

What can the aviation industry do over the next five years to ensure a sustainable long run future?

(Presented by ACI World)

1. What are the regulatory impediments to increasing sustainability? How can regulations be improved to incentivise and facilitate the aviation industry to be more efficient and sustainable?

While the aviation industry will continue to face challenges related to the COVID-19 pandemic, it is safe to say that we have entered a new phase. There are several reasons for optimism: vaccination rates have increased significantly, many countries have eased their travel restrictions and the dominant variant at the time of publishing has less severe symptoms, also indicating that immunization has made a positive impact.

Therefore, this is the opportune time to re-focus on action to tackle climate change, our biggest humanitarian threat. In 2021, the aviation industry committed to Net Zero carbon emissions by 2050, despite being one of the hardest sectors to abate emissions due to its dependency on fossil fuel. The International Civil Aviation Organization (ICAO) recently published a feasibility assessment report for a long-term aspirational goal for international civil aviation, which will be discussed at the upcoming 41st ICAO Assembly. ICAO also held several stocktaking seminars that have brought different stakeholders together to discuss potential solutions to support the decarbonization of the sector. It is clear that sustainable alternative sources of energy for aviation have never received so much attention from governments and industry players.

Indeed, achieving the Net Zero long-term goal requires immediate action as it will rely upon massive changes in both our economies and businesses. Technology, innovation, training, collaboration, policies, and regulations can be significant enablers, if appropriate, timely, and used in the right way. We cannot wait for certain technologies to mature to act, nor can we rely solely on solutions that come from within the sector.

Therefore, it is essential to increase collaboration within and outside aviation to identify existing best practices to reduce emissions and that could be easily replicated around the globe; and support the development of smart policies and a performance-based policy framework that can level the playing field and bring certainty to investors, without compromising new solutions, technologies, and innovations to prosper in parallel. States should support and facilitate a policy environment where aviation infrastructure and operations are adapted to and aligned with the global goal to reduce the sector's environmental impact and build resilience and preparedness to prevent, resist, respond, and recover from the inevitable impacts of climate change or other disruptive events.

Creating fertile grounds for all forms of investments in airports and the broader aviation ecosystem will be paramount. This means a policy framework that incentivizes airports and aviation stakeholders to build resilience and implement more efficient and innovative operating procedures, technologies, and methods that will permit the industry to thrive, reduce costs where possible, become more efficient as a whole, and continue its development, driving well-needed global economic growth.

An agile and performance-based policy framework will also help the industry recover quicker and strive to ensure the development of a more sustainable and resilient industry in the long-term. Environmental, economic, and social sustainability is at the heart of many industry concerns and

ensuring that the policy and regulatory machinery in place is structured to accompany the industry on the path to long-term sustainability is essential.

The most promising alternative in the short-term to reduce aviation emissions is Sustainable Aviation Fuel (SAF), a solution that requires minimal infrastructure adaptation from airports. SAF needs substantial investment to become a reality across the globe, hence the need for policy consistency and clarity on incentives, mandates, or other mechanisms to be considered from local, regional, and international perspectives.

2. How can industry participants better cooperate to improve sustainability? For example, how can airlines, airports and air navigation providers cooperate to improve sustainability over the next five years?

There are several collaborative approaches that aviation stakeholders can take. Increasing collaboration and information sharing among aviation stakeholders can greatly improve efficiency and reduce CO₂ emissions at several stages of the flight operation. Airport Collaborative Decision Making (A-CDM) showcases the importance of the relationships between airport operators, airlines, ground handlers, and air traffic controllers in sharing data to increase predictability in airport operations, thereby reducing delays and enhancing efficiency. The focus of A-CDM allows airport partners to share data on the state of their operation, so that each organization has a more complete operational picture across the entire airport system. Overall, A-CDM can achieve improvements in flow control and optimize the capacity of runways, terminals, gates, and airspace.

Other opportunities to increase airspace usage efficiency and avoid congestion—both with the potential to reduce emissions—are the Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO). They are aircraft operating techniques enabled by airspace and instrument procedure designs that are facilitated by air traffic controllers (ATC). CCO and CDO allow aircraft to use a flexible and optimum flight path that can deliver significant environmental and economic benefits—reduced fuel burn, gaseous emissions, and fuel costs—without any adverse effect on safety.¹

CCO and CDO operations allow aircraft arrivals or departures to descend or climb continuously, to the greatest extent possible. Aircraft applying CCO utilize optimum climb engine thrust and climb speeds until their cruising levels are reached. With CDO, aircraft engage minimum engine thrust, ideally from top of descent and in a low drag configuration, prior to the final approach. The use of these techniques results in time being spent at more fuel-efficient higher cruising levels, hence significantly reducing fuel burn, and lowering emissions and fuel costs.²

Aviation has a strong record of cooperation, however the challenge we face requires even closer and more efficient cooperation within the sector. Taking collaboration to the next level requires a new culture among aviation stakeholders that goes beyond specific projects. Such a culture prioritizes actions that could facilitate emissions reductions across the airport system and must be supported by leadership and incentivized to staff. Identifying and leveraging common areas of interest continues

¹ EUROCONTROL

² EUROCONTROL

to be relevant. Decarbonization requires aviation stakeholders to not compete among themselves, but rather work together to identify solutions and achieve common objectives.

Governments must also collaborate closer with the aviation industry in a more proactive and less bureaucratic manner. For instance, the greatest source of emissions for airport operations is energy consumption, something not under their direct control. The availability of renewable energy at the grid is fundamental for the ability of airport operators to decarbonize. In addition, incentives to reduce aviation emissions are still underprioritized. For example, it is much more appealing for fuel producers to invest in biodiesel than in SAF. One policy that could disincentivize this trend and still promote decarbonization on the road and on the air is to give incentives to the electrification of road transport. Of course, the electricity available needs to be renewable as well.

Governments indeed need to support appropriate policies for aviation to achieve its decarbonization and thrive in a Net Zero economy. Creating SAF policies that will provide certainty to investment in production and will support bridging the gap of SAF premium prices—one of its main barriers—is an immediate action that governments can pursue and a point in common on which aviation stakeholders can collaborate. This provides good leverage that could bring the sector together on common solutions.

Airports can act as facilitators to the deployment of SAF on site. This role can only be filled with cooperation among different stakeholders, which could include the following:

- Airport operator
- Airline
- Ground handling operator
- Aircraft refuelling operator
- Conventional fuel supplier or aviation fuel consortium
- Fuel farm operator
- SAF supplier
- Customs
- Environmental Agency
- Local department for transportation
- Fire and rescue teams at the airport
- Logistic companies
- Environmental NGOs familiar with aviation and the sustainability certification schemes of alternative fuels

Based on previous experiences, four steps are suggested for airports to start their SAF journey at this early stage:

1. Familiarization with SAF
2. Identification of current suppliers
3. Creation of working groups: One of the outcomes of the working groups could be an infrastructure feasibility study and an activation plan.
4. Process test flight³

³ Upcoming ACI/ATI *Sustainable Aviation Fuel from and Airport perspective*

3. What are the industry’s best practices, already in place, that improve sustainability? How can these best practices be fully implemented throughout the industry?

There are several best practices that airport operators and other stakeholders can implement in the next five years to reduce emissions, most of them focused on energy efficiency, reduction of energy consumption, use of renewable energy, and electrification of ground vehicles. Below are some practical examples derived from case studies from selected airports:

- Installing solar panels (nearby fields, parking/terminal rooftops, etc.)
- Installing LED lighting in terminals and apron
- Electrifying ground service equipment and vehicle fleet
- Installing common use charging points for airside and landside vehicles
- Implementing sustainable taxiing
- Becoming single-use plastic free facilities
- Installing waste plants on site
- Smart buildings (sensors, energy efficient materials, etc.)
- Upgrading to HVAC systems and water systems for more energy efficiencies
- Undertaking reforestation projects

Case studies

1. Airport development and growth plan⁴

Airport development and growth plans should include sustainability goals since design conception. Atlanta airport has a long history of incorporating sustainability within its development and growth plans. In recent years there has been a particular focus on the development of Planning and Development (P&D) Sustainability Standards, a comprehensive set of standards for the planning, design, and construction of airport buildings and other civil infrastructure. These standards support the overall vision and goals of the airport as outlined in the ATL Sustainability Management Plan and are a key driver for sustainability within the airport’s 20-year masterplan, ATLNEXT. The tools and resources used in the project were:

- Autocase: A project life-cycle analysis tool focused on the “Triple Bottom Line” of financial, environmental, and social impacts generated throughout the useful life of an asset.
- Mindful Materials: A materials database that helps project design teams identify sustainably produced materials.
- Re-TRAC Connect: A tracking platform for construction waste, used to aggregate data and track where project waste is sent.

Benefits delivered:

⁴ ACI World Sustainability Strategy for Airports Worldwide

- LEED certification
- Energy consumption: Against the airport's minimum target of a 20% reduction in energy consumption, an average reduction of 44% has been achieved.
- Water consumption: Against the airport's minimum target of a 40% reduction in water consumption, an average reduction of 40.6% has been achieved.
- Waste management: Against the airport's minimum target of 90% of construction and demolition waste not being sent to landfill, an average of 87.3% has been achieved.

2. Net Zero⁵

Vancouver Airport (YVR) has taken an integrative approach to ensure that all pillars of sustainability are part of its overall business model and embedded in everyday decisions. YVR strives to balance its contribution in providing optimal access for the community to connect to the wider world, against the negative effects of aviation on the quality of life of local residents as well as the negative climate impact of air travel. As the airport recovers from the effects of COVID-19, its strategic position to integrate sustainability and focus on strengthening resiliency will provide greater certainty to its commitment to deliver economic, social, and environmental prosperity to the region.

The value creation from setting a Net Zero by 2030 goal spans across multiple arrays of return. With aviation being among the hardest sectors to decarbonize, action towards climate change within the airport community is even more critical. As long-standing leaders in sustainability, YVR places its contribution to climate action at the core of its strategic plan. Benefits from setting a decarbonization goal includes:

- Long-term cost savings from energy efficiency measures
- Demonstration of leadership within the sector to decarbonize, providing support for global, national, and sectoral alignment with global decarbonization goals, such as ACI World's global Net Zero by 2050 airport sector target and commitments made under the Paris Agreement
- Creation of business opportunities, partnerships and collaborations towards building the airport of the future
- Demonstration of YVR's accountability toward responsible risk management and resiliency to secure funding, incentives, and investments from both government and the private sector
- Strengthening YVR and the sector's social goodwill. With growing concerns over the devastating effects of COVID-19, climate change has taken the forefront as the next leading global risk. Passengers are becoming increasingly more concerned with the environmental effect caused by the aviation industry. Taking action now is required and is an expectation of the community

⁵ ACI World Sustainability Strategy for Airports Worldwide

3. Circular Economy⁶

As the main airport of the Netherlands and a major European hub, Royal Schiphol Group (RSG) has set its sights on becoming the world's most sustainable airport operator. A key focus of this approach is the implementation of circular economy principles—moving away from traditional procurement practices which minimize upfront capital expenditure (CAPEX) costs, use large amounts of natural resources, and fail to account for decommissioning, reuse, and recycling of assets. By applying circular economy principles across the entire business, RSG has realized both environmental and economic benefits while minimizing the use of scarce resources.

Light and Displays as a Service

- In collaboration with Philips, RSG has implemented a “light-as-a-service” concept within one of its lounges. Within this model, Philips retains ownership of the lamps and fittings, while Schiphol pays for the light produced.
- Philips adapted light fittings, making it possible to replace separate components easily and extending the overall lifespan. Energy-efficient lamps were installed, with Philips responsible for collecting and recycling lamps and fittings when they reach the end of their life.

Dismantling of Cargo Building 18

- RSG was faced with the need to remove a cargo building from its current location in order to allow changes to the airport's taxiway system. As the 2,000-ton steel structure was relatively new, traditional demolition was not deemed to be a responsible solution.
- The airport produced a materials passport which detailed the quantities and status of all the materials which made up the building, and this was used in a demolition tender to provide bidders with sufficient information to assess the potential for reuse. Ultimately the entire building was sold to a company based close to the airport, and it has now been dismantled and moved to its new location where it is being rebuilt.

4. Improving Passenger Processing⁷

Copenhagen Airport (CPH) has adopted technology to maximize the capacity of its airport infrastructure without having to incur the cost and environmental impact of constructing additional physical capacity. By ensuring passengers are kept up to date with the latest information, and by directing them intelligently to make optimal use of the available processing facilities, CPH is increasing its capacity in a sustainable manner, while also improving the airport's resilience and ability to respond to rapidly changing situations.

⁶ ACI World Sustainability Strategy for Airports Worldwide

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The use of advanced IT systems such as Xovis and the CPH Airport App have enabled CPH to optimize its existing infrastructure by responding in real-time to passenger demand at each stage of airport processing. This has allowed the airport to increase its capacity and improve customer experience at a fraction of the cost of investing in new terminal buildings.

Security control at CPH

- Xovis uses sensor technology to monitor the number of people in these processing functions and to measure the rate at which passengers are being processed. It does this by tracking passengers throughout their processing once they are within the field of measurement. While the system can distinguish between individual passengers, even when standing at close proximity in large crowds, all tracking is done anonymously for data protection and confidentiality purposes.
- Information on the location and density of passengers obtained from the Xovis system is then fed into a dynamic queue management system provided by QMETRIX. This system analyzes the data and directs passengers to specific check-in or security processing queues to ensure optimal distribution of passengers and minimize the average processing time per passenger.
- Historical data from the Xovis system can be used to analyze trends in passenger numbers and behaviour, and to inform future airport planning decisions in a cycle of continuous improvement.

CPH's Smartphone App

- In addition to the Xovis system, CPH has implemented another information technology-based initiative to help optimize the flow of passengers in and around the airport, the CPH Airport app.

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