Dissemination of Free Basic Electricity in Rural Settlements

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Abstract— This paper evaluates the implementation of the Free Basic Electricity (FBE) programme in the needy South African households. A total of 5 governmental sites were used to assess the implementation of the FBE program; while 165 households were surveyed from 2016-2017 to determine the dissemination and use of FBE. The desktop survey revealed that approximately 1.8 million poor South Africans have access to FBE. Furthermore, tariff relief sets at 50 kWh based on 2001 household energy survey was found to differ per implementing agency, ranging from 20 kWh - 100 kWh. However, no data was available regarding the total number of South African who are energy poor. The survey found that 18% of households are employed, while 82% is unemployed and mainly depend on social grants. Majority of the households cannot afford electricity for cooking and heating, consequently spend over 14% of their income on energy budget which include a mixture of clean and dirty fuels such as wood, coal and paraffin. A total of 15 (9%) households are beneficiaries of FBE; while 91% indicated that they do not know about the tariff relief. Findings from this study suggest the need for an improved public communication strategy, especially in rural areas. It can be recommended that the 50-kWh tariff relief be reviewed to qualify the current household energy needs. Furthermore, enhanced community engagement is recommended in rural settlements to improve clean energy adoption strategies, either energy efficiency or FBE utilization.

***Index Terms*— FBE, rural settlement, tariff relief**

1 INTRODUCTION

Energy is an essential component of economic growth and South Africa's long-term development and competitiveness is fundamentally dependent on reliable access to clean energy services. Literature has documented that South Africa's clean programme including electrification is remarkable by most measures. Prior to 1990, less than a third of the population had access to electricity. To date, more than 87% of the South African population has access to grid in electricity [1], [2], [3]. However, it is arguable that access to electricity does not mean switch to electricity for household's activities. Many households burn wood, coal, animal dung, kerosene and candles for cooking, heating and illumination. Electricity is mainly used for entertainment and refrigeration [4], [5], [6]. The question though remains: "can households in South Africa afford to depend on electricity for all their main energy tasks (cooking, heating, illumination and entertainment)?"

As part of its election manifesto through the local government elections of 2000, the African National Congress (ANC), made promises to provide free basic services including free basic electricity to all poor South Africans. The aim of this provision was to bridge the gap between energy inequalities and socio-economics of indigenous households [7]. This paper evaluates the implementation of the FBE programme with its the stated aim of achieving access for all households to electricity. In addition, the paper reflects on the implementation of the programme in Louiville.

2 DATA

This paper employs two types of methods. The first method is concerned with a systematic review of literature on the progress of the FBE programme from the time of its introduction to current. Data was collected from five governmental sites and complemented with bibliographical references from the materials found on the site. The findings from the review answer two questions: 1) how many people have access to free basic electricity in South Africa? 2) Does the current FBE tariff qualify households' energy needs?

In addition, the remaining data was collected using a questionnaire. The questionnaire was adopted from the world bank comprehensive living standards surveys [8], [9] and the Sustainable Energy Technology and Research (SeTAR) Centre energy use scenarios questionnaires [10]. A total of 165 households were surveyed from 2016 to 2017 in Louiville, a rural community located in Louiville, in Mpumalanga province, South Africa.

3 RESULTS AND DISCUSSION

In this section results from literature search is presented using five government sites.

3.1 Overview of the FBE programme

Access to basic services including water and sanitation, as well as clean energy not only a human right but is believed to improve individual's health and reduce the burdens of diseases associated with dirty fuel use [20], [21], [22], [23]. As part of the United Nations, the South African government has long strived to provide people with basic services, with electricity and alternative clean energy being at the centre of

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its agendas for the past two decades. In 2000, the government committed to provide indigent households with free basic electricity [12], [13]. The provision of the FBE aimed at ensuring that poor households have access to basic energy for cooking, illumination and heating. However, for areas where access to grid electricity is limited, paraffin tax was removed making this energy source affordable for households [24]. The FBE is a limited "free amount" of electricity supplied to the user and deemed necessary to support basic energy services of a typical poor household as determined by Government from time to time. At the time of the first rollout, qualifying households received a maximum 50-kWh unit of FBE and this amount was estimated to be enough to facilitate access to lighting, water heating, basic ironing, electronic media services as well as cooking services [12], [13]. This section analyses the FBE programme from the time of its dissemination to current, the success of the programme, its perceptions by households as well as current challenges for continuous success.

3.2 FBE token accessed

During the financial year 2014/2015, Eskom configured a total of 1 177 250 as beneficiaries of FBE. However, only 911 075 customers actually collected their token. This suggest that a total of 23% of the configured number did not collect their tokens [24]. Meanwhile, from the literature search it is not mentioned as to why customers did not collect their tokens. Furthermore, the FBE tariff relief is not clear regarding the implementation mechanisms. This raises lots of questions. Maybe shall we follow up to find out why tokens were not collected?

3.3 FBE implementation at Ekurhuleni Metropolitan Municipality

At Ekurhuleni metropolitan municipality the FBE token was set uniformly at 100 kWh for households who meet the EMM criterion. The qualifying criteria is subjected to a 12 months energy consumption average of below 450 kWh. Furthermore, the joint income level for a household must be less than 11 500 per month. In addition the policy allows people who are physically challenged, mentally disturbed and pensioners to benefit from the scheme [25].

3.4 FBE implementation at EThekwini Metropolitan Municipality

At EThekwini metropolitan municipality the FBE token is raised from 50 kWh to 65 kWh. However, the qualifying criteria is a minimum income of R2 700, household must use less than 150 kWh a month and must be at prepaid meter plan. For household to access the FBE token they must first recharge and automatically the token will be activated. The recharge unit fees in the 150 kWh range is purchased at 94.14 c/kWh. However, should a household utilize over 150 kWh in a month the next recharge purchase fees rises to 131.47 kWh. This imply that households are liable for an additional 28% penalty for each unit utilised above 150 kWh set average [26].

3.5 FBE implementation at City of Cape Town [COT] Metropolitan Municipality

The City of Cape Town uses two categories of FBE subsidy termed lifeline tariff electricity, which further subdivided in to two sub-categories per monthly average energy consumption (350 kWh and 450 kWh). For households termed low income dwellings with property value of less than 400 000 or less than 4000 and 6000 rand income status; a 60 kWh and 25 kWh of free token will be given respectively. Similarly to EMM and EThekwini, COCT requires households to be on metered tariff plan. However, for senior citizens above 60 years old and a combined income of less than R15 000 they can access the token without being on prepaid meter [27].

3.6 FBE implementation at Ehlanzeni District Municipality [EDM]

A thorough literature search, couple with telephonic inquiries found that EDM has not yet established their own electricity tariff relief. However, the municipality have entered in to agreement with Eskom who allocate tokens to individual households which qualifies for the tariff relief [24].

3.7 Literature results discussion

Results from literature concur with previous studies suggesting that allocation of 50 kWh per month is insufficient to address energy expenses especially in low income households. It was also found that each municipality has their own tariff plan which brings about lot of questions as which model must be adopted should one need to address energy inequalities in South Africa.

4 Results and Discussion

In this section we are presenting results from energy use scenarios survey at Louiville, Mpumalanga.

4.1 Basic demographics

The study population consisted of 165 households. Of the 165 surveyed households, 18% (*n*= 30) have got access to formal employment, while 82% (*n*= 135) do not have access to employment. The latter are dependent on various forms of social grants to complement their household's needs. For households with access to employment, the average monthly salaries range between R1200 to R6000.

4.2 FBE distribution and household's energy needs in Louiville

To determine the dissemination of the FBE programme in Louiville, households were asked three questions:

1. *Do you know about the free basic electricity?*
2. *How much do you spend monthly on energy?*
3. *Do you receive free basic electricity subsidy?*
4. *If the response to the last question is yes, the households was asked to provide the amount in kWh of the electricity they receive.*
5. *What other energy sources do you use* and for what activity?

In general, over 70% (*n*= 115) of the households are connected to grid electricity. However, the findings on the FBE programme revealed that 91% (*n*= 150) of surveyed households are not aware of the tariff relief. Furthermore, the total number of households who are beneficiaries of the FBE tariff is 15 (9%). A study conducted by [11], revealed that over 84% of households in Louiville spend more than 14% of their income on monthly energy budget to acquire electricity. According to the Department of Energy, when a household spend over 10% of their income to acquire energy services, such household is energy poor. The tariff qualification criteria

as set by the (DoE), indicate that a total of 84% of households shall benefit from the tariff relief.

Furthermore, [11] also argued that with the current energy tariffs of R1.25 for indigent South African households, a household would spend R450 optimally while using appliances such as heater for an optimal 2 hours in a day. If this argument was to be put into context, it would simply mean that a single household would need an additional R149 to cover their energy needs using electricity only. Moreover, putting into context that the FBE beneficiaries only receive 50-kWh units of electricity, which equates to R62.5, relative to R84.5 needed to cover their energy needs.

However, because of incapacity to cover their basic energy needs coupled with high rates of unemployment in the area, Louiville households use various types of traditional fuels to complement their daily energy tasks (see table 1). The most frequent types of fuels include: wood, coal, candles and gas. Over 97% (n= 160) of households use woodfire for cooking, while another 95% (n= 157) rely on this fuel for household heating. In terms of illumination, candles are primary fuels, especially in households with no access to electricity, while coal and gas are occasional energy supplements in some of the households.

Table I. Energy choices for cooking, heating and lightning (n=165).

Fuel type	**Household tasks**		
	Cooking	**Heating**	**Lighting**
Electricity	5 (4%)	8 (7%)	115 (70%)
Wood	160	157	0
Coal	75 (45%)	75 (45%)	0
Gas	23 (14%)	5 (3%)	0
Paraffin	63 (38%)	7 (4%)	3 (2%)
Candles	0	0	50 (30.3%)

The findings of this study are similar in principle with the study by Adam [15]. Adam argued that current households needs far more what the first FBE policy presented in 2001m survey. With increasing number of people in households, and continuous monetary inflations, it is believed that modern South African poor households would need four times the proposed relief tariff to qualify their daily energy requirements in terms of cooking, heating, lightning only [15], [18].

In this study, it is argued to meet current energy demands in rural households, measures to increase the relief tariff are needed. Such measures include topping the current 50kWh units of electricity given to a household with an additional 67.5kWh. This amount was calculated using the current cost per unit (R1.25) for indigenous households. It was argued 50kWh of electricity is equivalent to R62.5. Therefore, the additional 62.5kWh of electricity is equivalent to R84.5.

Furthermore, Ruiters [16], Ballantyne [17] revealed many challenges and contradictions of the FBE programme communication and dissemination, especially in poor households. Regarding contradictions, it was reported that households are expecting a free cover of full energy needs by government, not merely a percentage thereof. Similarly, the review findings presented an argument likened to the above. There is a high level of inconsistency in terms of how the programme was communicated to the beneficiaries and their expectations. In many surveys conducted on the dissemination of the FBE and its setbacks, respondents reported that they expect a full coverage of their electricity as per governmental promise [18], [19].

5 CONCLUSIONS AND POLICY IMPLICATIONS

This paper evaluated the dissemination the extent of the dissemination of the FBE in poor South African households. The results showed a limited access to FBE for households in Louiville and high number of households who are not aware of the tariff relief programme. Findings from the study suggest the need for an improved public communication notification strategy, especially in rural areas. This could be achieved through enhanced community engagement with concerned stakeholders.

Furthermore, with view of current household's energy needs, it is recommended that the current 50-kWh tariff relief be reviewed to meet the current household energy needs. In addition, clean energy adoption strategies, either through energy efficiency or sustainable FBE dissemination and utilization are needed in order to increase access to clean energy for rural households.

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