



# The Development Of A Hybrid Generator

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## Introduction:

The tremendous fear of hydrocarbon power shortage in the near future and the impact it has on environment has been major issues of discussions in the media today. This has been a major focus on us for this project by experimenting on alternative ways of improving the portable generators that are in use today to be able to accommodate more than one fuel.

Being potential leaders of the future we see the importance of combining our imagination through carefully experimentation of the technology in place to have a way that can be improvised for local use to allow local societies build upon it to address power challenges in their immediate environment while supporting their daily life.



## AIM: PRODUCTION OF HYDROGEN USING WATER AND DIL. SULPHURIC ACID.

### Apparatus

Hoffman apparatus  
12 volts supply  
Platinum electrodes  
Two beakers  
Measuring cylinder  
25cc of dilute Sulphuric acid.



## MECHANICAL MODIFICATIONS

**AIM:** To modify a generator to use three fuels

**Methods:** Since the engine was formally working using petrol only, then we had to perform some mechanical modifications for it to run on butane gas and hydrogen gas. After fixing the cylinder block, the piston, crankshaft and the spark plug, we started putting the carburetor. A carburetor is a device that regulates the flow of air and gasoline into the engine cylinders.

Between the carburetor and the air filter, we made a hole that we linked it to the main gas jet. We put a slight constriction to maximize transmission of the pulses created during the intake stroke of the engine without acting like a choke and affecting the mixture when the machine is running on petrol.

**Results:** The generator could not start with the gas directly, unless little petrol is added. Other things in this generator are the same as other small generators with two strokes.

## Results:

The hydrogen production was very little to an extent that we couldn't even collect 25cc within one hour. We decided to let the experiment to continue throughout the night. But in the morning the results were still not satisfactory.

### Conclusion

Since the result were unsatisfactory,

Therefore we had to come up with new hypothesis, which were

Hydrogen production is increased by large amount of voltage.

Hydrogen production is increased by using large platinum electrodes.

Hydrogen production is increased by higher current.

All these three alternatives are under discussion on how to experiment them

While still on experimental stages of this generator it can be seen that among the three fuels used for operating the generator would still be better for gasoline as this was the original design followed by butane and finally hydrogen. Even though hydrogen seems to be most complicated on preparation of large quantities than the rest it still hold more advantage to the environmental pollution than the hydrocarbon compounds that is why we still see that the feature relies heavily on this. If the project outcomes brings promise on butane it would be of advantage to many villagers as the country has been found with a large reserve of natural gas which will likely raise the number of power users to nearly 30 % by 2015 if the harnessing goes as planned.

The power back up and security part seem to be working better with time even though they make the project complicated but this remains as a challenge to retain the portability nature of the two stroke engine.

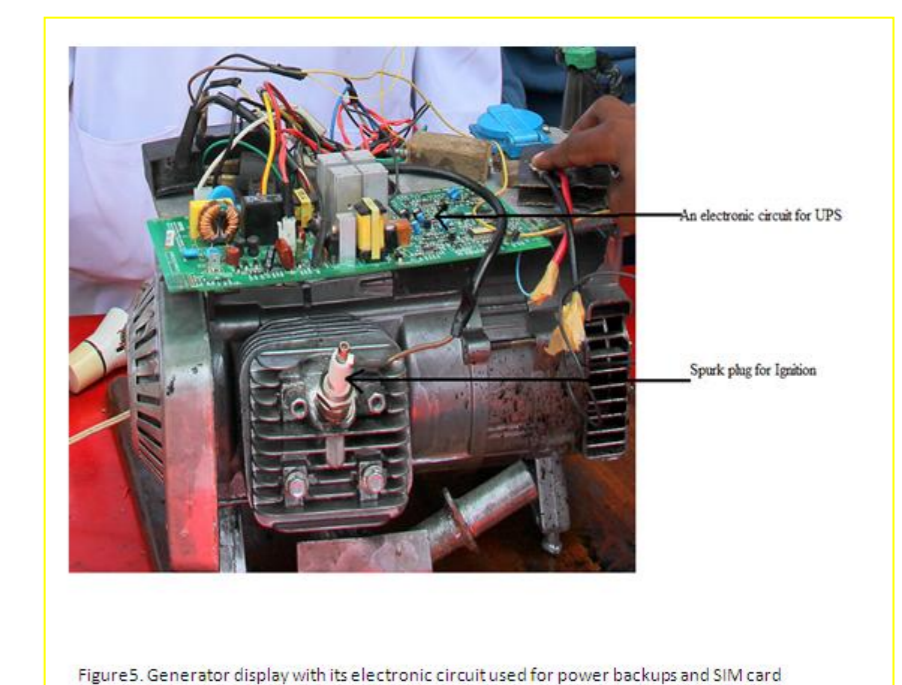


Figure 5. Generator display with its electronic circuit used for power backup and SIM card

## Conclusions:

Environment pollution being a major area of concern today the society should think of cheap alternative means of powering machines that are portable like chains saw, grass eaters, road bicycles and domestic backup generators. The move should be towards hybrid generators using more than one type of fuel for flexibility as well as taking advantage of machines when hydrocarbon reserve comes to an end in near future.

If research in this area becomes successfully it will readdress major challenges on carbon emission and global warming or even large the effect of dumping gasoline engines when gasoline supply comes to an end a reason why the focus has to be made towards alternative means of power using renewable energy sources.

## References:

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## Further information:

Download at: [www.youngscientists.co.tz/posters](http://www.youngscientists.co.tz/posters)

**Acknowledgements:** We would like to send our sincere thanks to God for giving us the gift of life and knowledge to share with others. In general we also like to give thanks to the Young Scientist Tanzania for the great opportunity they have given to the Tanzanian student talented in the field of science and technology.

We as well recognize the support of the St. Jude community, especially the following people: Nzinyangwa George Mcharo our Head of Science and ICT Department for his supervision, support and encouragement. Paskalina Badi and Zamoyo Onyango our laboratory technicians who supported us on materials that we needed for our project and some other times when they were too occupied but still could spare time to help us.