Exploring the driving factor on prepaid electricity meter rejecting the largest township of South Africa

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Abstract

Technology rejection phenomenon manifests itself differently across different societies. Over the past two decades, low income households in Soweto have persistently rejected prepaid electricity meters. Until now, the basis of the rejection in the region remains scientifically underexplored. We therefore conduct an exploratory study of pertaining prepaid meter rejection in Soweto. Through triangulation research and survey approach, 88 households based in Orlando East and Diepkloof were interviewed by means of a questionnaire. Our findings show that three aspects contributing to this phenomenon, namely: lack of quality consultation and education, the high levels of electricity consumption, and unattainable politically motivated promises are the main reasons that currently fuel prepaid meter rejection. We emphasise that the current state of the Free Basic Electricity (FBE) (2003) policy also fuels rejection, as it remains socio-economically inadequate and irrelevant for indigent households. We therefore note the need for an FBE policy review and update as well as the establishment of a policy monitoring committee to ensure implementation and enforcement.

Key words: Electricity consumption; Education; Prepaid electricity meter; Technology acceptance and rejection; Policy; Politics

1 Introduction

Technology acceptance can be defined as the willingness of certain individuals or groups of individuals to accept or adopt a newly introduced technology to their communities (Louho *et al.*, 2006), and this willingness is a critical factor determining the success or failure of the technology (Samaradiwakara and Gunawardena, 2014). Technology rejection, on the other hand, is characterized by certain individuals or groups of individuals deliberately choosing to refrain from utilising a particular technology newly introduced to the communities (Murthy and Mani, 2013). Technology rejection is not just a negation of technology acceptance, but rather a distinct concept with its own complexity (Murthy and Mani, 2013). How could both concepts be explained?

An important body of literature has investigated this question (e.g. MacKenzi and Wajcman, 1999; O'Neil, 2002; Vanclay, 2003; Louho *et al.*, 2006; Murthy and Mani, 2013; Samaradiwakara and Gunawardena, 2014). For example, MacKenzi and Wajcman (1999) pointed out that a new technology that facilitates social existence is *a priori* set to be accepted. Also, social needs shape the design and use of a new technology which, in turn, influences social life experiences (O'Neil, 2002; Murthy and Mani, 2013). It is therefore apparent that the social benefits of the technology may well determine its acceptance or rejection. Social benefits are changes to people's way of life, culture, community, health and well-being, fears and aspirations (Vanclay, 2003). Important indicators of social acceptance of a technology include knowledge/education (what does the public know), perception (what does the public think), and fear (what does the public feel) (Assefa and Frostell, 2007). When a technology is accepted, its impact on communities can be considered *a priori* effective and positive (Assefa and Frostell, 2007). In contrast, when a technology is rejected, the implications in terms of wasted investment, money, brain and time to design it, are enormous and ill-afforded especially in the developing world. Therefore, it becomes urgent to understand why a technology is rejected in order to make informed decisions on strategies of technology deployment and social acceptance in the future.

From this perspective, indicated that there are rejection-centric factors often associated with social realities. The characteristics of the technology are critical, and these include *Technological complexity* (the extent to which a technology is perceived to be relatively difficult to understand and use), *Technological fatigue* (this involves factors inducing technology fatigue in well-informed, educated and capable users), *Level of flexibility* (the user accepts the technology in ways that appeal to their personal/habituation/conversance), *Altering user-base* and *Switching cost and loss aversion* (the change a technology requires of its adopters and the perceived risks of uncertain results could lead to rejection). In addition, the response of local communities to a new technology can be context specific, driven entirely by the characteristics of the communities itself (endogenous factors) rather than exogenous factors. These endogenous factors include: i) the social group at hand (who rejects the technology), ii) how does the group differ from other social groups (who accepts the technology), iii)

how large is this social group, iv) where is the group located within the structures of society (Baur, 1995).

Evidence of context specificity of the responses of communities to new technology has been provided in various studies across the globe. Yuan *et al.* (2011), for example, in their study on the factors driving the acceptance of solar photovoltaic (PV) and solar water heaters (SWH) technologies by households in the Jinan city of China, have identified a number of factors that correlate with people's responses: the lack of awareness or education, the level of household income, age, high capital cost, and technological complexity. In another study, variables such as perception, level of awareness, relative advantage of the technology, moral norms, and consumer attitude, were identified as factors influencing the use of renewable energy in Iran (Rezaei and Ghofranfarid, 2018). In the Northern India, it was rather the cost of sustainable energy, inequality in access to energy, and the role of both public and private businesses that were reported to influence people's acceptance of off-grid solar power (Aklin *et al.* 2018). More importantly, Aklin *et al*. argued that residents are concerned about the inequality that comes with the introduction of solar power technology in villages – its cost remains expensive than conventional grid power. In Columbia, however, socio-political issues such as the lack of political willingness, supportive and restrictive policies, as well as their political stability, were identified as influencing the acceptance and use of technology of renewable energy (Rosso-Ceron and Kafarov 2015). Socio-political factors alongside social perception were also reported as dictating the acceptance or rejection of renewable energy technology in an early study (Wustenhagen *et al.* 2007). In Malaysia, however, the cost of the technology (solar panel), in addition to misleading information provided by the government were reported as explaining the rejection of the renewable energy technology by local communities (Solangi *et al.* 2015).

In Africa, most countries have now introduced the technology of electricity pre-paid metering system but with mixed success. Recent studies have explained this mixed success. In Zimbabwe for instance, distrust in the new loading and digitised system accounts for people's resistance or reserve towards the prepaid meter (Vutete, 2015). In Nigeria, however, the challenges reported on people's responses to prepaid meters are more about the cost of acquiring the meter, the delays in receiving and installing

the technology and the lack of electricity services on Sunday or holidays (Makanjuola *et al.* 2015). Even in developed world, greater energy poverty has been linked to electricity prepaid meter in 48% of households using prepaid meters in New Zealand, and this was mainly attributed to higher electricity expenditure and lower income levels (O'Sullivan *et al.* 2015).

Given these various challenges in different parts of the world, an approach referred to as "targeting strategy" was used to increase the acceptance of the prepaid meter technology by communities in Uganda. This approach consists of first deploying strategically the technology within a certain target group with high level of affordability and where the technology can have a huge return on investment to the group, i.e. where the technology can be seen as highly beneficial (Mwaura, 2012). The expectation of this strategic deployment is that, if the prepaid meter is welcome and seen as highly beneficial by the selected communities, these communities will actively or passively assist in disseminating the benefits of the technology across the country, and thus increasing the probability that other communities will accept it (Mwaura, 2012). For this approach to work, Mwaura (2012) recommended that this strategy should be accompanied with capacity building and improved customers' awareness of the benefits associated with the technology. Overall, Orillza *et al.* (2014) highlighted two important variables that drive consumers' acceptance of electricity prepaid meter: i) positive user experience, and ii) consumer perceptions on ease of use, affordability, and usefulness of the technology since the lower the perceived relative advantage of the technology, the higher the level of resistance will be (Khan and Hyunwoo, 2009).

In South Africa, in the context of the recent energy crisis, the debate around unpaid electricity bills particularly in townships resurfaces. The non-payment of electricity bills is grounded in the governmental Free Basic Electricity (FBE) policy of 2003. According to the policy in its Section 4.1 (ii), which attempted to socio-economically protect poor prepaid metered households, poor households connected to the grid are freely allocated with 50 kWh on a monthly basis. The 50 kWh threshold was based on the expectation that 56% of South Africa's households consume on average less than 50 kWh per month, a threshold consumption that is theoretically sufficient to me*et al*l electrical needs, including but not limited to cooking, ironing lighting, media access, and water heating. This threshold remains debated since several studies and civil organisations such as the

Congress of South African Trade Unions (COSATU) and Soweto Electricity Crisis Committee (SECC) have proven that households consume on average 750 kWh per month and not 50 kWh (Adam, 2010; Makonese *et al*., 2012).

Nonetheless, the recent and ongoing energy crisis in the country highlighted the need to enforce the existing policy of prepaid meters technology, a technology adopted to curb the rate of unpaid electricity bills including in the townships. This technology has been largely rejected in some communities particularly in Soweto, the largest low-income township in the country. The rejection of prepaid metering is not a recent phenomenon in South Africa as this was already recorded in Tembisa and Chiawelo townships in 1993-2011 (Barchiesi, 1998; Egan and Wafer, 2004; Ruiters, 2007; van Heusden, 2010; Makonese *et al.*, 2012). If the rejection of this technology is still noted today, the implication is that we still do not fully understand communities' perspectives on the technology. It is therefore not surprising that all studies indicated above, were more interested into the challenges and factors influencing acceptance of the prepaid meter technology, while they were hardly interested into its rejection. Nowhere in South Africa has this rejection phenomenon manifested itself as palpably as in the Soweto Township where the rejection of prepaid meters dated back to more than two decades ago(Barchiesi 1998; Tewari and Shah 2003; Ruiters 2007; McDonald 2010; van Heusden 2010). Unfortunately, there has been no study that comprehensively assess the reasons behind the rejection (not just the acceptance) of electricity prepaid meter in Soweto. The present study aims to fill this gag. Specifically the present study used a unique dataset on households known to have rejected the prepaid meter in Soweto, complement this dataset with newly collected data through interviews to investigate one important question: How can we explain the persistence of prepaid meter rejection in the largest townships in South Africa? Understanding this question is important as it will guide the revision of existing policy for future decision making process towards more acceptance in the future.

2 Research Method

A mixed method (sometimes referred to as triangulation) approach was adopted for this study. The authors were given access by Eskom (South Africa's Electricity Utility) to a unique dataset on the perspectives of 253 households on electricity prepaid metering in Orlando East (OE) and Diepkloof

(DK) regions of Soweto. These household responses were initially captured by the utility during a marketing and educational prepaid meter related initiative conducted between 2015 and 2016. In this dataset, 53% (136) of households rejected prepaid meters. The captured data did not detail reasons predicating this. Our study therefore seeks to cover this gap and expand the knowledge by interviewing these households. We targeted each of the 136 respondents and managed to get a response rate of 64% (88 households).

Structured interviews were conducted in 2017, over a period of 5 months. Systematic sampling was used to select which households to interview. The aim was to consider as broad and heterogeneous a sample as possible within each of the study areas. When the technology was deployed in the past, individuals tasked to train and educate local residents were systematically allocated with households within each street section. So, our study randomly selected streets and systematically considered every third household (interval = 3) on the list of households that rejected the technology in the respective study areas. Household participation was based on willingness and availability. The identity of all participants remains anonymous throughout the study.

A structured questionnaire, with both closed and open ended questions, was designed to guide the interviews. The intention for this was to permit households to express other important information that may have otherwise been not mentioned when a structured questionnaire was designed. Households were invited to participate in the study and face-to-face interviews were conducted with willing households. This method of contact was applied because of the nature of the study and questions asked which required in-depth responses and discussions with the participants. All the interviews were conducted by one researcher and were audio-recorded. . The questionnaire was divided into 3 sections: background (covering demographic and household characteristics such as number of rooms and size), household electricity consumption (involving questions pertaining to electrical appliances used, energy efficiency, and electricity tariffs), prepaid meter rejection (considers information on education, consultation, free electricity, and reasons why the participant rejects the technology). The data questionnaires were coded by the researcher who collected the data (each participant was coded from P1 to P88) and most of the information was stored on excel spread-sheet for descriptive analysis purposes. For qualitative data analysis of the responses from interviews, content analysis research

method was applied. According to this method of analysis, common themes emerging from the interviews were identified and used to frame the findings. These themes were for example extracted from the quotations highlighted in our findings. The selected quotations used serve as best examples representing each common theme identified.

3 Results

3.1 Profile of respondents

Tables 1 and 2 show that 52.2% (46) of the respondents were female and 47.7% (42) male. This is generally the situation in South Africa at large, where there are more (50%) females than males (49.5%). More than 62% (55) of the participants were ≥34 (ages) and 37.5% (33) were between 26 and 33 years old. Close to 80% of the interviewees either completed high school education or possess a university or college qualification. In contrast, approximately 20% (18) of the participants had no school education. In relation to household characteristics, all household structures had between 4 and 7 rooms. This is reflective of the typical household 'match-box' structures built in the Apartheid period with only 4 rooms (i.e. kitchen, two bedrooms, and dining room). Home owners have with time expanded the physical structures, which explains why some houses had 7 rooms. Most respondents were part of a household size with 3 to 6 persons. The average household size in the country is 3.3. About 48.8% (43) of the households had at least one person employed; the remaining 51.1% (45) of the participants indicated to be unemployed. About 65.9% (58) of the households indicated that they were proving space for renting in backyard rooms or shacks in their premises (Table 2). The renters sourced electricity from the main house in the premise.

3.2 Factors influencing prepaid meter rejection in Soweto

Inadequate community engagement and sensitisation

According to Table 3, approximately 56% (50) of the households were not consulted on the deployment of prepaid meters and received no education on how to use the technology. Among the 43.1% (38) respondents who were consulted and educated on the technology, 71.0% (28) rated the quality of consultation and education as poor. Only 28.9% (11) participants rated it as good. Furthermore, when all participants that had been consulted were asked about how many times were

you consulted or trained on the use and benefits of prepaid meters, they indicated that they had only been consulted or trained once. Above that, the duration of the consultations per household lasted only 15 minutes (maximum), and no information booklet on the technology and how to optimally benefit from it was received by the respondents.

One household highlighted that "if the programme roll-out was done properly (with consultations and regular meetings), then people would have been happy with the technology" ($P_{24}Q_1$)[1]. In one of the interviews conducted, a participant echoed the following: ($P_{71}Q_2$) "When the prepaid meter was installed I was not consulted, I was forced to install it because my electricity was arbitrarily cut-off. I was then told that I will only get supply after installing a prepaid meter". Another view of a pensioner that summarises further the problems raised during the interview is as follow: ($P_{04}Q_3$) "I used to pay my bills every month and used my electricity sparingly. I do not understand why I was forced to install a prepaid meter. We were not asked to install it, but told that we should install or else we will face disconnection. I am old now and do not know how to use this device".

Untenable political promises

The results regarding free electricity show that a majority of households do not believe in (the promise of) free electricity. When participants were asked: *what do you think about the historical (African National Congress (ANC)) promise of free electricity to households*, it emerged that they consistently identified this as a myth and unattainable. About 56% (49) of the participants echoed that free electricity is impractical. The following response from one household is very illustrative of this general view: ($P_{11}Q_4$) "The promise was a blunder on the part of politicians. There is no such thing as free electricity. If politicians were honest from the onset, it might have made things better for the poor households. It is a pity that these very same households are now being made responsible for this illusion". When asked about household entitlement to free electricity, again a majority (62%) of households perceived that as impossible.

In contrast, approximately 44%[2] (39) of households maintain that the promise should be kept and materialised because of socio-economic problems experienced in the townships (e.g. high

[1] Participant $_{(x)}$ Quotation $_{(y)}$

[2] In relation to the 56% of households that saw it as impractical

unemployment and poverty rates). Other households expressed their experiences with the Free Basic Electricity (FBE) incentive, stating that "the process of applying for FBE is long" and "it [50 kWh] does not even begin to help meet our household needs" ($P_{47}Q_5$).

Huge expenditures on electricity

Participants echoed that they spend more on electricity with prepaid meters than under conventional meters. Results on household responses to the question pertaining to electricity expenditure with prepaid meter were as follows: more than 56% of participants stated that their electricity expenditure had increased; 20.4% (18) households indicated that there has been no increase whereas 22.7% do not know whether it had increased or not. One household highlighted that "the consumption rate with these new meters is too much, so Eskom needs to reduce the rate of system electricity consumption" ($P_{57}Q_6$).

Furthermore, households largely raised issues of trust against the costing system. This is well illustrated in the following response provided by one of our respondents: "the whole system is fraud and criminal"; "they [prepaid meters] are not properly designed…they must design a system that will be conducive for our situation. And let them be transparent in all the dealings" ($P_{81}Q_7$). In another case, one participant pointed out that "As a pensioner I am not surviving because of the recent increasing usage and cost of electricity" ($P_{37}Q_8$). Households further specified that, even when exercising different energy conservation tips, they still pay exorbitant electricity amounts. Through several interviews conducted, it emerged that most households, on a monthly basis, spend around R900 and R1500. Additionally, when households were asked about their knowledge of the Inclined Block Tariff (IBT[3]), which largely determines the cost of electricity unit paid per month, none knew about it. Lastly, when the interviewees were asked: *Has government provided any form of assistance for saving your prepaid meter electricity; When purchasing household electrical appliances, do you consider whether they are energy efficient,* all participants responded that they had not.

Negative household perceptions

[3] Electricity price placed in several ascending blocks. The lowest price being in the first block. As the customer purchases more electricity in the month, the electricity unit price will eventually fall in block two which is more expensive. The unit price ascends per purchase (per block).

Our survey also shows that the perceptions of households of certain aspects related to prepaid meters have an influence on how they ultimately respond to the introduction of the technology. These aspects include: affordability; increase or reduction of electricity consumption and cost; encouraging people to pay for electricity; electricity debt; budgeting and savings; monitoring of electricity consumption. A large majority (79.5%) of respondents perceive the cost of prepaid meter electricity as expensive and unreasonable for indigent households. Furthermore, 69.3% (61) of households do, however, see the technology as a means of reducing unnecessary electricity consumption and enabling electricity savings. About 56.8% believe that while the technology assists in paying for electricity, it also increases electricity use and cost. Approximately 42.0% indicated that it helps with budgeting and savings. Only about 31.8% stated that they perceived the system as device for monitoring electricity consumption. All households interviewed indicated that they were forced to install the technology to avoid cut-off.

4 Discussion

In view of the results, it is apparent that the nature of technology acceptance and rejection phenomenon in Soweto is unique. How so? In the present study, we investigated this question, and found three types of contributory factors explaining the rejection patterns.

The first is the lack of consultation and education of residents about the technology. This is a well acknowledged determinant factor in technology acceptance or rejection (Yuan *et al.*, 2011; Vanclay, 2003; Assefa and Frostell, 2007; Mwaura, 2012; Rezaei and Ghofranfarid, 2018). We acknowledge this as one of the main prepaid meter rejection-centric factor (Baur, 1995). Our analysis reveals that a majority (56.8%) of the households rejecting prepaid meters had not been consulted or educated about the technology. Additionally, even among those who were consulted and educated, 71.0% deemed the quality of education received as poor. This finding on poor consultation and education, not only questions Eskom's marketing strategy of the technology, but also its insistence that consultations were properly undertaken and that adequate education was provided to all households[i] (SABC, 2016). Three possible reasons may underline the lack of proper consultation and education: i) households have been absent for consultation and education, ii) when present, because of the poor training given

by former Eskom agents, the education turns to be inadequate for households to optimally realise the benefits of the technology; and iii) Eskom provided no training/education/consultation whatsoever. The first two options are most likely because there is evidence disqualifying the third – it has been confirmed from the series of interviews that we conducted that some trainings took place. The fact that some residents still raise the lack of training as a reason to reject the technology implies that Eskom did not cover all households during their education/training/consultation campaigns.

In spite of the finding alluding to the lack or poor consultation and education, from statements such as those under Q1, there is willingness amongst households to embrace the technology, and there is too an opportunity for Eskom and households to invent or developing an appropriate strategy, perhaps similar to the Uganda's targeting strategy (Mwaura 2012) featuring *inter alia* how quality consultations and education for all can be ensured. Among a diversity of factors that need to be considered in this strategy, is how the elderly people are consulted and educated about the technology. As has been noted in our results, 62.5% of the households are older than 34 years (*de facto* a significant proportion of interactions undertaken during our interviews were with persons 60 years and older). We attribute this to the fact that the interviews were conducted during the day when the youth is at work. Similarly, during the consultations and education campaigns, the elderly may be largely found to be the ones at home. In that case, the risk of rejection is obviously high as it will be difficult to change the belief and behaviours of elderly people. Other aspects that need to be factored in the strategy, is the role of energy efficiency and IBT. We argue in line with several other authors (Colton 2001; O'Sullivan *et al.* 2011, 2014, 2015; Darby 2012; King 2012) that lower household energy efficiency levels under prepaid meters lead to entrenched energy poverty.

The FBE policy has acknowledged the importance of deploying and using energy efficiency interventions for local residents to realise the benefits of prepaid electricity meters. However, in the past 15 years little has been done to improve low-income household energy efficiency. Our results show that there is a lack of policy implementation, as we found that none of the households had received assistance from government on becoming energy efficient. Additionally, none considered energy efficient appliances when purchasing appliances. This may be because these appliances remain

unaffordable in the market. We therefore firstly recommend that there be a price adjustment of energy efficient electrical appliances to encourage indigent households to participate in the urgent need of the country to save and use sustainably electricity. Secondly, before and during the deployment of the prepaid meter technology, Eskom has to extensively (through various mediums) educate households on energy efficiency and conservation of electricity. Solangi *et al.* (2015) pointed out that government incentives can improve technology acceptance. Similarly, for our study we recommend that energy efficiency incentives be designed for indigent prepaid metered households.

The second factor for rejection is the electricity cost under prepaid meters. In Northern India, cost was an important acceptance factor for solar power (Aklin *et al.*, 2018). Approximately 56% of households involved in the present study indicated that, since the installation of prepaid meters, the level of expenditure on electricity had increased in an unaffordable manner. Moreover, 58% of households did not perceive the technology as ushering improved budgeting and savings. In contrast, the study by Faruqui *et al.* (2010) reflected that direct feedback by smart prepaid technology leads to reduced electricity expenditure because households use electricity efficiently. Interestingly, we found that some households are already applying energy saving tips although they also indicated that they pay more than they expected. We explain this through the *cause-effect system*. The first *cause* for high electricity expenditure under prepaid meters is the already-mentioned poor consultation, training, and education. How much one spends on prepaid electricity in a month fundamentally depends on the IBT system. Our findings show that none of the participants knew about this costing system. This, *inter alia* confirms the above finding that consultations or education provided to households was of poor quality.

Indeed, the lack of education is the first reason justifying people's perception that prepaid metering leads to increased electricity costs. This is incongruent to what Faruqui *et al.* (2010) ascertained, that prepaid meter direct feedback elicits reduced electricity. The real reason for increased electricity consumption that the community ignores is the escalating cost of electricity tariffs – which have increased by close to 400% between 2007 and 2017 (Deloitte, 2017). We infer, as Aklin *et al.* (2018) argue, that such an increase in electricity tariffs will deepen societal energy poverty, particularly with regard to access to sustainable electricity. Again, Solangi *et al.* (2015) noted that expensive solar

technology compelled households in Malaysia to opt for fuel generated electricity. For our study, escalating electricity costs are inevitable, therefore households currently remain without other options but to use prepaid meters, which may ultimately socio-economically marginalise them. As aforementioned, the introduction of energy efficiency incentives is an example of a mechanism that may assist in easing the problem of rising electricity costs under prepaid meters.

Our study further acknowledges the role of increasing electricity tariffs and therefore does not downplay the role of affordability in technology rejection. But we question the reliability of household claims that prepaid meters are the cause of increased electricity consumption or cost (Q6). These claims remain unfounded as no empirical knowledge has alluded to the fact that different prepaid meter devices (or even post meter) have an influence on final household electricity consumption rates. The recording system of electricity are mainly reliant on the rate of electricity consumed – logically and ideally the system cannot influence the consumption recordings. However, future research may study the relationship between these two; that is the rate of electricity consumption with different household prepaid meter technologies from keypad to current meters.

Another *cause* of the perceived high consumption due to prepaid meters is linked to the aspect of renting. About 65.9% (58) households acknowledged that they were providing space for renting in backyard rooms or shacks within their premises. This may be an overlooked reason for high electricity costs simply because there is no monitoring of electricity consumption by all parties within the premises. Without a full consideration of these two factors (i.e. renting and increasing tariffs) by the utility and households, the technology may further socio-economically marginalise households in the township. For example, the implication of increasing electricity costs may result in higher rates of disconnection per month, and therefore affecting energy-vulnerable or impoverished households.

The last factor identified in this study is linked to politics. Wustenhagen *et al.* (2007) and Rosso-Ceron and Kafarov (2015) have acknowledged the important role of politics in encouraging technology acceptance. Styan's (2015) has pointed out that Soweto's livelihood hinges on a political fabric of entitlement to free electricity. This view is very well debatable. First, our results cast doubt upon this assertion, as 55.6% (49) households (also Q4) acknowledging themselves that free electricity is impractical, an illusion, and unattainable. This is yet another indication that there is

willingness among households to pay for electricity. With the 44.3% (39) households maintaining that free electricity should be made available, we believe that the basis provided for this call remains plausible. Until now, although the ANC (ruling political party) has desisted from talking about free electricity, it is yet to rescind its promise of free electricity to Sowetans – hence households persistently believe in it (Styan, 2015). Styan has argued that Soweto is a politicised area, with an electorate that identifies itself with the African National Congress (ANC). In the 1970s households formed a defiance campaign against the apartheid regime, refusing to pay for electricity services. As a way of gaining political support, the ANC promised residents free electricity. With this, the ANC managed to win the elections in 1994, replacing the National Party. The promise of free electricity was maintained even under the democratic rule. For instance, during the ANC election campaign in 2000, the theme of free electricity was at the core of the party's manifesto. Sunday Times (2015) writes that:

> There seemed to be "an unofficial strategy" of government agencies and local authorities to look "the other way when certain communities [like Soweto] are not paying. The unwritten criteria seem to be that the communities [like Soweto] that are in the voting camp of the ANC are usually not given a hard time when it comes to non-payment of… electricity.

Based on this, households therefore have the right to protest and reject any policy that requires them to pay (i.e. prepaid meter programme; FBE policy). Moreover, the call for free electricity is socio-economically justified, as the majority of households are broadly characterised by high unemployment rate and poverty. In saying this we equally acknowledge that the government cannot afford free electricity for households. However, mechanisms for indigent households, under the prepaid meter programme, should be expanded beyond the FBE instrument. When assuming that free electricity is a possibility, other questions pertaining to household electricity management and responsibility may need to be addressed, especially in the light of recent load-shedding incidences.

Our results further showed that while close to 80% of the respondents either completed high school education or have a university or college qualification, and 51.1% are unemployed. With the

increasing electricity tariffs, prepaid meters are bound to become unaffordable for most households as a consequence of high unemployment rate which will lead to high rate of unpaid electricity bills. The initial purpose of prepaid meter deployed in South Africa is to curb non-payment of electricity bills. We consequently ask: why is the technology imposed even upon loyal paying households? The current approach of imposing or forcing households to install prepaid meters, history has evidenced, may ultimately result in societal civil unrest and not the desired socio-economic positive results. In addition, the merits of the rejection of prepaid meters are largely related to the socio-economic fabric of the township. Next, households spend between R900 – R1 500 (approximately US$65.79 - US$109.65)[4] on electricity every month (also consider Q5). Moreover, the FBE policy only allocate 50 kWh free consumption, which is 6% of average electricity consumed (750 kWh) monthly consumed by households (Adam, 2010; Makonese *et al.*, 2012). In relation to the above, we ergo assert as previous studies have, that the FBE allocation incentive is immaterial and inadequate for low income households (Ruiters, 2007; McDonald, 2010; Makonese *et al.*, 2012). There is therefore a need to review the FBE policy, as it remains socio-economically irrelevant to low income households. Additionally, there is a need to establish a committee solely responsible for monitoring implementation of this policy mechanism.

Lastly, the government can influence how households respond to technology in terms of acceptance and adoption (Aklin *et al.*, 20150). In the acknowledgement of the causal relationship between politics and prepaid meter rejection, we propose that the current government needs to devise a capacity building initiative that specifically aims to educate the populace on the importance of paying for electricity service. This will *inter alia* ensure that the historical and politically-motivated promise of free electricity is addressed and reversed. We see this incentive as an important determinant in a transition towards the acceptance of prepaid meter technology.

5 Conclusion and policy implications

In conclusion, to erode the rejection phenomenon, the current prepaid meter programme needs to be characterised by flexibility and adaptability to the socio-economically heterogeneous society of South

[4] Using exchange rate of $1=R13.68 – 18 June 2018

Africa. Soweto has been faced with a two decade-long phenomenon of prepaid electricity meter rejection. Through a series of interviews with 88 households from Orlando East (OE) and Diepkloof (DK), this study unveiled important elements contributing to the rejection phenomenon. We conclude that the lack of adequate and quality consultation and education stands out as an important factor explaining the rejection. Moreover, we recommend that, in an effort to reverse this, a targeting and capacity building strategy needs to be developed. This strategy is to *inter alia* focus on how the elderly will be effectively educated on the use of the technology, on energy efficiency, and on IBT system. We also conclude that household rejection based on the belief that prepaid meters that have engendered increased huge expenditures on electricity can be explained through a cause-effect system. We attribute the *effect* of increased expenditures to: poor education (particularly on the IBT system), rental in backyard rooms or shacks in premises, and poor monitoring of electricity usage by parties renting within the premises. The study notes that unattainable politically motivated promises have an influence on household rejecting the technology.

In association with the findings presented, the following policy implications and suggestions are equally recognised. Firstly, the FBE related free monthly allocation (50 kWh) to indigent households is insufficient to meet the basic households needs and unrealistic as recent studies (Adam, 2010; Makonese *et al.*, 2012) have shown – households consume about 750 kWh per month. An FBE policy review and update is required, wherein a socio-economic reflective allocation will be determined and used. Secondly, while the FBE policy acknowledges the importance of household energy efficiency in realising optimum prepaid meter benefits, our results show that households remain energy inefficient and little has been done by government to assist in this regard. To overturn this policy shortcoming, it is recommended that there be: 1) a formulation of an FBE monitoring committee, whose role will be to ensure and expedite the process of policy implementation and enforcement; 2) an energy efficiency centred education campaign, designed to benefit indigent households; 3) adjustments in energy efficient electrical appliances, affordable for poor households. In the quest for improved policy designing and decision-making, a consideration of the foregoing is considered as an important step towards ensuring improved prepaid meter acceptance in townships, such as Soweto.

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