

Executive Summary

The purpose of the Collegiate Wind Competition, commissioned by NREL and the Department of Energy (DOE) and undertaken by Zephyrus, is to design and construct a portable wind turbine to meet a specific need. Additionally, the team is required to identify a market for their turbine and develop a business plan to support all marketing and financial decisions.

An increasing focus on renewable energy by the U.S. government is driving opportunity for products that safely harness power from the natural environment. Wind energy has become a large part of this focus, with a goal to increase production in the U.S. to 20% by 2030. Capitalizing on the future of wind energy, Zephyrus has created a portable wind turbine that targets the abundant market of outdoorsmen, hikers, and campers.

The Revolve turbine is based off a Savonius design and produces 5 volts during operation, enough power to charge most portable electronics. The Revolve has many advantages over its competitors, solar chargers and batteries, as well as various factors that make it desirable to its market consumer:

- It has the ability to charge at night;
- It does not require recharging prior to use;
- It is lightweight, weighing under 5lbs;
- It is collapsible to a size of 12 inches;
- The design utilizes recyclable materials;
- It is color customizable.

Zephyrus will be formed as an employee-owned limited liability company (LLC) with four individual owners. Marketing strategies will heavily utilize far-reaching and inexpensive social media outlets to spread information and gain a consumer base for the Revolve. A warehouse, located in central Colorado, will provide space for all assembly to be done in house. As sales increase, Zephyrus will outsource storage and shipping to a third party, providing room for machinery and allowing employees to

focus on marketing and production.

Based on operating and material costs as well as results from a customer survey, the Revolve will be initially sold for \$175. Demand was forecasted over five years using data from global portable electronic sales, camping participation, and the customer survey, predicting sales of over 11,000 units by the end of Year 5. Zephyrus will require \$45,000 in initial capital investment, acquired in the form of a small business loan, and will begin to see net profit by the middle of Year 2. At the end of Year 5, Zephyrus expects to sell 37,000 units, giving a net income of over \$530,000.

The Revolve

