



Portable Wind Power

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Introduction

There has been a slow shift in renewable energy from large-scale to small-scale operations. One clear example of this is the increase in solar panels installed in homes. Although there are some issues with descaling wind power, such as a loss in efficiency, we believe that developing smaller scale wind turbines is still a valuable exercise. We hope that our portable wind turbine will prove that smaller wind turbines can benefit their users and solve some of the problems associated with large wind turbines.

Purpose

Our wind turbine will generate power for small appliances from the patio of on-campus dorms/apartments. We believe that the campus' proximity to the ocean and tall buildings make it the perfect location for a small turbine.

Block Flow Diagram

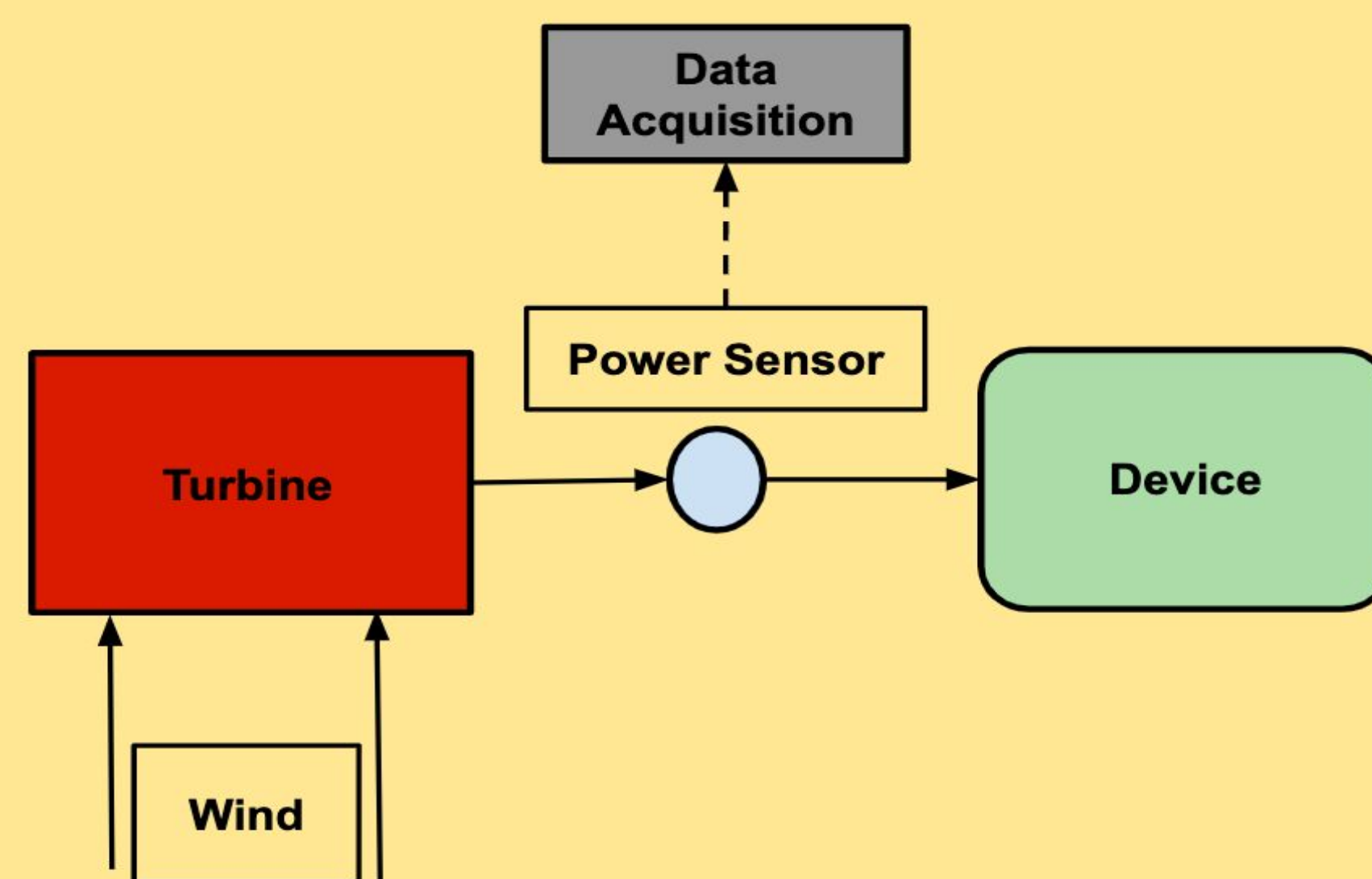


Figure 1: PFD of system. Power sensor will record the amount of energy, in kWh, produced by the turbine.

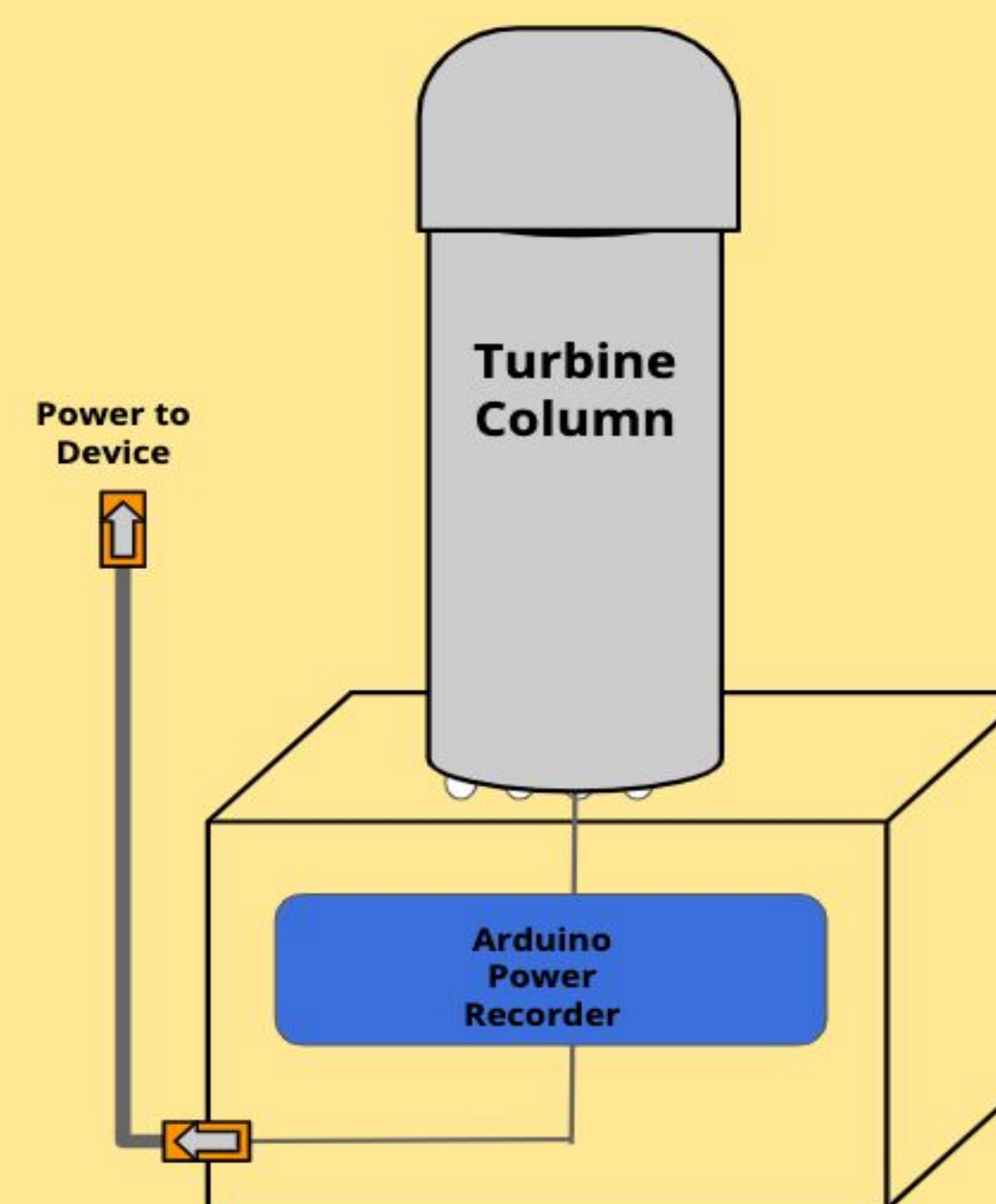


Figure 2: System diagram showing layout of components.

Future Steps

Our future steps consist of finalizing our choice of axis for our turbine. We will also continue CAD modelling of our system for 3-D printed parts so that assembly of the turbine can begin.



Figure 5: 3-D print of horizontal blades and hub.

Horizontal Turbine



Figure 2: Common horizontal turbines

Horizontal wind turbines are among the most common type of turbine produced, utilized, and studied. While they are easier to manufacture at the small scale, they do not produce as much power as vertical turbines.

Vertical Turbine

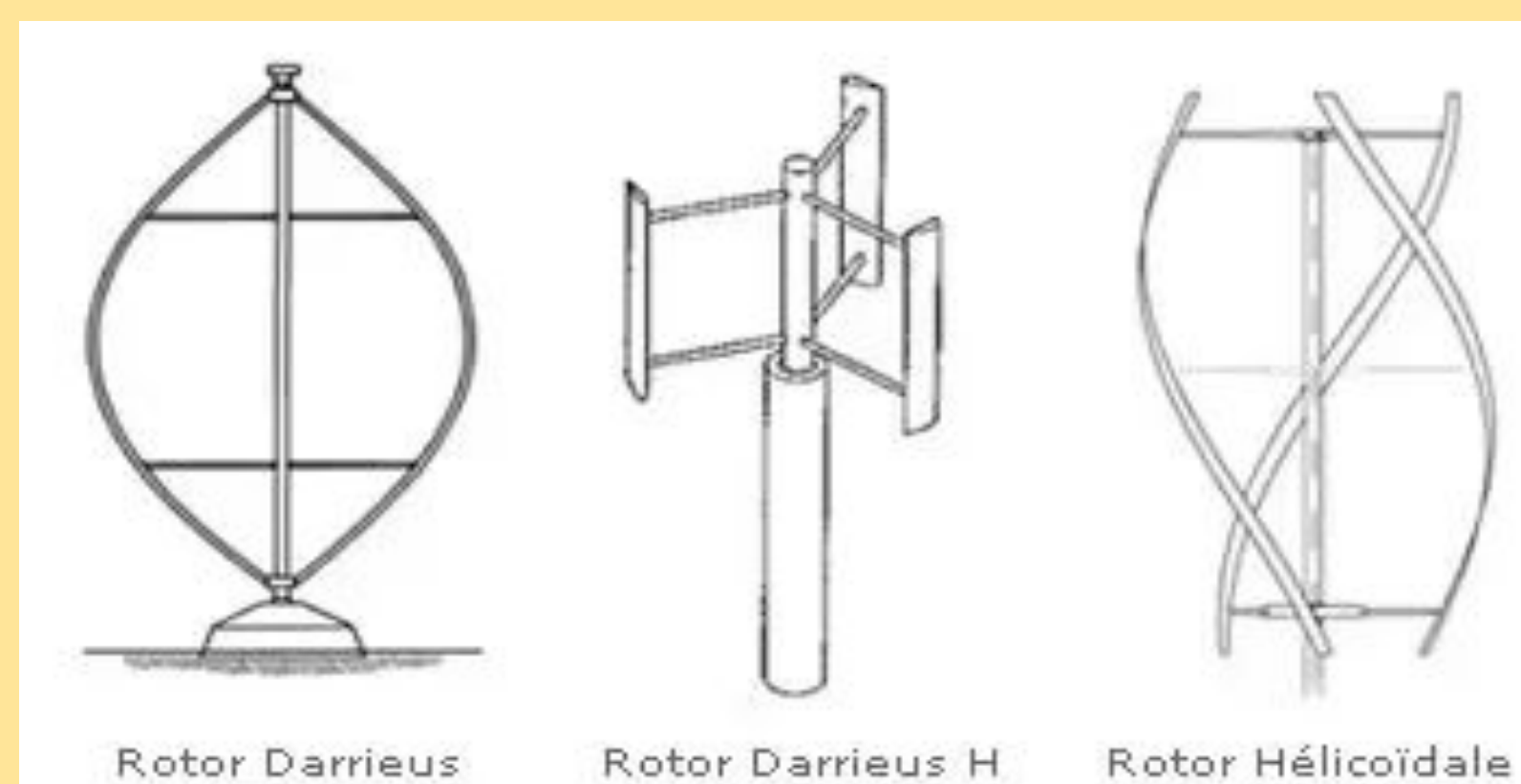


Figure 3. Common vertical turbines

Vertical axis wind turbines have been shown to provide greater power generation at smaller scales when compared to horizontal turbines. However, the curved blades are more difficult to manufacture, increasing the potential cost of the system.

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