**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ENGINEERING**

**FACULTY OF MECHANICAL AND CHEMICAL ENGINEERING**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**BSC MECHANICAL ENGINEERING**

**FIRST YEAR DESIGN PROJECT**

**GROUP 10: TEAM ERUDITE**

**A REPORT ON PROBLEM IDENTIFIED AND THE SOLUTION OBTAINED**

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**GENERATION OF ELECTRICITY USING SPARK PLUGS**

Electricity is not freely available in nature, so it must be transformed from one form of energy before we get the electricity. For utilities in the electric power industry, it is the stage prior to its delivery (transmission, distribution, etc.) to the end user or storage. Electricity is most often generated at a power plant by electromechanical generators, primarily driven by heat engines fueled by combustion or nuclear fission but also by other means such as the kinetic energy of a wind and water which is the main source of electricity to Ghanaians. Other energy sources include solar photovoltaics and geothermal power.

The photovoltaic effect is the transformation of light into electrical energy, as in solar cells. Photovoltaic panels convert sunlight directly to DC electricity. Although sunlight is free and abundant, solar power electricity is still usually more expensive to produce than the generation of electricity by means of spark plugs in conjunction with a permanent magnet. As we find alternative ways of generating electricity, the country would not then depend only on the Akosombo dam for electricity. This would also go a long way to minimize the power fluctuation and breakdown which has leads to the collapse of many industries.

**THE PROBLEM WE’VE IDENTIFIED**

When there are power outages, the average individual is unable to use basic household appliances such as electric irons, kettles and rice cookers and even common lighting systems.

**AIM OF THE REPORT**

Our goal as a group is to find some possible ways to generate electricity using non-conventional mean s. The prime purpose of this initiative is to ensure continuous supply of electrical power and at a cheaper cost.

**HOW SPARK PLUGS HELP TO GENERATE ELECTRICITY**

A spark plug is a plug that sparks when high voltage is applied or introduced to it. A lot go on behind the scenes to produce that high voltage spark. There are some spark plugs which generally do not generate electricity. Copper and iridium spark plugs are the only ones that can help to generate electricity.

Copper spark plugs generates electricity without the use of magnet whilst iridium spark plugs generate electricity in conjunction with a magnet. The iridium spark plug has pulse circuit which helps to initiate the process when a magnet is placed on it.

Pulse circuit is a circuit designed to produce electrical pulses and electric pulse amplification, transformation and shaping of the circuit.

The magnet also produces a magnetic field. The presence of this magnetic field is determined by placing a compass near it. So, the magnet generates magnetic lines of force which form a closed loop from the north pole to the south pole. As such, there is a linkage between the coiled spark plug and the magnetic lines of force.

From the principle of electromagnetic induction, emf is induced in a conductor whenever there is a relative movement between the magnetic field and a conductor. When this energy required by the electrons is supplied, they are able to move throughout the whole circuit causing the flow of electric current.

**OUR PROPOSED MECHANISM**

In our model, Four spark plugs which have many turns of copper wire are affixed to a board and two cables connected to a circuit box are in turn connected to the spark plug. Put the wires together and tape it. A bar of magnet is attached to the plug. The size of the magnet determines the current to be produced. This is because, the greater the magnetic flux linkage, more emf induced and as such more current to be generated.

**SUSTAINABILITY OF OUR PROJECT.**

By increasing the number of magnets and their size, we aim to produce a voltage sufficient to power basic household appliances like electric irons and kettles. We seek to incorporate such devices like an inverter. The inverter as in the generation of electricity using solar modules will amplify the voltage generated by our spark plugs mechanism.

Moreover in order to reduce the necessity of always having to run the spark plug generator before obtaining power, we would incorporate a rechargeable battery where voltage generated can be stored.

**CONCLUSION**

We forsee the spark plug generator having far out reaching impacts as it would help to alleviate the stress incurred during power outages. Moreover, the spark plug generator is tailored to be cost efficient unlike the solar generator and the a.c generator.