

# **Domestic Electricity Provision in the Democratic South Africa**

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## **1 Introduction**

South Africa has an installed electricity generation capacity of some 40 000 MW, with an extended national grid spanning some 281 000 km of high voltage transmission and distribution lines (DME, 2002). The maximum demand for the winter of 1999 amounted to just over 27 800 MW, leaving South Africa with a substantial excess generation capacity. At the same time the country boasts the second lowest unit price of electricity in the world at 12.29 c/kWh [1998 Rand value] (DME, 2002). Yet, when the new democratic government came into power in 1994, millions of South Africans were without access to electricity.

Under the apartheid government, prior to 1994, government policies were geared at serving the needs of the minority white population group. Energy policies, including electricity provision, focused on ensuring sufficient supply for the mining, chemical and agricultural industries, which formed the backbone of the South African economy. Due to the UN-led oil embargo energy policies were shaped by the objective of becoming energy self-sufficient, leading to large, often uneconomic investments in synthetic fuel plants and in the nuclear fuels chain (DME, 1998), leaving little financial resources for improving household access to electricity.

Thus, in terms of domestic access to electricity there was (and still is) a huge discrepancy between population groups and areas. The vast majority of people without electricity are black South Africans and electrification levels in rural areas generally fall short of the ones in urban areas. In both rural and urban areas, the poorest people are most likely to be the ones without access to electricity.

Against this background the newly elected democratic government initiated a large scale electrification programme with the objective of improving access to electricity for the poor and ultimately providing access to electricity for all South Africans. The electrification programme is complemented by further policies directed at improving electricity availability for the poor, such as the Free Basic Electricity (FBE) policy, as a result of which households receive a minimum amount of 50 kW/h of electricity per month for free. At the same time, a substantive restructuring of the electricity supply

and distribution industry is on the way, with the goal to make the industry more efficient in order to ensure that growing industrial and domestic electricity demands can be met in the future.

This paper analyses the ongoing implementation of the electricity sector policy reforms in South Africa with a specific emphasis on domestic electricity provision for the poor.

## 2 Background - sources of energy and consumption by sectors

South Africa's energy supply system is largely based on the country's abundant coal reserves. Coal plays an important role for the country's synthetic fuel production (the conversion of coal to synthetic fuels) and coal is by far the most important energy source for electricity generation.

In 1999, 69 % of South Africa's total primary energy supply stemmed from coal, with crude oil accounting for 22 % and the rest being made up by nuclear energy (3 %), gas (1 %) and renewables (solar, wind) and waste (5 %). As far as energy sources for electricity generation are concerned, the importance of coal as a primary energy source is even more predominant. In 2001 93 % of electricity in South Africa was generated from coal, with nuclear energy and hydropower accounting for the remaining 7 % (see Figure 1).

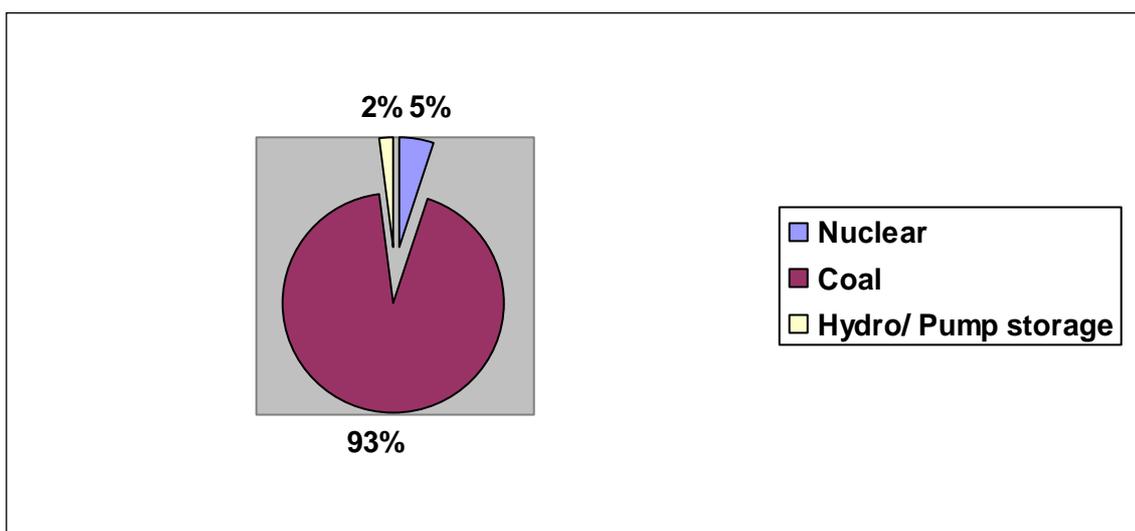


Figure 1: Energy sources used in electricity generation in South Africa

Source: NER, 2003

The industrial sector (excluding mining) accounts for the largest portion of electricity use in South Africa with 40 % of overall consumption, followed by the mining industry, which accounts for 27 % of total consumption. Domestic (residential) use is the third biggest consumption sector, accounting for 17 % of the overall consumption (see Figure 2 below).

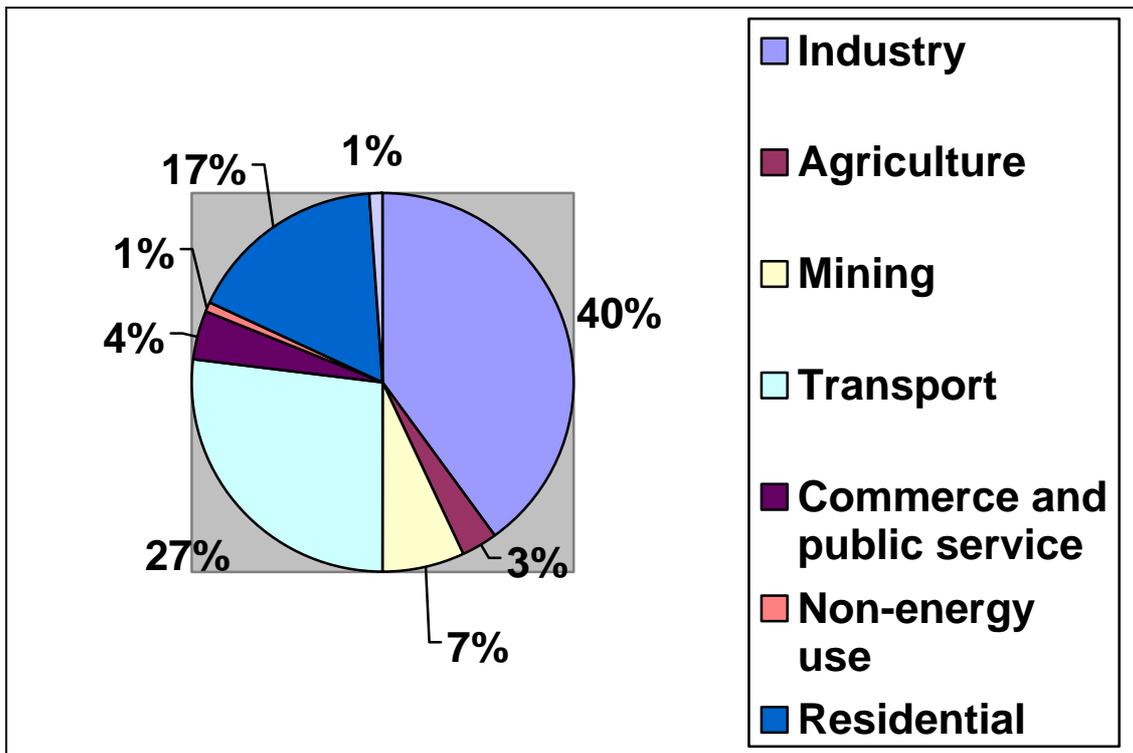


Figure 2: Energy consumption by sector in 1999

Source: ISES, 2001

### 3 The post-1994 restructuring of the South African electricity sector

Under the apartheid system development progressed on racial lines and this pattern pervaded the energy industry. Consequently the focus of electricity provision was on heavy industry, mining and white households, which comprised about 12 % of the total population (Davidson and Mwakasonda, 2004). When the new, democratic government came into power in 1994, South Africa’s energy policy saw a fundamental shift in focus. The new government placed developmental objectives at the forefront of its policies and the energy sector was no exception. Under the slogan “access to electricity for all” the new government made the provision of electricity to the disadvantaged one of the cornerstones of its development policies (Davidson and Mwakasonda 2004:29).

### **3.1 Policy development and reform**

Already in May 1993, in the run-up to the 1994 elections and change in government, the National Electrification Forum was established, which presented a set of recommendations for the reform of the energy sector to cabinet in the second half of 1994 (DME, 1998). These recommendations were used by the drafters of the Reconstruction and Development Programme (RDP), the first democratic government's key development programme. The RDP had five key programmes, with the first one being "Meeting Basic Needs" (Pauw et. al., 2002). Based on the recommendations of the National Electrification Forum the RDP established the electrification targets for households as well as schools and clinics (see more detailed chapter 4 below).

In 1995 the government established the National Electricity Regulator (NER) as a successor to the Electricity Control Board that had been established in 1987 (Davidson and Mwakasonda, 2004). In 1998 policy-making efforts for the restructuring of the South African energy (including the electricity) sector culminated in the White Paper on the Energy Policy of the Republic of South Africa (hereafter the White Paper). The White Paper spells out the key objectives for electricity sector reforms and forms the basis for the ongoing restructuring of the electricity sector.

According to the White Paper the overall objective of the government's electricity policy is to create an electricity sector that is capable of being the engine for growth, development and prosperity for South Africa (DME, 1998). Specific objectives for the restructuring of the electricity sector are therefore to:

- improve social equity by specifically addressing the energy requirements of the poor
- enhance the efficiency and competitiveness of the South African economy by providing low-cost and high quality energy inputs to industrial, mining and other sectors
- achieve environmental sustainability in both the short-term and long-term usage of natural resources (DME, 1998)

Against this background the White Paper identifies a number of challenges, all of which directly or indirectly deal with or impact electricity provision for the poor in one or the other way. The most relevant challenges in this context are:

- Approximately 40 % of all homes in South Africa (1998 figures – see more recent figures in chapter 4 below) and tens of thousands of schools and clinics are without ready access to electricity supply
- The distribution sector is highly fragmented, with more than 400 distributors, resulting in low efficiencies, high costs, wide disparities in tariffs, and financial viability problems in many distributors
- The electricity distribution industry continues to experience high levels of non-payment and electricity theft, resulting in increasing arrears and payment defaults
- Municipal electricity departments are expected to make a contribution towards the funding of other municipal services, particularly in major urban areas, but are faced with the burdens of non-payment and the need for significant expenditure on electrification (DME, 1998)

### **3.2 Restructuring in practice**

The restructuring of the electricity sectors affects all three segments of the electricity sector, generation, transmission and distribution. The most pressing need for reform was seen in the distribution segment and consequently much of the reform efforts have concentrated on this segment. As it has been the case in other public services sectors in South Africa, the reforms include (partial) privatization of the sector in order to improve the efficiency of the sector through competition. An additional rationale for the restructuring was to provide an opportunity to correct the previous imbalances in management and operations of the electricity sector.

#### *Eskom governance*

Electricity generation in South Africa is dominated by Eskom, the state-owned electricity utility. Eskom also owns, operates and maintains the national transmission grid and is thus a *de facto* monopolist on both the generation and transmission level

(ISES, 2001). The government embarked on restructuring of the generation sector through a set of legislative changes. In January 2000 Eskom was converted into a tax- and dividend-paying entity through the Eskom Amendment Act 126 of 1998 (FFC, 2002). This was followed by the promulgation of the Eskom Conversion Act 13 of 2001, which leads to the unbundling of Eskom's generation and transmission functions and licenses each entity separately. Under the Act it is intended to sell 30 % of Eskom's generating assets by 2006, which may pave the way for new, independent power producers (Davidson and Mwakasonda, 2004). At the same time Eskom itself has embarked on certain strategic initiatives aimed at making its energy and related services a business institution in Africa, and is now involved in 39 other African countries.

### *The distribution industry*

The most fundamental reforms are being made to the distribution segment of the electricity sector. In 1990, about 430 separate distributors ranging from Eskom through large metropolitan councils and smaller municipal distributors existed (ISES, 2001). To date, the distribution industry is still highly fragmented. In 2003 there were still 190 licensed electricity distributors in South Africa (NER, 2003), many of them with a very low number of customers and low revenue generation, often resulting in high electricity prices for domestic consumers.

One of the negative consequences of these structures is the unequal pricing of electricity. Vast differences exist between electricity prices charged to different economic sectors. The same is true for prices charged to domestic consumers with significant price differences between regions. In many cases, poor people, particularly in rural areas, have to pay higher per-unit prices than consumers in urban areas, but even the prices in and between urban areas differ substantially. It is for example claimed that township dwellers in Soweto typically pay 30 % higher per-unit costs than consumers in Johannesburg's white suburban areas (Fiil-Flynn and SECC 2001). Whereas domestic consumers pay an average of 24,59 cents per kW/h, rural consumers are paying as much as 48 cents per kW/h (Fiil-Flynn and SECC 2001: 4).

Another problem of the current distribution structure is that electrification and major contributions to other municipal services are funded out of electricity tariffs, which will

leave the industry unable to meet its financial obligations in the long-term (FFC 2002), unless tariff increases are introduced. In this context it has been estimated that if the distribution industry is not restructured, electricity tariffs will rise 40 % in real terms in the next ten years (FFC 2002). Inevitably, the additional financial burden placed on consumers would be felt most severely by the poor.

The White Paper assumed that while there are many distributors that are not financially viable, collectively the industry is able to fund both the supply of electricity and electrification over the long-term (DME 1998). In order to improve the efficiency of the distribution sector with the goal of ensuring the provision of low-cost electricity to industries and domestic consumers, the government has decided to reduce the number of electricity distributors to only six distributors nationwide. In practice the process started after the establishment of Electricity Distribution Industry Holdings (EDI Holdings) in 2003, a 100 % government owned company with a mandate to conceptualise, implement and monitor the creation of the REDs (Thale 2004: 1). These six Regional Electricity Distributors (REDs) are located in the six major metropolitan areas in South Africa, Johannesburg, Tshwane (Pretoria), Ekurhuleni (East Rand), eThekweni (Durban), Nelson Mandela Metro (Port Elizabeth) and Cape Town. The restructuring process will see Eskom Distribution and the electricity distributing municipalities transferring all their assets, liabilities, obligations, staff and rights to the six REDs (Thale 2004). The first RED is expected to be operational towards the end of 2005 and once all REDs are set up the role of EDI Holdings will be to monitor and support them until the company is disbanded in 2008 (Thale 2004: 2).

The rationale behind the restructuring is that the optimal area for the effective performance and sustainability of electricity reticulation is much greater than the area of any single municipality (FFC 2002). Although each RED will have its own set of tariff structures and rates for various consumer categories, the multitude of different rates as currently being experienced will be abolished. There can still be price differences between different RED areas, however, consumers of the same category within the same RED area will pay the same electricity prices, thereby ensuring greater price equity compared to the current system. Due to the more efficient, concentrated distribution system, it is expected that the massive price increases that were expected in

case the sector would not be reformed, can be avoided and low-cost electricity can be provided (FFC 2002).

The reform is not without implications for municipalities, which could affect service delivery to consumers. Currently, many non-electricity related services provided by municipalities are effectively cross-subsidised by revenue made from electricity sales and ring-fencing of costs is not practised. On the hand the restructuring model takes this into account as the municipalities will own shares in the REDs and thus benefit from the profits made by the REDs. Additionally there are other compensation mechanisms in place to off-set the direct income loss of municipalities. However, municipalities might experience indirect income losses as a consequence of the restructuring. Those municipalities with the capacity to operate sophisticated billing systems can link electricity provision to the (non)-payment of rates and other municipal services. This provides them with a powerful mechanism for consolidated billing and integrated customer management (FFC 2002). Once electricity provision has been transferred to the REDs this tool is lost and could lead to income losses from non-electricity services such as refuse removal, water or sanitation. Hence, whereas electricity provision by the REDs is likely to generate overall economic benefits, it remains to be seen whether or not service provision by municipalities is adversely affected in the long-term.

#### **4 Improving electricity access for the poor – the National Electrification Programme**

In 1993 only 36 % of the South African population had access to grid electricity (Davidson and Mwakasonda 2004: 32). This triggered government's decision to fast-track electrification through the National Electrification Programme (NEP). The NEP (1994-1999) is undoubtedly the electricity sector reform with the greatest impact on electricity access for the poor. It initially focused on providing access to grid electricity with off-grid electrification as a second tier being introduced at a later stage.

#### 4.1 The grid electrification programme

The NEP was a government-financed initiative targeting mainly the formerly disadvantaged and rural areas as well as schools and clinics. The key objective of the programme was to raise national electrification levels to about 66 % by the year 2001 with an average electrification level of 46 % in rural areas and 80 % in urban areas (Davidson and Mwakasonda 2004: 30). This implied providing electricity to an additional 2.5 million households.

The overall electrification target set out in the NEP for 2001 were met with the national electrification level being 66 % (NER, 2003). The distribution between urban and rural areas was slightly more in favour of rural areas (compared to the NEP target) with the rural electrification level being 49 % and the urban one being 77 % (NER, 2003). Since then electrification has continued, albeit at a lower rate of new annual connections, and in 2003 the overall national electrification level was 69 % (see Figure 3 below).

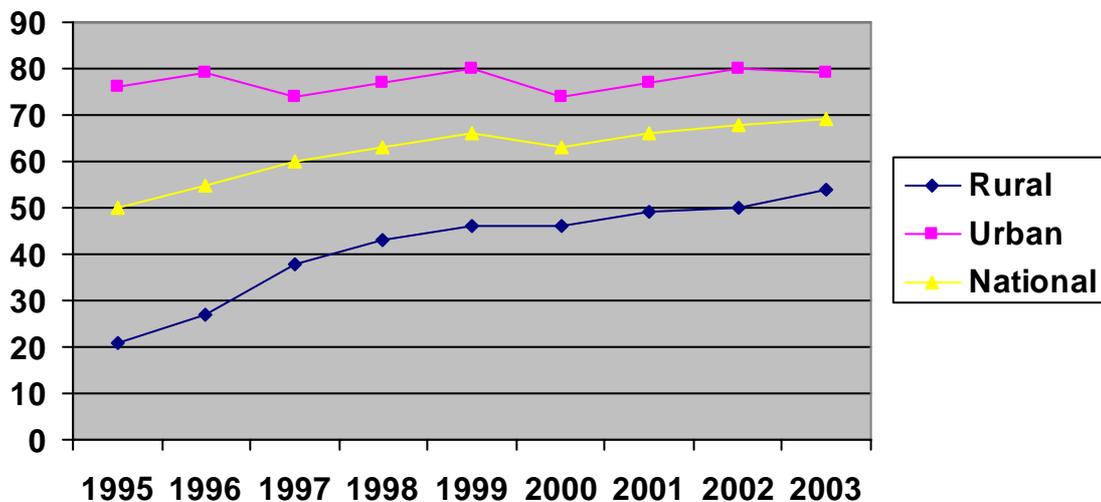


Figure 3: Trends in electrification of households in South Africa (1995-2003)

Source: NER, 2003

The NEP was implemented by Eskom and the municipalities with a small number of connections being made by large-scale farmers connecting their farm workers. Between 1994 and 2000 new annual household connections averaged around 450,000 per year (see Figure 4 below). By 2001 the target of 2.5 million new connections was exceeded with more than 3.4 million new connections achieved between 1994 and 2001. To date

about 30 % (20 % urban and 50 % rural) of the population, primarily composed of the poor, are still without access to electricity (Davidson and Mwakasonda 2004: 32). The government is therefore continuing the programme with the intention to electrify 300,000 homes annually. At the same time, however, disconnections as a result of non-payment of bills and arrears continue to lead to severe social problem for many poor households and are strongly contested by social activism groups (see more detailed discussion in section 5.3)

#### **4.2 The off-grid electrification programme**

The second tier in the government's electrification programme is the off-grid electrification programme for rural areas. When it became clear that the National Electrification Programme would not be able to ensure grid electrification of remote rural areas in the short or medium-term, alternatives to grid electrification were explored. Supported by a number of external donor agencies, which promote non-grid technologies as a clean energy source, off-grid electrification was initiated in an effort to widen electricity access in remote areas (ERC 2004). The government pursued the Energy Service Company (ESCO) model with a fee-for-service approach. Five private companies were each granted concession areas to establish non-grid energy service utilities. The licensing agreement entitles the concessionaire to install and maintain non-grid electricity technologies in allocated rural areas (ERC 2004). To date this has been limited to the provision of Solar Home Systems (SHSs), producing electricity for household use. Currently, the government awards a subsidy of R3 500 to the concessionaire for each installation of a SHS, towards the capital cost – although the ESCOs claim that this does not cover all the costs (ERC 2004). The government has therefore agreed that the ESCOs may charge each household a monthly service fee of R58 and an upfront installation fee of R100. The service fee covers the maintenance and servicing costs (ERC 2004). R40 of the R58 monthly service fee is covered by the government as part of the FBE policy (see more below in section on FBE).

The SHS technology has also been used for providing schools and clinics in remote areas with off-grid electricity. Whereas the programme was seen to have reasonable success in the electrification of clinics, there have problems as far as the electrification of schools is concerned. A survey established that of the 1,400 systems installed in

schools in 1996 and 1998 only 6 % were found partially operational in 2000 (Davidson and Mwakasonda 2004: 32).

The SHSs provided are rated at 50 Wp capacity, which can power approximately four lights, a radio and a black-and-white TV, estimated to consume about 6 kW/h per month (Davidson and Mwakasonda 2004). For the beneficiaries of the SHS off-grid electrification this means that they can still not cook using electricity since the capacity of the SHSs is too low to power a stove or hot-plate. Hence, the benefits of SHS electrification fall short of those of grid-electrification. This is particularly true for women, who are traditionally responsible for the collection of firewood for cooking. Consequently, a recent survey reveals a certain dichotomy in consumer satisfaction with the SHS systems. Whereas on the one hand the benefits of improved lighting and radio and television are appreciated, consumers are on the other hand unhappy with the fact that the system does not provide sufficient energy for cooking. Hence, most SHS users want to use the system only as an interim solution until they are being connected to grid-electricity (ERC 2004).

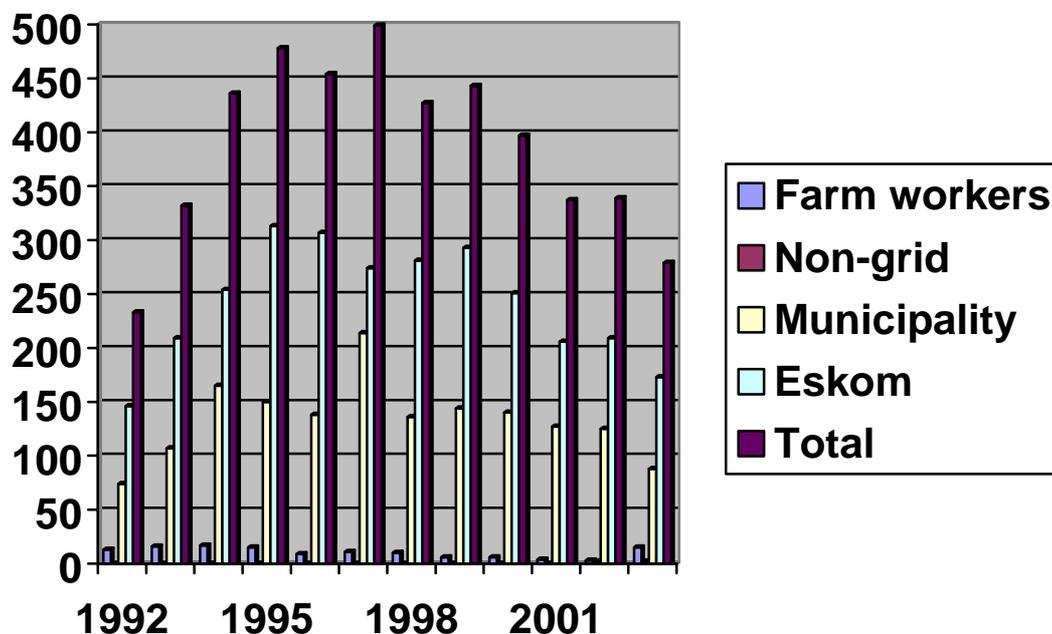


Figure 4: Annual new household electricity connections in South Africa, 1992-2003

Source: NER, 2003

### **4.3 The benefits of the electrification programme**

In general the welfare of poor communities with access to electricity has improved significantly under both off-grid and grid programmes (with greater benefits to grid-connected users). In addition to direct benefits such as availability of electricity for domestic and small-scale economic activities, which in turn improve the welfare situation of families and communities, electrification has resulted in numerous indirect benefits. These indirect benefits include:

- reduction of fire incidents, particularly in low-income urban areas, from the use of paraffin and candles
- reduction of local and indoor air pollution from firewood use
- electrification of clinics has yielded significant benefits from improved health-care service provision
- involvement of schools in evening adult education
- improved efficiency of school operations through use of equipment such as photocopiers and computers

Hence, despite certain shortcomings of the electrification programme, particularly as far as the off-grid electrification programme is concerned, the electrification programme has brought substantive improvements for the welfare of poor communities.

## **5 The service delivery/cost recovery tension zone: poor realities on the ground**

Despite the achievements in providing access to electricity made by the National Electrification Programme, for many poor people true access to electricity is a problem that goes beyond connectivity and ultimately depends on affordability. Often poor households are unable to reap the benefits of being connected to the electricity grid since they cannot afford even the minimum amount of electricity required for their basic needs. In addition to this, many poor people are burdened with high arrears, electricity cut-offs and poor service quality. This has triggered protests and activism campaigns by various community based groups such as the one of the Soweto Electricity Crisis Committee, which is campaigning for better electricity service delivery to the poor and the introduction of more radical pro-poor policies relating to electricity provision.

### **5.1 Is there a legal right to affordable electricity?**

There is no doubt that access to affordable electricity for all is a desirable development objective. Given the enormous social and economic benefits derived from household electricity provision, the question can be asked, whether access to affordable electricity can even be qualified as a socio-economic right to which all citizens are entitled. This question deserves particular attention since the South African Constitution (Act 108 of 1996) recognises and spells out a number of socio-economic rights, some of which relate to basic services, such as the right to sufficient water as contained in Section 27 (1) (b) of the Constitution. Yet, the Constitution does not contain an express right to have access to electricity. According to the interpretative maxim “*expression unius est exclusio alterius*”<sup>1</sup>, the fact that certain socio-economic rights have been included in the Constitution probably rules out the possibility of reading into the Constitution other, non-enumerated socio-economic rights (CALs 2003: 3).

However, the Centre for Applied Legal Studies (CALs 2003:3) argues (in the context of the restructuring of the electricity industry) that certain pro-poor measures relating to the problem of affordable electricity can be derived from the constitutional right to

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<sup>1</sup> To express or include one thing implies the exclusion of the other, or of the alternative.

equality. Not only does the right to equality require that policy choices are being made, which ensure that the provision of public goods occurs equitably in the sense that everyone is entitled to an equal standard of service provision (ibid.). In Section 9 (2) the Constitution contains a provision that is arguably relevant in the light of South Africa's legacy of unequal municipal service provision. The provision states that the state is authorised to take "legislative and other measures designed to protect or advance persons, or categories of persons, disadvantaged by unfair discrimination" (RSA 1996). Based on this provision the Centre for Applied Legal Studies (CALS 2003:3) argues that there should not only be no differential adverse impact on poor consumers, but also that "positive measures be taken to reduce the cost of electricity to those consumers". This demand of active steps being taken to reduce electricity costs for poor consumers is not merely an academic suggestion. In fact, it reflects the fundamental demands of pro-poor activism groups such as the Soweto Electricity Crisis Committee, in their campaign for more affordable electricity and better quality of service delivery to poor people (see more detail in section 5.3 below).

## **5.2 The Free Basic Electricity (FBE) policy**

Whereas there has been good progress made towards the goal of "electricity for all" as far as electrification is concerned, the South African government realised that the increase in electrification would not be accompanied by meaningful levels of electricity consumption among poor households due to affordability problems (Mapako and Prahad 2005: 1). Hence, in delivery of its announced policy intent to provide free basic services (water, sanitation and energy) to poor households, the government introduced the FBE policy to address affordability problems related to energy, more specifically, electricity services (Mapako and Prahad 2005: 1). Municipalities, acting as Service Authorities, are responsible for the implementation of the FBE policy. For grid-connected households FBE means that they qualify for free 50 kW/h per month (approximately R 18), off-grid electricity users are subsidised with R 40 per month towards the R 58 monthly service fee (ERC 2004). The R 40 subsidy for off-grid users is paid directly to the service providers (ESCOs), meaning that households only have to make a cash-payment of R 18 per month.

Whereas the FBE subsidy paid to consumers is certainly a contribution to affordable electricity, there remain numerous problems related to the FBE policy. In the Ministerial foreword to the government notice introducing the FBE policy, the government claims that “conventionally, the average poor household does not consume more than 50 kWh of electricity per month” (foreword DME 2003), which is why the allocation of free basic electricity is set at exactly that amount. This is highly contested by consumer and activist groups, who claim that the 50 kWh are by far not sufficient to serve even the most basic needs of poor households. In their survey conducted in Soweto Fiil-Flynn and SECC (2001: 17) established that the average monthly usage in poor households is more than ten times that amount, sometimes up to 600 kWh. Much of this due to insufficient insulation in poor people’s houses, thus increasing electricity needs for heating in winter. However, even for basic cooking and lighting the 50 kWh per month are hardly sufficient, which is the reason why many people with access to grid-electricity still use firewood or paraffin for cooking (Mapako and Prahad 2005: 2).

Another problem is that the FBE allocation is made to all households without distinction. First, since it is difficult to determine a baseline as to who is poor and thus qualifies for the subsidy, and from an operational perspective perhaps even more difficult to allocate the subsidy only to people who were identified as eligible beneficiaries, the subsidy is paid to all consumers regardless of their income levels. Hence, a significant amount of the overall budgetary allocation for FBE goes to non-poor consumers and has no poverty reduction effect. Second, there is no differentiation being made between household sizes, meaning that there is effectively a disproportionately lower benefit for bigger households. Given the reality that larger households are mostly female headed (often by a pensioner with dependent grandchildren who lost their parents to an Aids related illness), this policy further disadvantages women and the poorest households.

The implementation of the FBE policy for off-grid connections has caused similar problems. Naturally, to receive the R 40 subsidy to the service fee for the SHSs, such a system needs first to be installed. However, the poorest households were excluded from the installation of SHSs due to the selection criteria employed to qualify for installation. Poorer households could not afford the initial once-off connection fee of R 100 and the subsequent service fee of R 58 (as FBE was introduced only at a later stage) in addition

to continued purchase of wood and paraffin, given the limited capacity of SHSs (Mapako and Prahad 2005). Consequently, they did not qualify for the installation of a SHS and also do not benefit from the FBE policy. Thus, some of the poorest people do not benefit from the FBE policy, thereby limiting the intended poverty reduction effect and the constraining the abolishment of inequalities in service delivery.

### **5.3 Service delivery quality – an unresolved challenge**

Affordability is undoubtedly the key problem for poor households to truly benefit from electricity access in a way that improved the social living conditions and the welfare of individuals and communities. Directly related to the affordability problem are numerous other issues, which in sum, make the promise of quality service delivery for all an empty one for many poor people. Being unable to afford basic electricity needs often leads to a cycle of arrears, billing disputes, electricity cut-offs and illegal re-connections with negative impacts on poverty reduction on the one hand and causing consumer dissatisfaction to the brink of (local) political instability on the other hand.

#### *Arrears*

The inability to pay for their basic electricity needs has resulted in high arrears for many poor people. In their survey conducted in Soweto Fiil-Flynn and SECC (2001) established that average monthly bills in the sample households were between R 150 (summer) and R 500 (winter). Given the average income levels in Soweto and the need to provide for other basic needs such as food, water etc. these bills can effectively not be paid by many households. As a consequence, 89 % of the sample household in the above-mentioned study (Fiil-Flynn and SECC 2001: 10) had electricity arrears, 30% of them owing more than R 10.000, an amount that is effectively unpayable given the household incomes in the area. Interestingly, some of these arrears date back to the 1980s and the “rent boycotts” of the anti-apartheid struggle (Seekings 2000). Although it was agreed in negotiations with civics that Eskom would write-off half of all debt accumulated to June 1995, many residents claim that Eskom did not honour the write-offs (Fiil-Flynn and SECC 2001: 10). Yet, even where the write-off is honoured, amounts are often so high, that re-payment of the remaining 50 % (and new arrears) is unrealistic.

It needs to be pointed out that, despite identical results (non-payment), the reasons for non-payment today compared to the reasons during the apartheid area, differ fundamentally. During the apartheid area inability to afford electricity might have played a role, however, it was not the main driver of the rate boycotts and the often cited “culture of non-payment” (Swilling 1998). In the times of the political struggle against the apartheid regime, non-payment of rates and service fees was a deliberate political tool, a means of protest against the policies of the apartheid government. Today’s non-payments, as Fiil-Flynn and SECC 2001: 11) claim, cannot anymore be linked to the “culture of non-payment” and is simply a result of the real inability to pay. In fact, the majority of people try to make regular payment of bills and arrears wherever their financial situation allows, but are unable to pay the full amounts of their bills or reduce the arrears with the low or unstable incomes that most people of poor households receive (Fiil-Flynn and SECC 2001: 11).

#### *Service cut-offs and illegal connections*

For many people the continuing inability to pay and mounting arrears eventually lead to electricity cut-offs by Eskom (or the local municipality where it is the provider). In the above-mentioned survey (Fiil-Flynn and SECC 2001) it was established that more than 60 % of households had experienced electricity cut-offs in the past year. Where residents are able to renegotiate payment with Eskom, electricity supply has eventually been reinstated, however, often electricity cut-offs lasted for months. For those who are not financially able to make payment arrangements with Eskom the cut-offs often lead into a cycle of worsening poverty. In order to meet their basic electricity needs people make illegal grid-connections. Interestingly, in about half of these cases, the illegal connection is offered by the same Eskom employee who had originally disconnected the resident, usually at a charge up to several hundred Rand (Fiil-Flynn and SECC 2001: 15). When these illegal disconnections are discovered by Eskom it leads to the permanent removal of electricity cables from the house by Eskom. Once the cables have been removed, the price of reconnections is often impossible to meet for poor households meaning that they have to live permanently without electricity with adverse impacts on their living and welfare conditions. Negative effects named by poor people that had experienced cut-offs are that they are not able to cook food properly, that their

personal hygiene is affected, that children cannot study properly and that the work load for women increases (Fiil-Flynn and SECC 2001). In addition the necessary increased use of alternative energy sources such as wood, coal and paraffin causes increases in health problems, particularly respiratory illnesses. Safety is also negatively affected by the cut-offs, as Eskom employee purposefully leave electricity sub-station open in order to make a second income from illegal electricity connections (Fiil-Flynn and SECC 2001: 14).

Another response by Eskom and municipalities to the high rate of non-payment has been the installation of pre-paid meters in households. When using this system, consumers pay a certain amount of electricity pre-paid and load it on their meters for subsequent consumption. Whereas this allows for efficient monitoring of consumption and can contribute to energy savings, it also means that people are left without electricity once the pre-paid electricity units are used up. Since poor residents are often unable to buy enough pre-paid units for the month, they frequently end up having no electricity towards the end of the month. This has caused strong opposition against the installation and use of pre-paid meters and some protests have resulted in the deliberate destruction of the meters.

### *Billing disputes*

The issue of electricity cut-offs is closely related to problems that residents experience with billing and customer care by Eskom. Many respondents who had experienced cut-offs claim that insufficient notice is given (i.e, they are not given a chance to pay or to try and negotiate a payment schedule) and that cut-offs happen even when bills have been negotiated or settled (Fiil-Flynn and SECC 2001: 12). Notices of cut-offs are printed on the electricity bill, often giving the resident just 14 days to reply. Apart from the very short notice before cut-offs, it is often the case that bills are not received regularly, making it difficult for consumers to be informed of their payment situation and their arrears. In response to this problem, Eskom claims that customers are responsible for collecting their bills at local Eskom depots if they are not delivered and are therefore responsible for knowing if their service is to be cut (Fiil-Flynn and SECC, 2001: 12). Whereas this is a rather unusual practice compared to service and consumer care experienced in more affluent areas, it also needs to be questioned in relation to the

short reply period of 14 days that is granted. If a consumer first has to wait and find out whether or not his bill is delivered and after coming to the realisation that it will not be delivered has to go to the local depot to fetch it, if leaves little time, if any, to reply to cut-off notices and make possible payment arrangements with Eskom.

Another problem relating to billing disputes and insufficient consumer care is, that according to respondents in the study conducted by Fiil-Flynn and SECC (2001) the bills do not inform the consumer how to dispute the bill. Nor do the bills inform consumers of the existence of the National Electricity Regulator (NER) as a place to take their account disputes. Furthermore, cut-offs are often performed when consumers have already made arrangements for repayment and in some cases no notice is given prior to a cut-off (Fiil-Flynn and SECC 2001: 12).

Poor consumers generally feel that Eskom staff has a negative attitude towards them and is unwilling to assist in billing disputes or even explaining the bills. It is this combination of inability to pay for basic needs and receiving poor consumer services that has sparked the ongoing protest against electricity cut-offs in the townships and the more recent wave of (sometimes violent) protest against poor service delivery in many areas in South Africa.

#### **5.4 Possible solutions?**

Clearly, the current situation is unsatisfactory for both poor consumers, who receive poor services and have difficulties to pay for their basic electricity needs, as well as for Eskom (and distributing municipalities as they experience the same problems) from an economic perspective. Hence, solutions that address both parties concerns are required. Those have to be found in the context of the given policy environment, where economic efficiency based on the cost-recovery principle and financial sustainability of the electricity industry are driving forces.

As far as the quality of service delivery is concerned, improvements can be achieved faster and cheaper compared to the affordability problem. Where misunderstanding about billing contributes to payment related problems and eventually to the cycle of cut-offs and illegal connections, improved sensitivity towards consumer needs as well as

better consumer information can help ease the situation. In this context it is suggested that new billing format should clearly indicate the date in which disconnections will be carried out if an account is not paid, the reason for disconnection and the address or telephone number of a place where consumers can go to dispute the bill (CALs 2003: 13). The fact that most people are willing to pay their electricity bill and try to make payments whenever their financial situation allows it, shows that non-payment is far less a result of a “culture of non-payment” as sometimes claimed. Instead the study of Fiil-Flynn and SECC (2001) has shown that many of the issues leading to protests against poor service delivery are process-related. Taking the needs of poor consumers seriously and putting in place the necessary means for consumer information could go a long way in improving the situation. In the light of the apparent general willingness to pay for electricity services, this would also be in the economic interest of Eskom and other distributors and should be given priority by the operators of the future REDs.

Cost-recovery is undoubtedly necessary for the financial sustainability of the industry. However, it needs to be balanced with the reality that poor people are often genuinely unable to pay even for their basic electricity needs. From a social development perspective and in the light of the South African government’s expressed policy objectives of improving the living conditions of the poor and achieve greater equity, electricity cut-offs should not be the final answer. As the FBE policy has only been able to mitigate but not solve the affordability problem, more effective means of cost subsidisation are required.

In this context the SECC call for the reinstatement of the flat-rate system, which would allow poor consumers to use an unlimited amount of electricity for a fixed monthly fee (of R 50 as demanded by the SECC) (Fiil-Flynn and SECC 2001). Whether such a system is economically feasible requires careful consideration. However, the reality of the affordability problem and the social welfare benefits derived from universal access to electricity require that the discussion on alternative policy options remains open.

## **6 Conclusion**

The energy policy changes and restructuring efforts for the electricity sector in South Africa are well in process. Both market driven (electricity pricing and restructuring) and

poverty alleviation (grid and off-grid electrification, FBE) policies have been introduced (Basson, 2003). The restructuring of the industry is likely to improve the overall financial health of the industry and ensure continued, low-cost electricity supply to industrial and domestic consumers. The unequal pricing structures and the multitude of tariffs will be eliminated once all REDs are fully operational. At the same time, access to electricity for domestic consumers has remarkably improved in numbers compared to the pre-democracy situation. Whereas this has improved the overall social welfare situation of poor households, there remain numerous problems relating to affordability and insufficient service delivery quality. Much of the non-payment is not a result of a “culture of non-payment” but rather the consequence of real inability to pay even for basic electricity needs. The growing number of protests against poor service delivery in South Africa is a reminder to increase efforts of addressing the needs of poor consumers.

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## **Appendix: Case study on pre-paid meters in Tembisa and Ivory Park**

By Bright Kamoto (Group for Environmental Monitoring)

### *Background*

Tembisa and Ivory Park are neighbouring townships that are located between Pretoria and Johannesburg (Highveld) on the East Rand of South Africa's most economically powerful province Gauteng. Tembisa falls under the jurisdiction of the Ekurhuleni municipality, while Ivory Park is part of the municipal area of the City of Johannesburg. They have a population of approximately 700,000 (Tembisa) and 750,000 (Ivory Park) people respectively. The majority of residents fall into the mid- and low-income categories.

Tembisa was not planned according to proper town planning standards. It developed more or less unplanned as a result of the influx of migrant labourers who settled in the area. The forced removals of residents from other areas led to a further influx of residents to the area. Ivory Park originated from informal settlement that mushroomed around Tembisa. As a result of the municipal restructuring and demarcation that was undertaken in the post-apartheid area Ivory Park became part of the City of Johannesburg.

In the past all the residents in Tembisa bought electricity from Eskom and were using the conventional metering system. Because of economic reasons most people could not afford to pay for monthly bills, which resulted in electricity cut-offs and illegal connections.

During the period 1985 to 1988, the council introduced an electricity master plan that compelled every household to pay for the electricity infrastructure without any formal agreement. Around 1998, the Mass Democratic Movement (MDM) called for land and electricity boycotts. This included the Tembisa Residential Association (TRA), the local branches of the COSATU, local SACP and the ANC. One of the activities of the MDM during the boycotts was operation *Khanyisa* (Operation Lighting). People were responding to electricity meters that were not working. The situation worsened when

Councillors switched off electricity to the households. In an attempt to solve the problem, civic organizations engaged both Eskom and local authorities in trying to get a solution. As a result the civic organisations proposed a flat rate as a way of moving away from a “culture of non-payment”.

The “culture of non-payment” persisted to the time of democratisation of the country in 1994. Eventually authorities saw it fit to forcefully introduce pre-paid meters with the aim of eradicating the culture of non-payment. In addition to this system, a remote controlled conventional metering system was introduced in the Eastern part of Tembisa, i.e. Lehlabile.

### **Approach and Methodology**

The case study was conducted over a period of four weeks. Tembisa and Ivory Park were identified as case study sites because the areas have a strong political background resulting from the political activities of the anti-apartheid struggle. They are also still struggling to catch up with sustainable human settlement development, access to affordable electricity, water and sanitation facilities.

In the two areas a total of 20 households were selected and interviews were held with household members. The low-income households, living in low cost houses (colloquially called RDP houses, since they were built as part of the government housing programme under the RDP) and informal settlements were targeted by random sampling. The other reason this group was selected was due to the fact that most use pre-paid meters and some use conventional metering system. Many of the people from these surroundings work under low wage benefits and some are unemployed.

The twenty selected households were classified into categories of; (a) access to electricity and level of income; (b) billing system and service provider.

*Access to electricity and level of income:*

Criteria used to select the households were:

- Is connected to electricity but not employed
- Not employed and not connected to electricity
- Is not connected to electricity but employed
- Connected to electricity and employed

*Billing system and service provider:*

The used selection criteria were:

- Those that use a pre-paid meters and purchase their electricity directly from Eskom
- Those that use pre-paid meters and purchase their units from the municipality
- Those that use conventional metering systems and obtain their rates from municipality.

A questionnaire was developed for conducting interviews for data collection. The study also involved attending community meetings whose agenda were complaints and grievances of residents on electricity bills and metering systems; meetings with community leaders, one official from the electricity department of Ekurhuleni municipality and Eskom and leaders of business forums in Tembisa.

### **Objectives of the Research**

The overarching objectives of the case study were to:

- Identify existing gaps in the provision of domestic electricity that have created barriers to people's access to affordable electricity
- Assess the impact of knowledge or awareness on electricity policy, pricing and usage among low-income households
- Examine the change that has occurred in the domestic electricity development in regards to apartheid and post apartheid regime

## **Results**

### *Cost of electricity Unit*

Most of the people being interviewed complained about the cost of a unit of electricity. The price of electricity goes up once or twice every year. Most of them cannot afford to purchase enough electricity units to meet their energy needs. Many of them are even paying more because of the arrears that are appearing on their accounts, sometimes still carried over from the apartheid era.

Residents from Ivory Park buy their electricity units directly from Eskom, while residents from Tembisa get their electricity services from Ekurhuleni municipality. Since Ekurhuleni buys electricity in bulk from Eskom and sells it to the residents with a mark up, this makes the price of electricity different in the two respective areas. Residents in Tembisa are paying more for a unit than residents in Ivory Park, yet they are neighbouring townships divided by a street. The difference between prices varies from 9 cents to 15 cents. In addition to that, residents pay more for a unit of electricity than industries that are situated even close to the two residential areas. According to the Eskom official, this happens due to the fact that industries use large volumes of electricity and thus receive discounted rates

### *Metering System*

Two different electricity metering systems are used in Tembisa and Ivory Park. The first one is the pre-paid meter where consumers load the units themselves on to the meter board in the house. Another one is a remote conventional metering system where consumers pay for the units that are loaded for them online. In the remote conventional system, a consumer is given an electronic meter that from time-to-time is plugged to the mains in order to check their balance in terms of electricity units. In the process of checking the balance the gadget uses some of the electricity since it has to be left for a while for it to reflect the consumption and balance of the meter. Although seventy five percent of the residents are happy with the pre-paid metering system, they still argue on why do residents in other parts of the same township are given the remote conventional metering system. At the same time, those using remote conventional system are

complaining about the existing irregularities. One example of such an irregularity is that one of the residents purchased electricity units through a remote conventional system. Eventually the electronic loading of the units detected her neighbour's house and ended up loading the units on her neighbour's meter box instead of her meter box. In another case a resident paid for electricity units from the municipality and could not get her units on her meter box for the period of three days.

#### *Use of other energy options*

Due to high price of electricity and persistent domestic economic constraints people resort to using fossil fuels such as coal, wood and paraffin. Sometimes they subsidise with gas as an alternative to grid electricity while they have electricity. These have a big negative impact on their health and environment. Some energy resources such as coal produces large amounts of carbon that contributes to respiratory problems, particularly on young children and elderly people.

#### *Knowledge and understanding of the electricity pricing details*

Residents realise that electricity is an economic resource that needs to be paid for. But what they do not understand is what a unit is, how much they pay for a unit, under what circumstances would a unit last longer and what behavioural patterns would make units last long. These questions remain unanswered up to now and accumulate doubts and loss of trust in electricity services providers, which in the end result into boycotts. Many residents also struggle to understand how the FBE policy works and what it means for their personal accounts. No one from either the Municipality or Eskom has ever convened a meeting and explained more about the FBE. For those using pre-paid metering system, they do not understand most of the details indicated on the receipt except being told about a set of numbers they have to insert when loading the units. Hence, they are not aware that the 50 kW/h are automatically loaded for free on each first monthly electricity purchase. This leads to misunderstandings as to whether or not all residents receive the FBE amount and makes the consumers question the equity of the policy.

### *Knowledge of energy saving options*

“Just as people would save some water for future use, food to sustain them for a longer period, money for future developments, they would also wish to save some electricity units to last them a bit longer. But how?” This was a comment made by one of the respondents in Tembisa. She is one of the residents who indicated that they do not know how they could save their electricity and start realising paybacks. They admitted to have seen the message on television but it was too short and quick to understand all the advantages and necessary measures to undertake.

### *Municipality's capacity in managing electricity services*

Ekurhuleni municipality and City of Johannesburg are responsible for Tembisa and Ivory Park in cases of service delivery. There are many complaints from residents that have not been attended to. The relationship between the residents and the councillors is not strong because they have not reported back to the residents as feedback from the municipality. When it comes to meter reading, most of the meter readers from the council never open the box and physically collect the readings. Rather, they bill the residents based on guesswork. The council lacks sensitivity and understanding when dealing with electricity problems existing among residents.

### *Unskilled wiring*

This is another problem area. Municipalities and Eskom need to improve for the better livelihoods of the users. Most dwelling units particularly in the informal settlements, had electricity wires and cables hanging loose and non-insulated. The meter box is fixed on an old piece of wood. Some of the cables and wiring are not properly sized to carry enough current to feed the load. Consumers buy their own cables without proper instruction from a qualified technician. Such types of installations are unsafe and not user friendly. In some cases people have lost their lives and property due to fire sparked from non-insulated and loose electricity wires.

### *Interpretation and discussion of the results*

Electricity is an essential resource for human economic and social development. As a social economic good the provision of such services needs to go together with policies and legislation that provide a clear direction for implementing sustainable pro-poor policies. People have the right access and benefit from safe and affordable electricity that enables them to meet their energy needs. Nevertheless electricity is an economic resource. It has a value. The users need to compensate a certain percentage of the value to sustain the provision of quality services. When transparency and accountability are overlooked, inefficiencies such as leakages and unclear pricing against metering occur.

From the results of the study, it appears that people are happy that they are connected to grid electricity, but are not satisfied with the services that they are getting from Eskom and the municipality. This contradicts with the government's emphasis on quality service provision especially to the poor. Eventually people are tempted to neglect the requirements and start abusing the systems.

Awareness is the key component in the domestic electricity provision. Much as we are saying the users have the right to access quality services, they have a role to play to ensure meaningful quality services. For this they need sufficient information about the various aspects of domestic electricity provision, such as how the different metering systems work, what FBE means for them and how energy savings (thus costs savings) can be achieved.