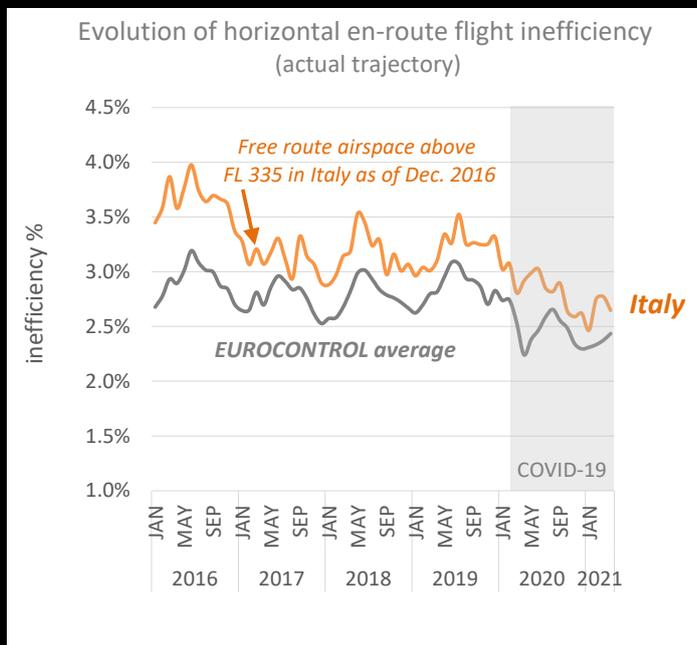
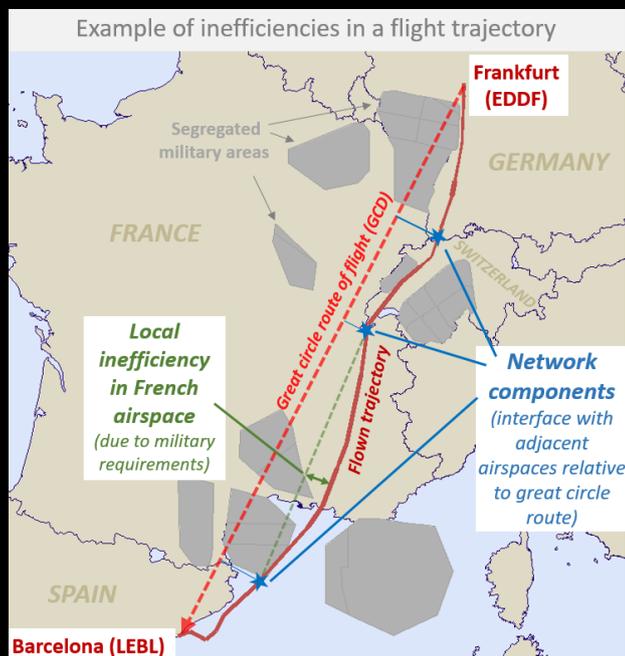


EUROCONTROL Data Snapshot

Horizontal flight efficiency - why the great circle is relevant - but not necessarily the most fuel-efficient route

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The EU Green Deal aims at climate neutrality by 2050 and aviation, including air navigation services, is expected to contribute to reaching this ambitious target. Improved flight efficiency reduces both fuel burn and CO₂ emissions, which were already high on the agenda before the COVID-19 crisis and will, without a doubt, remain so during the recovery and beyond.

EUROCONTROL has been a leader in establishing operational efficiency indicators, which are vital tools in understanding and monitoring performance. The indicators usually compare actual performance with a defined reference value, in order to determine the level of inefficiency. For example, the horizontal en-route flight efficiency (HFE) indicator compares the actual route with the shortest distance between flight origin and destination (great circle distance (GCD)).

As illustrated on the map, the route can be made up of a number of country segments. Even if the flight segment within one country is short and efficient, it may be part of an inefficient route as a result of closure or avoidance of airspace in another country (as currently is the case with Belarus). As a result, the entire route needs to be considered, including both local and network components. Here, cross-border initiatives can help to improve efficiency.

For EUROCONTROL airspace taken as a whole, horizontal en-route flight efficiency remained – with seasonal variations – relatively stable during 2016-2019, and only improved as traffic declined due to the COVID-19 pandemic. Nonetheless, there were notable changes at country level. The example of Italy above shows a marked improvement in horizontal flight efficiency following the implementation of free route airspace in late 2016.

For the interpretation of the HFE indicator results and the setting of targets, it is important to stress the indicator cannot and should not reach zero. This is because some deviations from the great circle are necessary (separation, danger areas, etc.) or even desirable. For example, the wind-optimum route is the most fuel-efficient but not necessarily the shortest route.

While the current, distance-based HFE indicator is still relevant as a stable indicator to monitor trends over time, it has limitations as it does not correspond to the fuel or environmental optimum. To address these shortcomings of the current HFE indicator and hence to help identify new opportunities for improvement, EUROCONTROL is developing complementary indicators, specifically addressing fuel efficiency and environmental performance, in close coordination with industry partners.

Technical bits: More information on the indicator can be found [on the dashboard](#).