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Data

Frequentis

The Route to Greener Air Traffic Operations

Supporting ATCOs with decision-making support tools, can provide significant fuel reductions

Air traffic synchronisation solutions and advanced decision-support tools are contributing to a sustainable future for the aviation industry. Frank Köhne, member of Frequentis ATM Executive Board, explains how.

How is Frequentis contributing to a greener future within the aviation industry?

Frank Köhne: The aviation industry faces a significant challenge in meeting net zero targets by 2050, with aviation fuel being a major emissions contributor. Our high-performance traffic synchronisation solutions are designed to enhance air traffic management (ATM) and airport operations and reduce emissions by optimising runway utilisation. By supplying air traffic controllers (ATCOs) with advanced decision-support tools, we enable more efficient management of flights, thus reducing the need for prolonged holding patterns and taxi times. These operational improvements directly translate to significant reductions in fuel burn and emissions – contributing to a greener future for aviation.

Could you provide an example of these solutions and how they provide benefits?

FK: Our Arrival Manager (AMAN) and Departure Manager (DMAN) are pivotal for enhanced flight efficiency. AMAN supports controllers by efficiently

streaming arrivals into Terminal Manoeuvring Areas (TMAs), reducing airborne stacking and enabling fuel-efficient operations. This approach extends to en-route controllers, optimising flights and speeds before descent, curbing inefficient flight profiles. Similarly, DMAN improves slot adherence and departure sequences, lessening holding and taxi times. Both solutions significantly contribute to reducing fuel burn and emissions. An example is our Integrated AMAN/DMAN (IAD) solution, deploying in a 'world first' at Singapore Changi Airport, amplifying ATCO decision-making, maximising runway use and saving fuel.

Are there any noteworthy success stories related to these solutions?

FK: Absolutely. A notable success is the Extended AMAN (XMAN) deployment for the UK's National Air Traffic Services (NATS) in 2014. This cross-border deployment for Heathrow Airport reported annual savings of 3,500 tonnes of fuel in 2017, £1.82 million in cost savings for its airline customers.

In 2021 XMAN was reported to be saving £7 million annually and reducing CO2 emissions by 40,000 tonnes. These numbers underscore the significant environmental and economic benefits of our solutions.

### Which of your other solutions are contributing to greener aviation?

FK: The Demand Capacity Balancer (DCB), jointly developed with NATS, is an essential component of the Airports Operations Plan, enhancing predictability within the aviation ecosystem. It has been validated to accurately predict demand, capacity and performance metrics for both the short term, on the day of operations, and up to six months in advance, empowering stakeholders to proactively manage resources and reduce potential bottlenecks. Predictability in flight operations is a key factor in reducing fuel consumption.

Additionally, our TowerPad solution consolidates various tower applications on to a single screen, automating routine tasks for ATCOs. By streamlining processes, it effectively helps to reduce taxi times and, in turn, environmental footprint. Its innovative routing and guidance service, known as 'follow the greens', employs red and green lights to guide taxiing aircraft, minimising fuel consumption and emissions whilst simplifying runway navigation.

How do these solutions align with global initiatives?

FK: Our efforts are closely aligned here. The ICAO System Block Upgrades (ASBU) and the Single European Sky ATM Research (SESAR) programme emphasise the need for greener air traffic management. Frequentis' high-performance traffic synchronisation solutions have emerged as significant contributors to these initiatives by enhancing decision-making support for ATCOs and enabling more efficient management of incoming and outgoing flights. Their purpose is to reduce fuel consumption and emissions, making these solutions integral to advancing the goals of both ICAO and SESAR.
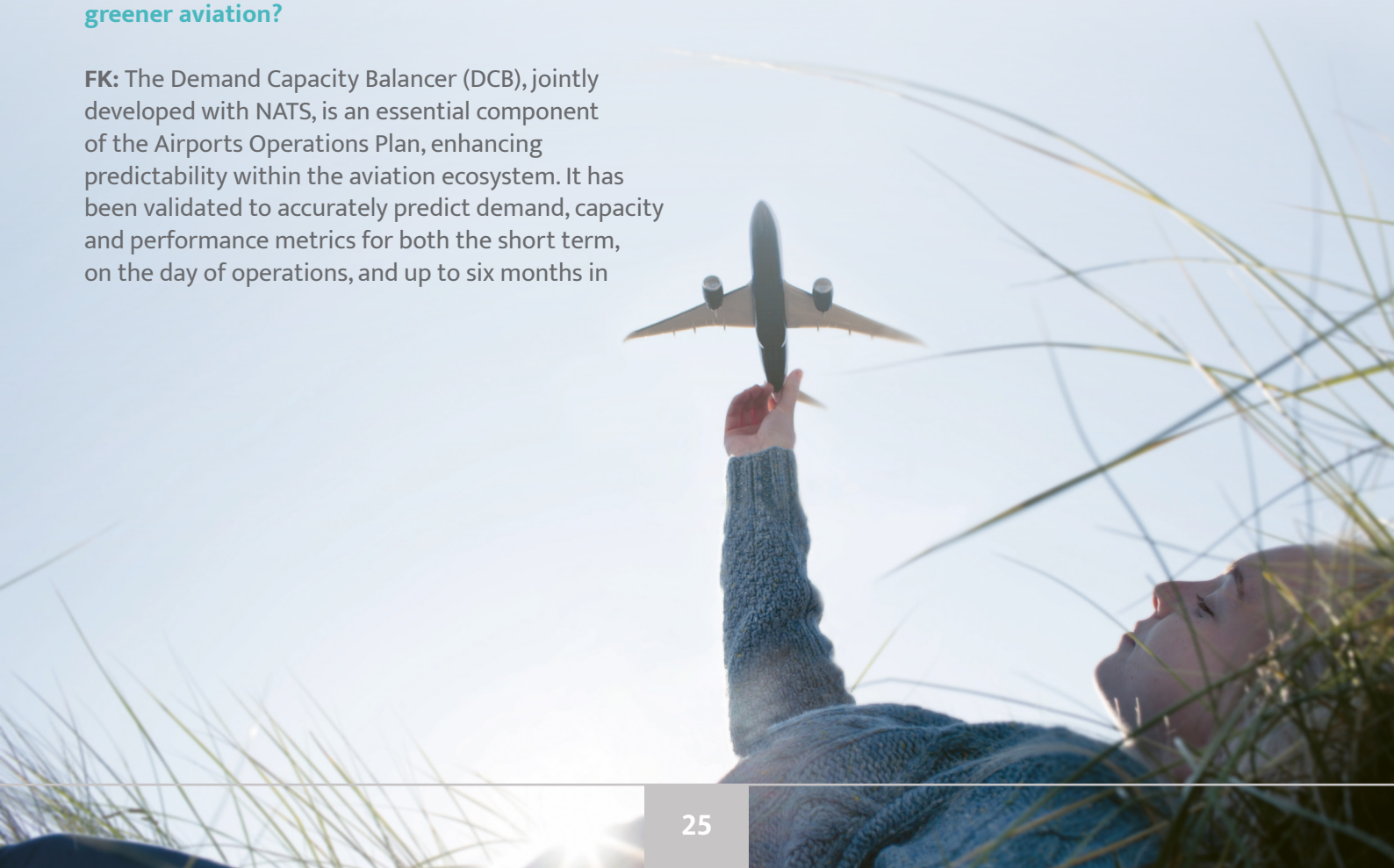
Could you tell us about any other projects you are working on which contribute to reduced fuel consumption?

FK: We are actively researching innovative technologies to drive further advancements in ATM operations. Project SlotMachine, for instance, focuses on leveraging blockchain and multi-party computation technologies in order to create a privacy-preserving platform for flight slot swapping. Airlines will be able to swap flights with other airlines without fear of exposing private information, streamlining operations and reducing inefficiencies or lost slots, enhancing the overall predictability of flights for smoother operations. With more efficient slot swapping, airlines can optimise their schedules in advance, resulting in overall efficient use of airspace. Ultimately, fewer idling aircraft translate to lower CO_2 emissions.

Your commitment to sustainability is clear. Can you touch upon Frequentis' success and achievements in this area?

FK: Our AMAN deployment has a track record of success spanning over 20 years. Since its inception in 2001 for Swiss Air Navigation Service Provider (ANSP) Skyguide, it has saved over one million tons of CO_2 emissions globally. It also won the CANSO Maverick Sustainability Award in 2021 at World ATM Congress in Madrid. Frequentis AMAN has been implemented for other major hubs including Hong Kong, Istanbul, London, Rome, Singapore and Toronto, demonstrating its ability to efficiently manage aircraft arrivals whilst offering sustainability and environmental benefits. In Norway, Oslo Airport was also named top performer for continuous decent operations (CDO) in Europe by EUROCONTROL in 2022 thanks to its CO_2 reductions since implementing Frequentis AMAN to support the Point Merge System (PMS). PMS is an innovative sequencing technique to simplify and enhance arrival operations, now part of ICAO's aviation system block upgrade and supporting CDO.

What last message would you like to convey to the aviation community and stakeholders?

FK: The aviation industry's goal of achieving net-zero emissions by 2050 is a critical step toward a sustainable future, and Frequentis' strategic vision aligns with this ambition. But I would like to emphasise that the journey towards a greener future requires collective

*Frank Köhne,
Member of Frequentis
ATM Executive Board*

action. By embracing technology, innovation and collaboration, we can drive meaningful progress in reducing emissions and building a more sustainable aviation ecosystem, emphasising environmental responsibility within this industry for future generations.

About Frequentis

Frequentis' safety-critical communication and information solutions leverage more than seventy-five years of cross-industry experience in civil aviation, defence, public safety and public transportation markets. Frequentis ATM ensures the safety of 95% of the world's passengers and aircraft and helps ANSPs worldwide efficiently deliver safer and more secure capacity for airspace users.

About Frank Köhne

Frank joined the aviation industry as an air traffic control engineer and continued his career at Lufthansa Operations and Traffic Control for the three Berlin airports. He joined Orthogon in Bremen in 1991, becoming Managing Director in 2009. With the Frequentis acquisition in 2021, Frank also became a member of the Frequentis OneATM Executive Board, driving the OneATM strategy.

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