

SAVING ELECTRICAL ENERGY IN THE RESIDENTIAL SECTOR: COMBINING EDUCATION AND TECHNOLOGY

Combining Education & Technology to Save Energy

The cost of electricity in Ghana has increased significantly in recent times, prompting consumers to look for opportunities to cut their bills. The two major barriers to meaningful progress on energy efficiency in the country is the general lack of information about efficient use of energy and the availability of energy efficient end-use products. A pilot project was launched by the Energy Foundation in collaboration with the University College of Education Winneba, Kumasi Campus to study the impacts of providing information and the introduction of energy efficient technologies on electricity consumption in Ghanaian households.

The study involved six students of UCEW-Kumasi, who were trained in the techniques of identifying and implementing energy conservation measures in households and six selected households located at Ada-Foah (1), Agona-Ashanti (1) and Kumasi (4). The main energy saving measures used in the study were (a) the education of the residents on house keeping measures and (b) the introduction of Compact Fluorescent Lamps (CFL) to the selected households as an energy efficient alternative to incandescent lamps which were being used before the study..

The study lasted for eight months during which the energy consumption of each household, was closely monitored by the students. During the first three months, the electricity consumption was only monitored without making any comments by the students. Thereafter, the households were taken through education on how to reduce electricity waste through house-keeping measures and the

consumption pattern was again monitored for a further two months. At the end of this period, all the incandescent lamps in the various houses were replaced with CFLs, provided by the Energy Foundation. The consumption for the three-month post lamp replacement period was also monitored by the Energy Foundation through the utility billing system. .



Compact Fluorescent Lamps (CFLs) are now common in the Ghanaian market

Results

The results of the study show significant energy savings in all the six households (See Table 2). The mean energy consumption for the six households prior to the study was 1520kWh and this reduced to 1119kWh when the households were educated on house keeping measures. This represents an average reduction of 26.4% in the energy use of the six households. The least saving recorded was 12.9% while the highest was 48.6%. After the introduction of the CFLs the consumption reduced to only 48% of the figures before the exercise, representing a saving of 52%. These are strong indications that there is significant potential for saving energy in households across the country especially if the households replace the numerous incandescent lamps with energy efficient CFLs.



Different Brands of CFLs



Compact Fluorescent Lamp

Table 1 Frequency Distribution of Lamps in the Selected Households.

House Number	Location of household	Number of Lamps		
		Incandescent	Fluorescent	Total
A/2/226B	Ada-Foah	3 (50%)	3 (50%)	6
L/c4	Agona-Ashanti	3 (75%)	1 (25%)	4
H27	Patase Estate – Kumasi	5 (62.5%)	3 (37.5%)	8
PLT.12 BLK.7	Asokwa – Kumasi	1 (25%)	3 (75%)	4
PLT.23 BLK.11	Kwadaso North – Kumasi	5 (83%)	1 (17%)	6
34 BLK.B	Buokrrom Estate - Kumasi	10 (100%)	0 (0%)	10
Total		27 (71%)	11 (29%)	38

House No.	Location	Av. monthly consumption before education kWh/month	Av. Monthly consumption after education, kWh/month	Percentage savings after education, %	Av. Monthly consumption after introduction of CFL, kWh/month	Percentage savings after introduction of CFL, %
A2/226B	Ada Foah	164	84	48.6	43	74
L/C4	Agona Ashanti	67	58	14	37	45
H27	Patase Estates Kumasi	433	377	13	303	30
PLT.12 BLK7	Asokwa, Kumasi	242	161	33	89	63
PLT.23 BLK11	Kwadaso North, Kumasi	225	171	24	***	***
34BLK.B	Buokrrom Estate	390	268	31	198	49
		1,520	1,119	26	670***	52***

***The figures indicated in the last two columns do not include House No. PLT.23 BLK11, Kwadaso North because of meter malfunction. The meter actually read zero.

Conclusion

All the six households that took part in the study recorded energy savings ranging from 12.9% to 48.6%, an average of 26% following the educational programme. The savings increased further to 52% on the average after the introduction of the CFLs. The saving in one household was deleted due to meter malfunction during the final three months.

The study has established that a combination of education and the use of energy efficient appliances can significantly reduce energy cost in Ghanaian homes.

This case study was sponsored by the International Institute for Sustainable Energy, Winnipeg, Manitoba, Canada.

For further information on this and other Good Practice Case studies, please contact:

**The Energy Foundation
20 Mankralo Street
P.O. Box CT1671,
Cantonments, Accra
Ghana**

Tel. +233-21-771507

Fax: +233-21-771508

e-mail: energyfn@africaonline.com.gh
www.ase.org/ghanaef