By integrating wind turbines into aircraft wings, the potential exists to create a quasi-closed energy loop, where the motion of the aircraft generates airflow that the turbines convert into electrical energy to supplement onboard systems. While this system does not achieve perpetual motion due to energy losses inherent in mechanical systems, it represents a significant advancement in improving energy efficiency for electric aviation. This innovative approach aligns with broader research into renewable energy integration, where onboard harvesting technologies reduce reliance on external energy sources while enhancing operational sustainability. The aerodynamic optimization of turbine designs further supports the practicality of such systems by improving energy capture during flight conditions.

In conclusion, this study successfully identified the parallel-to-wind turbine as the most effective design for wing-mounted applications in electric aircraft. By aligning the blades with airflow to minimize drag and maximize energy capture, this design significantly outperformed traditional turbine configurations. These findings contribute valuable insights into the development of sustainable aviation technologies and underscore the importance of aerodynamic optimization in energy harvesting systems. Future research should explore the integration of energy storage solutions and real-flight testing to further validate the practical applications of these findings.