

FINAL REPORT – EXECUTIVE SUMMARY

Project Number: R-040-050
Recipient: Evolve Analytics, LLC
Award Amount: \$500,000.00
Total Project Costs: \$1,523,704.72



Goal of Project: The Phase I proposal revolutionized renewable energy operations, enabling sophisticated drone use by minimally trained, onsite technicians with the push of a button. (See Demonstration Video: <https://vimeo.com/user118060877>)

Significant Findings: The project created a clear path to commercialization by demonstrating the value of onsite technicians operating AI powered drones with the push of a button. The technical, operational, and regulatory foundations were established enabling further development as part of a Phase II proposal.

In the past wind energy producers spent over \$3,000 per turbine for total annual inspection costs (both indirect and direct) per turbine, at a frequency of one time per year proactively, plus reactively post-disaster/catastrophic event. Manual inspection of a standard wind turbine takes 3 inspectors approximately 24 man-hours to complete. With Airtonomy, customers are spending ~\$150 per turbine per year and can conduct unlimited inspections on demand, allowing for earlier detection of critical flaws and issues, at a total time of 15 minutes per turbine. Additionally, the intelligence and accuracy of Airtonomy's solution increases as its use increases, as Airtonomy's solution identifies new issues, at centimetric accuracy, learns to recognize the issue systematically, and applies this learning to both historical and new imagery.

With increased inspection frequency, accuracy, learning, Airtonomy's solution will not only deliver more than 20:1 Opex savings to Xcel on current inspection spend, but also support greater power generation uptime, earlier resolution of issues at lower costs, and faster warranty claims for turbines under warranty.

Next Steps: Building upon foundational work in Phase I, a Phase II proposal seeks to build a full suite of artificial intelligence (AI) powered software applications. Joined by industry partners, (Xcel Energy and Minnkota Power), technical partners (Microsoft and Qualcomm), and collaborators (University of North Dakota Research Institute for Autonomous Systems and Northern Plains UAS Test Site); Airtonomy is maximizing the value proposition of autonomous drones operated by onsite wind technicians offering significant time, convenience, scalability, and accuracy advantages over existing processes.

Benefits of the Project to ND: Phase I accomplishments were validated by paid engagements on North Dakota wind sites, specifically those owned by Xcel Energy, NextEra (Otter Tail Power), Enel Green Power, and Acciona. Since awarding of a Phase I Renewable Energy Grant, Evolve Analytics added 12 software development, engineering, and computer science positions with plans to more than double that number in 2021.