ACHIEVING SUSTAINABILITY AT AIRPORTS

Landside, Airside and Terminal

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Introduction

Aviation contributes approximately 2% to 3% of all global CO_2 emissions, with the majority of the emissions stemming from flying of aircraft. However, airports are also a source of a considerable number of emissions across various scopes. Emissions from the aviation industry have been increasing at an annual rate of about 3% in recent years, up until 2019. This growth can be attributed to the constant increase in passenger demand, which is expected to continue rising and to double by 2050, potentially resulting in aviation to account for 25% to 30% of all CO_2 emissions by 2050 if no actions are taken. When the negative impact and the forecasted growth of the industry are considered together, the need and urgency to take immediate action to support net-zero goals becomes even more clear.

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Imperatives for Sustainability at Airports

The rising social, regulatory, and economic pressures are increasingly gaining the attention of airport operators and highlighting the need for ramping up efforts to support sustainably at airports:

Government - The Sustainable Development Goals (SDGs) and government regulations such as the UK government's new decarbonisation plan and the European Union's recent Green Deal proposal and many such policies by various regulatory bodies and governments across the world are beginning to set targets to achieve net-zero for the aviation industry. As a result, airports are actively seeking ways to meet these requirements and achieve the established goals.

Hear from the UK Jet Zero Council on how government actions will impact the route to Net-Zero in aviation.

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Social – Passengers and the community at large are becoming increasingly aware and engaged in pursuing sustainability, especially in Europe where significant social pressures regarding short-haul intra-regional air travel is prompting a shift towards more energy-efficient transportation alternatives such as rail.

Economic – The cost of fuel as well as electricity, gas and water are constantly rising, which is putting huge pressure on airports to maintain profitability, further compounded by the ongoing economic instability.
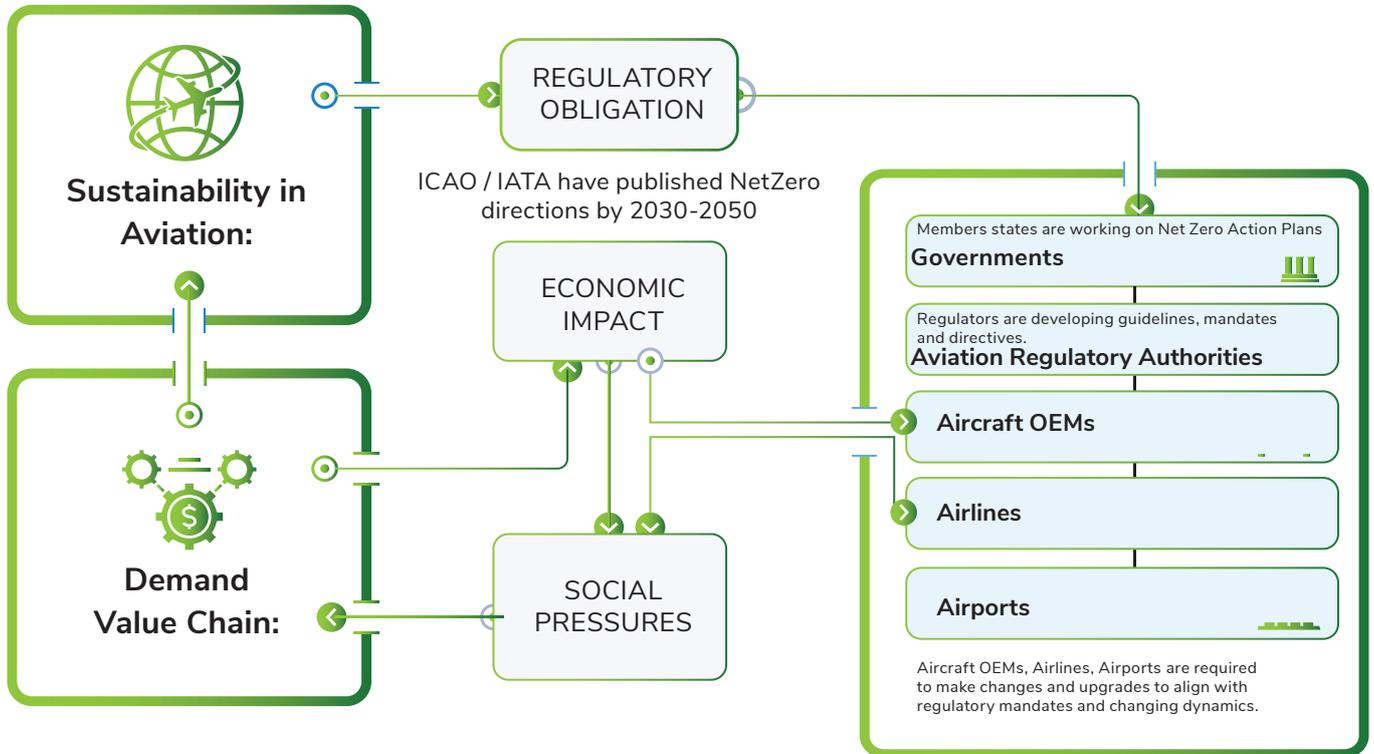
Opening Keynote presentation at inter airport FOCUS will outline how we achieve Net Zero Goals and afford them.

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Sustainability in Aviation – Imperatives

Sustainability in Aviation:

Demand Value Chain:

REGULATORY OBLIGATION

ICAO / IATA have published NetZero directions by 2030-2050

ECONOMIC IMPACT

SOCIAL PRESSURES

Members states are working on Net Zero Action Plans
Governments

Regulators are developing guidelines, mandates and directives.
Aviation Regulatory Authorities

Aircraft OEMs

Airlines

Airports

Aircraft OEMs, Airlines, Airports are required to make changes and upgrades to align with regulatory mandates and changing dynamics.

To achieve sustainability at airports, it is crucial to consider all three scopes of emissions. This entails identifying and measuring emissions within each scope to facilitate the efficient and effective deployment of solutions, which may involve operational changes, technology deployment, changes to the physical aspects of the airport or other measures.

Scope 1: Scope 1 emissions are direct emissions and are owned and controlled by the Airport such as ground operations and energy usage across the airport.

Scope 2: Scope 2 emissions include the emissions caused by the power demand of the airport such as the fossil fuel burn for the electricity or other energy sources purchased by the airport.

Scope 3: Scope 3 emissions include indirect emissions caused by other stakeholders at the airport such as airlines, transportation to and from the airport.

It is crucial that emissions sources across all the 3 scopes be identified and then initiatives/solutions be developed and deployed in collaboration with all the stakeholders to achieve the desired impact.

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How can Airports achieve Net-Zero?

Airports need to identify key sources of emissions and then develop strategies accordingly, targeting the specific requirement across Terminal, Airside and Landside.

Hear how airports are using strategic roadmaps to overcome the sustainable challenges they face.

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Terminal

Terminal buildings make up for one of the largest source of energy consumption at an airport mainly required for heating/cooling, lighting, and powering the vast amount of equipment in the terminal. There are various initiatives and solutions that can be deployed depending on whether it is a greenfield or a brownfield project to support power generation, power storage and power consumption.

Terminal Design to Reduce Energy Usage
Lighting at an airport terminal is a crucial aspect in operational functionality as well as a huge source of power consumption. Incorporating design elements in terminal buildings that allow natural light to enter can significantly reduce the need for artificial lighting during daylight hours. Additionally, implementing smart energy-efficient lighting systems can further contribute to significant energy savings in terms of lighting needs.

Find a range of lighting suppliers and sustainable terminal solutions at inter airport Europe.

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Energy Efficient Equipment

As terminals undergo increased digitization and modernization, the number of equipment present within a terminal, including self-check-in & Bag Drop kiosks, Passenger Information Systems, Advertising Screens, and various others across the passenger value chain as well as operational equipment, have significantly increased. Additionally, the heating/cooling also contributes to substantial energy consumption. By replacing outdated equipment with more energy-efficient alternatives, airports can make significant strides in reducing their overall energy requirements.

Learn from data professionals within the industry who will be showcasing their digital innovations at inter airport Europe.

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Harnessing Renewable Energy to make Airports Self Sufficient

Airports have access to large areas of land, and this is ideal for installing large solar farms/solar grids as well as wind turbines to generate electricity. Using renewable energy to generate the electricity required will aid in making an airport completely self-sustained. Alternate energy sources such as geothermal, solar, or natural ventilation for heating/cooling of the terminal building enable further reduction in power requirements.

Learn about the potential for renewable energies and their operation at airport sites in the 'Renewables and Alternative Fuels' content stream.

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Stockholm Arlanda Airport – One of the first airports to achieve carbon neutrality has a cap on CO2 emissions across all 3 scopes of the airport. The airport uses a biofuel system system to heat its terminals, hangar, and airfield buildings. It has also linked a series of wells to an underground aquifer to be used for cooling and heating of the terminal.

Airside

Airside of an airport is potentially the single largest source of fuel and energy, contributing to the majority of an airport's CO2 emissions. The 2 key operations that form a chunk of these emissions are GSE and taxing of aircraft. This is the reason why a large portion of innovations are focused on decarbonising these sources.

Discuss all things airside with our ramp exhibitors at inter airport Europe.

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Electric/Hybrid Airside Vehicles
Vehicle movement on the airside, including passenger transport as well as GSE run mostly on non-renewable energy and lead to increased CO2 emissions of an airport. Replacing these with electric powered alternatives can help reduce considerable amounts of emission on the airside.

Hear a range of industry perspectives with our Sustainable Terminal, Apron & GSE Operation content stream.

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Electric Aircraft Taxing
Large amounts of emissions come from taxing in and out where aircraft use both the engines which not only burns costly aviation fuel but also leads to high amounts of CO2 emissions. The deployment of electrically powered assisted taxing vehicles can aid in reducing emissions from aircraft while on the ground.

Airside Layout
As airports continue to expand in size, aircraft now face longer travel distances to and from the gates. This not only increases the time spent on the ground but also contributes to higher emissions resulting from fuel burn during ground movements. Designing the airside in a way that reduces aircraft travel distance not only aids in increasing airport capacity but also enables to reduce emissions from the aircraft.

The Electric Apron panel will identify the challenges and opportunities created across the supply chain in achieving it.

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Supply & Production of SAF
Sustainable Aviation Fuel now becoming mandatory in the EU results in an increase in demand for SAF which will continue to increase, so that airports will need to support airlines by offering facilities to store as well as in some cases having production plants on-site.

Receive an introduction to SAF, a discussion on its potential and measurement proof on its capabilities at inter airport FOCUS.

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Infrastructure to support Hybrid/Hydrogen/Electric Aircraft
For Hybrid/Electric/Hydrogen to be commercially deployed on a large scale, airports will have to set up the necessary infrastructure such as having charging infrastructure, hydrogen storage and the other required supporting elements for the operation of the new aircraft type.

Munich Airport – The airport currently operates a large fleet of electrically powered vehicles including baggage tugs and passenger boarding bridges, amongst others as well as its car fleet. The airport is aiming to have all its vehicles electrically powered by 2030. The airport has also implemented a range of other initiatives such as solar power, energy-efficient equipment, and recycling programs.

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Landside

In recent times, the landside area of an airport has garnered significant attention, especially regarding transportation to and from the airport. The reliance on private vehicles for airport travel has resulted in increased emissions and although parking is a lucrative source of revenue for airports, airports in collaboration with stakeholders in the transportation sector, should prioritize efforts to make transportation more sustainable and eco-friendlier.

Use of AAM/UAV for Airport Connectivity

Transportation to and from an airport leads to large amounts of carbon emissions through various modes of transport. This also puts strain on the cities' infrastructures while also causing congestion. Planning for adoption of Advanced Air Mobility and Urban Air Mobility as transportation options holds great potential for reducing the indirect emissions by airports.

Understand the potential for from industry analysts and market operators at inter airport FOCUS.

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Organic Farming, Pisciculture and Reforestation

The landside area of an airport often encompasses vast expanses of unobstructed land that remain vacant due to regulatory requirements. This land can be used for farming and fish farming which can then either be processed and used for airline catering or for the local community. Some airports are also working with the local forest departments to try and develop patches of forest which can then support in capturing carbon and act as carbon sinks for the emissions generated by an airport.

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Electric/ Hybrid Transportation & Connectivity
Airports can play a crucial role in reducing emissions associated with private transportation by promoting and supporting the use of electric vehicles by having charging stations, which can further aid in reducing emissions. Airports, in collaboration with city councils, could work on enhancing connectivity to promote use of public transport and more environmentally efficient alternatives.

Discover a variety of strategies being adopted across the airport industry to balance market factors, financial pressures and industry regulation in achieving Net-Zero goals.

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**Copenhagen Airport is aiming to become carbon-neutral by 2025.
The airport has installed solar panels, wind turbines, and geothermal systems to generate renewable energy. They have also reduced waste by instating waste management and recycling programs which includes turning food waste into biogas.**

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Roles & Responsibilities of stakeholders in Airport Ecosystems to support and achieve Net-Zero Targets

To attain the desired net-zero targets and bolster overall sustainability, airports must address various aspects beyond emissions, including noise reduction, water conservation, waste management, and more. Achieving these goals necessitates collective efforts from stakeholders across the airport ecosystem.

Airport Operators - Integrate sustainability across all airport operations, conveying its importance to staff and embedding it into the airport's strategy and planning. Airports should also consider developing new-business models that can assist in sharing the costs linked to sustainability as well as have a dedicated team in place that will deliver efficient decision making. Airport operators will also have to work with airlines and technology providers to develop the supporting infrastructure for SAF as well as Electric and Hydrogen aircraft.

GSE Operators - GSE operators need to collaborate closely with airports, technology providers and GSE manufacturers to enable swift and efficient adoption of initiatives to decarbonise the GSE operations.

Airlines – Airline operators will need to collaborate with airports to support various initiatives such as use of assisted taxing, amongst others as well as adhere to the changes in operational requirements of the airport that aim to improve the sustainability quotient of the airport.

Airport Owners – In cases where operators and owners of the airport are separate, airport owners will need to act as a liaison between government authorities and airport operators and support from a financially and decision-making aspect to implement and adopt sustainable initiatives at the airport.

Government/Regulatory Authorities – The relevant authorities will need to closely work with the stakeholders to speed up certification and approval process to support use of new and innovative solutions/technology/initiatives that aim to improve sustainability.

Solution/Technology Providers – Organisations must prioritise R&D efforts in collaboration with airports and other stakeholders to jointly develop innovative solutions that meet real-world requirements, considering regional variations and the diverse needs of different airport tiers. They could also work with other investors to support financially in R&D efforts that may aid in speeding up of development and to possibly overcome cost concerns.

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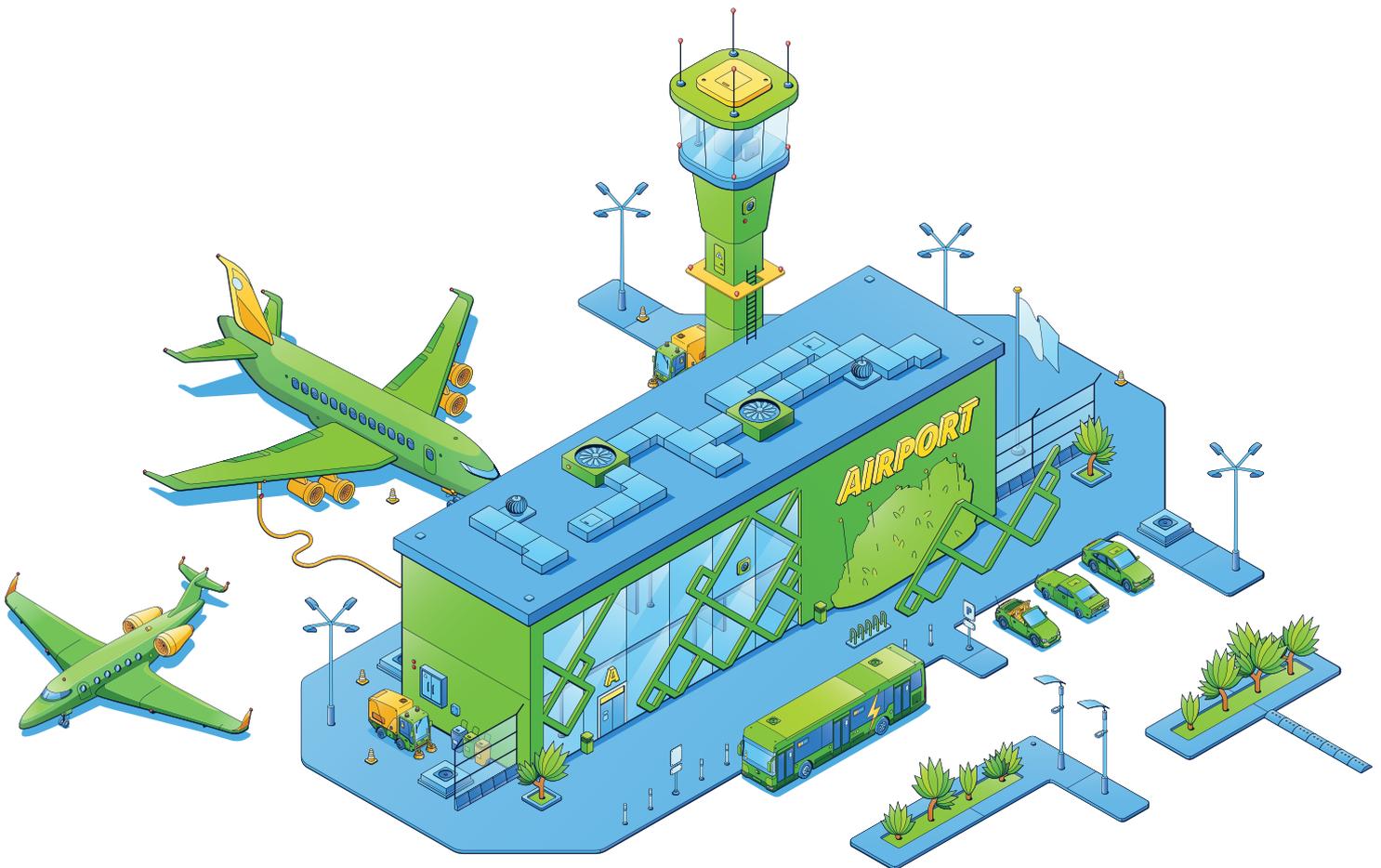
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Future Outlook

In the last decade, the aviation industry has experienced tremendous growth both in terms of passenger demand as well as technology innovation, positively impacting stakeholders across the value chain. Airports in Europe and beyond began experiencing capacity challenges by 2019, and many are projected to face similar conditions as passenger demand recovers more rapidly than previously anticipated. As the industry continues to grow, the environmental impacts of the industry including that of airports will increasingly come under scrutiny resulting in development of new regulations, mandates, guidelines, and targets which will then trickle down in affect driving various initiatives across the value chain.

There will be certain potential headwinds which will need to be considered and addressed collectively by the industry, as achieving net-zero targets becomes increasingly crucial for all stakeholders involved.

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**A few of the challenges/key questions that the industry will have
to navigate are:**

- **Who will bear the cost of sustainability?** – One of the key challenges that
  stakeholders constantly are trying to address, is that who will bear the ultimate cost to
  support sustainability and how/what business models can be adopted so no one single
  stakeholder will have to bear it all.

- **How to manage growth and sustainability simultaneously?** – With airlines, airports
  and all other stakeholders poised to reap the benefits of the growing industry but with
  sustainability also being the need of the hour, stakeholders are continuously looking for
  ways to maintain the balance between the two.

- **Delay in certification and approval of new technology/solutions** – Given the stringent
  testing and certifying process, rightly so for safety reason, many times innovations get
  stuck in bureaucratic hurdles causing delays to their adoption/deployment.

- **Technology limitations** – Many sustainable initiatives/solutions require leveraging
  technology and unless the technology is matured enough to support optimum benefits
  it is difficult to achieve desired results.

- **Possible impact on current operations** – Stakeholders would have to go through an
  impact assessment on how certain changes or deployment of certain sustainable
  solutions/initiatives impact the current operations.

- **Delayed decision making** – With the airport ecosystem having multiple stakeholders it
  becomes difficult for one single stakeholder to take a decision in silo and many a times
  consensus amongst all stakeholders is required leading to delayed decision making.

- **Implementation Challenge**s – When deploying new technology/solutions or changing
  process, there are many factors that airport operations need to consider, key ones being
  the life cycle cost of the solution, cost to benefit and the overall usability of the solution.

**Hear about the challenges in achieving Net-Zero from those
professionals working to overcome them at inter airport FOCUS.**

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Although, as the industry approaches 2050, and social, economic and governmental factors
intensify, governments, and regulatory authorities will further develop and implement
mandates though in a staggered approach leading to stakeholders, including airports,
accelerating their focus on sustainability initiatives while navigating the headwinds to achieve
net-zero goals. This will drive significant research and development efforts by companies of all
sizes resulting in the availability of a wide range of innovative of innovative and cost-effective
solutions from an operational, technological and infrastructure standpoint while having even
more benefits. This is expected to speed up rate of adoption of sustainable practices by
airports of all tiers and from various perspectives - social, economic, and environmental.

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