

Power Generation through Recycled Materials



Team # 7
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Micro-Hydro Electric Turbine (MHET)

Horizontal Axis Wind Turbine (HAWT)

Problem Statement
 Design and construct a power generation device that implements the use of a renewable energy source and is composed entirely of recycled materials.

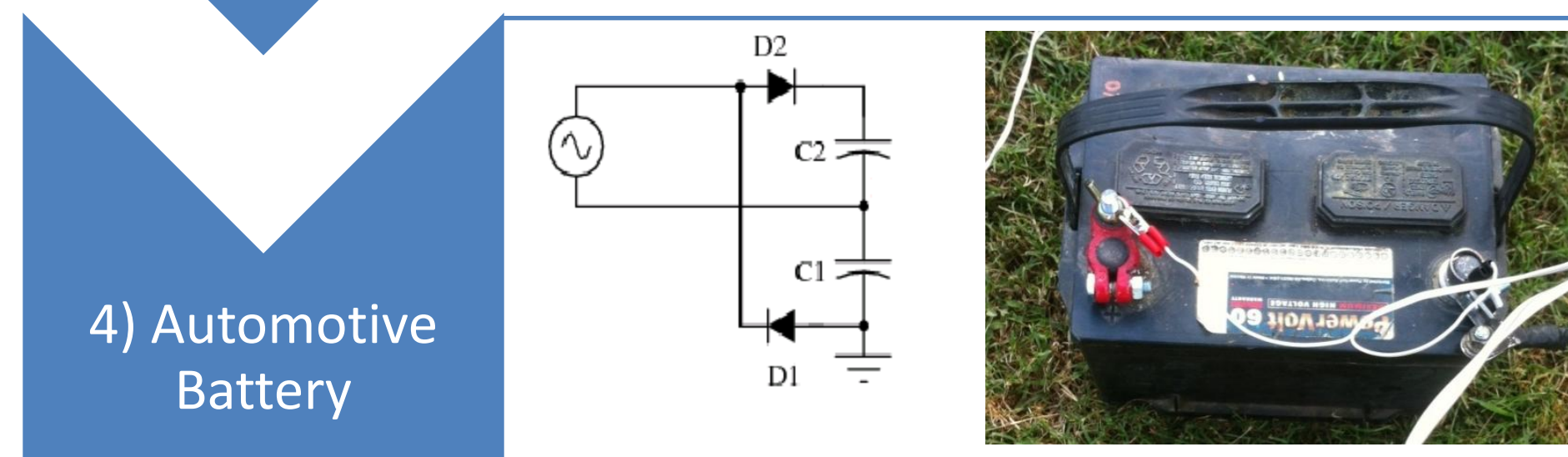
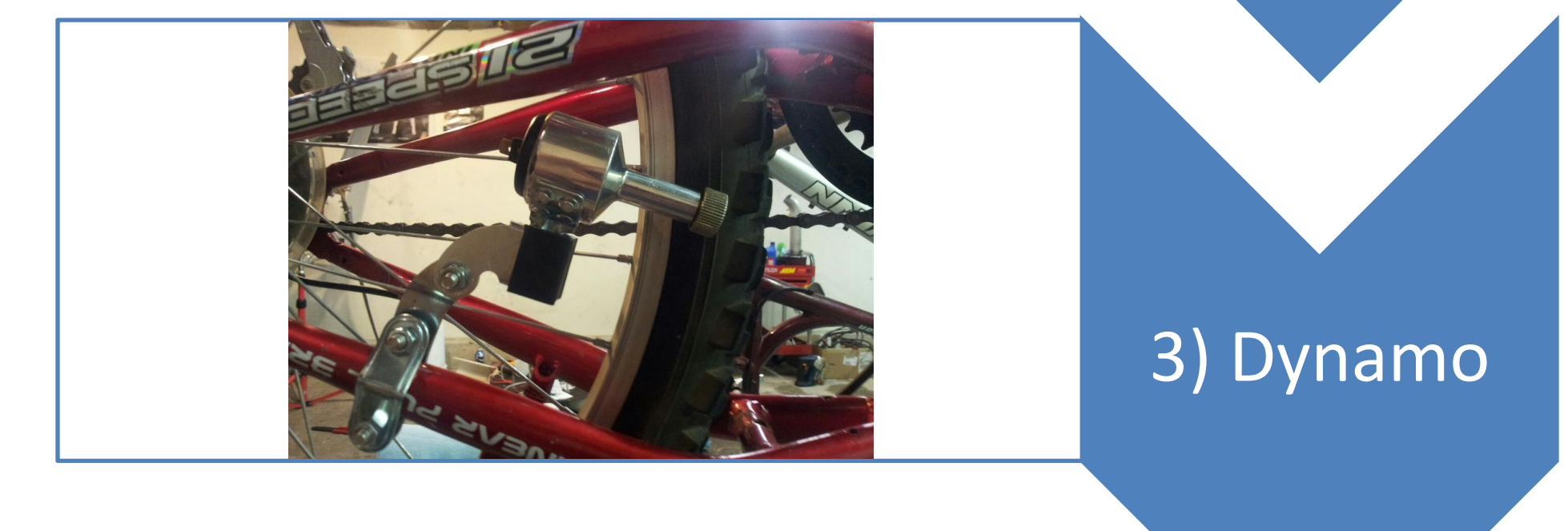
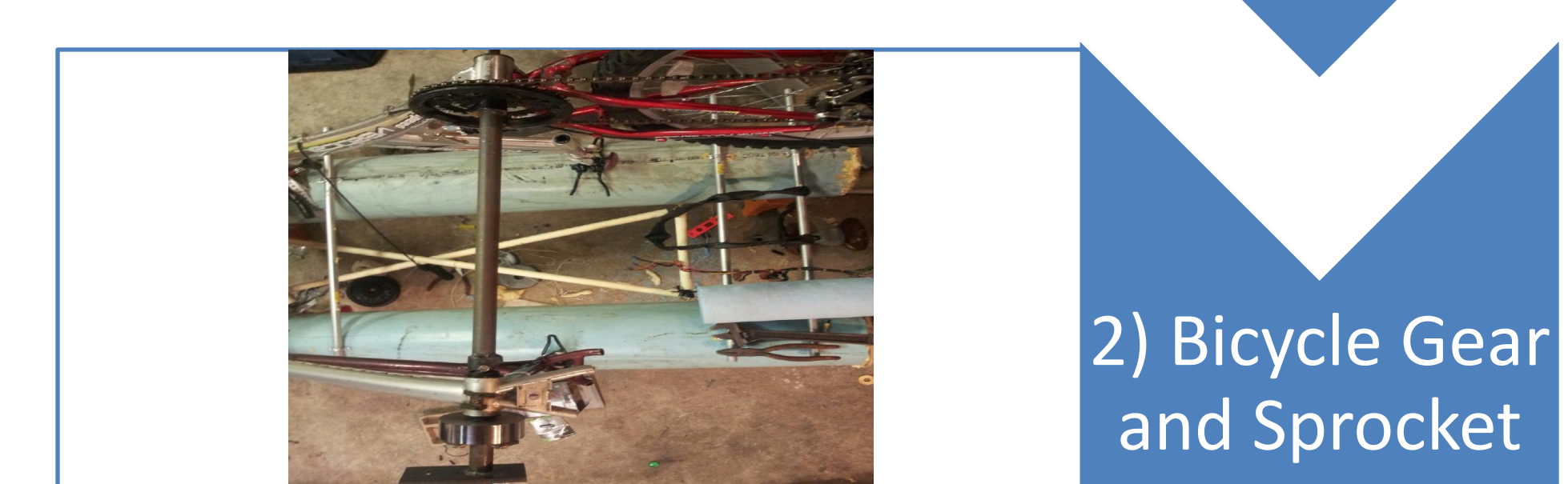
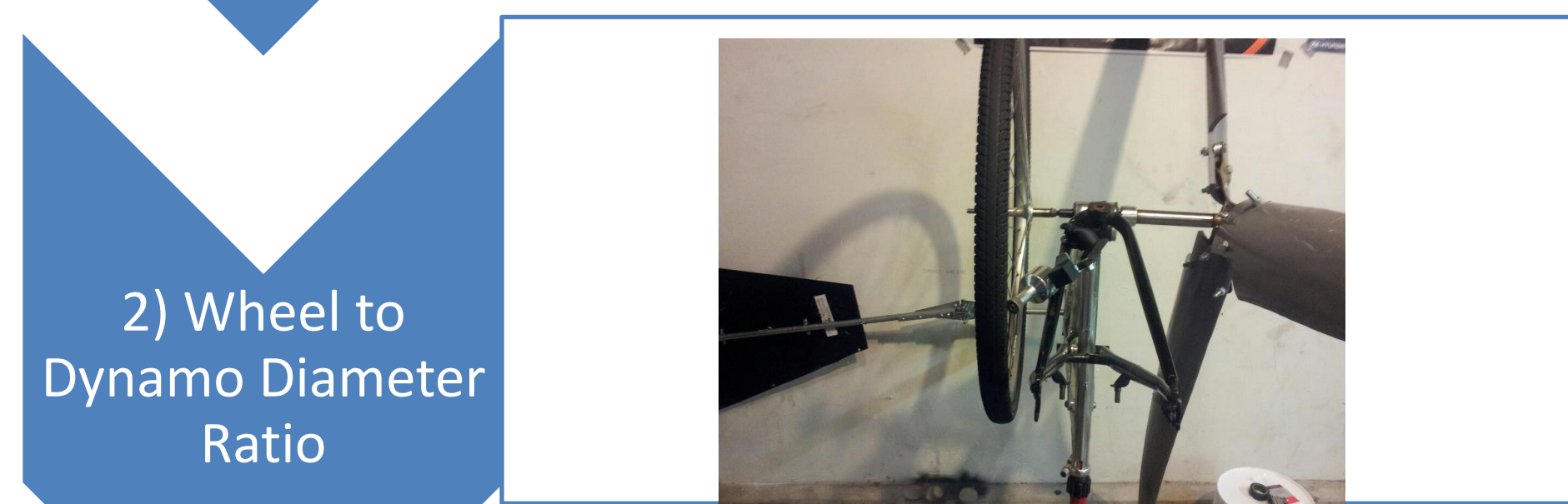
Objectives

- *Must generate 100 W•h/day
- *Must store 300 Wh
- *Output must be 12 V DC

Constraints

- *Must choose three different geographic locations
- *100 km away from the ocean, 500 km away from each other
- *Final product must cost under \$50

Functional Diagram

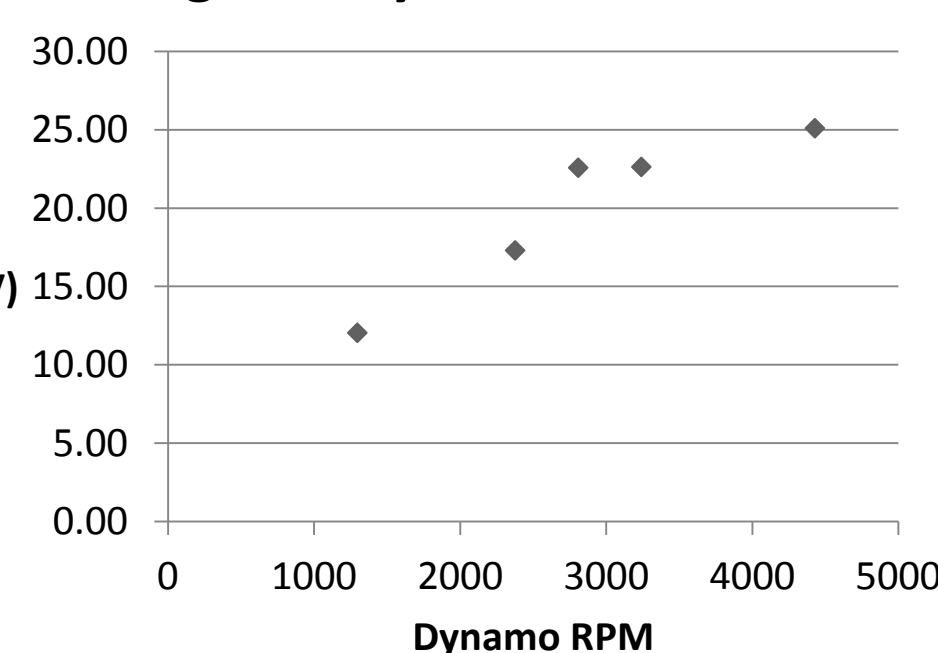


Final Designs



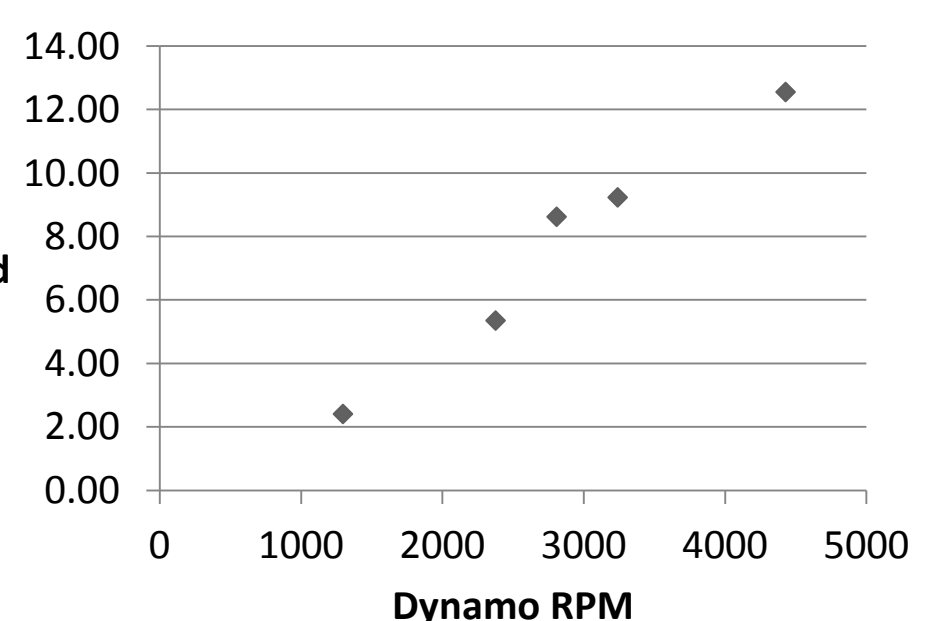
Results

Voltage vs. Dynamo RPM



Minimum Required Water Speed for 100 W•h/day Generation
 24-hour constant output
 4.17 W required
 1.56 m/s = 3.48 mph
 Assuming 80% Turbine Efficiency

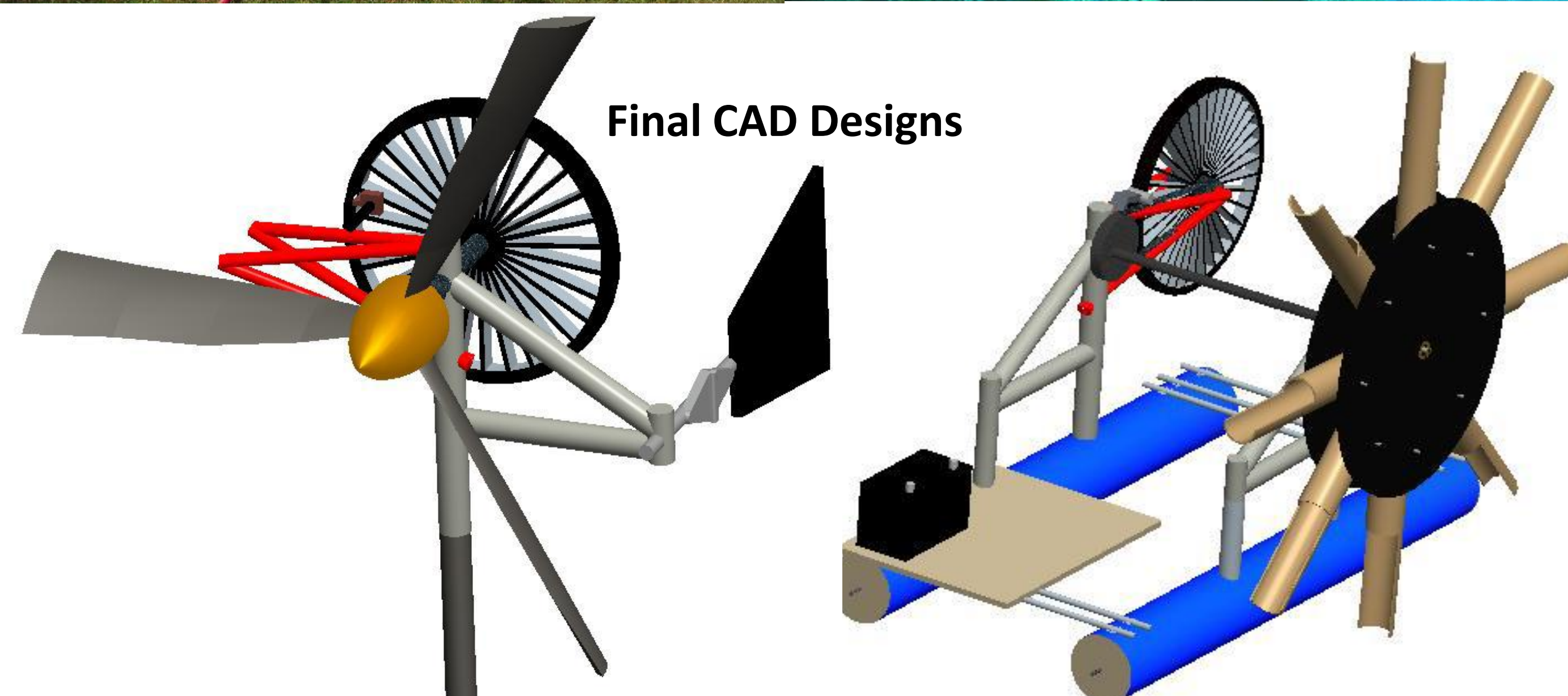
Power Generated vs. Dynamo RPM



Time Required for HAWT Power Generating Objective

Wind Speed (m/s)	Power Generated (W)	Time Required for 100 W•h (hours)
2.2	2.41	41.53
4	5.35	18.69
5	8.62	11.60
6	9.23	10.83
8	12.55	7.97

Final CAD Designs



MHET Flotation

