Driving the Future

Engineering Project by ECO-POWER

Adam Ramberg, Adam Hunter, Akitomo Amai, and Kelvin Koka

Position | Volts | Amps | Volts
---|---|---|---
120 cm away | 1.57 | .11 | .1727
60 cm away | 2.75 | .31 | .8525
20 cm away | 3.99 | .72 | 2.8728

Solar Data

Wind Data

Sec/rotation | Watts | mAmps | Volts
---|---|---|---
3.5 | .084 | 56 | 1.5
3 | .2040 | 68 | 3
1.5 | .54 | 120 | 4.5
.94 | .84 | 164 | 5
.85 | 1.08 | 180 | 6
.57 | 1.608 | 201 | 8

Results and Conclusion

• The key part of the testing for this project involved taking measurements of the watts, amps, and volts being generated from each power source.

• It was determined in analysis that the cars would not move due to the type of motor being used. Our solution is a gate-control system that regulates the power.

• In conclusion, so much was learned through this design process. It was determined quickly that the motors would only work with a certain amount of power, so the Arduino regulation system was our solution to figure out.

• It was learned that integrating renewables can be difficult, requiring many iterations. However, once in operation, renewables are truly sustainable in more ways than one.

Sustainability

• CO2 and other air pollution from fossil fuel vehicles is a critical problem to solve for sustainability, leading to climate change and other environmental issues.

• Our goal was to model how clean energy like wind and solar can be used to power cars, while achieving the same high level of sustainability—no emissions being created.

• We also demonstrated how renewable energy is sustainable in an economical way. Generating the power is cheap and efficient once initial set-up is complete. There is no reliance on any fuel resource.

• This project is also sustainable in a social aspect. The renewable energy industry can create green jobs that lead to a harmony of social and environmental prosperity.

The concept of this project is to demonstrate the generation and usage of sustainable energy for transportation. This is done by using solar panels, a windmill, and hand-crank to power model electric cars.

• Power from all three power sources rests on the table and flows into the Arduino component, which displays the voltage being generated on an LED screen. The power then flows out to power three separate cars on three separate tracks below the table.

• Requirements of our project were a high level of functionality and sustainability. Quantitatively, we registered enough power from each energy source for the cars to work. Qualitatively, there were issues with getting the cars to move from this power. This required some thinking outside of the box.

• We encountered various problems in the design process. First of all, the cars would not move using direct power from the renewable energy sources. We solved this issue by creating an Arduino controlled system that regulates the power. There were other problems encountered such as wires getting tangled and cars coming off the tracks. These required further iterations, including the twisting of car wires.

• The design process led us in many different directions, where would come up with many different ideas, encounter many roadblocks, and make many different changes to our project along the way. We definitely did not stick with our original plan. In the end, the brainstorming and revisions were necessary in order to create an ultimately successful demonstration.