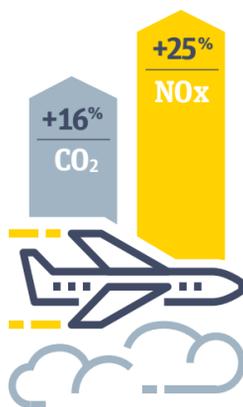
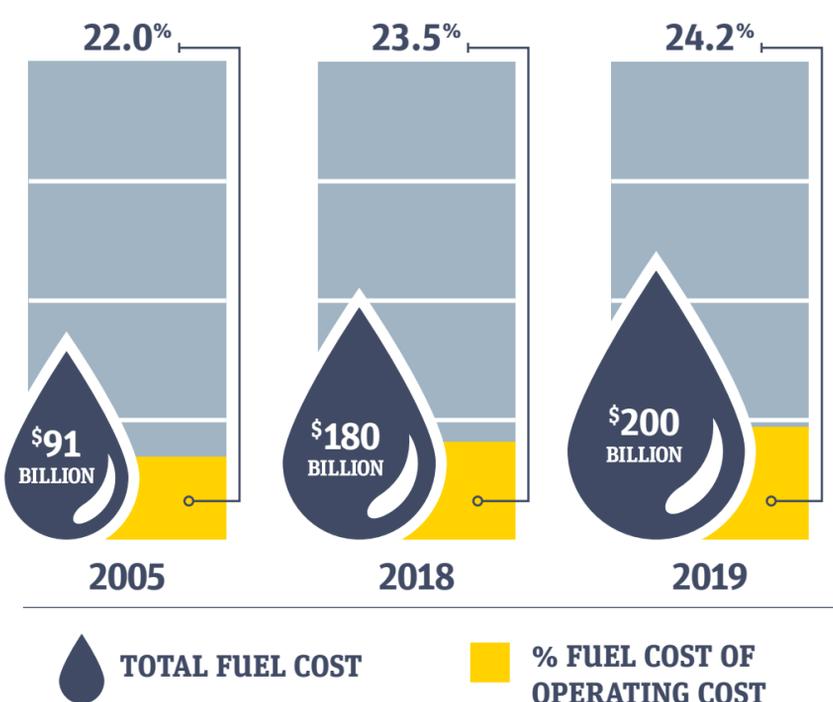


Aerospace companies are facing rising operating costs and more stringent environmental regulations.

THE GLOBAL AIRLINE INDUSTRY'S FUEL BILL

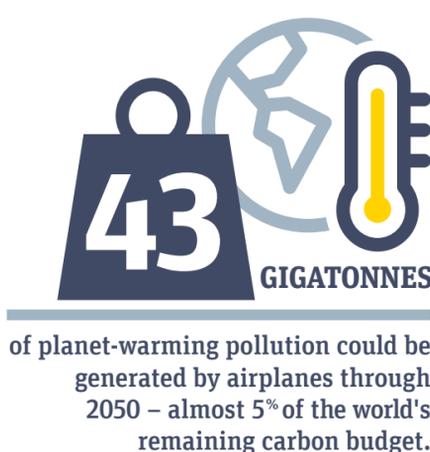
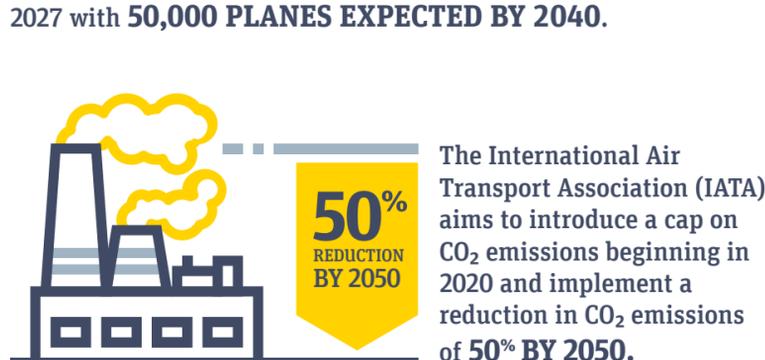


Between 2005 and 2017, CO₂ emissions from aviation increased by 16% and NO_x by 25% due to more flights

To meet stringent regulations, aerospace companies must devise a long-term strategy for significant emissions reduction.



In 2017, the active global commercial fleet totaled 25,368 aircraft. Experts predict a 3.4% net annual growth over the next 10 years, increasing the count to 35,501 by 2027 with **50,000 PLANES EXPECTED BY 2040**.



The focus of the industry.



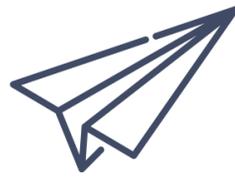
ADVANCED PROPULSION
Improving engine efficiency to cut emissions by just 1% could eliminate more than **350,000 TONS** of emissions per year

Electric-powered taxiing of planes on runways could save **77,000 GALLONS** of fuel per aircraft per year



DRAG REDUCTION
1% reduction in drag could save more than **\$2 BILLION** in fuel per year

Planes with winglets could save 83,000 gallons per aircraft annually and **\$247,000** in operational costs



LIGHTWEIGHTING
1% of mass reduction on a medium range, narrow-body aircraft could save more than **\$1 BILLION** per year on fuel

To address these issues, A&D companies must utilize engineering simulation to accelerate their digital transformation.



AERODYNAMICS



DRAG REDUCTION
Major aircraft OEMs have used high-fidelity CFD and FSI simulations to add winglets to planes without impacting the development schedule



AEROSTRUCTURES



WEIGHT REDUCTION
Engineering simulation has been key to the development of composite cargo pallets that are **18% lighter** than traditional pallets



PROPULSION



REDUCTION IN FUEL BURN
Simulation has been critical to the development of new classes of engine design