



National Aeronautics and Space Administration



# NASA Electric Flight New Aviation Horizons



**Commercial Airliners (2030):** As electric flight technologies are developed and proven with smaller-scale aircraft, they can provide the certification basis while incubating the technologies in early adopter emerging aviation markets. The strategy provides the most rapid path towards achieving highly efficient and sustainable aviation solutions.

**Thin-Haul Commuters (2025):** Small commuter aircraft only need to fly relatively short distance (<300 miles), which aligns well with projected battery technologies to achieve carbon-free in-flight emissions, with low operating costs.



**Ultra-Quiet Urban VTOL Air-Taxi's (2020):** Distributed Electric Propulsion (DEP) offers the opportunity to completely change the way aircraft are designed so that Vertical Takeoff and Landing (VTOL) aircraft can be reliable, redundant, safe, quiet, efficient, with good ride quality.

**NASA SCEPTOR (2016-2018):** Scalable Convergent Electric Propulsion Operations Research is modifying a Tecnam P2006T General Aviation aircraft to validate DEP technologies can achieve a 5x reduction in the cruise energy required for high-speed (175 mph) cruise flight.



**NASA HEIST/LEAPTech (2015):** Mobile ground testing of a full-scale 31' span wing with 18 electric motors and propellers validated the ability to use leading edge propulsion to increase the  $CL_{max}$  from 2.5 to over 6.

**NASA GL-10 sUAS (2014):** The first Distributed Electric Propulsion (DEP) fixed-wing VTOL performed flight testing to showcase robust transition control and high cruise efficiency.



**NASA Green Flight Challenge (2011):** Together with the CAFE Foundation and Google, the largest aviation prize ever (\$1.5 million) was awarded for achieving 404 passenger miles per gallon at an average speed of 114 mph across a 200 mile course with an electric aircraft.

**BUSINESS DEVELOPMENT CONTACT:** Mark.D.Moore@NASA.GOV, NASA Langley Research Center