

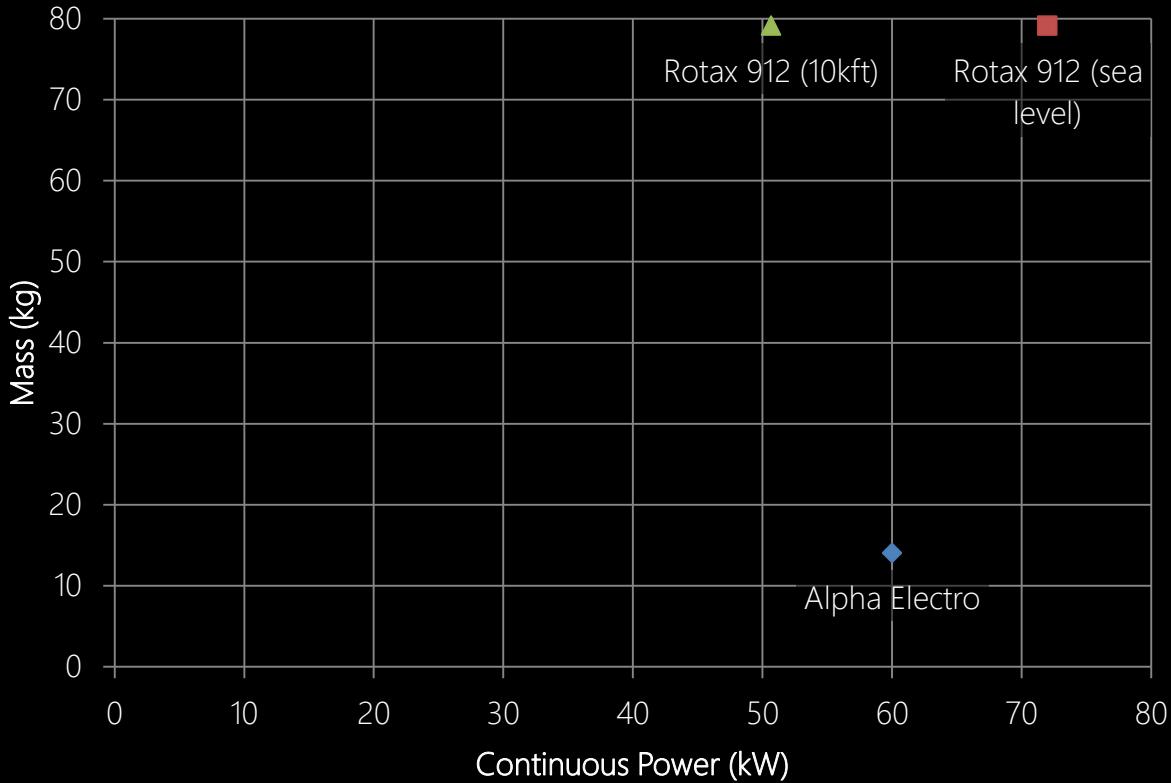
# Faster, Quieter, Safer, and Cheaper

Distributed Electric Propulsion and the Coming VTOL Revolution



Alex Stoll  
Joby Aviation







**JOBY**  
AVIATION



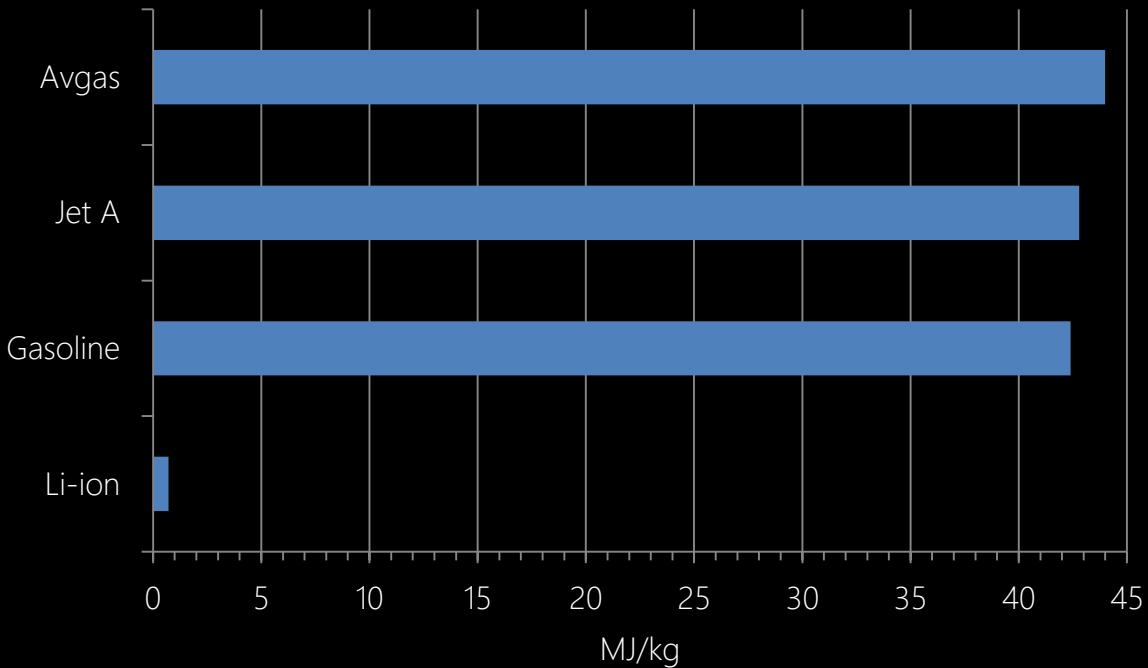


# Properties of electric propulsion

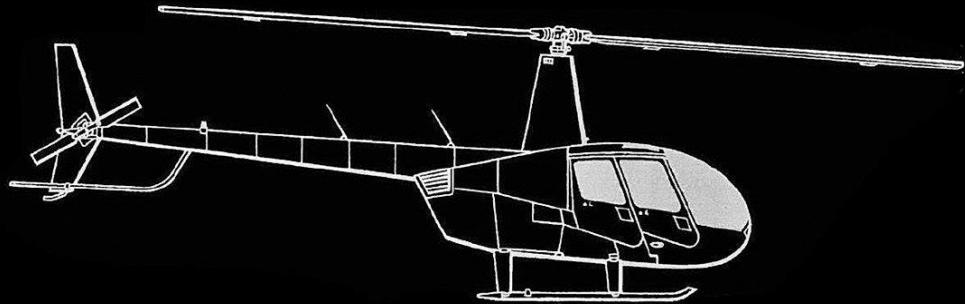
- Motors are small and light
- Increased reliability and reduced maintenance
- Motors are relatively scale-free
- $\sim 3\times$  more efficient powertrain
- Wider useful RPM range
- Major noise reduction potential



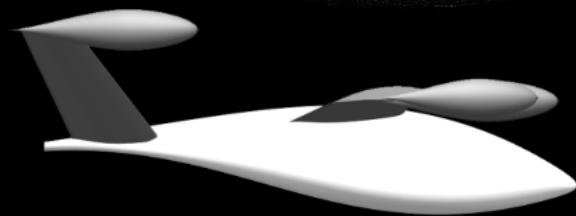
## Specific Energy



Robinson R44

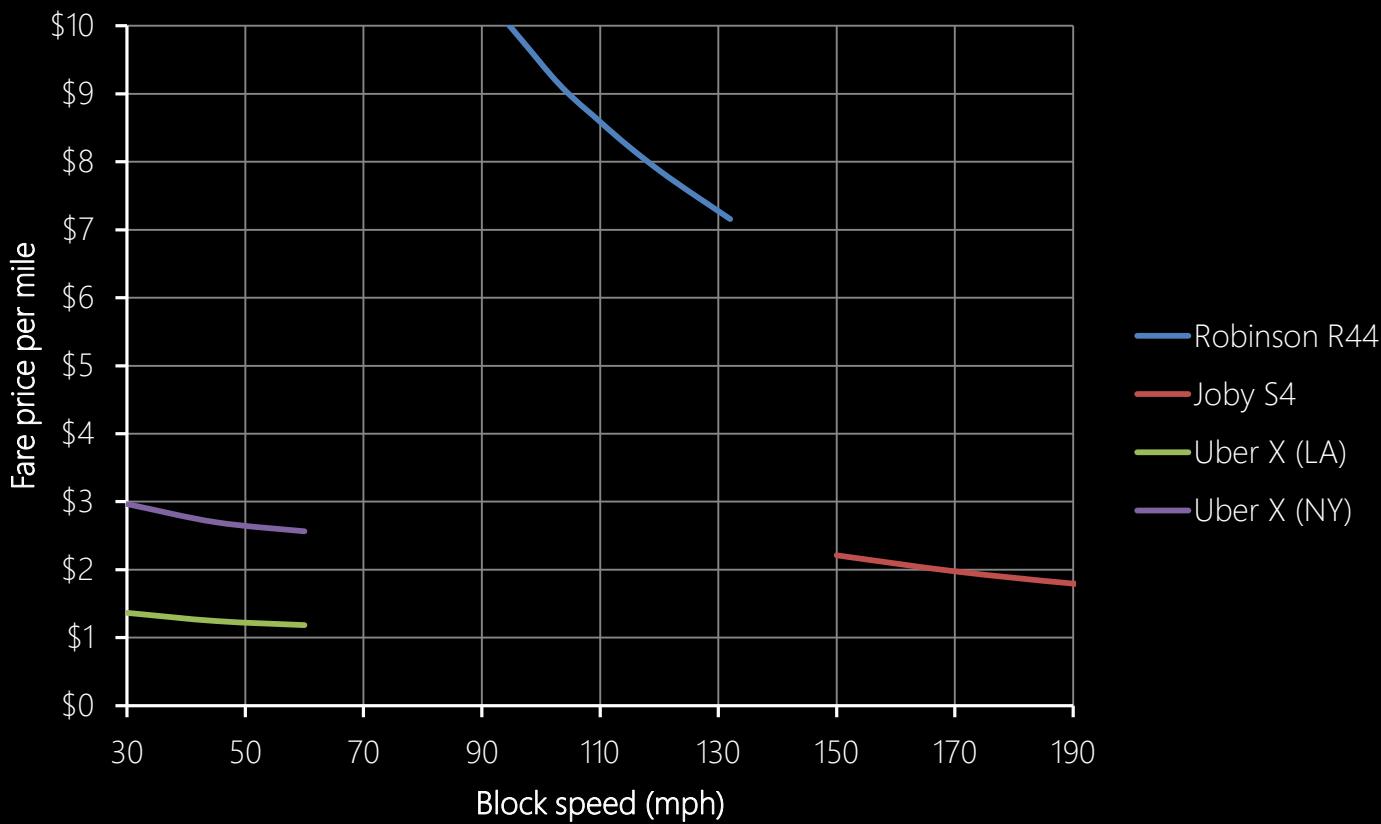


Joby S4

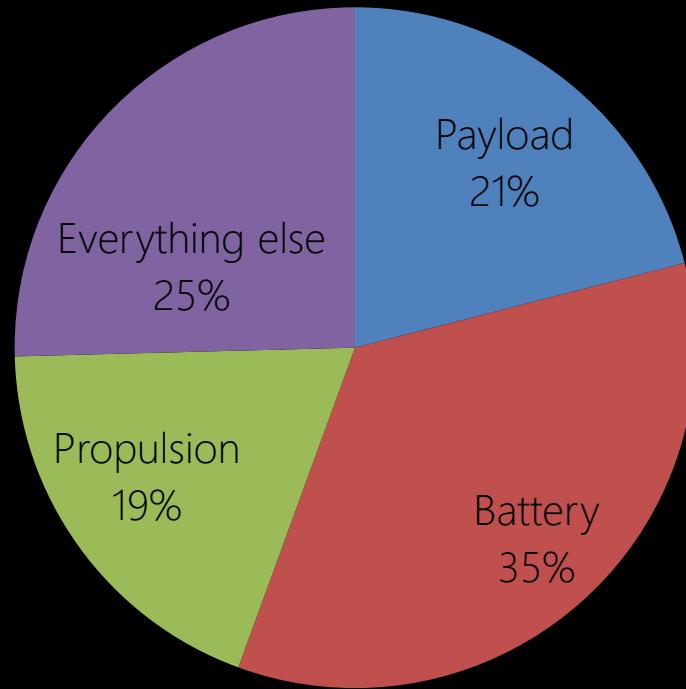


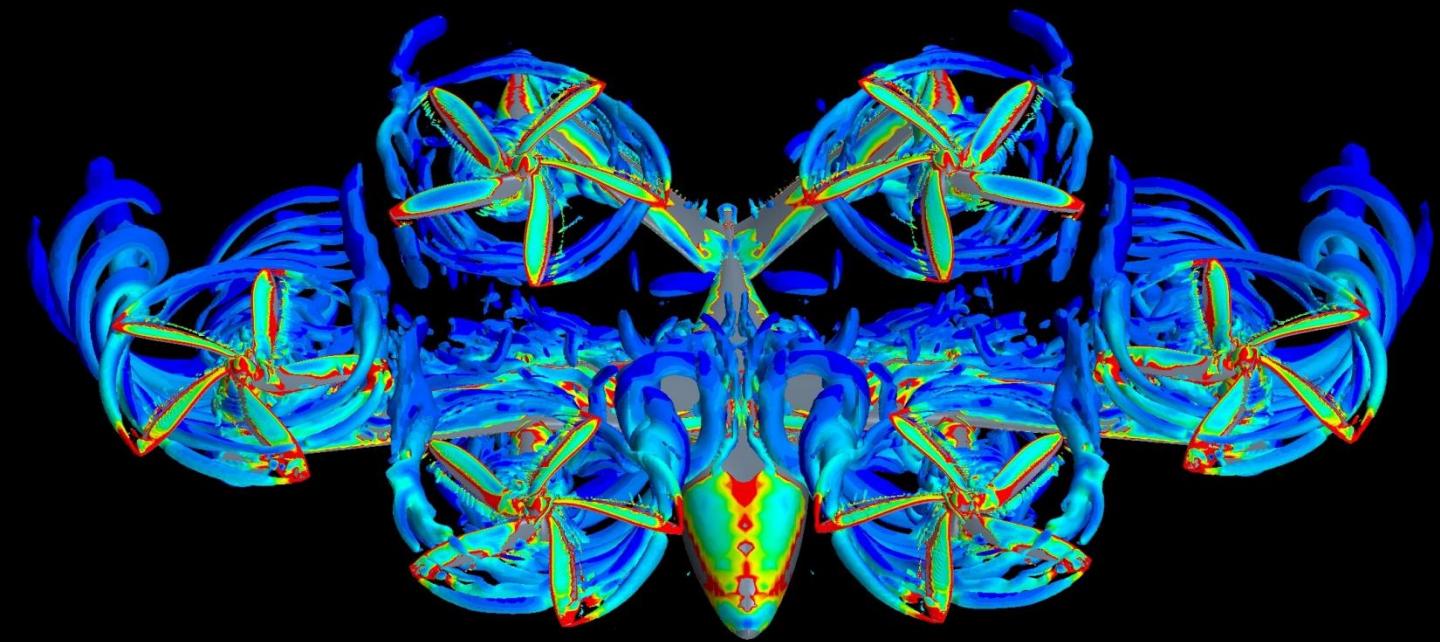
Pipistrel Panthera





# S4 mass breakdown





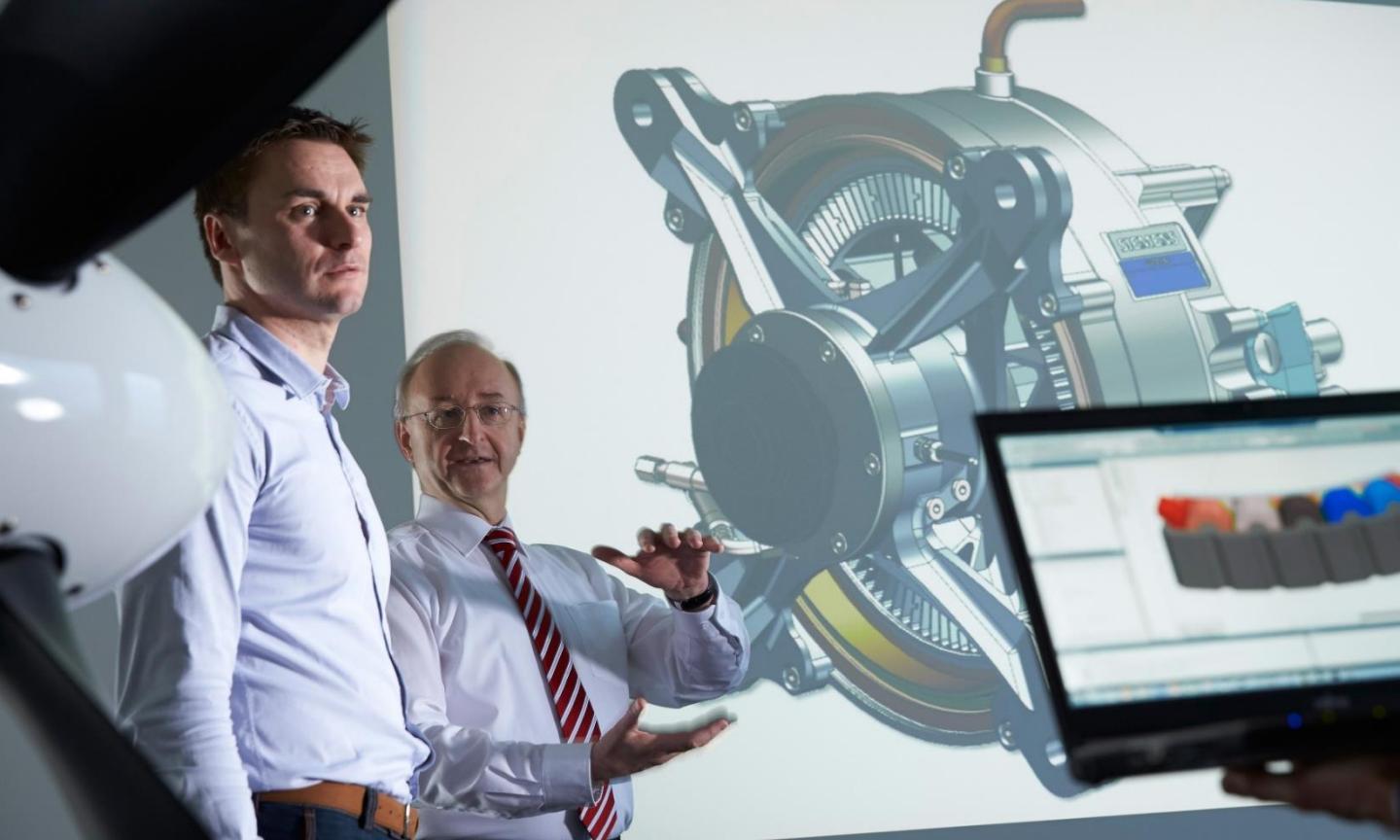
# NOTIONAL SCENARIO





Joby Motors





Siemens eAircraft 260 kW electric motor