



THE SOLUTIONS BEHIND AVIATION SUSTAINABILITY GOALS IN 2025

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Every day the world is confronted with numerous factors, which are causing a planetary crisis of climate change, pollution, and biodiversity loss. To address this problem, the aviation sector is paving the way towards more sustainable operations every year. What can be done in small steps to make the industry a little greener?

The European Aviation Environmental Report 2025 says that airlines, airports, and other aviation sector operators have to make their contribution by adopting technologies and practices to reduce environmental impacts from noise and air pollution, including the risk from ultrafine particles.

In terms of environmental impact, the focus should not only be on improving engine efficiency or using cleaner fuels, but also on paying more attention to the aircraft maintenance. In particular, airplane exterior plays an important role in the aviation industry's sustainability goals. There are few key factors why surfaces of the aircraft should be properly taken care of.

First, we should mention operational efficiency, which can be directly affected by dirty aircraft outer layer. The built-up dirt on the outer shell can cause the drop of airplane's operational efficiency by

creating turbulent airflow across the whole fuselage. Because of this, fuel consumption to maintain the required aircraft speed and altitude grows up.

Second, increased fuel consumption can be caused by the added weight of the dirt on the airplane surface. Heavier aircraft require more energy to lift off the ground and maintain flight, therefore airplanes should be professionally cleaned.

Moreover, the coating of dirt and residue on the exterior usually contain hazardous substances and particulate matter. When released into the atmosphere, these substances can harm air quality and even public health.

So, what would be the solution for all these issues? Of course, to clean the aircraft exterior properly and regularly. But even if the surfaces are cleaned steadily, there are still environmental issues behind the process. The traditional manual aeroplane surface cleaning routine, using pressurized water technique, causes immense water usage – from 9,500 litres up to 11,300 liters, based on aircraft type. Therefore, traditional cleaning process could be a severe problem regarding sustainability in the aviation industry.

To resolve it, the airlines could consider adopting advanced technologies for the cleaning process. Meet the Nordic Dino, a modern aircraft exterior cleaning robot, designed to minimize the use of water and detergent during every wash.

Veronika Andrianovaite, CCO of Nordic Dino Robotics AB commented: “This advanced robot can reduce the use of water and detergent, as well as carbon and nitrogen dioxide emissions, because it can be powered by electricity. In terms of optimizing water usage, compared to traditional washing techniques the innovative cleaning robot can reach 84 percent reduction, from 11,300 liters to approximately 1,800 liters of water per aircraft wash.”

It is especially important to take care of the jet exterior in some specific regions, where the surfaces naturally accumulate more dirt. One of these regions is the northern hemisphere and its harsh winters, where the conditions can cause a higher dirt buildup on the aircraft, especially the lower part of the belly. Another problematic area is regions, where most of mosquitoes appear. This causes insect residue that forms extensive deposits on aircraft outer shell.

As we discussed before, clean aircraft surface is not only a matter of aesthetics, but it also makes a significant impact towards sustainability. “Some of the pioneering airlines are investing in advanced exterior cleaning processes, they consider this type of investment as a step towards a greener future. Innovative technologies help airlines to ensure that the fleet is as clean as possible and it also minimises both the use of water and detergent on every wash,” notes Veronika Andrianovaite.

Future environmental goals for noise and emissions reductions have been agreed at the European and ICAO level, and the last few years have seen significant developments in the European Union under the European Green Deal as well as globally through ambitious targets. Sustainability and eco-friendliness should not be considered as impossible achievement in the aviation industry. By utilizing the right equipment, finding alternatives to polluting methods, and increasing efficiency at every possible step, companies could come one step closer to achieving both operational efficiency and sustainability targets.

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