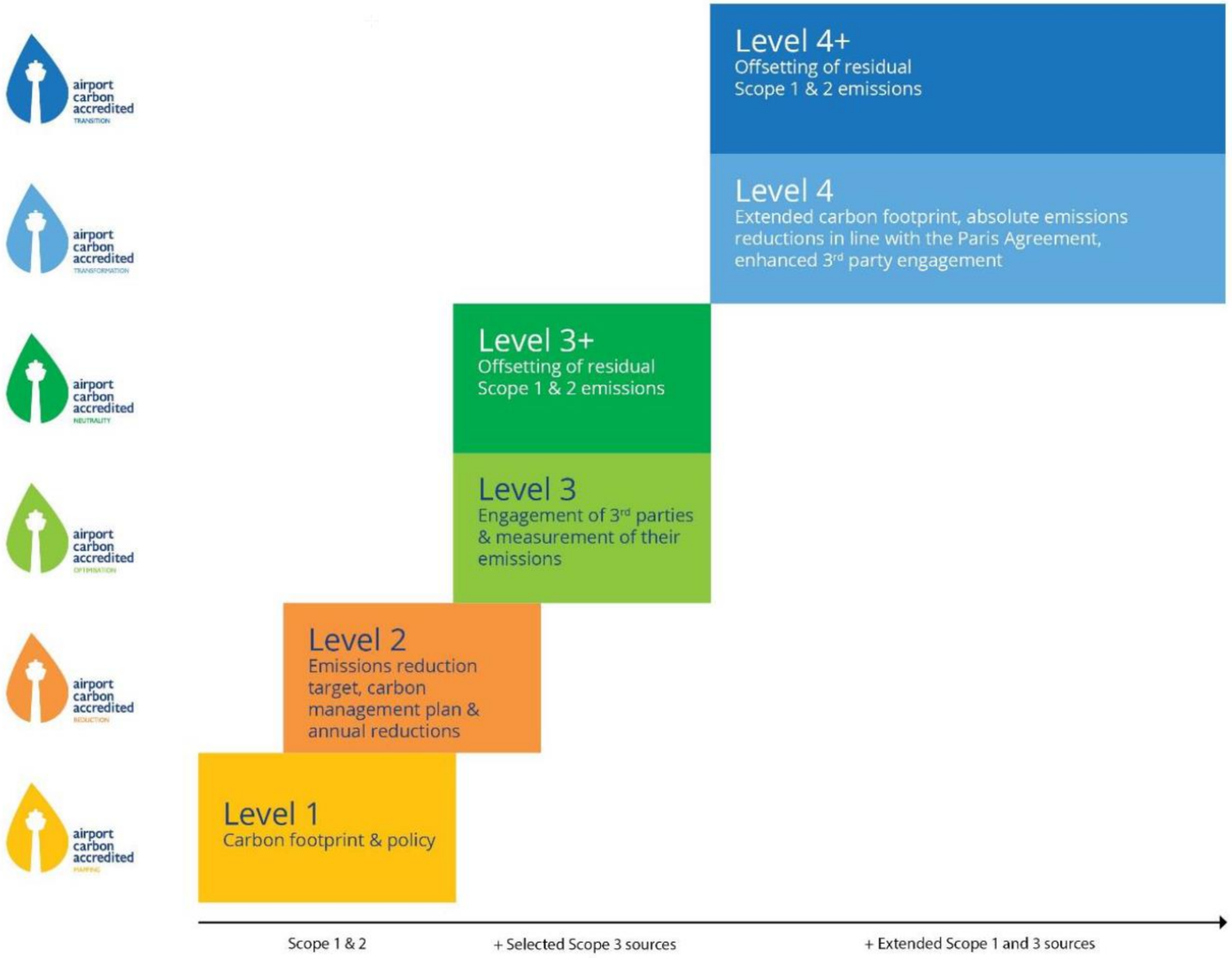
1 MW charging station in OSD



Simulated power output and input on VBY, solar power included

Heart Aerospace ES-30

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

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ACI EUROPE RESOLUTION

Adopted by the ACI EUROPE Board on 16 May 2019
Published at the 29th Annual Congress & General Assembly on 26 June 2019
Last updated at the 32nd Annual Congress & General Assembly on 23 June 2022

EUROPEAN AIRPORTS COMMITTING TO NET ZERO CARBON EMISSIONS BY 2050

Dozens of airport operators have committed to Net Zero Carbon emissions by 2030.

- Edinburgh Airport — BY 2040
- Antwerp
- Ostend-Bruges
- EuroAirport Basel Mulhouse Freiburg — BY 2030
- BER Flughafen Berlin Brandenburg
- FINAVIA — BY 2025 — 20 airports in Finland, including Helsinki
- Düsseldorf Airport DUS
- Hamburg Airport — BY 2035
- Allgäu Airport Memmingen — BY 2030

Airports have published concrete roadmaps on their journey to Net Zero Carbon emissions on www.aci-europe.org/netzero

Luxembourg Airport: Net Zero Carbon Roadmap

Montpellier-Méditerranée Airport: Feuille de Route Net Zero 2050

Brussels Airport: Roadmap Towards Net Zero Carbon 2050

FINAVIA: Net Zero Carbon Roadmap

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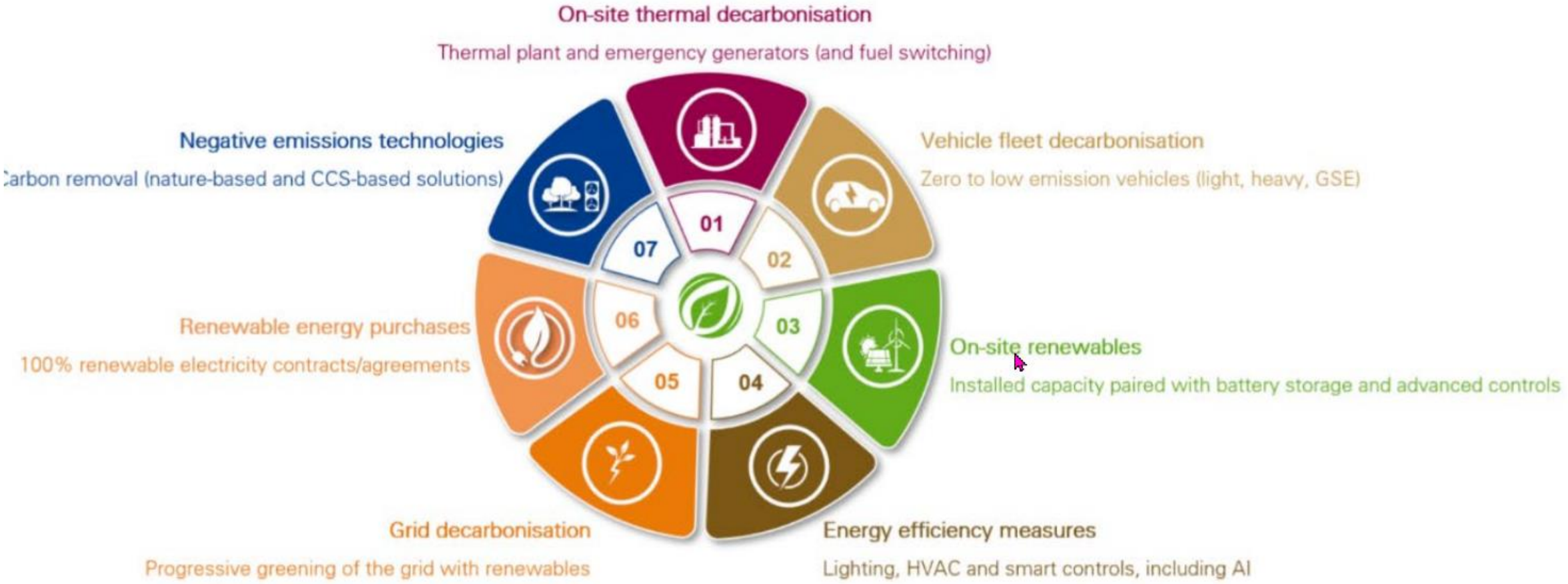
Airports Have Concrete Plans on Achieving Net Zero in Scope 1&2 Emissions

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 infrastucture funding

Access to renewable and green energy is vital

Emission reductions shall be reached throughout all the airport stakeholders

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”Every Sustainable Flight Begins At The Airport”

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Thank you!

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