MOD I

- Ground Validation of Distributed Electric Propulsion (DEP) High-Lift System
- Flight Testing of Baseline Tecnam P2006T

GOALS:
- Establish Baseline Tecnam Performance
- Pilot Familiarity

MOD II

- Retrofit of a Baseline General Aviation Aircraft with an Electric Propulsion System
- Ground and Flight Test Validation of Electric Motors, Batteries, and Instrumentation

GOALS:
- Establish Electric Power System Flight Safety
- Establish Electric Tecnam Retrofit Baseline
- Optimize design for 3.3x lower energy use at high speed
MOD III

- Modified Configuration with a Cruise-optimized DEP Wing
- Electric Cruise Motors Repositioned to Wingtips
- Installation of High-Lift Nacelles along Wing’s Leading Edge

GOALS:
- Optimize Design for Additional 1.5x Reduction in Energy Use
- Reduction of Wing Area to Reduce Friction Drag

MOD IV

- Modified Configuration for Adequate Low-Speed Takeoff
- Ground and Flight Test with Fully-Integrated DEP High-Lift Motors and Folding Propellers

GOALS:
- Certification Basis of DEP Technologies
- DEP Acoustics Testing
- Low-Speed Control Robustness
MISSION GOAL

- HELP Develop Certification Standards for Electric Aircraft Markets
- SHARE X-57 Design and Airworthiness Process with Regulators and Standards Organizations to Further Develop Airworthiness Certification Approaches
- ADVANCE the Nation’s Science and Industrial Base by Establishing a Reference Platform for Integrated Approaches of DEP Technologies, Including Best Practices and Lessons Learned

DESIGN DRIVERS

- 500% Increase in High-Speed Cruise Efficiency
- Demonstrate Zero In-Flight Carbon Emissions
- Demonstrate Flight that is much Quieter for Communities on the Ground
LITHIUM ION BATTERIES

- X-57 is Powered by 860lbs of Lithium Ion Batteries, Specially Redesigned to Isolate Potential Overheating Issues
- The Batteries Feature 69.1kw hours Energy Usage, with 47kw hours usable

HIGH-ASPECT RATIO WINGS

- Starting in Mod III, X-57 will feature a skinnier, High-Aspect Ratio Wing, featuring a large Reduction in Area, with Wing Loading Increasing from 17 lbs/sqft to 45 lbs/sqft

CRUISE MOTORS & PROPELLERS

- X-57’s Electric Cruise Motors are Inboard on Mod II, and Repositioning to the Wingtips for Mods III & IV
- These Air-Cooled, Out-Runner Cruise motors feature 60kW of Power each, and 5ft Diameter Propellers

HIGH-LIFT MOTORS & PROPELLERS

- In Mod IV, X-57 will feature smaller High-Lift Motors and Propellers along the Wing’s Leading Edge, featuring 10.5kW of Power
- These Motors and 1.9ft diameter Propellers are Powered to Generate Lift for X-57 to Take off and will fold to reduce Cruise Drag