



**TRADE AND INDUSTRY CHAMBER**

**FUND FOR RESEARCH INTO INDUSTRIAL DEVELOPMENT,  
GROWTH AND EQUITY (FRIDGE)**

A study into approaches to minimise the impact of  
electricity price increases on the poor

Executive Summary Report

**April 2010**



**In Association with Prof Anton Eberhard, Graduate School of Business,  
University of Cape Town**

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# 1 Context and purpose

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The cost of generating electricity is increasing as a result of a need to develop new generation capacity.<sup>1</sup> The cost of distributing electricity needs to increase to provide adequately for maintenance and rehabilitation of the network.<sup>2</sup> Failure to find the resources to match these necessary and efficient expenditures will result in supply shortages and a degraded, unreliable network. This will increase the cost of doing business, reduce foreign direct investment and negatively affect job creation. These impacts will be felt most acutely by poor households. Therefore, finding the resources to match the necessary expenditures is pro-poor. However, sharply rising electricity costs and prices will have a significant impact on the welfare of poor households and effective ways need to be found to target affordable subsidies that will mitigate these impacts.

Establishing a framework for protecting poor households through tariff and subsidy design, in the context of increasing costs, is the primary focus of this study, as it is these measures that will have the greatest impact on poor households.

## 2 Existing subsidies

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### *Existing pro-poor subsidies are significant*

It is important to note that existing pro-poor subsidies (that is, electricity subsidies to protect poor households) are significant. These are summarised in the table below.

**Table 1: Existing pro-poor subsidies**

<b>Subsidy</b>	<b>Amount (R billion per annum)</b>	<b>Comment</b>
<b>Electrification grant</b>	2.7 <sup>1</sup>	During the last few years, new electricity connections have not been keeping pace with new household formation.
<b>Free Basic Electricity</b>	1.0	Data uncertain, could be substantially less. Many do not receive FBE.
<b>Eskom tariff subsidy to poor households</b>	2.1	Cross-subsidies to poor households within municipalities are excluded. The available data on this is poor and it is hard to quantify these subsidies.
<b>Theft</b>	2.5	About 4 000 GWh per annum, equivalent to 50% of Eskom's domestic sales. Excludes municipal theft.

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<sup>1</sup> Eskom's costs (and hence prices) will increase by a factor of 1.95 (25% per annum for three years) over the next three years.

<sup>2</sup> Electricity Pricing Policy (2008).

<b>Total</b>	<b>8.3</b>	More than 10% of revenue in the industry.
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Notes: 1. Submission to parliament by Minister of Energy, 4 February 2010

It is also important to note that not all poor households currently get subsidies.

The electrification grant has not yet reached all poor households. There are still 3.4 million households (25%) without electricity. About R60 billion is needed to connect these households.<sup>3</sup>

The Free Basic Electricity grant does not get to all poor households. It is estimated that about R4 billion per annum will be needed in future to cover the cost of providing 50 kWh of Free Basic Electricity to 4 million households.<sup>4</sup>

***Full application of existing policies will increase subsidies substantially***

The total cost of applying existing pro-poor subsidies fully will rise substantially as a result of more comprehensive cover combined with an increase in electricity costs. Indicative figures are presented in the table below.

***Table 2: Indicative future pro-poor subsidies (existing policies with greater coverage and higher costs)***

<b><i>Subsidy</i></b>	<b><i>Amount (R billion per annum)</i></b>	<b><i>Comment</i></b>
Electrification	6	To achieve universal access in 10 years.
Free Basic Electricity	4	50 kWh to 4 million households.
Tariff subsidy for poor households	5.5	4 million connections.
Theft	5	Assume constant 4 000 GWh per annum at higher cost of supply.
<b>Total</b>	<b>20.5</b>	A 2.5 times increase in real terms, representing more than 25% of current sector revenues.

Note: Eskom's costs are assumed to double over a three-year period. See main report for details.

The important point to note here is that the full implementation of existing policies within the context of increased costs could result in subsidies that are reaching possible fiscal and macro-economic constraints.

***Subsidies that are not pro-poor negatively impact poor households***

There are also substantial subsidies that are not pro-poor:

⇒ Farmers get a subsidy of R2 billion per annum;

<sup>3</sup> 2009/10 Rands. In 2010/11 R2.7 billion will provide 150 000 connections.

<sup>4</sup> Assuming Eskom's generation cost doubles in next three years from about 30 c/kWh to 60 c/kWh, and 50% of connections eligible. Note that this 4 million households refer to households who already have electricity connections, but do not receive FBE. In other words, this is over and above the 3.4 million unserved households referred to in the previous paragraph.

- ⇒ Energy intensive industries with special price agreements get a subsidy of about R1 billion per annum at present; and
- ⇒ Municipalities pay more than cost for their bulk supply by about R1.4 billion per annum.

These subsidies are relevant because they negatively affect poor households by reducing the amount of money available to subsidise poor households.

Correcting these distortions would reduce the cost of electricity supplied to municipalities by about 7.5% (current costs) and could make available about R1.6 billion per annum which could be used to subsidise poor households.

### **3 Approaches to protecting poor households**

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Subsidising the cost of electricity for poor households is by far the most effective mechanism to protect poor households. The costs involved in doing this are substantial, as already indicated above. For these reasons, this study has focussed much of its attention on electricity tariff and subsidy design.

There is a sound rationale to subsidise tariffs to poor households. The most significant benefit is moving from no electricity to access to electricity. Affordable access can be promoted through:

- ⇒ Connection fee subsidies (low or zero cost to get connected); and
- ⇒ Monthly fixed fee subsidies (low costs for low levels of consumption).

There are various ways to subsidise consumption:

- ⇒ Free basic allocation
- ⇒ Tariff subsidy with or without consumption limit

Subsidies can come from two sources: government revenue or cross-subsidies within the electricity sector.

#### ***International best practice***

The lessons from international best practice are clear. First, subsidise connections to the grid through zero connection costs because the poorest households are those without electricity.<sup>5</sup> Then subsidise fixed costs (no monthly fixed fee).<sup>6</sup> Then provide a free allocation to support use of at least a basic amount that provides a strong public good (in particular, access to lighting and communications which supports education and which reduces the household and social costs of unsafe energy sources such as paraffin and candles).

It is best to maintain an energy charge that is related to the variable cost of providing electricity. This provides the appropriate signals to value electricity and to use it wisely. If necessary, this can also be subsidised, but subject to a consumption limit otherwise

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<sup>5</sup> Subsidising connection costs promotes access to the grid. This is an important benefit for households without access to electricity and is pro-poor.

<sup>6</sup> Subsidising fixed costs for a category of small users lowers the entry cost of use and is pro-poor. Fixed costs are sunk costs and hence subsidising these costs does not affect the efficiency of use.

this subsidy will tend to benefit large consumers more than poor households and become very expensive.<sup>7</sup>

The total subsidy needs to be affordable and sustainable.

The better the subsidy is targeted, the greater the benefit to poor households. A general subsidy is the least pro-poor tariff. The international literature (on theory and practice) overwhelmingly recommends service level and tariff self-selection as the best practice to target electricity subsidies to poor households. This approach is objective, allows free choice, is effective (low errors of inclusion/exclusion) and is inexpensive to implement. The alternatives - indigent registers, income determination, and area targeting - all suffer from significant disadvantages.

***South Africa’s pro-poor tariffs align with international best practice***

South Africa’s primary pro-poor tariffs align with international best practice, as shown in the table below.

<b><i>Subsidy</i></b>	<b><i>Best practice?</i></b>	<b><i>Comment</i></b>
<b>Electrification grant</b>	Yes	This is the most pro-poor subsidy.
<b>Free Basic Electricity</b>	Yes	Promotes affordability of modest use with high public benefit (lighting, communications).
<b>Eskom Homelight tariff<sup>8</sup></b>	Yes	This is a well-targeted subsidy with zero fixed monthly cost and no connection cost.

***A number of existing practices do not align with best practice***

A number of other practices in the electricity industry in South Africa do not align with international best practice. These are described in the table below.

<sup>7</sup> Subsidising the variable energy cost will always benefit larger users more than small users and therefore is inherently regressive unless the energy subsidy is limited to a defined group of poorer users. This is possible through service level and tariff level self-selection

<sup>8</sup> Eskom’s Homelight tariffs are its tariffs for low-income “modest-usage” consumers (typically less than 500 kWh per month). Eskom’s tariff terminology is explained in the main report.

<i><b>Subsidy</b></i>	<i><b>Comment</b></i>
<b>Theft</b>	This practice is extensive (1.3 million connections or more), inequitable and threatens financial sustainability.
<b>Subsidies to large industries</b>	Subsidies to large industries come at a high opportunity cost for poor households.
<b>Subsidies to farmers</b>	Similarly, subsidies to farmers come at a high opportunity cost for poor households.
<b>Municipalities pay more than cost</b>	Municipalities supply a large proportion of poor households nationally and this practice is therefore not pro-poor.
<b>Cross-subsidies within municipalities</b>	At present, cross-subsidies within municipalities for electricity are not transparent (poor reporting on costs, lack of ring-fencing), hard to quantify, and are inequitable (poor households in the poorest municipalities benefit the least).

### ***A strategy to protect poor households***

In light of the above, the appropriate strategy is to extend and build on the best practices whilst ensuring financial viability and fiscal affordability, and to eliminate or reduce the subsidies that are not pro-poor (to free more resources to protect poor households).

### ***Gaps in implementation***

The current gaps in protecting poor households have more to do with implementation difficulties rather than the approach. The main implementation gaps are as follows.

In the case of the **electrification grant**, strategies need to be developed to increase the pace of new connections and effectiveness of spending.

In the case of the **Free Basic Electricity grant**, practical obstacles to a wider reach of the benefit need to be addressed before considering increasing the amount of the benefit.<sup>9</sup>

In the case of **Eskom's Homelight tariff subsidy**, the number of "inactive" connections needs to be decreased by addressing theft effectively.<sup>10</sup> This will convert an informal subsidy into a formal subsidy with more equitable outcomes.

In the case of **municipal pro-poor tariffs**, there are too many tariff categories, the equivalent of Eskom's Homelight tariff subsidy option is often not available, there is a lack of transparency around costs and subsidies and households in poorer municipalities are disadvantaged.

### ***Who is poor?***

For the purposes of this project, a pragmatic approach has been adopted, in which poor households are defined as follows:

<sup>9</sup> In the case of Eskom, for example, only a third of eligible households receive Free Basic Electricity.

<sup>10</sup> About 1.3 million of the approximately 4 million Homelight tariff connections recorded zero consumption over the period of a year.

- Households without an electricity supply (about 3.4 million households);
- Households with a demand limited 20 Amp supply (about 2.5 million households); and
- Households with a single-phase 60 Amp supply (or lower) and that consume modest amounts of electricity (such as the Eskom Homelight 1 customers with 60 Amp supplies and prepaid meters) accounting for about 1.5 million households (there is no accurate estimate of this number available).<sup>11</sup>

This approach is consistent with the Electricity Pricing Policy.

### ***Institutional arrangements affect pro-poor strategies and options***

More than half of domestic connections are provided with electricity by Eskom (about 4.1 million connections). The majority of these households are poor. The six metros provide electricity to about 30% of domestic connections (about 2.4 million connections). The remaining 20% of domestic connections are provided by the other municipalities (about 1.4 million connections).

Eskom applies a uniform approach consistent with the Electricity Pricing Policy for its 4.1 million connections. Municipalities apply a wide variety of tariffs. Municipal systems and capacity vary greatly between municipalities. No good comprehensive municipal data on electricity tariffs applied, and associated costs by tariff category, exist.

### ***The cross-subsidy pool is not equally distributed***

Non-domestic consumption is unequally distributed between distributors with most non-domestic sales being supplied by Eskom. Within the current institutional context, a pro-poor strategy that relies on cross-subsidies within electricity distributors will not be equitable.

### ***Practices to avoid***

There are a number of practices that are not pro-poor and could be avoided.

Not finding the revenues (tariffs and taxes) to meet the required efficient expenses to sustain the industry will have a devastating impact on the economy and hence on the ability to eradicate poverty through economic growth. This is not a pro-poor option.<sup>12</sup>

Providing a general subsidy to Eskom is not pro-poor.<sup>13</sup>

An inclining block tariff is not equitable and therefore not pro-poor for the following reasons: The tariff cannot be implemented for a large proportion of domestic users because these users use prepaid meters and these meters do not have clocks.<sup>14</sup> The tariff cannot be applied with any sound rationale to non-domestic users. Within the current institutional environment, the tariff relies on local cross-subsidies. These are inequitable. An inclining block tariff is incompatible with the more appropriate time-of-use tariff structure for high demand consumers. The Electricity Pricing Policy provides for time-of-use tariffs. Most municipal distributors do not understand their own

<sup>11</sup> Although good data exists for Eskom, this is not the case for municipalities.

<sup>12</sup> The experience in Zambia, discussed in the main report, and also Zimbabwe, are relevant.

<sup>13</sup> For every one billion Rand of general subsidy from government to Eskom, Eskom's average tariff will reduce by just 0.6 c/kWh (and less in future years), and provide a benefit of just over R1 per month to a household using 200 kWh per month (the average use of households with a 20 Amp single phase connection). In contrast, Eskom's average industrial user will receive a benefit of over R9 000 per month.

<sup>14</sup> It is possible to fix this, but it will require either a replacement of the meters (over 4 million in total) or the development of on-line vending systems (which are difficult to maintain).



consumption distributions and therefore are unable to accurately predict revenues when implementing a block tariff model. This creates a revenue risk.

Means testing and indigent registers, as a means of targeting poor households, are expensive and error prone. They are subject to errors of both inclusion and exclusion.

Condoning theft is inequitable and threatens the financial sustainability of the industry.

## **4 Key options for protecting poor households**

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A wide set of options to protect poor household are set out in the main report. A number of them are described below.

Because of the significant benefits of household access to electricity, and because many households still do not have access to electricity, any subsidies available to (and in) the electricity supply sector could prioritise the facilitation of affordable access to electricity through the electrification grant and zero connection fees for poor households.

A national pro-poor set of electricity tariffs with subsidies prioritised to level 1 tariffs first and then to level 2 tariffs could be implemented as follows:

**Demand limited 20 Amp supply**, with free connection, no monthly charge, free basic allocation, energy tariff set equal to generation and transmission cost (fixed network cost) is subsidised. ("domestic level 1").

**An intermediate supply** (40 to 60 Amp), with no fixed charge, free basic allocation and an energy charge set to breakeven with full cost at 350 or 500 kWh per month. Households to switch to domestic level 3 at breakeven consumption, or technical switch. ("domestic level 2").

**Standard domestic supply** (60 Amp single phase) with full cost recovery through two part tariff - monthly fixed charge and energy charge set equal to generation and transmission cost. ("domestic level 3").

**High demand (3-phase) supply** with full cost-recovery tariff with time-of-use introduced to create incentives to shift demand to off-peak periods. ("domestic level 4").

Household choice between these four service levels could be allowed, with subsidies targeted to the domestic level 1 (20 Amp single phase). This provides a very effective mechanism for targeting subsidies to poor households.

The service level 1 tariff could be amended to be more pro-poor by subsidising the fixed network costs and setting the energy tariff to equal the variable energy cost only.

The domestic level 1 tariff could be extended to be available to all households. (Currently this option is typically not available for households supplied by municipal distributors.)

The subsidy implications of adopting this approach are very significant. If the energy charge for domestic level 1 connections is maintained at 60 c/kWh<sup>15</sup> in real terms, then the subsidy requirement will increase to **R9 billion per annum** in the next three years. This is as a result of the increase in costs and the expansion of the subsidy to a

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<sup>15</sup> This is approximately the current average Homelight 1 tariff, and also coincidentally equates roughly to the long run average cost of generation and transmission, that is, the likely future average cost of generation and transmission. The long run marginal cost of new generation will be higher than this.

further 1.3 million users (from 2.7 to 3.8 million users). That is, maintaining Homelight 1 tariffs at current levels in real terms (adjusted only by inflation) and making this subsidy available to all those that are likely to qualify will result, on its own, in a significant expansion of the subsidy required.

Another option is to introduce a domestic level 2 (intermediate) tariff option and to set the tariff level nationally. This subsidy could be made conditional on disclosure of costs and consumption distributions. This option would require undertaking more detailed modelling to determine subsidy implications and affordability (in combination with all of the other subsidies) as well as implementation details.

A further option is to extend the reach of the free basic allocation to all eligible households, but do not increase the amount of the allocation. Difficulties currently experienced in implementing the free basic allocation should be resolved and its reach extended before consideration is given to increasing its amount.

A new dedicated grant mechanism to support poor households could be introduced. This grant could be available to domestic service level 1 users only (or to domestic level 1 and 2 users), and be used as an incentive to municipalities to offer these service level options. This will ensure that the subsidy is targeted to poor households.

A dedicated national grant can be complemented with a national cross-subsidy pool. A national cross-subsidy is more equitable than reliance on local cross-subsidies.

Theft could be reduced. Prior to implementing a theft reduction strategy, it is necessary to undertake a study to quantify the estimated losses arising from theft and non-payment, and the geographic, institutional and customer tariff incidence of these losses. Once the magnitude and distribution of theft is better understood, recommendations can be made as to how best to address this issue.

Initiatives to finance the displacement of electricity could be strengthened and accelerated.

## **5 Pro-poor policy framework**

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### ***Designing a pro-poor strategy***

A strategy to protect poor households requires more than a selection from a menu of options. A number of different considerations must be balanced and there are trade-offs between options. The subsidy design must be viewed as an integrated whole. There are also important issues related to timing, practicality, effectiveness and overall affordability.

### ***Towards a pro-poor policy framework***

There is an existing electricity tariff policy framework for electricity and poor households in South Africa, which is reflected in a suite of policies, described in the main report. The existing policy-framework compares well with international best practice and protects poor households.

Some options to refine the framework are proposed in the main report. What is most important is that decisions made in terms of this policy framework, and in the design of a pro-poor strategy (the selection and sequencing of options, together with more detailed choices related to subsidy levels), are coordinated.

There are at least three key actors whose decisions can have major impacts on subsidies for poor households:<sup>16</sup>

- ⇒ **National Treasury**, through the division of revenue to local government (equitable share) and the regulation and management of government grants;
- ⇒ **Department of Energy**, through the Free Basic Electricity policy; and
- ⇒ **NERSA**, through approval of Eskom revenues and tariffs and the regulation of municipal tariff structures and levels.

Within the context described, it is particularly important that the policies and decisions made by these actors are coordinated, and that the full implications of the combined options and choices are fully understood in a holistic and integrated way.

### ***Implementation considerations***

The primary implementation challenges are summarized below:

- ⇒ There are still a significant number of households (one in every four households) without electricity. Within this context, the pace of electrification is not as great as it could be.
- ⇒ Many poor households do not make use of, or do not have access to, Free Basic Electricity. (For example, in the case of Eskom customers, only a third of eligible households benefit from Free Basic Electricity. Challenges also exist in municipal areas.)
- ⇒ There are a very large number of inactive connections. (For example, 1.3 million connections in the case of Eskom customers, representing nearly one third of all of their domestic connections. Inactive connections are likely to also exist in municipal areas, however good data is not available.)
- ⇒ Theft is significant. (For example, about half of Eskom's current domestic sales for Eskom's customers. Theft is also significant in municipal areas.)
- ⇒ The existing level of understanding of subsidy flows within municipal electricity distributors is very poor. (It is not possible to quantify these subsidies on the basis of existing information.)

Solving these implementation issues will:

- ⇒ Increase the understanding of existing subsidies (through better cost accounting and reporting on tariffs, costs, revenues, consumption and subsidies); and
- ⇒ Increase the amount of subsidies going to poor households significantly (more poor households connected to the grid and more households getting Free Basic Electricity).

As costs increase, the amount of subsidies will also increase.

The combined effect of better implementation together with increased costs will result in very significant subsidies going to poor households. The researchers estimated this to be R20 billion per annum. This represents more than 25% of current sector turnover and is a very substantial amount, possibly reaching fiscal and macro-economic affordability limits.

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<sup>16</sup> Only the primary channels are described.

This context suggests a prudent approach when considering new subsidies, or increasing subsidies. In particular, new and/or increased subsidies could be carefully modeled within a full understanding of the total subsidy flows within the sector.

Consideration also could be given to strengthening the role of the regulator, particularly in the area of reporting and increasing the transparency of existing subsidies.

## **6 Monitoring**

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### ***Monitoring domestic retail tariff design and subsidies***

It is the role of the regulator to monitor and regulate electricity tariff structures and levels. This mandate includes the monitoring of the implementation of Free Basic Electricity, as this is part of the tariff. Options to strengthen this monitoring role are set out in the main report.

### ***Monitoring solar water heater rollout***

The national solar water heater rollout is being facilitated by the Eskom managed solar water heater rebate programme and the draft South African National Solar Water Heating Framework and Implementation Plan (DoE). There are specific monitoring and verification approaches in the Eskom programme and the Solar Water Heater Framework will be including specific targets as well as specific monitoring and verification approaches.

### ***Monitoring thermal efficiency of household stock***

With respect to the thermal efficiency of housing stock it is recommended that this be seen as an important design parameter for the national subsidised housing programme and be integrated as one of the performance indicators for all state-subsidised low-income housing.

## **7 Summary and way forward**

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Options to protect poor households from rising electricity prices have been presented. These need to be carefully considered in light of the fact that the primary constraint to increasing subsidies appears to be macro-affordability. Existing subsidies account for more than 10% of the current electricity turnover and this will increase to 25% with increased subsidy coverage (all eligible households get subsidies) and the increased electricity costs (doubling of energy costs over three years).

The subsidy options that are most targeted to poor households are:

- ⇒ The electrification grant (free connections to the grid for poor households);
- ⇒ The domestic level 1 subsidy for 20 A single phase connection (no fixed charge, free basic allocation and an energy charge which covers the cost of generation but not the sunk network costs); and
- ⇒ Free Basic Electricity allocation of 50 kWh per month.

It is recommended for consideration that the extension of the first two subsidies be prioritised and that the implementation difficulties related to the Free Basic Electricity grant be addressed to ensure all eligible households receive this benefit.

The extension of any existing subsidies and the introduction of any new subsidies need to be carefully modelled (within the context of all existing subsidies) and coordinated to ensure medium and long-term macro-affordability.