Fact Sheet

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Boeing ecoDemonstrator Program Technology Testing Highlights

2018: 777 Freighter owned by FedEx Express — 37 projects

- Surface Operations Collision Awareness System (SOCAS) uses optical and radar sensors on the airplane to detect obstacles (other aircraft, ground vehicles, buildings).
- FLYHT Aerospace Solutions' Automated Flight Information Reporting System (AFIRS) provides tracking, distress and data-streaming capabilities from flight data recorders; tested in collaboration with Embraer.
- Several flights use 100 percent sustainable aviation fuel — a first for a commercial airliner — to reduce carbon emissions and assess performance.
- Manufacturing byproducts reused as high-value materials for fittings replacing titanium alloy (Ti64) with over 75% recycled content.

2016: E170 owned by Embraer — six projects

- Ice-phobic paint improves safety and reduces drag.
- Wireless measurement of airflow over the surface of the wing (boundary layer).
- Wing slat cove fillers that reduce noise.
- Air data measurement system using light distancing and ranging (LiDAR).
- Sustainable aviation fuel sourced from Brazilian sugarcane.

2015: 757 owned by the aircraft finance division of Stifel — 20 projects

- Robust wing designs that enable natural laminar flow and improved aerodynamic efficiency:
    - Krueger shield to protect the leading edge of the wing from insects.
    - “Bug-phobic” coatings that can reduce drag from insect residue (in cooperation with NASA).
- Active flow control to improve airflow over the rudder to potentially improve its aerodynamic efficiency by more than 15% and allow for a smaller vertical tail design in the future (in cooperation with NASA).
- Utilized 5% blend of renewable diesel to support ongoing industry efforts to approve this sustainable fuel for commercial aviation.
- Dismantled and recycled the 757 using environmental best practices. About 90% of the airplane was reused or recycled (in cooperation with Stifel, the Aircraft Fleet Recycling Association and an airplane demolition company).

2014: 787 Dreamliner ZA004 owned by Boeing — 35 projects

- Fuel efficiency and smaller noise footprint:
    - Aerodynamic and flight control improvements.
    - Advanced wing coatings to reduce ice accumulation.
    - Software applications and connectivity technologies that can improve flight planning, fuel-load optimization, in-flight routing and landing.
- Airborne Spacing for Terminal Arrival Routes (ASTAR) system helps achieve precise spacing between aircraft during approaches (in cooperation with NASA).
- Airplane connectivity enhancements:
    - Touch-screen displays on the flight deck.
    - Wireless sensors that can reduce wiring, reducing weight and saving fuel.
    - Outer wing access doors made from recycled 787 carbon fiber.
- Historic first flight using renewable diesel, a sustainable fuel widely available in ground transportation.

2012: Next-Generation 737-800 owned by American Airlines — 14 projects

- Aerodynamic performance of the 737 MAX advanced technology winglet.
- Variable area fan nozzle to optimize engine efficiency.
- Active engine vibration control.
- Regenerative hydrogen fuel cell for aircraft electrical power.
- Flight path optimization for operational efficiency.
- Carpet made from recycled materials.
- Sustainable aviation fuel.

For more information, visit boeing.com/ecodemonstrator.

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