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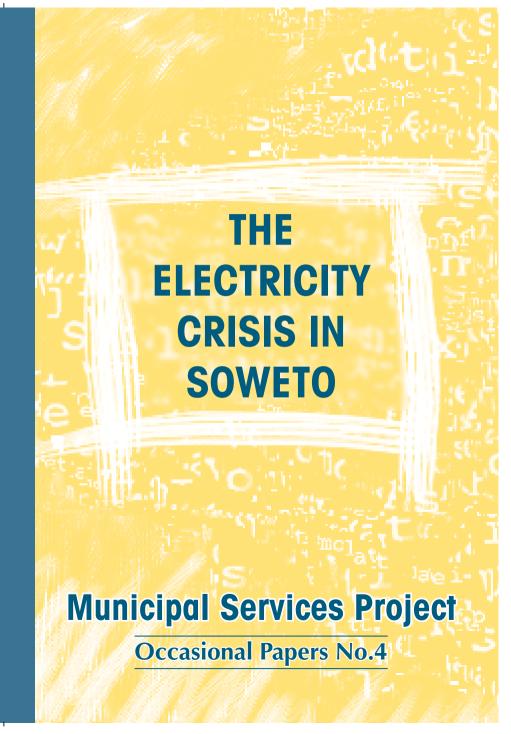


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THE ELECTRICITY CRISIS IN SOWETO

By Maj Fiil-Flynn With the Soweto Electricity Crisis Committee

Series Editors

David A McDonald and Patrick Bond

ABOUT THE PROJECT

The Municipal Services Project is a multi-year research, policy and educational initiative examining the restructuring of municipal services in South(ern) Africa. The project's central research interests are the impacts of decentralization, privatization, cost recovery and community participation on the delivery of basic municipal services like water, sanitation and electricity to the rural and urban poor. The research has a participatory and capacity building focus in that it involves graduate students, labour groups, NGOs and community organizations in data gathering and analysis. The research also introduces critical methodologies such as 'public goods' assessments into more conventional cost-benefit analyses.

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Table of Contents

EXECUTIVE SUMMARY	1
Main Findings of the Report	1
Alternative Pricing Options	3
INTRODUCTION	5
THE CASE OF SOWETO	10
Composition of Households	11
Access and Affordability	13
Arrears	14
Service Cut-offs	16
Disputes with Billing	18
Health and Safety Impacts of Electricity Cut- offs	19
Illegal Connections	22
Consumer Satisfaction?	23
Free Electricity?	24
A Flat-rate System?	27
CONCLUSION	29

ENDN	OTES	30
REFER	ENCES	31
LIST O	F INTERVIEWS AND WORKSHOPS	33
LIST O	F TABLES	
Table 1:	Size of Households in Pimville and Orlando	10
Table 2:	Breadwinner's Status in Household	11
Table 3:	Main Breadwinner's Employment	12
Table 4:	Household Electricity Bills	14
Table 5:	Amount of Arrears	15
Table 6:	Length of Time for Arrears	16
Table 7:	Number of Cut-offs Reported by Households in the Past 12 Months	17
Table 8:	Length of Electricity Supply Cut-off	17
Table 9:	Effects of Electricity Cut-offs	20
Table 10:	Electricity and Health	20
Table 11:	Consumer Satisfaction with Electricity Services	23
Table 12:	Comparing Electricity to Other Services	24
Table 13:	Electricity Usage in an Average Low-income Household	25
Table 14:	Perceptions of "Free Electricity"	26
Table 15:	Preferences for Electricity Payment	28

EXECUTIVE SUMMARY

ne of the priorities of the African National Congress (ANC) when it came to power in 1994 was to make electricity accessible and affordable to all South Africans. In some respects the government has been successful in this regard, having connected more than 2.5 million additional homes to the electricity grid with plans for 600 000 more connections by the end of 2002.

This push to expand access to electricity has been undermined, however, by its lack of affordability. High per-unit costs for township dwellers – typically 30% higher than white suburban areas and up to ten times higher than off-peak prices offered to industry – has meant that low-income households are unable to purchase the volume of electricity they need to sustain even the most basic requirements of heating and cooking. Self-imposed reductions of electricity usage, combined with aggressive cutoffs by Eskom for nonpayment of bills, has meant that tens of thousands of low-income households are without the electricity they need, with dire consequences for public health and safety and poverty alleviation.

This report provides the first detailed case study of access and affordability to electricity in the township of Soweto, in Johannesburg. Although not necessarily indicative of electricity supply and pricing in the country as a whole, the findings presented here raise some troubling questions about the effects of cost recovery on essential services for the rural and urban poor.

Main Findings of the Report

The main findings of the report can be grouped into six key findings. The first finding is that most Sowetans are unable to pay their electricity bills. But contrary to the "culture of nonpayment" thesis which argues that nonpayment is a legacy of the boycott era of the 1980s, the large majority of the 200 households surveyed made regular contributions to their electricity bills. Moreover, most households kept their electricity bills on file and were well aware of their payment situation.

A second finding is that arrears for nonpayment were common in Soweto, with 89% of households having some level of electricity debt. Some households had arrears of more than R30 000 and a large proportion of arrears were more than four years old, suggesting a long-term debt trap for many low-income households.

This combination of arrears and inability to pay has led to a rash of electricity cut-offs in Soweto – up to 20 000 households per month in early 2001. Fully 61% of the households we surveyed have had their electricity cut off in the past 12 months, with some households going as long as nine months without power. Another 10% of households have had their electricity cables removed permanently by Eskom for allegedly having reconnected illegally to the electricity grid. The health and safety implications of these cut-offs are serious, especially for women and children, with respondents complaining of spoiled food, increased workloads for women, loss of productivity in small shops, increases in domestic violence and a range of other concerns.

A fourth finding relates to customer satisfaction with electricity services. Not surprisingly, given the findings outlined above, Sowetans are singularly unimpressed with Eskom, with two thirds saying that the service is "bad" and 70% saying that it is worse than it was five years ago. Interviewees identified problems with inaccurate, inconsistent and confusing billing, poor customer relations, and lack of notification before disconnections took place as some of the reasons for rating Eskom's service so poorly.

A fifth finding relates to the electoral promises by the ANC of "free electricity". One of the main criticisms is that the 50 kiloWatt hours per month being offered for free is less than 10% of average household usage and therefore makes little difference to the overall household electricity bill. There were also complaints that the use of the "household" as a unit of measurement biases against large families. Interestingly, 40% of respondents also suggested that the promise of free electricity (which has not yet been provided in Soweto) was just an election ploy, with some suggesting it was an "outright lie".

Finally, there would appear to be a growing demand in Soweto for a return – at least on a short-term basis – to a flat rate for electricity (*i.e.*, a single monthly rate for all households regardless of the amount of electricity consumed). Representatives from the Soweto Electricity Crisis Committee have made a case for fixing this flat rate at R50 per month. Although counter to the general push for volumetric pricing and cost recovery on the part of government, the idea of a flat rate would appear to

have strong political support in Soweto and may offer an interim solution to the affordability crisis.

Alternative Pricing Options

The general conclusion to be drawn from this research is that the price of electricity for low-income households in Soweto will have to decrease if government is to fulfill its affordability mandate. A return to a flat-rate pricing system is one option for dealing with this situation in the short term. Longer-term options would need to involve an increase in subsidies from national government and/or an increase in cross-subsidies from wealthy suburbs and industry (with the latter being achieved in part by the introduction of more progressive block tariffs). It is also necessary to re-evaluate the positive benefits generated from universal electricity coverage (e.g., improved public health, better gender equity, healthier local environments) and to incorporate these benefits into a more holistic analysis of how they price electricity for the poor.

Finally, it is recommended that government consider offering a considerably larger supply of free electricity to low-income households and that these calculations be done on a 'per person', rather than a 'per household', basis in order to avoid bias against large families.

INTRODUCTION

t is widely accepted that access to affordable electricity has a wide range of positive developmental effects. Increased usage of electricity generally improves the level of welfare (particularly for women and children), decreases health expenditures, and improves life opportunities for low-income families. The South African government's 1998 *White Paper* on electricity reflects these concerns, arguing that "energy should therefore be available to all citizens at an affordable cost" (DME 1998).

In some respects the African National Congress (ANC) has made great strides in this respect. An additional 2.5 million homes have been connected to the electricity grid since 1994 (when less than four in ten African homes had access to electricity), bringing the percentage of electrified households in the country to 79.7% in urban areas and 46.3% in rural areas (NER 1999). Eskom – the parastatal company that generates all electricity in the country – has slowed down its electrification programme but says that it is committed to electrifying an additional 600 000 homes between 2000 and 2002 (Eskom 2001a, 39).

There have been two major problems with the post-apartheid electrification programme, however. The first has to do with inadequate infrastructure for low-income households. The Department of Provincial and Local Government's *Municipal Infrastructure Investment Framework* supports only the installation of 5-8 Amp connections for households with an income of less than R800 per month, which does not offer enough power to turn on a hotplate or a single-element heater. In newly electrified rural areas, amperage as low as 2.5 is sometimes used. In most historically white areas, meanwhile, 60 Amps has been the standard.

An even bigger problem is the issue of affordability. Being attached to the electricity grid – Soweto was the first township in the country to be connected in the early 1980s, with some parts of the township being connected as early as the 1930s – is only meaningful insofar as one can afford to pay for the service. High electricity prices for township and

rural households, aggravated by large and growing payment arrears, has meant that millions of low-income households have significantly reduced their electricity consumption because they cannot afford to use as much as they would like (even for essential activities like cooking) and hundreds of thousands of households have experienced service interruptions and cut-offs for non-payment of electricity bills.

Cost-recovery policies on the part of Eskom and various levels of government have been partly to blame for this. There is some crosssubsidisation taking place from industry to households (somewhere in the order of R1.8 billion according to Eskom officials), but these subsidies and other national government transfers remain insufficient to ensure that lowincome people are able to afford sufficient electricity. "Cost reflectiveness" as Eskom officially refers to its policies of charging consumers as much of the costs of service delivery (including the short-term marginal costs of new infrastructure provision) as it can – has meant a large-scale shift from flat-rate systems where township consumers paid a single monthly rate regardless of the amount of consumption to metered consumption where payment is based on the amount of electricity used. For most township areas this has resulted in considerable price increases – sometimes more than 400% per month over their flat rates – despite the fact that the average real price of electricity has decreased by 15% from 1994-2001 (Eskom 2001a). To make matters worse, recent media reports have been arguing that the cost-plus pricing strategy that may be adopted as Eskom commercialises could raise electricity costs to households by a further 20-50%, a point that was not denied by Eskom officials in our meetings with them.

Price imbalances are also to be found in the per-unit costs of electricity. Low-income households (which consume less than 3 percent of the electricity produced in the country) pay a great deal more per kiloWatt hour (kWh) than well-connected corporations. Domestic consumers pay an average of 24.59 cents per kWh (with rural consumers paying as much as 48 cents per kWh), while the manufacturing sector pays 12.83 cents per kWh and the mining sector 12.32 cents per kWh on average. Moreover, special deals are sometimes negotiated with large consumers (e.g., Alusaf) with prices as low as 3.5 cents per kWh (subject to special conditions and certain hours of the day). Defenders of these lower prices for industry argue that (a) the relatively few number of large companies constitute significantly lower administrative costs per unit than the millions of small poor residential users, (b) that industry can take advantage of off-peak

prices, (c) that there is vast excess in the Eskom system due to overly ambitious planning in the 1980s and this capacity needs to be utilised, and (d) that South African industry must remain globally competitive. In fact, South African industry enjoys the lowest industrial charges for electricity in the world (*Business Day* 25 April 2001).

There are also significant differences in electricity prices between middle-class suburbs and townships (Eberhard and van Horen 1995, 37-8), despite the fact that the quality of service in the latter is generally much worse. Johannesburg Metro, for example, is able to charge the lowest domestic consumer price in the country for its predominantly white suburban residents, while Sowetans are charged up to 30% more per kWh. Even residents of wealthy Sandton who are also served by Eskom pay less than Eskom customers in Soweto.

As a result of these pricing imbalances, post-apartheid energy policy has largely avoided the kinds of cross-subsidies from industrial users to township users that the 1994 *Reconstruction and Development Programme* called for. Instead, government has made it clear in its 1998 *White Paper* on electricity that prices to industry must not be affected by a household electrification programme: "Cross-subsidies should have minimal impact on the price of electricity to consumers in the productive sectors of the economy".

Government has not ignored the problem, however, and initially created a national equity share to help subsidise electricity costs to low-income households. This indigence policy awards poor households deductions from their municipal services of up to R86 per month. Households qualify if they earn less than R800 per month (R1 000 in Pretoria and Johannesburg). However, this policy has proved difficult and expensive to implement and has not significantly improved affordable access to services. As a result it has been replaced with the "Free Services" policy from 1 July 2001, whereby all households (regardless of income levels) are granted a portion of electricity for free, after which they must pay for each unit used. But once again, there is a problem. As this report makes clear, the amount of free electricity being offered is often less than 10% of the average needs of poor households and therefore makes little difference to use and affordability in that township. This blanket policy is also biased towards small families as it is based on a per-household calculation, regardless of the number of dependents.

There have also been major implementation problems and disputes over funding. Eskom, for example, has been insisting that national government provide it with R500 million to subsidise free electricity in Soweto and has therefore delayed free provision to thousands of households in that township for the foreseeable future (a dispute that is complicated by the fact that Eskom is in the process of being set up as an independent utility(ies) and may even be privatised over the next few years).

The contrasts from the apartheid era could not be more glaring. White consumers and industry were heavily subsidised by the state and Eskom played a leading role in promoting (white) welfare and prosperity in the country. External funding played a key role here as well with more than half of the World Bank's \$200 million in credits to the apartheid regime (from 1951 to 1966) going towards Eskom's expansion, including the highly polluting coal-powered stations that the country remains dependent upon to this day. South African electricity consumption (per capita) soared to a level similar to Britain, even though black South Africans were largely denied domestic electricity for decades. As a result, greenhouse gas emissions were twice as high per capita as the rest of the world, alongside enormous surface water pollution, bucketing acid rain and dreadfully low safety/health standards for coal miners.

One book, *The Political Economy of South Africa* by Ben Fine and Zav Rustomjee (1996), helps to put this sector into economic perspective. Electricity is located at the heart of the economy's "Minerals-Energy Complex", a "system of accumulation" unique to South Africa. Mining, petrochemicals, metals and related activities that historically accounted for around a quarter of economic activity typically consumed 40% of all electricity. Thus Eskom was centrally responsible for South Africa's economic growth for many decades. Fine and Rustomjee refer to this as the "Dutch disease", to recall the damage done to Holland's economic balance by its reliance on cheap North Sea oil – a problem well illustrated by the fact that poor planning at Eskom in the 1970s led to massive overcapacity in the late apartheid years (which at its peak in the early 1990s generated 30% more electricity than was demanded).

To what end? Today, most low-income South Africans still rely for a large part of their lighting, cooking and heating energy needs upon paraffin (with its burn-related health risks), coal (with high levels of domestic and localised township air pollution) and wood (with dire consequences for deforestation). Women, traditionally responsible for managing the home, are most adversely affected by the high cost of electricity and spend far more time and energy searching for alternative energy sources. Ecologically sensitive energy sources such as solar, wind and tidal power

have barely begun to be explored in South Africa, while the few hydropower plants (especially in neighbouring Mozambique) are based on controversial large dams that, many experts argue, do more harm than developmental good.

The purpose of this report, however, is to shed light on the more micro dimensions of these broader macro-economic changes. How have electricity price changes and billing systems affected the daily lives of low-income households? To what extent are people "unwilling" to pay for electricity as opposed to being "unable" to pay, and what does this imply for payment arrears and access to electricity provision? What do people think of the promise of "free electricity" and what might be some alternatives for ensuring access and affordability to the poor?

The report is based on the results of a survey of households in the township of Soweto in Johannesburg. These surveys are not necessarily indicative of the electricity experiences of all township households in the country (and we would certainly advocate more micro research of this nature to enrich our understanding of this complex issue), but as one of the oldest, largest and most politically important townships in the country, Soweto serves as a useful indicator of township experiences and attitudes and a useful bellwether of the state of electricity provision in the country.

THE CASE OF SOWETO

n early 2001, detailed interviews were conducted with a random selection of 200 households in two areas of Soweto: Pimville and Orlando East. The residents in these areas are predominantly workingclass pensioners or unemployed and most reside in council houses, 1 which is reflective of Soweto as a whole (Morris 1999, IX). Household selection was discussed with municipal planners and local Soweto residents in order to get a fair representation of family structures in the two sample areas. However, only council housing and private housing dwellers were chosen for interviews because they have generally resided in Soweto for a longer period of time and could provide more detailed historical accounts of their access to electricity. In cases where backyard shacks were accessing electricity from the formal dwelling, the number of residents in these shacks were accounted for, but only members of the main household were interviewed. On average, the main households consisted of 5-6 people, while backyard dwellings brought this average up to 7 (see Table 1). While all households had electricity infrastructure, some had their electricity supply cut off by Eskom at the time of the interview.

Pimville and Orlando East were separated into five areas representing different socioeconomic and demographic profiles. In the five areas, streets were selected randomly and every tenth house was approached for an interview. In cases where the potential respondent was not at home or did not want to participate (this only happened in two cases) the next adjacent house was chosen.

Table 1: Size of Households in Pimville and Orlando (%)

	Number of residents (main house)				
Area	1 or 2	3 or 4	5 or 6	7 or 8	9 +
Pimville	6	16	15	8	5
Orlando East	10	14	13	8	5
Total	16%	30%	28%	16%	10%

N = 200

The aim of the survey was to establish a better understanding of the problems experienced by households with respect to electricity supply and the extent to which these problems constitute a social and economic

'crisis'. The preferred respondent in interviews was the person in the household responsible for electricity management. All interviews were conducted face-to-face in the respondent's home and in the respondent's first language, using a mix of quantitative and qualitative questions.

Fieldworkers were selected from the community and went through extensive training and pilot testing of interviews. Both the questionnaires and the survey results were workshopped with fieldworkers several times and a public meeting based on preliminary results was held in Soweto to get feedback from residents. A pamphlet explaining the findings was also circulated to respondents with an invitation to a public meeting. Furthermore, a discussion workshop was held for academics and the electricity industry before this paper was finalised.

Individual, semi-structured interviews were also carried out with representatives at the National Electricity Regulator (NER), Eskom, the Department of Minerals and Energy and several other government agencies (please refer to "List of Interviews and Workshops" at the end of this report).

Composition of Households

Of the 200 people interviewed, 72% were women and 28% men, figures that reflect the fact that many township homes are female-headed as well as the fact that women were more often the managers of energy consumption and payment in the household. It is also worth noting that the women who participated in the survey provided more detailed information than male respondents. In 73% of the cases the respondent was also the breadwinner in the household, while 50% of household breadwinners were mothers (see Table 2).

Table 2: Breadwinner's Status in Household

	%
Mother	50
Father	24
Child	9
Retired family member	15
Other person	2

Table 3: Main Breadwinner's Employment

	%
Pensioner	40
Unemployed	22
Professional	10
Business/self-employed	9
Skilled labour	6
Unskilled labour	11
Informal	2
Other	1

N=197

Note: All figures rounded to the nearest percent and may not add to 100.

In 62% of cases the main breadwinner was unemployed or a pensioner, suggesting that incomes in most of the surveyed households are low. The 9% of interviewees that report having a business or being self-employed are street vendors, 'sheeben' (informal bar) owners or have small 'spaza' (convenient store) shops that typically generate small incomes. Fieldworker observation confirmed that over three quarters of the households interviewed live in poor economic conditions, a point further reinforced by a 1998 survey which found that 40% of households in the area had a family income less than R1 000 and over half had less than R1 500 per month (Morris 1999, 10). (It should be noted that in Johannesburg a household income of less that R1 000 per month entitles a family to deductions in their service charges, but none of the participants in this survey received these deductions.)

Reflecting the modest income in the two areas, a common incomegenerating strategy is renting out backyard shacks. Three quarters of respondents have shacks in their backyards, most consisting of a single room. In Soweto as a whole, 97% of all backyard structures are found behind council houses (Crankshaw *et al.* 2000, 845; Morris 1999, 14). The residents of the main house decide if they want to extend the electricity service to the backyard residents and if so, at what price. According to the Soweto Electricity Crisis Committee (SECC), shack residents often complain of unfair billing, while main households often feel that the services are mis-

or overused by shack dwellers, resulting in overloading and blackouts.

With formal employment such as the categories "professional" or "skilled labour" the households tend not to have shacks, while lower-income households such as "pensioner" or "unemployed" more frequently have shacks. Female-headed households also had to rely on the backyard economy more often, as women more commonly have less income than their male counterparts, creating additional energy-related complications for women.

Township housing structures in South Africa often lack essential ventilation and insulation needs, increasing electricity bills for heating needs and aggravating indoor pollution from fuel combustion. Households in our survey were no different in this respect with a quarter of the homes lacking any form of insulated ceiling. Material luxuries, meanwhile, such as indoor toilets and electric appliances, are few and mainly exist in the households where the main breadwinners possess a job that is relatively well paid. Fieldworker observations showed that 95% of households own only basic appliances. Ten percent of households did not have any kind of refrigerator, while 60% only possessed a small refrigerator. Eleven percent of those with a fridge turn it off occasionally to save on electricity.² Six percent of respondents do not own any form of electric cooker, while only 40% own hotplates and ovens. Eleven percent lack television sets and 38% do not have any form of electric heating. Many of those who have electric heaters still use coal in winter as it is cheaper.

Respondents often said that they use less electricity than they need in order to save money (although many also complained that they did not see a corresponding decline in their electricity bills). Thirty-eight percent of respondents, for example, said that they cooked less than they wanted, especially traditional (and time-consuming) dishes for their families.

Access and Affordability

One of the key complaints that we had from interviewees is that they cannot afford to pay for the electricity they use. Average bills in the summer months are in the range of R150 per month (approximately 500 kWh of consumption) while monthly bills of more than R500 were frequent during winter months (see Table 4). Nevertheless, regular bill payments are typical, with each of the households interviewed indicating some level of monthly payment, even if only a portion of the amount owed. In winter months, for example, households with bills in the range of R400 pay an average of R200 per month towards their bills.

Table 4: Household Electricity Bills

	Percent of households in each price range		
Amount of monthly bill	Winter months	Summer months	
R0-50/month	2	3	
R51-100/month	5	16	
R101-150/month	9	12	
R151-200/month	13	22	
R201-250/month	7	12	
R251-300/month	12	11	
R301-350/month	10	3	
R351-400/month	8	5	
R401-450/month	5	1	
R451-500/month	7	3	
R501 or more/month	22	11	

N = 195

Part of the problem here, of course, is a more general problem of poverty, with the bulk of homes in the sample area earning less than R1 000 per month, making it very difficult to meet all the basic needs of the residents. But the affordability issue is also, as noted earlier, a product of an inequitable pricing structure that favours large corporate consumers over small domestic consumers.

Because of these high costs, nearly three quarters (72%) of respondents stated that they had tried to lower their electricity usage. Some reduced their use of television and cooking while others would switch fridges and hot water heaters off at night. However, most respondents said that even though they try to save and follow electricity saving instructions, they are still not able to reduce their electricity charges.

Arrears

The high cost of services has contributed to a serious problem with electricity arrears in Soweto (*i.e.*, money still owed on previous bills). Just how serious is the arrears problem? According to our survey, 30%

of respondents owe more than R10 000 (an amount that is effectively unpayable given household incomes in the area). Another 20% owe between R6 000 and R10 000 and 25% owe between R2 000 and R6 000. Only 11% of households do not have any electricity arrears (see Table 5). Moreover, over a fifth of these arrears (21%) are more than four years old with another 36% being three to four years old, suggesting a long-term debt trap for half of the households interviewed (see Table 6). In total, Eskom reports that arrears in the greater Soweto area are more than R1.1 billion (Eskom 2001b). With high interest rates (14.5%) and continuous unpaid service fees these arrears increase steadily.

It should be noted that some of these arrears date back to the 1980s and the 'rent boycotts' of the anti-apartheid struggle. Eskom did cancel some of this older debt – it was agreed in negotiations with civics in Soweto that half of all debt accumulated to June 29, 1995, plus interest, would be written off and as many as 60 000 customers signed the agreement – but some respondents claim that Eskom did not honour the write-offs on their bills. Others said that they did not understand what they were signing in the first place, bringing into question the validity of the whole process. Eskom, meanwhile, claims that consumers have not honoured their repayment schedules.

Table 5: Amount of Arrears

Amount owed to Eskom by household for electricity	Percent of households
Does not owe any money	11
R1-2000	15
R2 001-4 000	12
R4 001-6 000	13
R6 001-8 000	11
R8 001-10 000	9
R10 001-15 000	17
R15 001-20 000	4
R20 001-30 000	6
R30 001 or more	3

Table 6: Length of Time for Arrears

Length of time respondent has had electricity arrears	Percent of respondents
0-2 months	4
3-4 months	7
5-6 months	5
6-12 months	13
1-2 years	14
3-4 years	36
4 years or more	21

N = 169

Eskom blames the arrears situation on a "culture of non-payment" carried over from the 1980s, but our interviews suggest that people do try to pay their bills and that they take their arrears very seriously. Respondents repeatedly stated that they are willing to pay for (good quality) services but are simply unable to pay the full amounts of their bills with low or unstable incomes. The fact that over half the households interviewed keep their electricity bills for more than four years, and some have bills going all the way back to 1980, further challenges the "culture of non-payment" thesis. Only 2% of respondents do not keep their bills. One of these persons replied that she gets so depressed looking at the bills that she has finally started to throw them away.

Service Cut-offs

Inability to pay has also led to a rash of electricity service cut-offs in Soweto in the past few years, with up to 20 000 households per month being cut off in early 2001 (this high rate of cut-offs was, in fact, the impetus for this research). These cut-offs accelerated dramatically when, in April of 2001, Eskom made a decision to cut electricity supply to households in Soweto that had in excess of R5 000 in arrears and when payment was more than 120 days overdue.³ In the beginning of March it was announced in an Eskom press statement that 131 000 households in Soweto would be cut off with this new policy (despite the fact that only 126 000 consumers exist in the area, indicating a cut-off rate of more than 100%!) (Eskom 2001b).⁴

In our sample, 61% of households had experienced at least one electricity cut-off in the past 12 months (*i.e.*, the electricity was intentionally interrupted by Eskom) while some had experienced four or more (see Table 7). Eighty-six percent of those who had experienced cut-offs said that it was due to non-payment of their electricity bills.

Table 7: Number of Cut-offs Reported by Households in the Past 12 Months

Number of cut-offs	Percent of households
One	36
Two	14
Three	5
Four or more	6
N/A (no cut-off)	39

N=200

The length of service cut-offs has been devastatingly long in the two areas surveyed. Forty-five percent of households experiencing cut-offs were without electricity for more than a month, and many reported cut-offs of up to nine months in length (see Table 8). Several of these respondents still did not have electricity in their homes at the time of interviews.

Table 8: Length of Electricity Supply Cut-off

Length of cut-off	Percent of households
Up to one day	9
A couple of days	12
Approximately one week	14
1-2 weeks	10
3-4 weeks	11
More than a month	45

Almost half of the households surveyed (49%) paid Eskom to have their power reconnected. Fifty-eight percent have renegotiated their payments with Eskom to try and avoid cut-offs in the future, while 13% indicated that they have needed legal assistance in the past to deal with cut-offs. A further 7% of the sample had received summons from Eskom in relation to their arrears.

Of the households experiencing cut-offs, 10% had their electricity cables removed permanently by Eskom (a method used when a consumer has been found to have reconnected illegally). However, once the cables have been removed the price of reconnection is often impossible to meet due to infrastructure costs and the fact that arrears must be paid in full. Many of these households now live permanently without electricity, while others are forced into a vicious cycle of illegal connections/disconnections and power interruptions.

Not surprisingly, 89% of respondents say that they worry regularly about their electricity payments. The main concern is long-term service cut-offs, but many (women in particular) stated that they worry that their neighbours will look down on them for not having electricity in their house. They feel less worthy and a loss of dignity from cut-offs, reflected in the fact that 70% of respondents stated that "it is degrading to my family to live without electricity".

Disputes with Billing

Interestingly, 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. Furthermore, the rule set by Eskom not to cut off households with less than R5 000 in arrears, and to give consumers 90 days to pay off arrears after a notice is served, has, according to some respondents, not been adhered to. Notices of cut-offs are printed on the electricity bill, often giving the resident just 14 days to reply. Many also complain that they receive two bills a month, one from the local council and another from Eskom's head office, creating confusion. Others still complain that bills are not received regularly, making it difficult to keep on top of the arrears and payment situation.

According to Eskom, 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. According to respondents, however, 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. Cutoffs are often performed when consumers have already made arrangements for repayment and in some cases no notice is given prior to a cut-off.

Several households provided evidence of inconsistent billing which appeared to be a result of faulty metres or the non-reading of metres, bringing into question the reliability of billing. Nine percent of households, for example, reported that their electricity bills always come to the same amount each month despite the fact that usage fluctuates considerable. Forty-two percent stated that their metres were only read occasionally, and a further 26% claimed that Eskom *never* read their metres. Despite these inconsistencies, only 14% of those households that had experienced cutoffs in the past year disputed the cut-off with Eskom.

Health and Safety Impacts of Electricity Cut-offs

The loss of dignity referred to earlier is only one of the many consequences of electricity cut-offs identified by respondents in our survey. When asked a series of questions about what happens when electricity is cut off in their homes respondents provided a litany of concerns, from increased domestic violence to the spoiling of food (see Table 9).

The gendered nature of electricity disruption is particularly important given the disproportionate increase in the domestic workload that falls on women in South African townships, with 65% agreeing that electricity cutoffs mean that "women have more work to do". No doubt women also bear the brunt of the rise in domestic violence that is identified by over a third of respondents as a result of electricity cut-offs.

But it is not just women that suffer. Nearly half of our sample (46%) has experienced health problems related to the use of alternative sources of energy like coal and paraffin (see Table 10). The most common problems are respiratory, such as breathing and coughing, a figure that corresponds closely to a previous study that estimated that 40% of Sowetans suffer from respiratory problems (Morris 1999, 34, 41). There were also reports of children being poisoned from drinking paraffin and household fires due to candle or paraffin use (sometimes leading to the destruction of tens or hundreds of shack dwellings in one blaze).

Table 9: Effects of Electricity Cut-offs

When electricity is off	Percent of respondents who "agree" with the statement
Food gets spoiled	98
We cannot cook food properly	90
Our personal hygiene is negatively affected	88
We spend more money on alternative fuels	84
The children cannot study properly	81
It increases crime in the area	73
It is degrading to my family to live without electricity	70
Women have more work to do	65
It is bad for our working life	62
It disrupts home business	41
It increases domestic violence in the neighbourhood	36

N=200 Note: Respondents could provide more than one answer.

Table 10: Electricity and Health

Have you experienced any health problems related to alternative energy consumption in your household (e.g., coal or paraffin)?	Percent of respondents who said ' yes'
Breathing/coughing	19
Eye problems	9
Child drinking paraffin	5
Children being burned	3
ТВ	1
Other health problems	9
No problems reported	55

A study from 1992 concluded that domestic fuels in South Africa were a major cause of the human exposure to air pollution and a major contributor to degrading children's health status in particular (Terreblanche *et al.* 1992). An important reason for this is that cooking is often done inside houses with inadequate ventilation. This is especially true in low-income households where ventilation issues are largely neglected in construction. Recent research has shown that people in South Africa spend up to 80% of their time indoors, adding to the potential hazards (Fuggle and Rabie 1998, 599).

The respiratory problems depend on the size of the particles that are emitted from the fuels. Smaller particles can penetrate further down and cause diseases such as bronchitis, pneumonia or asthma, while larger particles tend to cause problems such as runny noses, earache and hay fever (Terreblanche *et al.* 1993, 84). Moreover, the exposure to fuel combustion often creates chronic irritation, such as permanent or returning eye infections. Other chronic problems caused by air pollution can be acute respiratory diseases, cancer and cardiovascular diseases (Terreblanche *et al.* 1992, 26-7). Exposure to unhealthy air pollution in South Africa has been found to exceed the risk level in 100% of black households, in both rural and urban areas (Terreblanche *et al.* 1993, 102).

These health issues can be directly linked to a loss of electricity supply. Other more indirect factors that lead to a general worsening of health include a lack of access to important public health information supplied by televisions (e.g., AIDS awareness campaigns) and a pervasive sense of despair leading to a downgrading of the importance of one's own health maintenance and the sense of responsibility to other family and community members.

Respondents also reported that Eskom's cut-off procedures often result in loose electricity cables on the streets (either because the cut-off was done improperly or due to a subsequent illegal reconnection that was not done properly). In a shack settlement outside Cato Manor in Durban this problem caused the death of 11 children in the past year (*Mail and Guardian* 16-22 March 2001). It was also stated that Eskom employees leave substations unlocked, creating additional potential hazards for residents. Eskom employees reportedly make a second income from illegal electricity connections and might therefore purposefully leave substations open. Residents in Pimville and Orlando East find themselves in a dilemma reporting these dangers since Eskom might also discover the illegal connections on inspection, leaving families without electricity.

As a result of these health and safety dangers, virtually all respondents (93%) said they prefer electricity to all other energy sources. Many even refused to list a second or third choice of energy sources, arguing that electricity is the only source they want to use. Of those that did list other fuel choices, coal was the most common alternative, followed by paraffin (both are used by 37% of the sample). Natural gas scored very low on attractiveness with most respondents saying they are scared of explosions. Only 6% of the sample uses gas. A third of the households collect firewood for themselves (either in the plains surrounding Soweto or on trips to the countryside) while 59% stated that they use candles, but mainly as a supplement when there are power failures.

Illegal Connections

Given the importance attached to electricity supply, it is not surprising that cut-offs are resisted in various ways. In some areas of Soweto cut-offs have been resisted by residents with violence. Whistles are also used to alert neighbours to the arrival of Eskom employees. Several marches have taken place to protest cut-offs and some dialogue has taken place between community groups and Eskom representatives (the Soweto Electricity Crisis Committee being the largest and most vocal in this respect). Most recently, residents have developed an informal network of people that will reconnect consumers to the electricity grid illegally. Called *Operation Khanyisa* (to light), this open challenge by Sowetan residents has led Eskom to threaten to press charges (*The Star 4* June 2001).

How widespread is this practice of illegal connections? Understandably, this is a sensitive question for most households so instead of asking directly if the house had an illegal connection we asked whether the household had been *offered* an illegal connection by anyone. Almost one quarter of households (22%) had been made this offer.

In half of these instances the illegal connection was offered by the person who had originally disconnected the respondent's electricity (*i.e.*, an Eskom employee), or by another person employed by Eskom. In one out of three cases the person was unknown to the respondent and in 17% of cases the person who offered the illegal connection would be a family member. The price of an illegal connection ranged from zero, usually for that offered by family members, to the several hundred Rand reportedly charged by Eskom employees.

It was also rumoured prior to the survey that it was possible to buy a device to slow the metre so that the consumer pays less for electricity. Such a device has been offered to 8% of the households in the survey. It is unclear whether the device actually works (Eskom claims it does not) but people with the device reportedly have lower bills. Households who were offered such devices were mainly households with high electricity payments but it is unknown whether they actually acquired one.

Consumer Satisfaction?

High electricity prices, large arrears, unreliable billing, and unsafe connections seem to have contributed to a generally low level of satisfaction with electricity service provision amongst respondents. Fully two thirds of interviewees (66%) indicated that they are not satisfied with electricity provision in their house and 70% think that electricity services are less satisfactory than they were five years ago when the municipality distributed electricity in Soweto. Only 16% are of the opinion that electricity provision is better today than it was at the end of apartheid. Interestingly, the level of arrears seems to make little difference to people's level of satisfaction. As Table 11 also indicates, it is not just those with high levels of arrears who are dissatisfied.

Table 11: Consumer Satisfaction with Electricity Services

Amount of arrears	Satisfied with service (%)	Not satisfied with service (%)	
0	5	6	
R1 - 2 000	5	10	
R2 001 - 4 000	4	8	
R4 001 - 6 000	5	9	
R6 001 - 8 000	3	8	
R8 001 - 10 000	2	7	
R10 001 – 15 000	6	9	
R15 001 - 20 000	1	3	
R20 001 - 30 000	2	3	
R30 001 or more	1	3	
TOTAL	34%	66%	

We also asked respondents how they compare electricity provision with other basic services in the township (refuse collection, water, roads and toilets) and electricity was considered by far the worst, with 48% of responses (see Table 12). Given the poor state of roads, water, sanitation and refuse services in Soweto this is a sad indictment of electricity provision indeed.

Table 12: Comparing Electricity to Other Services

Which of the following services would you consider to be the worst in your neighbourhood? (one choice only)	Percent of respondents	
Refuse collection	17	
Roads	11	
Toilets	9	
Water	15	
Electricity	48	

N=188

Respondents were also asked if they had any other problems with payment of their electricity bills. Close to a third (30%) said "yes". Most often cited were problems of long queues on payment days (a serious problem for older pensioners who sometimes spend the better part of a day standing in line in the heat, rain or cold), a lack of help with assistance explaining bills, and generally poor service from Eskom staff. On the latter point, it was frequently reported in interviews that Eskom staff have a negative attitude towards consumer problems. Consumers know that they must take their complaints to Eskom but feel intimidated to do so, and problems therefore go unresolved (or electricity is cut off). Many added that it would be helpful to educate Eskom staff about how to deliver proper service and information to consumers.

Free Electricity?

As part of its campaign for the December 2000 local government elections, the ANC (quickly followed by the Democratic Alliance party) promised the delivery of "free electricity" to residents of municipalities where it won a majority of councillor seats (both parties also offered free water along the same lines). The ANC promised 50 kWh per month for free to every household while the DA promised 20 kWh per month.

Might this be an answer to the crisis of unaffordability and electricity cut-offs in townships like Soweto? The answer, in short, is no. The biggest problem is that 50 kWh per month is a mere 10% of average monthly usage in the households that we surveyed in Soweto and will therefore make little difference to the bills that residents say they cannot afford to pay. As estimates from Eskom (1996) demonstrate, lighting needs alone in a low-income household in South Africa necessitate 60 kWh per month while other basic electricity needs take monthly usage to approximately 600 kWh per month (see Table 13). (Even rural households that have electricity and which have significantly lower electricity requirements of between 200 and 300 kWh per month on average (Thom, Mohlakoana and Dekenah 2000) would benefit only marginally from the "free electricity" policy due to the even higher per-unit costs of electricity in most rural areas and generally lower household incomes).

Table 13: Electricity Usage in an Average Low-income Household

Appliance	Rating in Watts (W)	Estimated kWh per month	Approximate ration in Amps (A)
Stove and hotplate	2 000 W	200 kWh	10 A
Heater	1 500 W	150 kWh	7.5 A
Kettle	2 000 W	50 kWh	10 A
Iron	1 000 W	50 kWh	5 A
Refrigeration	100 W	38 kWh	0.5 A
Lighting	120 W	60 kWh	0.5 A
Hi-fi/radio and TV	100 W	46 kWh	0.5 A

Source: Eskom 1996, 13

Another problem with the "free electricity" policy is that it does not take into account different household sizes. If free electricity is awarded to household regardless of size, then households consisting of one or two adults would benefit disproportionately as compared to a household with, for example, a single pensioner and six dependents. And given that larger

households tend to be female-headed, this household policy would further disadvantage women.

These fundamental tensions in the free electricity proposals would appear to be further aggravated by popular perception of what is meant by free electricity. When asked what they understood the ANC to mean when they promised "free electricity", 13% of our sample understood it to mean that *all* electricity would be free while an additional 15% thought that it meant *all arrears* would be written off as well (see Table 14). Only 16% assumed, correctly, that a small part of electricity would be provided for free (although it was not asked what they thought a "small part" would mean in Rand terms).

Table 14: Perceptions of "Free Electricity"

"How do you understand the ANC promise of free electricity?"	Percent of respondents
Have never heard of it	15
A small part of the electricity is free	16
A large part of the electricity is free	2
All electricity will be for free	13
All electricity for free and arrears written off	15
Other	40

N=200

Tellingly, the largest group of responses (categorised in Table 14 under "other") refused to believe that the free electricity promise had any real meaning. Fully 40% of respondents felt that it was either just a campaign ploy to get them to vote or an outright lie. Several respondents also stated that they considered it a waste of their time to vote anymore. The fact that the promised implementation date for free electricity in Soweto (July 1, 2001) has come and gone without any free electricity provision, and that it is now unlikely that Sowetans will see any free electricity until sometime in 2002 due to logistical problems and demands by Eskom for subsidies from national and municipal government, no doubt means that this scepticism and cynicism has deepened in Soweto.

Trevor Ngwane of the Soweto Electricity Crisis Committee (SECC)

echoes these survey sentiments, arguing that "Many people in Soweto have little or no faith in the ANC keeping its promise of free basic electricity". He is also critical of the household as a unit of measurement, arguing that free lifeline supplies of electricity should be allocated on a "per person" basis so as to avoid bias against large families. The current SECC proposal, by contrast, is for "at least one kiloWatt hour per person per day [of free electricity]. For a family of ten that would translate to 300 kWh per month, or R86.10 at the current high price of R0.287 per kiloWatt hour. That is a fair subsidy – less than R9 per person per month – and we think a rich company like Eskom has the means to pay it."⁵

A Flat-rate System?

As illustrated in this report, electricity provision in Soweto is highly controversial, with protests against cut-offs and threatened payment boycotts creating serious political challenges to existing government policies. What might be done to address the concerns of Sowetans (and other township and rural residents with similar concerns about electricity provision)?

When we asked Sowetans what they thought could/should be done, many were of the opinion that only well-organised community protest against Eskom and the (physical) resistance of cut-offs by Eskom employees would help to move the issue forward. "We need to stand up and fight" was a common response to the situation. Certainly there was a considerable amount of tension at a community meeting sponsored by the Soweto Electricity Crisis Committee in early May 2001, when more than 400 residents from various parts of Soweto met in a community hall to learn about the extent of the electricity cut-off situation and to hear from an Eskom spokesperson. The room was filled with people of all ages telling stories about unjustified electricity cut-offs and their (unsuccessful) efforts to reinstate their service, accounts of how they live with the threat of a disrupted service, how they can never expect to pay off their arrears, and so on. The mood was composed but angry, and imbued with a deep sense of frustration with a service that many Sowetans find more expensive and less accessible than they did under apartheid. Several more community gatherings have taken place since this meeting.

When asked what kind of a payment system they would prefer, close to two thirds of respondents (59%) said they would like to see a return to the "flat-rate" system (*i.e.*, where households pay a regular monthly rate regardless of the amount of electricity consumed) (see Table 15). When asked what they would be willing to pay per month for such a flat rate,

56% of respondents were prepared to pay R26-50, 15% were prepared to pay R51-75 and the remaining 29% were prepared to pay R76-100 per month. Those with larger bills were generally prepared to pay the larger amount while those with lower bills wanted to pay less, but it is noteworthy that the amounts people were willing to pay were significantly lower than the average summer monthly rates of R150 per month and certainly much lower than the R500 per month in the winter.

Table 15: Preferences for Electricity Payment

What payment system would you prefer?	Percent of respondents	
Prepaid metre	28	
A set amount of electricity free	11	
Flat rate	59	
Other	2	

N=198

Another one of the demands of the SECC is in fact the reinstatement of a flat-rate system, at least as a short-term measure, as articulated here once again by Trevor Ngwane:

People want to be charged a fixed price each month that they can budget for. That price is R50 for each household in Soweto. We consider this flat-rate demand a return to our tradition of anti-apartheid struggle, because that was the demand that emerged during the 1980s in Soweto. With leaders in the Committee of Ten like Motlana, Ramaphosa, Chikane, Ncube, Masondo, Mogase and others, we won that short-term struggle. It is sad that Sowetans are using old demands against the apartheid regime in dealing with the democratic government. This is a short-term demand, reflecting growing alienation in the present circumstances, whilst we await a more equitable, sane system.⁶

Although anathema to the principles of cost recovery and marginal cost curves, the idea of a flat rate has political cache in Soweto (and likely in other township areas) and is grounded in the realities of what people can reasonable expect to afford. Policymakers may therefore need to

reconsider the logistical, political and economic implications of a flat-rate system and should incorporate this possibility into the ongoing discussions of electricity delivery policy options.

CONCLUSION

f the research results presented here are any indication of the larger electrification picture in South Africa – and there is ample anecdotal evidence from other parts of the country to suggest that it is – then it can be argued that the ANC government's stated commitment to electrifying low-income households is largely unsustainable because the per-unit price of electricity is too high for township dwellers to afford.

One reason for these high prices is that Eskom, and by extension national government, has failed to factor in the full set of benefits (positive externalities) associated with access to affordable electricity. These benefits include: a net improvement in the immediate living environment of the poor; fewer respiratory diseases and other public health problems; fewer hazards associated with fire; greatly increased gender equity; improved productivity on the part of workers; improved capacity to learn on the part of youth; greater chances for class desegregation; and many economic spinoffs from those who can use electricity for income-generating purposes. Although sometimes difficult to measure, these benefits could far outweigh the financial costs associated with additional subsidies on electricity.

Eskom will also need to consider the introduction of more progressive rising block tariffs as a way of cross-subsidising electricity costs for the poor while at the same time helping to curb the hedonistic consumption of energy in wealthy households and energy-inefficient industries. Current subsidy mechanisms appear to be inadequate in terms of generating the necessary resources needed to make a significant difference in affordability for low-income households.

Continued cut-offs of electricity supplies to low-income households are not going to solve the electricity crisis in Soweto and other townships around the country. Nor is this option even constitutionally sound. As a recent ruling by the Constitutional Court in the Western Cape has demonstrated, electricity is now considered a basic human right and can be included as a "vital service" in terms of the Bill of Rights. The case of Irene Grootboom, a shack dweller in Cape Town, has shown that the poorest must receive at least a lifeline supply of basic services:

A society must seek to ensure that the basic necessities of life are provided to all if it is to be a society based on dignity, freedom and equality....For a person to have access to adequate housing...there must be land, there must be services, there must be a dwelling....The state's obligation to provide access to housing depends on context....Some may need access to land and no more; some may need access to land and building materials; some may need access to finance; some may need access to services such as water, sewage, electricity and roads. (Grootboom v Republic of South Africa, 2000)

Electricity policymakers cannot ignore these tensions any longer. As the experience and anger of respondents in this report indicate, electricity provision is indeed in a crisis situation. If government is to fulfill its mandate of "affordable and accessible electricity for all" it will need to reconsider current energy policies which tend to benefit energy-hungry suburbs and industry at the expense of basic needs.

ENDNOTES

- 1 Council houses were built by the previous government and rented to residents. They are now continuously transferred to the residents.
- 2 To turn off your refrigerator occasionally or overnight is unlikely to save electricity, however. Once the refrigerator is re-plugged it uses a larger amount of electricity in order to cool down. The previously saved electricity is thereby lost unless the refrigerator is left off for long periods.
- 3 Personal interview with Frans Marais of Eskom, May 2, 2001.
- 4 In the Johannesburg Metro, the municipality has been cutting off water supplies as well in an effort to force people to pay their electricity bills (Saturday Star 10 March 2001).
- 5 Interview, August 19, 2001.
- 6 Interview with Trevor Ngwane, August 19, 2001.

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LIST OF INTERVIEWS AND WORKSHOPS

Interviews

(Personal, telephonic and e-mail)

- Reneilwe Langa, National Electricity Regulator (NER), March 2001
- Richard Duke, Princeton University, March 2001
- Peter Brandt, Eskom, March 22, 2001
- Owen Crankshaw, University of Cape Town, April 2001
- Paul Harris, PM Energy Services Pty Limited, April 25, 2001
- Frans Marais, Shirley Savoldi and Billy Madike, Eskom Pricing Group, May 2, 2001
- Nelisiwe Magubane, Chief Director: Electricity, Department of Minerals and Energy, May 3 and 10, 2001
- Peter Adams, EE Publishers, May 8, 2001
- Dan Mashitisho, Chief Director, Gauteng Provincial Department of Development Planning and Local Government, May 11, 2001
- Pascal Moloi, Municipal Manager, Johannesburg Metro, May 12, 2001
- Kevin Morgan, Margie Nkalashe, Rose Phetoe, Fundi Rampete, National Electricity Regulator (NER), May 15, 2001

Workshops

- Department of Minerals and Energy workshop on Electricity Basic Support Services Tariff Strategy, Midrand, March 30, 2001.
 Approximately 100 participants from local, provincial and national government, Eskom and NER.
- Discussion of issues in draft report, Wits Graduate School of Public and Development Management (P&DM), April 19, 2001. Attendees included: African Mineral & Energy Forum Mandla Tshabalala; Eskom Billy Madike, Shirley Savoldi and Frans Marais; EE Publishers Peter Adams; CBI Roland Hill; SECC Sydney Bam, Bongani Lubisi, Trevor Ngwane, Dorothy Mthembu, Richard Masenya, Nonhlanhla Vilaigazi, Aubrey Setshedi, Lufuno Chuchu, Virginia Setshedi, Lerato Poele; The Democratic Alliance Manthole Selepe; MEPC Tieho Theoha; AIDC George Dor; Meadowlands Civic Thabo Raphela; Wits Law School Sean Fiil-Flynn; P&DM Mokgadi Moima and Nombulelo Mpato; Municipal Services Project Patrick Bond and Grace Khunou; Hands-on Production Gillian Schütte.
- Discussion of issues in draft report, Funda Centre, Soweto, May 5, 2001. Approximately 400 local electricity consumers and Soweto Eskom representatives.
- Discussion of draft report with a panel from the electricity sector, August 19, 2001. Attendees from the electricity sector: Nelisiwe Magubane, Chief Director: Electricity (Department of Minerals and Energy); Xolani Mkhwanazi, Chief Executive Officer (National Electricity Regulator); Jacob Maroga, Manager: Distribution (National Electricity Regulator). Representatives from civil society were: Neva Makgetla, senior researcher (Cosatu); Virginia Setshedi (SECC); Wiseman Hamilton, Johannesburg Anti-Privatisation Forum; Patrick Bond, Co-Director (Municipal Services Project).

SECC consultative workshops and meetings with residents of Soweto

- 21 March, march to present statement of grievances to Johannesburg mayor Amos Masondo
- 3 April, Zone 4 Pimville
- 4 April, Zone 3 Pimville
- 5 April, Zones 5 and 7 Pimville
- 8 April, Klipsruit Zulu section
- 10 April, Zone 2 Pimville
- 15 April, Lipsruit Sotho Section
- 31 May, Zone 6 Pimville
- 2 June, Zone 9 Meadowlands
- 7 June, Zone 6 Diepkloof
- 9 June, Soweto mass march to Johannesburg Council offices
- 19 June, Zone 2, Diepkloof
- 29 June, Dobsonville veterans meeting
- 30 June, Picket at Mayor Amos Masondo's house
- 30 June, Zone 3 Zola
- 4 July, Dobsonville veterans
- 10 July, Zone 9 Meadowlands
- 12 July, Zone 7 Meadowlands
- 14 July, Dube Township
- 21 July, Soweto-wide rally at Orlando Community Hall
- 29 July, Extension 4 Dobsonville
- 31 July, Zone 7 Meadowlands
- 3 August, Dlamini 01
- 9 August, Dlamini 02
- 9 August, Naledi veterans
- 14 August, Mofolo Hall veterans

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15 Augsut, Zone 3 Meadowlands

18 August, Soweto-wide boycott of Eskom rally