

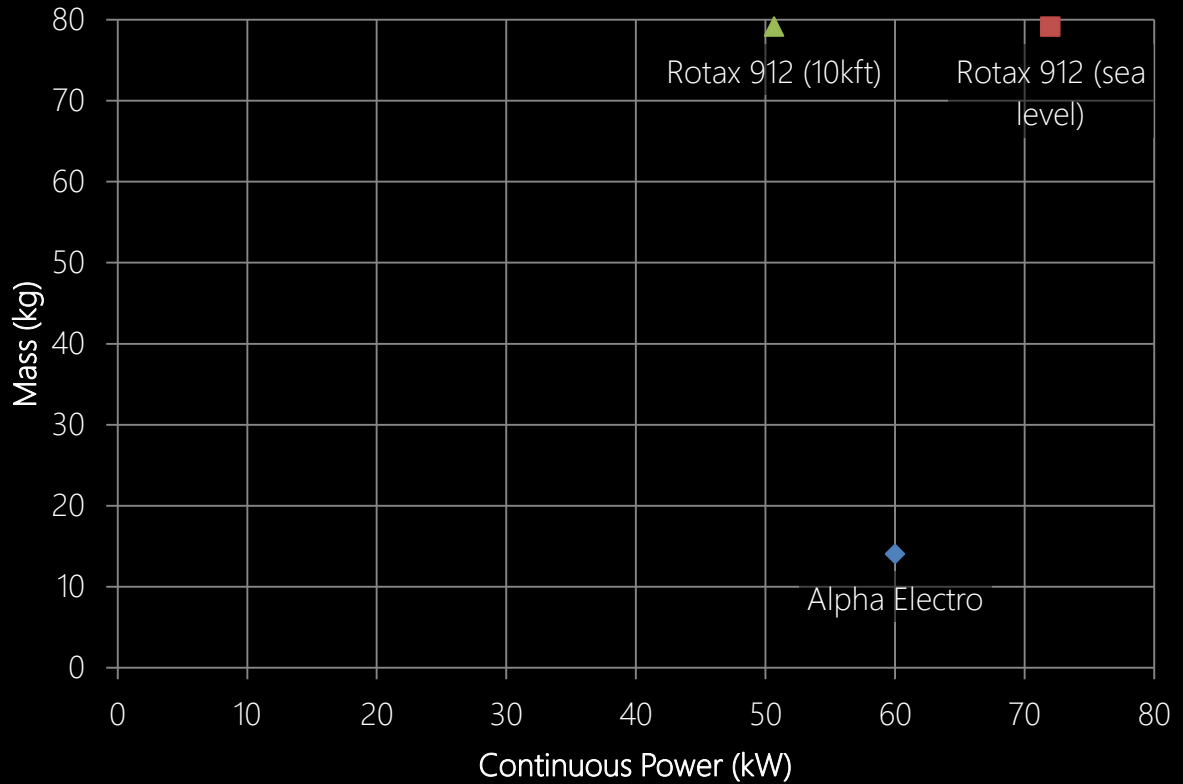
Faster, Quieter, Safer, and Cheaper

Distributed Electric Propulsion and the Coming VTOL Revolution

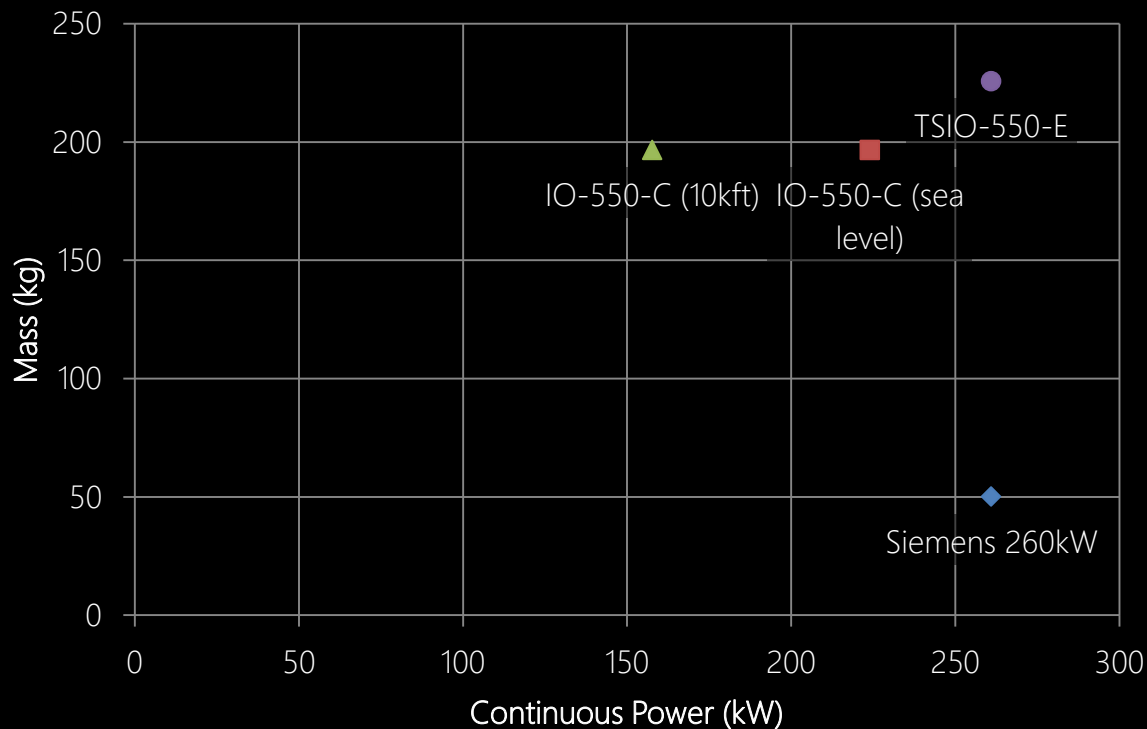


Alex Stoll
Joby Aviation







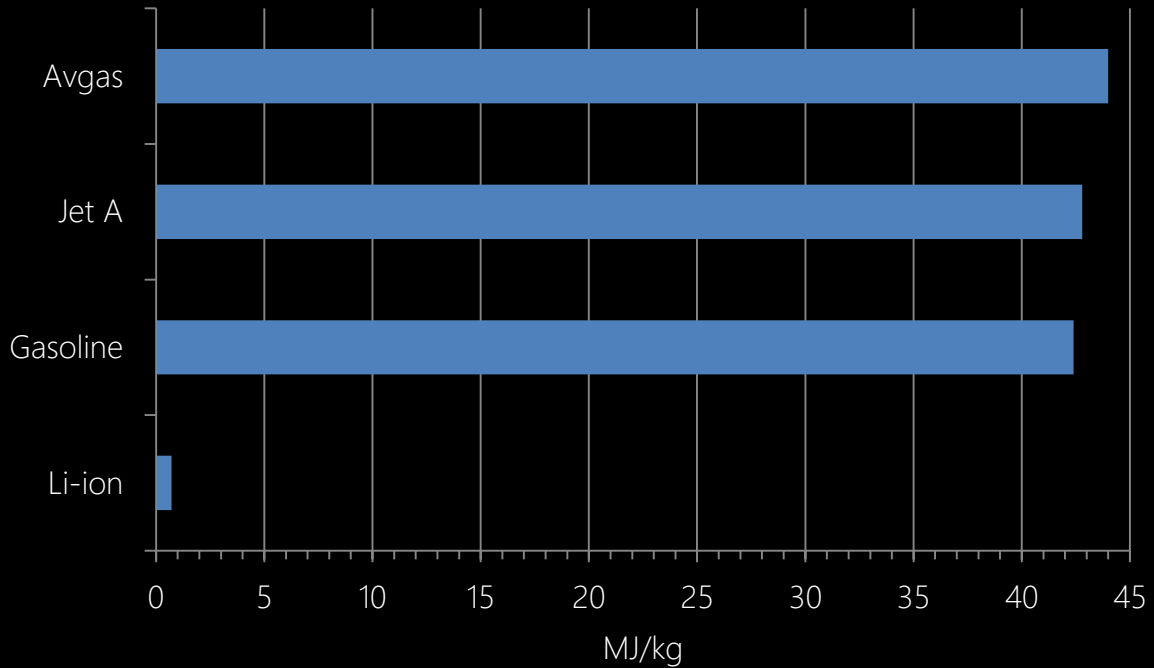


Properties of electric propulsion

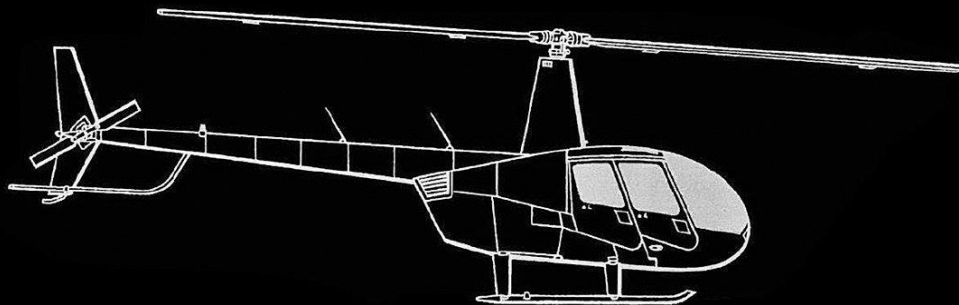
- Motors are small and light
- Increased reliability and reduced maintenance
- Motors are relatively scale-free
- $\sim 3\times$ more efficient powertrain
- Wider useful RPM range
- Major noise reduction potential



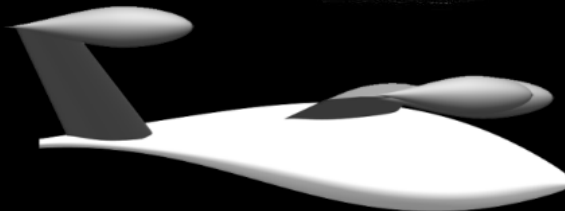
Specific Energy



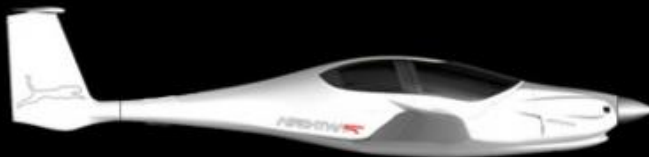
Robinson R44

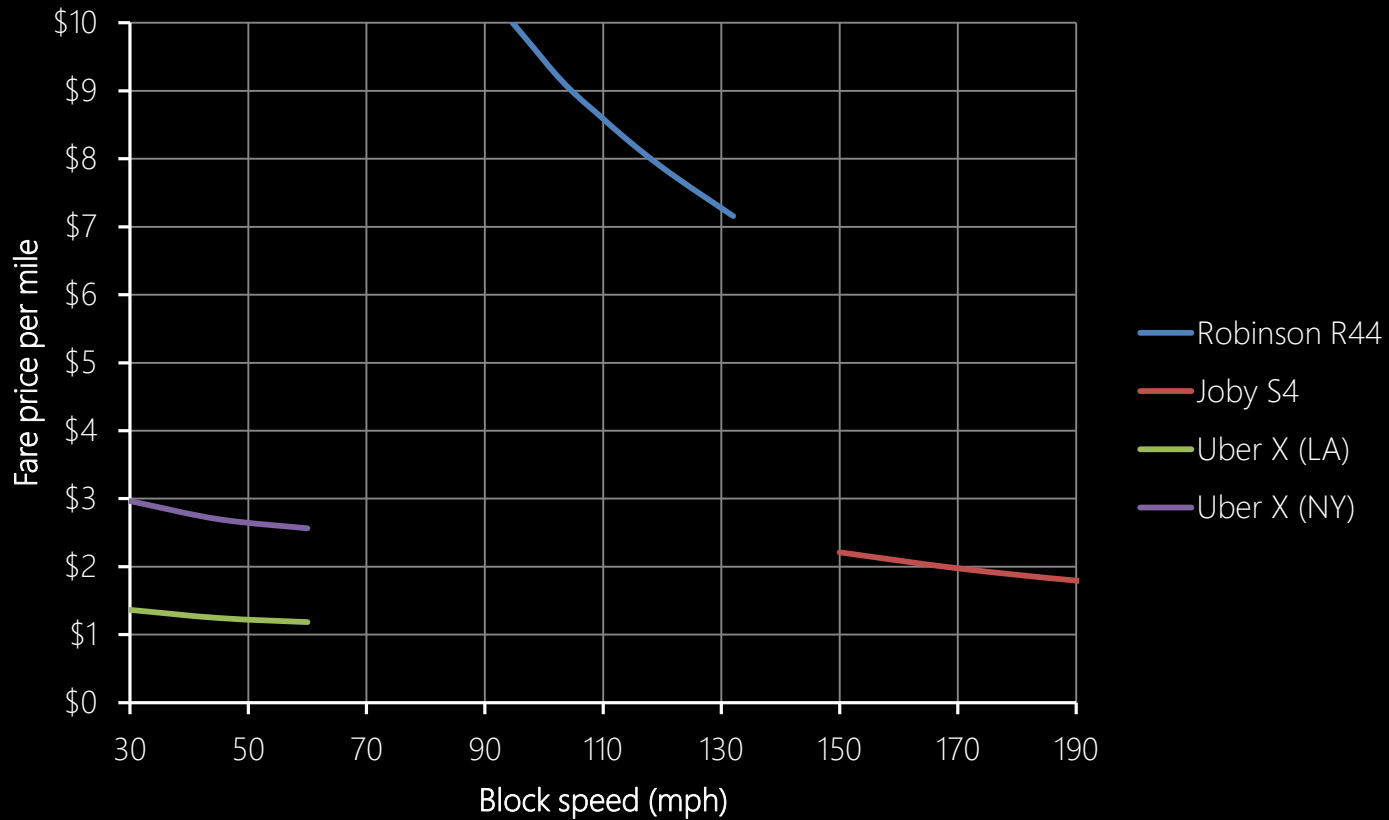


Joby S4

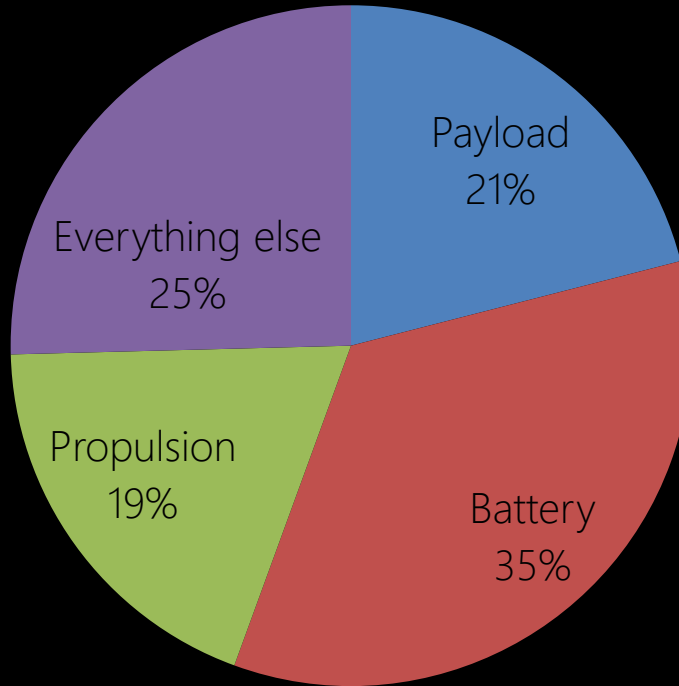


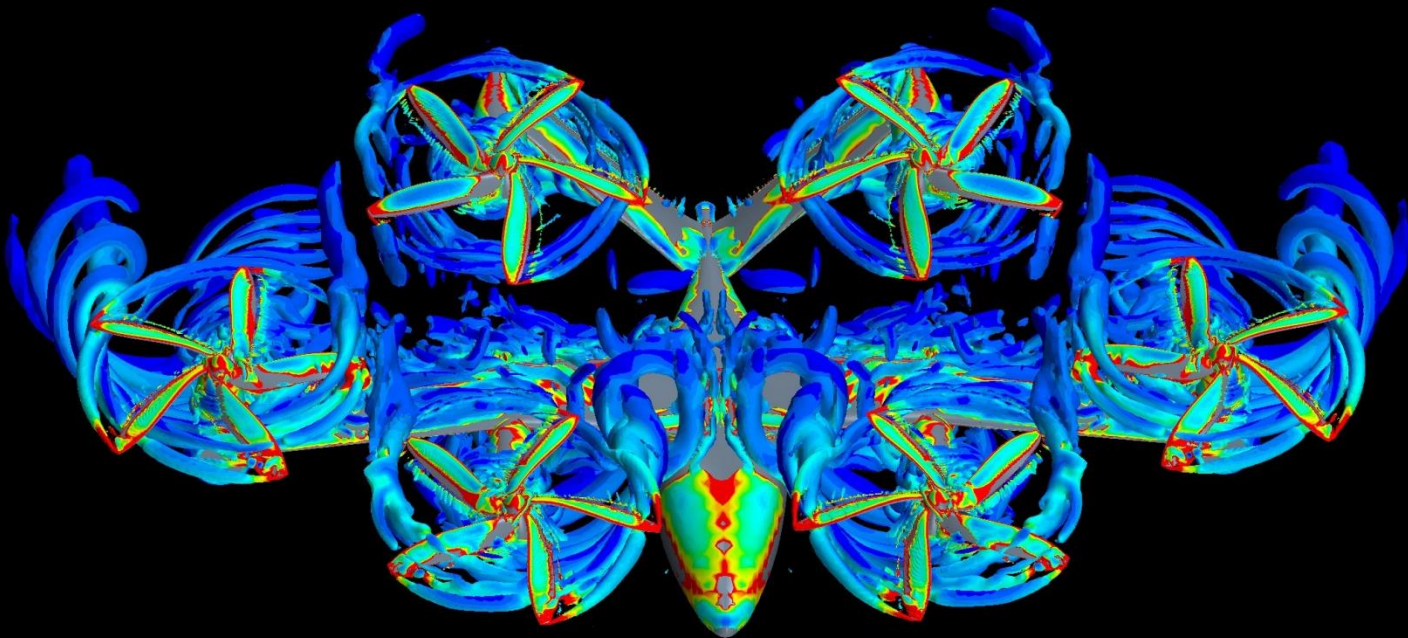
Pipistrel Panthera



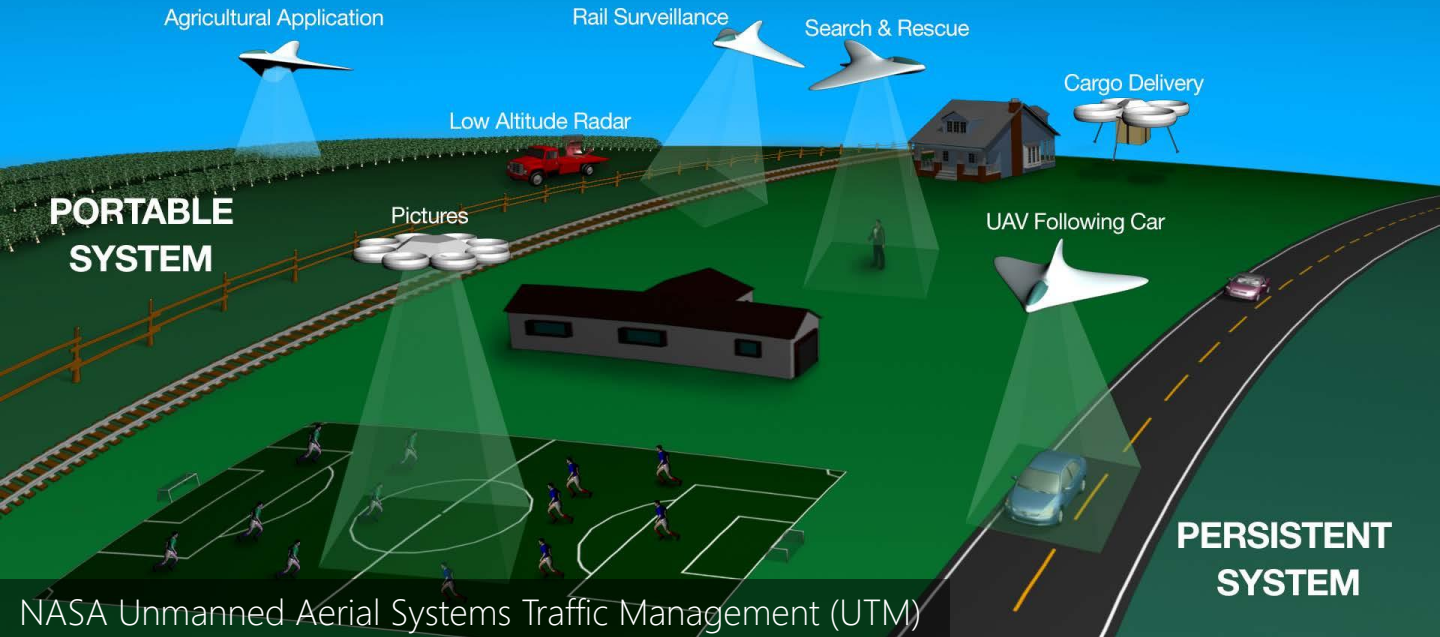


S4 mass breakdown





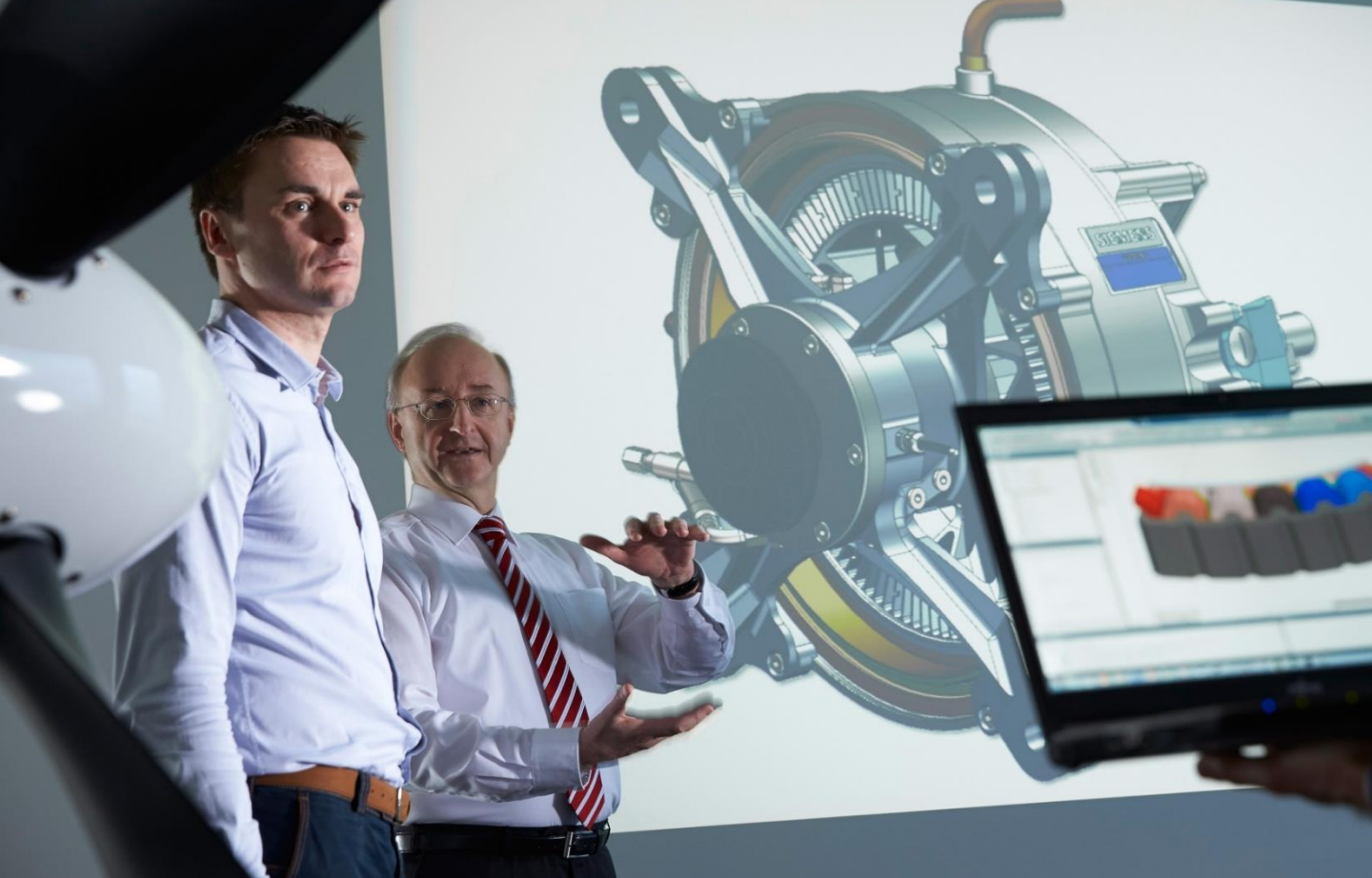
NOTIONAL SCENARIO





Joby Motors





Siemens eAircraft 260 kW electric motor