

Research Project: Energy Efficient Landing Approaches (EELA) 2020

A typical approach to a large commercial airport takes place via predefined routes. Sink and horizontal flight phases alternate. While the engines power is reduced during descent, it must be increased again and again in horizontal flight phases. This has several disadvantages compared to a continuous descent.

As the level of horizontal flight takes place in the lower layers of the air with a higher air density, more fuel is burned during this approach and consequently more harmful fuel gases such as CO₂ are emitted. The multiple load changes of the engines lead to higher maintenance costs and cause increased noise pollution for local residents.

It would therefore be desirable to change these landing procedures and instead use only continuous descent approaches (CDAs). Therefore, a new CDA procedure with optimized approach planning was developed. It is based on extensive preparatory work that was successfully used at the FernUniversität Hagen to implement emergency landing assistance systems. With CDAs based on emergency landing trajectories, 210-280 kg of kerosene or 700-900 kg of CO₂ can be saved per landing approach. Around 1.15 million commercial aircraft landed in Germany in 2018, i.e. around 1,000,000 tons of CO₂ could be saved. This would allow 250,000 cars to circumnavigate the earth.

In the research project, a demonstrator is developed in order to evaluate the practical suitability of the new approach procedure and, at the same time, the enormous savings potential in CO₂ emissions.

