# GOVERNMENT POLICIES AND GRID EXTENSION AS SOLUTIONS FOR AVAILING ENERGY SERVICES FOR THE URBAN POOR

IP Da Silva and Joan Kyokutamba
Makerere University and Uganda Electricity Board, Kampala, Uganda

**ABSTRACT**

**Urban poor households face challenges of meeting energy needs within their economic resources and established infrastructure. Previous Government efforts to meet this need by subsidizing modern energy supply were poorly designed and ill targeted. Despite those initiatives, the eventual energy sold was not used for income generation activities. This study analyses the impact of government policies and available technologies to improve the percentage of poor households using electricity in the urban areas of Uganda.**

## 1. INTRODUCTION

Results of a previous study [1], which reviewed the influence, and consequences of income on energy consumption for the urban poor revealed that up to 43% of the urban poor cannot afford to pay for modern energy. Up front costs of electricity, namely connection and wiring are so high that households depend on biomass and kerosene for 85% of the domestic use and income generation activities such as cooking for commercial purpose and alcohol brewing. Unfortunately the Government has diverted prioritisation to rural electrification and have left the urban poor areas to be served by market forces that cannot target the poor in their services. Past initiatives including promotion of energy saving stoves [2], the lifeline tariff [3], and lower tax levy on kerosene, has failed to improve the quality of life of this target group having their subsidies eventually reaching the non-poor.

In Uganda we have experienced a kind of "miracle" in the field of telecommunication: A certain company had been in the country for three years providing mobile services to subscribers at a very high cost. Throughout that period it managed to have less than 1500 subscribers. A second company was given a licence to operate and it came with the idea of pre-payment, low cost rates and targeting the low-income costumer who, by the way, are the immense majority of the Ugandans. In three years this company has got more than 150,000 subscribers and continues to grow. A third company is now also offering mobile services and the amount of Ugandans using mobiles just skyrocketed. This phenomenon gives rise to some questions: is it that people are poor or rather energy is not properly marketed among the so-called "poor"? They are given a mobile almost for free for the companies know that they will eventually recover their money. Would it be possible for the utility companies to go the same way and offer free-of-charge connection and wiring hoping to have this investment recovered on a pre-payment system?

The private sector could have a say on this matter if backed by government policies and proper legal framework. An overview on government policies and adequate technology seems crucial for the success of the widespread use of modern energy and the upbringing of the living conditions in this country.

## 2. BASIC DATA FOR THE STUDY

The access to proper data on the urban poor is the foundation of this study. Who are the urban poor? How much they earn per month? How many are they? Where are they located? What is their budget like? What would they do with the electricity if available?

**The urban poor**

The urban poor were divided into three categories: poor, very poor and extremely poor [1]. These categories correspond to a monthly income of Ush 150,000/, Ush 100,000/ and 50,000/ respectively. [1 USD=1740 Ush]

Table 1 shows how much each category spends monthly in energy:

**Table 1: Average monthly energy expenditure**

| Item | Poor | Very poor | Extremely poor |
|---|---|---|---|
| Electricity | 10,200 | 7,500 | |
| Kerosene | 7,000 | 5,100 | 4,600 |
| Charcoal | 9,000 | 6,600 | 5,600 |
| Firewood | 19,200 | 11,900 | 9,200 |
| Total | 45,400 | 31,100 | 19,400 |
| % of income | 30% | 31% | 39% |

In terms of market study one must know that in Kampala alone the urban poor can be estimated in about 30,000 households. One details one cannot forget is that these people are all very near to a transformer of the distribution network of former UEB. This fact makes it possible that an eventual connection could be worked out quite cheaply. Communities a bit far, say up to 1000m far from the line could be eligible for the SWER grid extension [4].

**Income generating activities**

In order to effect the quality of life everything comes down to improving the income of households. Using modern energy for activates such as small restaurants, barbers, small shops, ironing clothes, brewing some alcoholic drinks, etc.

The utility could organise a special plan for those households willing to go into some of these small enterprises. A simple feasibility study would ensure proper

recovery of the investment. NGOs could come to provide similar schemes to communities in specific areas. Banking support in the form of small grants eventually could work. We have had very positive experiences with certain banking institutions. They have been able to get up to 98% recovery of debts.

**Actual subsidies**

According to a table published in the papers in January 2001, the real cost of a one-phase, "zero pole" connection, including VAT was Ush 368,191/. The costumer was meant to pay Ush 80,000/ only. This means a 78% subsidy in the connection. Regarding tariff, until June 2001 the subsidy on electricity consumption was as follows: the first 30 units (one unit = 1 kWh) would cost 20 Ush, the following 170 would cost Ush 70 and the remaining ones Ush 100. These tariffs have been unchanged for about nine years. From June onwards it was changed; the first 30 units went to Ush 50 and the remaining ones to Ush 189.8. In spite of the increase of the tariff the subsidy for the first 30 units augmented from 70% to 74%.

The problem is that this subsidy is ill targeted and only 33% of it reaches the real poor.

Let's consider, for the effect of this study, poor the ones who spend 30 units or less per month. In this category we have presently 58000 people in Uganda. The total number of costumer in UEB is 164000. If we multiply the difference of these two numbers for the 30 units and the difference between the unsubsidised and subsidised tariff we get a figure of more or less 3.3 million dollar, which is given per annum in subsidy to the non-poor. This is what is called in Uganda "blanket subsidy" for it "covers" everybody.

Similar thing happens to the subsidy given to kerosene. It is given to improve the quality of life of people who use this fuel for lighting (tabooda or paraffin lamps). What happens normally is that these people don't normally buy their paraffin from petrol stations but from retailers who add their profit margin, which makes void the said subsidy.

## 3. PROPOSED SUBSIDY

The idea behind the proposed new subsidy is to bring the same amount of capital the company is putting in subsidising the poor into proper focus and make it reach 100% the poor and not only 33% as has been the case so far in terms of energy consumption. The proposal is quite simple: we suggest the company subsidize only those costumers who consume 30 or fewer units. All the 106,000 other consumers would pay the full tariff of Ush 189.80. per unit. The revenue per annum would them increase in more than USD 3 million. For each individual the difference is hardly perceptible though the total at the end of a year is a sizeable amount. What could than be done with this money? We have some suggestions.

**Free connection**

If we divide that USD 3 million by USD 46 (the equivalent of Ush 80,000/, which has been charged for the one phase, zero pole connection) we could give free connection to more than 65000 households each year. It means that in 3 years we would double the number of people connected to the utility.

**Wiring**

In order to make also electricity "user-friendly", apart from the free connection, the utility could liase with some third part private sector companies to provide for free wiring. Table 2 shows the cost of wiring a two-roomed house

**Table 2 : Cost of wiring a two-roomed house**

| Material | Num. | Cost (Ush) | Total |
|---|---|---|---|
| 13 A socket | 2 | 3500/ | 7000/ |
| 5 A switch | 2 | 2500/ | 5000/ |
| 40 Watt lamp | 2 | 1000/ | 2000/ |
| Lamp holder | 2 | 2000/ | 4000/ |
| Wire for lighting | 12m | 550/ | 6600/ |
| Wire for sockets | 8m | 700/ | 5600/ |
| Consumer unit | 1 | 25,000/ | 25,000/ |
| Circuit Breakers | 2 | 7,500/ | 15,000/ |
| Labour costs | | | 15,000/ |
| **TOTAL** | | | **85,200** |

If the utility were to give besides of the connection also the wiring of a two-roomed house, still we could have more than 32000 new costumers per year using the same amount of money we use today for the subsidy.

**Beneficiaries**

Surely if the utility were to come with a announcement in the newspaper offering free connection we can bet for kilometric queues in the costumer care next morning. How could the service provider choose the eventual 32000 beneficiaries for that year?

Setting a questionnaire to be filled asking for income level, if the household is engaged in some income generating activity One idea would be

## 4. AVAILABLE TECHNOLOGIES

Apart form the government policies, utility company, financial institutions and private sector participation, one cannot forget the role of new technologies. Are there cheaper and more adequate ways of providing energy to customers? This question can be answered in an affirmative way:

**Swer (single wire , earth return)**

The use of only one cable to provide single phase power to remote areas is a very known technology and has been used extensively in Australia, Brazil and New-Zealand to quote some countries only. It is known that this technology can reduce the cost of grid-extension in more than 30%. Normally this kind of solution is used to rural electrification. Nonetheless there is no counter-indication in using this technology to extend the grid in the case of communities that are located in urban areas. For more than two poles connection (called SCHEMES by the utility) the cost is above two million Ush; more or less above USD 1200. In that case for each connection there would be a

saving of at least USD 360. A paper on this matter was published in DUE2001 Conference [4].

**Pre-payment meters**
Pre-payment meter was originally developed to counter the problem of non-payment for electricity. The case of debt in Uganda is quite serious. The amount of money in uncollected bills reaches now the sum of several millions USD and in average 25% of the billed customers don't pay the electricity they consume. The main advantages from the viewpoint of the utility are: revenue received up front, no billing and accounts required, no postage and stationery costs, staff no required for cut-off and reconnections, etc.
From the customer's perspective it helps to set a energy consumption awareness for the customer has in his on meter a energy usage indication. Eliminates penalties and reconnections fees., etc.
Most of the modern models of pre-payment meters are tampering-proof and besides it would be ease for the utility company to assign area inspectors to verify meter conditions.[5]

**Service limiters**
If the above-mentioned connections were top be made using the conventional meters, one new technology that could be put into place is the "service limiters". This kind of circuit breaker is a small thermal switch equipped with a fuse. It has been used by EDF (Electricite de France) to provide impoverished customers with a limited access to electricity [8]. This gadget would avoid customers to use electricity for cooking, ironing, etc. This is to the advantage of the customer for it would assure that at any time they would be inside of the 30 units/month consumption category. Lighting and entertainment would be already a great uplifting in the quality of life of the urban poor.

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## 5. LIMITATIONS

Changing of attitude, behaviour, way of doing things is always a difficult process. It takes time,. Requires training, demands openness of mind. On the top these other limitation are present:

**Theft**
Right now in Uganda there is a programme called "Sigma Operation" going on with the aim of curbing electricity thefts. It is estimated that around 15% of the consumed electricity in Uganda are stolen by dint of bypassing the meter. Some customers are quite sophisticated in their wrong doings. Underground concealed cables directly serving cooker and water-heaters while having the other loads duly connected through the meter is just an example of the ability to steal. The past year's campaign to reduce that 15% above mentioned was met with very little success. One could eventually ask whether this same problem wouldn't happen also to the urban poor. The hope that the new connections would be more difficult to tamper with is not even in the vicinity of solving this behavioural problem.

**Co-operation Utility/Private Sector**
Though the willingness to co-operate is there at least in theory, a proper channel for the integration between the utility and the private sector is a must for the success of this plan. The wiring of new customer could be assigned to certified companies who would be more than willing to do business in Uganda, A proper bidding procedure and other tools must be in place to ensure a fair a transparent so-operation.

## 6 CONCLUSIONS AND RECOMMENDATIONS

The problem that is considered in this paper is by its very nature a quite complex one. Giving solutions for each and every point weren't the goal of the study. Few points nonetheless are quite clear:

- To stop the "blanket subsidy" and direct the saved money to subsidise new connections
- To provide 100% subsidy for the urban poor new connections
- To work out a plan for the wiring of the new customers using the private sector.
- To begin pilot projects using new technologies to avail electricity to urban poor communities (swer, pre-payment meters, limiters)
- To study a better legal framework to punish the customers who steal electricity. It would discourage others to try such ventures.

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## 8. AUTHORS

**Principal Author: Izael Pereira Da Silva** holds a PhD in Power Systems from the University of Sao Paulo (Brazil).

At present is a lecturer at Makerere University and is working in projects related with Renewable Energy and Energy Policies. His address is:

P. O Box 21706 Kampala Uganda
Tel. 256-41-540415
Mobile 256-77-505792
Email: bugala@afsat.com

**Co-Author: Ms. Joan Kyokutamba is a soicial scientist and** holds a Bachelor of Arts degree in Education. She holds also a Diploma in human resource management She is currently a senior administration officer in UEB (Uganda Electricity Board) Owen Falls Station, and is responsible for the day-to-day duties of the personnel office. Ms. Kyokutamba has authored and co-authored several publications on Uganda's Power Sector. She is currently a principal researcher with AFREPRENS's Energy Services for the Urban Poor Team Group.

P. O Box 7059
Kampala Uganda
Tel. 256-41-254071
Mobile 256-71-620696
Email: kyokutamba@ueb.co.ug