ASME, GVSU Chapter

# SDC Design Report

2023 Wind and Sun Student Design Competition

By: Capps C, Myer A, Lubbert G, et al
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# 1 Project Description

## 1.1 Functional Requirements

Key functional groups:

- Mobility and (mechanical) chassis design
- Power management and electrical design
- Communication and controls design

# 2 Design Development

## 2.1 Budget

Below gives an itemized budget for components by general category. A more detailed budget may be made available once components are purchased.

Figure 2.1-1 General Project Budget

| Item/Category | Budgeted Amount (USD) | Quantity | Subtotal (USD) |
|---|---|---|---|
| Motors | $ 20.00 | 5 | $ 100.00 |
| Solar Panels | $ 20.00 | 1 | $ 20.00 |
| Weigh Scale | $ 30.00 | 1 | $ 30.00 |
| Weights | $ 40.00 | 1 | $ 40.00 |
| Sizing Box | $ 10.00 | 1 | $ 10.00 |
| Wheels, Bearings, Bolts, Lubricant | $ 100.00 | 1 | $ 100.00 |
| ESP32 MCU | $ 10.00 | 1 | $ 10.00 |
| Batteries, AAA | $ 15.00 | 1 | $ 15.00 |
| PS4 BT Controller | $ 30.00 | 1 | $ 30.00 |
| Misc. Electrical | $ 30.00 | 1 | $ 30.00 |
| Batteries, LiPo | $ 30.00 | 1 | $ 30.00 |
| 3DP Filament | $ - | 0 | $ - |
| Registration | $ 30.00 | 0 | $ - |
| Fan, Source | $ 25.00 | 1 | $ 25.00 |
| Heater, Source | $ 50.00 | 1 | $ 50.00 |
| Grand Total | $ 490.00 | | |

## 2.2 Bill of Materials (BOM)

## Appendix A

The following table can be used to input any useful information such as videos, websites, pictures, etc. The topic column should be filled in with a brief description of what the entry contains and the content column contains whatever information was found be it a link, picture, or a longer text entry. Note: picture width should not exceed 4.3".

Table A-1 – Research Files

| Topic | Content |
|---|---|
| • How do solar panels work<br>• How would a basic solar panel circuit be built? | Electronic Basics #29: Solar Panel & Charge Controller - GreatScott! |
| • How to design a Windmill power generator | Interactive Windmill - Instructables<br><br>Wind Charge Controller Circuit Diagram<br><br> |