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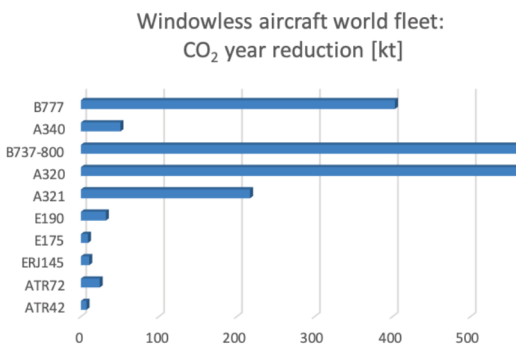
Research Area 7: **Technology and Engineering** Idea Number: **19**

Windowless concept

In the proposed concept we aim to cut emissions for short-, medium- or long-range aircraft, through a reduction of the structural weight. The reduction of weight is directly linked with reduction of fuel consumption, and consequently there are advantages in terms of operative costs and emissions. This purpose is achieved exploiting a windowless configuration. This configuration consists in removing windows, except those for emergency exits, from the aircraft fuselage. In fact, windows are holes in the structure and they need reinforcements, that add weight. To guarantee the passengers comfort, windows are replaced with monitors connected to external cameras, which allow to the passengers to see outside. A preliminary analysis shows the advantages of this configuration, taking in account both the removed elements (reinforcements and windows panes) and the added elements (monitors, cables and cameras, structural elements as stringers and material to 'refill' the holes). In fact an analytical model was created to study this configuration and it was applied on several aircraft models, showing a not-negligible weight reduction, hence a saving in terms of emissions and operative costs. Furthermore the fuel consumption due to the visual system (monitors and cameras) is calculated. The visual system must be light and efficient. For this reason, organic light emitting diode (OLED) technology has been chosen for monitors, achieving very light displays. Furthermore in a mid-term future the visual system could be improved using eye tracker devices or augmented reality glasses.



Key Characteristics

Organic light emitting diode (OLED) technology • Aircraft emissions