



BRA offering air transport service and low emissions of greenhouse gases
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With the home base at Bromma Airport, BRA (Braathens Regional Airlines) offers domestic flight services to 14-15 destinations in Sweden. By offering fast and punctual transport, the country is connected through an airborne public transport. BRA flies partly with the Avron jet aircraft, which is gradually being phased out in favour of the more modern turboprop aircraft ATR. ATR is both quieter and more fuel efficient. In addition, ATR flies at lower altitudes, which means that emissions hardly need to be calculated with the high altitude effects (Radiative Forcing Index)



Figure 1. ATR at Bromma Airport. The propellers are driven by turbine engines.

BRA's operations are climate requirements are governed by aviation's part of the EU's emission allowance trading system. This means that carbon dioxide emissions must be reported annually. With changed emission quotas, this requires a need for reduced emissions so that the operating costs of the business do not rise too much. Locally, operations are governed by the fact that airports have regulations for permissible noise levels and thus permitted flight times.

Otherwise, aviation is surrounded by a strong focus on safety through strict governing regulations. This is something that also has an impact on conversion to bio-based aviation fuels. The fuel specifications must meet international requirements to ensure reliable combustion and thus adequate air safety. Reliability requirements are the same regardless of whether the aircraft is powered by the jet A1 fuel, Biojet A1 or later electricity. In addition to legal requirements, there is a clear trend that customers are starting to set more and more harsh climate and, to a certain extent, environmental requirements on their air travel. A fossil-free aviation business requires a comprehensive restructuring of the business.



To enable an introduction of biofuel, BRA's customers can pay a biofuel supplement. At present, bio-based aviation fuel costs four to five times more than conventional fossil aviation fuel. Thanks to the fuel supplement, BRA can buy enough volume for it to be delivered on a large scale rationally to the airport. Delivery is made to the airport's regular fuel tank where it is mixed with other fossil fuels. This means that all departing aircraft may have access to the fuel. The reason is that refuelling to aircraft must take place in a common way for the entire airport. This ensures security requirements and cost effectiveness at the airport. Initially, biofuel was purchased from California, but now it is purchased from Neste in Finland. In addition to customers' climate requirements, they also question the presence of disposable packaging on board.

The short-term most important climate measure is to implement energy efficiency that reduces the need for aviation fuel. For aviation, the measures include:

- Speed Reduction
- Energy-efficient landing, CDA¹

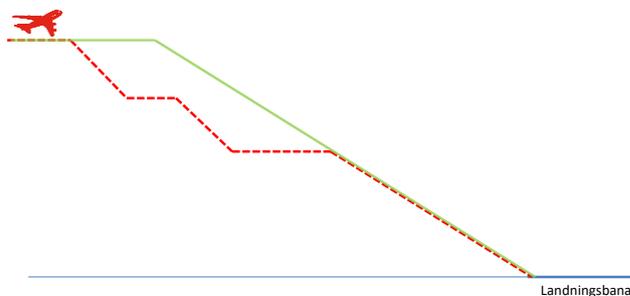


Figure 2 Approach for landing with conventional descend in relation to a greater degree of gliding. A prerequisite for a more energy efficient approach is that traffic management and traffic situation allow for such conditions.

- Optimized route, although this can be difficult in prioritizing Arlanda traffic
- Minimize the amount of cargo in the form of optimal amount of fuel. However, this must be weighed against regional price differences in aviation fuel and the need to demand sufficient volumes for maintained service in several locations.

BRA releases about 180,000 tonnes of CO₂ per year (ttw). By switching to more efficient turbo propellers, both fuel consumption and emissions are reduced. Furthermore, BRA buys as much biofuel as possible, but this is limited by costs and lack of access. In 2018, BRA purchased 37 tonnes of biofuel whose emissions of biogenic carbon dioxide should formally be counted towards the climate compensation². These represent only a very small fraction of the total emissions. The total emissions of climate are compensated by two wind power projects. BRA compensates for 190,000 tonnes of CO₂, which is slightly more than the total emissions³.

¹ Continuous descend approach

² Ett via Gold standard samt ett via Voluntary Carbon Standard

³ 2018 var utsläppen 173 000 ton



BRA's long-term climate ambitions in relation to official climate targets are to:

2025

Halve the emissions per passenger. The big challenge is to get biofuel coupled with both price and available volumes.

2030 (-70%)

- Offer a fossil-free flight

2045

Zero net emissions where electrification of the flight is available and electric powered aircrafts is part of BRA's aircraft fleet

In order to demonstrate the reduction possibilities that can be achieved through today's technology, BRA presented "The Perfect Flight project". With a full propeller aircraft⁴, BRA made a climate-optimized flight between Halmstad and Bromma. The flight was collaboration between BRA, aircraft manufacturer ATR, the suppliers of biofuel Air BP and Finnish Neste.

The project also included Halmstad City Airport and Bromma Stockholm Airport. The flight was carried out with 50% fossil-free biofuel in the tank, an optimized flight altitude, a slower approach, the fastest possible flight route. Through these measures BRA reduces net emissions of carbon dioxide by 46% compared to the same flight with fossil fuels. The example shows that domestic aviation can make major improvements with known technology that reaches the targets for 2030 towards long term targets for 2045.

In order to achieve a comprehensive and systematic climate change of the aircraft, BRA wishes for a national priority on domestic airline restructuring.

⁴ ATR 72-600