The Alteration of Wing and Winglet Designs on Commercial Passenger Aircrafts for the Reduction of Carbon Dioxide (CO2) Emissions and the Increase of Aerodynamic Efficiency

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When one sees an airplane take off, one wonders how an object so heavy, weighing tons, can lift off with ease. Thanks to complex aeronautics and aerodynamics airplanes are able to perform a seemingly impossible task by transporting their own weight and the weight of their cargo. Nowadays, aeronautical engineers are looking to reduce the aircrafts' fuel consumption which in turn will reduce carbon dioxide emissions. How can this be achieved? The answer lies in the improvement of the aeronautical efficiency of airplanes. Currently, airplane manufacturers are utilizing ultra-efficient, very large jet engines to improve the aeronautical efficiency. The current belief is that the larger the engine - the larger the efficiency, while maintaining the aeronautical design of the aircraft. I hypothesize that "The Alteration of Wing and Winglet Designs on Commercial Passenger Aircrafts for the Reduction of Carbon Dioxide (CO2) Emissions and the Increase of Aerodynamic Efficiency" will prove to be more beneficial than the utilization of over-sized jet engines. To prove my hypothesis, I built a windtunnel to test eight wing and five winglet designs. The results were impressive. In conclusion, I know that my project is an approach that the airplane manufacturers should consider to improve the aerodynamic and aeronautic efficiency of an aircraft while reducing CO2 emissions.

Awards Won: