



Buoyancy-Driven Electricity Generation: A Novel Approach to Sustainable Electricity Production

Abdulhameed Bukhari ME
 Faisal Bazarah ME
 Abdulaziz Alsharyan CHE

Mubarak Alfaihani CHE
 Ali Alherz EE
 Faisal Algahtani ISE

Coach: Ammar Alzaydi

ELEVATOR PITCH

Can you imagine a day that you got a very low electricity bill? Our project is a generation system project that utilize the buoyancy force for generating electricity. this generation system is sustainable and affordable by residential or commercial use. Additionally, it will aid in reducing the cost of electricity, and minimizing carbon dioxide emissions.

PROBLEM STATEMENT

The amount of carbon dioxide has been elevated over the years, and a large amount of these emissions are due to electricity generation. This project aims to solve the issue of the carbon dioxide emissions by building a new type of an electricity generation system.

OBJECTIVES

The objective is to design and build an electricity generation system that mainly utilize the concept of the buoyancy force with using the gravity force to generating electricity and having an output electricity that is greater than the input.

SPECIFICATIONS

-  Output power $\geq 240W$
-  Input power $\leq 70W$
-  Cycle time $\leq 25s$
-  Piston's weight $\leq 15Kg$
-  Final RPM between 2500RPM and 3000RPM

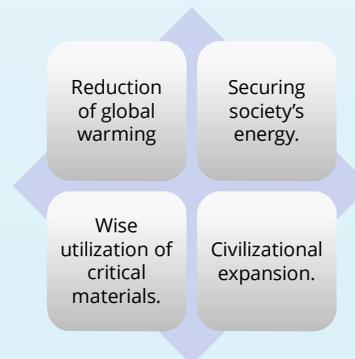


CONSTRAINTS

-  Thermodynamic Laws
-  Initial Energy Input
-  sizing
-  Material Selection
-  Cost Effectiveness



PROJECT IMPACT



TESTING AND VALIDATION

For pumping mechanism testing, the pump was mounting inside the hollow cylinder and then the hollow cylinder was filled partially with water. There are two wires connected to a battery. Then the pump starts pumping the water. So, it is valid to use.

For piston and reservoir sliding motion testing, the testing process was done after the two reservoirs were finished. We took the piston after assembling it and dropped it inside the reservoir. We noticed a slight friction between the piston and the aluminum sheet. So, both the reservoir and the piston are actually meeting their specification except the upper aluminum sheet as it not a uniform cylinder.

For the output power, all systems were integrated together, transmission, reservoir, pumping, and electrical systems. Also, the linear and rotational movement were good. Hence, the output power meets the specification.

PROJECT COST

