NON-GRID

HOUSEHOLDS ELECTRIFICATION

POLICY

GUIDELINES

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1. INTRODUCTION

Experiences from other electrification projects that are mainly in rural areas have shown that initially, customers use very little electricity. They use electricity only for lighting purpose and in some cases to power a small radio. Although the national average consumption for electrification customers is about 100 kWh per month, most of the electrified customers (in poor communities) use on average less than 50 kWh per month in the first year.

The main cause of low consumption in these areas is and limited financial resources due to poverty levels of our rural areas. There are also often other sources of energy that are available and easily obtainable in these areas without money exchanging hands and these are normally unfriendly do the environment and very primitive.

In less dense settlements, mountainous and also remote rural areas, where the cost of grid extensions is extremely high and uneconomically justifiable, non-grid supplies will thus be proposed. The cost of such supplies will be comparable to the cost of connection of the lowest grid supply option available to the denser settlements. Solar Home Systems using photovoltaic system is currently being subsidised as a viable option and the systems provides for four hours of quality lighting using high efficiency lights, a small monochrome TV for two hours per day and a small radio for ten hours per day and also cell phone charging.

For cooking and other thermal purposes, other energy sources will have to be used, as SHS cannot cater for high energy applications. The service providers participating in the Integrated National Electrification Programme (INEP) are required to make these available at commercial prices.

2. OBJECTIVE

The overall objective of this document is to contribute to: -

- An improvement of living conditions by way of environmentally friendly cost effective energy efficient supply to poorer segments of the population in remote rural areas; and
- The promotion of cost effective job creation through the project and within the SHS-producing and distributing industries.

The capital government spending on electrification will be limited to a certain amount that will be reviewed annually. In remote areas, where a grid supply cannot be made available within the set capital expenditure per connection, the viability of non-grid supply option would be investigated. If viable, the non-grid supply option will be used to make a basic electrical supply available.

3. SCOPE OF APPLICATION

The Non-Grid Electrification policy guidelines will be applicable to all licensed implementing entities of the Integrated National Electrification Program (INEP) and service providers contracted through the Department of Minerals and Energy.

4. POLICY CONTEXT FOR NON-GRID ELECTRIFICATION

"In remote rural areas, where the lowest capacity grid system cannot be supplied within the capital expenditure limit and outside the 3 year grid electrification plan, this system will provide a natural opportunity for Remote Area Power Supply (RAPS) systems to be supplied." Thus

"Annual connection targets, and related subsidies, will be allocated for non-grid electrification in accordance with the National Electrification Strategy."

Such an integration of the available electrification technologies and electricity supply options on the basis of the most economical application will allow the provision of basic energy services to a larger portion of the population in the shortest possible time within the constraints of available funding. It is regarded as the only viable way of bringing the goal of sustainable "*universal access to electricity*" within reach over the longer term.

4.1 Household Energy Demand

Government recognises that household access to adequate energy services for cooking, heating, lighting and communication is a basic need. Universal access to a "basic electricity service" does not necessarily satisfy this basic need. Increasing access to affordable energy services for disadvantaged households, small businesses, and small farms and community centres is therefore, identified as one of the main objectives of the Energy White Paper. Pursuit of this objective acknowledges that the provision of energy services entail more than just the supply of fuels. Consequently,

> *"Government supports the concept of "Energisation", i.e. the widening of access to a safe and effective energy package within grasp of the low-income consumer and will promote its implementation where appropriate."*

Energy is only useful when it is affordable and sustainable, and when safe, easy-to-use, efficient appliances, consumer information and technical advice are available from service providers.

4.2 Non-Grid Electrification of households Roll-out Programme

Universal household access to electricity is one of the cornerstones of the White Paper on Energy Policy. The connections made during the electrification programme (1994 – to date), were mainly in the urban areas. This disparity in the provision of electricity to households can be attributed to the increasingly high cost of extending the grid to rural areas that are remote from the existing network, where there is a low density of houses and low electricity consumption and where difficult terrain is encountered.

With a view to increase the level of rural electrification, the White Paper on Energy Policy makes provision for non-grid electrification in areas where grid is not economically feasible. At present, the average cost of connecting a household to the grid is R 4000 excluding VAT. This amount is fully subsidized considering the fact that electricity sales in rural areas barely cover the operating costs borne by the utility.

In terms of the integrated NEP Government will subsidize a portion of the capital

cost of non-grid electrification. Rural end users will purchase non-grid electricity services from the service provider who will, among other things maintain the solar home systems.

The solar home systems, as is the case with the lowest grid supply, cannot meet the Cooking/thermal needs of the households. Therefore one of the requirements of the Department of Minerals and Energy is that the suppliers of non-grid technologies should augment their services by selling thermal fuels such as paraffin and Liquefied Petroleum Gas (LPG) to meet the cooking needs.

The installation of SHS must much be such that the maximum densification of the installed base is achieved in a specific area. The service provider must ensure that universal access is achieved in a village identified as a non-grid area.

5. GENERAL, SECTOR AND PROBLEM ANALYSIS

The *Solar Home System* (SHS) offers both technologically and an economically viable alternative to provide "a basic electricity service" for such essential services as quality lighting and access to the electronic media, to the rural consumer, where the grid cannot reach within cost norms.

An SHS, typically comprising a 50Wp solar panel, a charge controller and a 105 Amp-hour battery, will provide enough electricity to drive four lights and a small black and white television for four hours per night and a small transistor radio through the day, also cell phone batteries can be charged for basic communication. The current installation cost of such a system is approximately R3500 (excluding VAT), with potential for reduction through volume manufacturing and installation.

In cases where larger amounts of electricity are required, e.g. for productive purposes, other localised technologies, such as PV/diesel/wind hybrid systems, diesel-powered generators, or small hydro-powered turbines, augmented by non-electrical energy supply

options where appropriate, will be considered, if grid-connection appears to be too costly, as compared to alternatives in the long run so as to ensure sustainability.

Such an integration of the available electrification technologies on the basis of the most cost-effective application will allow the provision of basic electricity services to a larger portion of the population in the shortest possible time and bring the goal of universal access within reach.

The largest impediment to the large-scale dissemination of SHSs is the virtual non-existence of the two main value chains normally required to sustain viable commercial delivery of these technologies in the targeted more remote rural areas, and to stimulate the potential market to grow, namely.

- The availability of marketing, installation and maintenance services for hardware at community level, and
- The provision of financial services to end-users to allow payment over time.

In addition there often are negative perceptions amongst potential end-users on the characteristics, durability and utility of these technologies, which need to be combated through the availability of maintenance services and focused and sustained public education and marketing campaigns.

The affordability (the ability of households to pay for goods and services within the framework of household budgets) and utility of systems to rural households are the prime factors in determining demand. Subsidies reduce the cost of goods and services, while economic activity and growth largely influence disposable incomes. Both of these are prerequisites for successful dissemination.

The utility route can readily address the delivery issues and the affordability question. The utility will install, maintain and own systems and sell the service at an appropriate monthly tariff (**As per the nationally approved Suite of Supply Options**). In addition to providing a handle on the delivery, maintenance, revenue collection and affordability issues, the utility route has the following further advantages:

- It should facilitate electrification planning and funding at the national level, allowing regulatory procedures and financing mechanisms to maximise targets and optimise resource allocation.

- It should facilitate relocation of technologies that may arise over time as the planning process evolves.
- It could substantially reduce costs through bulk buying.
- The utility will carry the hardware as assets, which should facilitate the raising of capital on the money market.
- The strong financial and maintenance controls should facilitate the channelling of international development funding, both grants and concessionary loans.

The main disadvantage of the utility route possibly lies in the fact that the hardware is installed at the end-user's premises, under his control but not under his ownership and responsibility and is, therefore, prone to vandalism, neglect and misuse.

It is of course possible that the utilities could be privately owned provided that the issues of demarcation of areas of jurisdiction and subsidies are resolved.

It was decided at the outset to involve the private sector directly in the non-grid electrification programme. At the beginning of 1999, the Department of Minerals and Energy issued a call for proposals in the field of non-grid rural electrification. Of the 28 responses received, six consortia were selected through an open bidding process to participate in the first phase of a programme to provide non-grid electricity services to rural areas with the licensed electricity utilities in those areas. The process coincided with the Presidential priorities, namely Limpopo, Kwa-Zulu Natal and Eastern Cape.

Concessionaire	Municipal Area	Map reference	Comments
Summer Sun Trading (Pty) Ltd Shine The Way cc ILITHA Cooperative	DC15 excluding EC157, DC21; DC43; DC44	Eastern Cape, South Kwazulu-Natal	This is a former Eskom Shell concession area after the liquidation of Eskom-Shell, 3 smaller service providers were appointed to maintain the customer base.
Electricité de France-Total Fina Elf Group	DC22, DC23, DC24, DC29	West of Kwazulu Natal	
Nuon RAPS Utility (Pty) Ltd	DC25, DC26, DC27, DC28	North of Kwazulu Natal	
Solar Vision (Pty) Ltd	DC34, DC35, CBDC3	Limpopo	
KfW sponsored project	DC13, DC14, and DC12 (proposed) instead of North West	Eastern Cape	

6. DONOR FUNDING FOR RURAL ENERGISATION

The German Government, through the German Development Bank, Kreditanstalt für Wiederaufbau (KfW), donated 25m Euros to finance an additional non-grid electrification project in the Eastern Cape (with promises of more funding in the future if this venture is successful). This is indicative of the immense international interest in the South African non-grid electrification programme, regarded in many respects as a world first (particularly in respect of engaging the private sector).

A delegation of KfW visited South Africa to appraise a proposed non-grid electrification project for rural remote areas. The delegation had the opportunity to meet representatives from all major stakeholders concerned and visited a part of the selected project areas. Project issues, especially the legal and institutional framework on part of the South African Government, are continually discussed with the Department of Minerals and Energy as well as all other stakeholders.

The KfW mission expressed its concern that the proposed project area in the Eastern Cape Province would probably be too small regarding the potential demand for SHS to allow the full utilisation of the envisaged grant funding. They were not amenable to include the already selected concessionaires in their programme. In order to make a separate concession a viable undertaking, it was agreed to add a second region to the districts DC 12, 13 and 14 of the Eastern Cape. In addition, it was agreed to include schools and clinics earmarked for non-grid electrification in these areas into the project. A further design mission will now be fielded prior to appointing a sixth concessionaire through an open bidding process.

6.1 Project measures

Financed project measures will include: -

- Assistance to DME in appointing a private concessionaire responsible for procurement, installation and maintenance of non-grid photovoltaic supply systems in compliance with international tendering rules.
- Subsidisation of the investment cost of approx. 30 000 SHS installed by the selected concessionaire.

- Information and sensitisation campaign before start up of concessionaire activities to ensure by participatory means the potential customers full understanding of the offered electricity supply by SHS and its acceptance.

6.2 Project implementation

The DME as project sponsor appointed ESKOM as the concession giver (concedante) in its function as transitional regional distribution licensee. The new Regional Electricity Distributor (RED) will substitute ESKOM and local municipalities at a later stage after the restructuring of the Electricity Distribution Industry (EDI) in the relevant regions. The National Electricity Regulator of South Africa (NERSA) will act as regulatory body; especially safeguarding the customer interests with regard to prices requested by the concessionaire as well as control of the performance of the concessionaire.

It is envisaged that the NERSA will be actively involved in all decisions where ESKOM may be considered as having underlying conflicts of interest. Unless otherwise agreed, NERSA will monitor the concessionaire's physical project implementation and request the release of funds by KfW in favour of the concessionaire on the basis of progress in connecting households and other consumers.

Consultants will be involved on the basis of a contract with DME to support the Department at different stages of the implementation cycle and perform specific tasks such as:

- Information and sensitisation of local communities;
- Selection of a Concessionaire; and
- Periodic monitoring of the concessionaire's performance.

The future installation of non-grid electrification systems will be determined using a modelling tool designed to identify areas that will not be electrified by grid technology within the foreseeable future. Depending on the successful implementation, more areas will in future be opened up to non-grid electrification.