# Planning considerations for rural electrification

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Rural Electrification



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# 1. Introduction

In this paper some considerations of particular importance for electrification planning pertaining to rural areas will be discussed. In this section, some background will be provided on matters such as (1) the extent of electrification in 'rural' areas, (2) the use of electricity by rural households, (3) rural development, and (4) the role of electricity in rural development. Some of the key planning issues will be discussed in the section that follows.

## 1.1 Rural areas

It is difficult to define 'rural' areas in the South African context. One definition is that all areas which do not fall within promulgated local authority boundaries, are rural. However, this definition includes many large and fairly dense peri-urban settlements, particularly in the former homeland areas, which can be regarded as 'functionally urban'.

Because of a lack of accurate demographic and planning information on 'rural' areas, it is currently only possible to make a broad distinction between two categories of households: residents in the former homelands, and farmers, farmworkers and their families who live on commercial farms. An estimated 12% of households in all 'rural areas' (including farmworker households) are currently supplied with grid electricity, although the percentage of households outside of functionally urban areas with electricity is probably less than 12% (Thom et al 1995b). It has also been estimated that about a quarter of farmworker homes, and a smaller proportion of farmworker *households*, have been electrified to date.

## 1.2 Electricity use in rural areas

Household electricity consumption in rural areas is fairly low. For example, the consumption amongst newly connected households on prepayment systems in Eskom's former Pretoria distributor, which is regarded as the most rural in nature of all the former distributors, is about 55 kWh/month at present (measured in terms of electricity sales). Consumption is expected to grow with time after connection, but not much information is available on this at present.

Studies have shown that the majority of electrified households in rural areas use electricity for lighting (one study found this to be between about 75% and 90% for households earning less and more than R800 per month respectively), while a high percentage of electrified households also own TV's (about 30% and 70% for the different income groups) (Ward 1995). However, it has also been found that a significant percentage of electrified rural households, including households earning less than R800 per month, own appliances such as stoves, fridges and kettles, and use electricity for purposes such as cooking and water heating. One study put the percentage of electrified rural households earning less than R800 per month which uses electricity for such purposes at about 25% (Ward 1995).

Nevertheless, it is clear that electricity does not become the dominant fuel in the majority of rural households, as wood and paraffin are still the main fuels used for cooking and heating purposes, particularly by lower-income households. *In most electrified rural households electricity is merely one of the forms of energy used.* For example, one study found

that about 77% of electrified rural households used more than one fuel, most of which used three of more fuels (Ward 1995).

## 1.3 Rural development

Rural development has been defined in the following way by one of the leaders in this field (Chambers 1983):

> Rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need. It involves helping the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits of development.

This definition places people at the centre of development. It emphasizes the achievement of concrete goals, as well as the way in which these are defined and achieved, i.e. the process. Chambers argues that the primary development objective should be *to enable the poor to identify their development priorities and to obtain what they have identified as their needs*, while other objectives such as greater productivity, equity and sustainability should follow. The important point that needs to be made in this regard is that equity goals often are not achieved in rural areas *unless special provision is made to involve poor and marginalised people, including rural women, directly in the planning and implementation of development initiatives*. It can be concluded that, to be consistent with rural development objectives, and in order to achieve the goal of greater equity, rural electrification planning would need to provide for an increased role for rural people, particularly the poor, in identifying and achieving their goals.

This approach to rural development does not exclude economic development, but reflects the experience around the world that rural development which focuses primarily on economic development often leads to greater impoverishment of poor rural people, with only a few people benefiting from such development.

It is further agreed that a holistic and integrated approach to rural development is required to address the current problems and to cultivate opportunities in rural areas, given the multi-dimensional nature of the problems that exist, and the inter-relatedness of different facets of development - for example, water supply and health, roads and access to markets, etc. It is therefore argued that the elements of development that complement one another must be linked to ensure that the greatest possible synergistic effect is achieved. This is of particular importance for rural electrification, as will be discussed below.

Finally, international experience has shown that the decentralisation of rural development planning is crucial to the success of development initiatives, because of the great complexity and diversity of rural needs which require sensitivity to locally-specific conditions and problems, as well as the need to facilitate local involvement in planning, as discussed above (Thom et al 1995a).

## 1.4 The role of electrification in rural development

International experience has shown that the development impact of electrification *on its own* is very limited, both in terms of alleviating the energy problems of households, in improving the quality of basic services (for example, education and health services), and in

stimulating economic activity (James 1995). Only when electrification forms part of a broader initiative to achieve these objectives, and is properly coordinated with other inputs, can it play a meaningful role in the development of rural areas.

As discussed above, rural households generally do not adopt electricity as their primary source of energy, but continue to rely mainly on wood and paraffin. Unless problems with access to these fuels are addressed in addition to providing electricity, their energy problems would not have been alleviated to a significant degree. Furthermore, if schools and clinics electrification does not form part of a broader initiative to upgrade services at these facilities, such as the supply of equipment and the training of staff, it could have virtually no impact on the quality of services at these facilities. The common assumption that electricity 'causes' economic development has also been shown to be a fallacy. Rather, the impact of electricity seems to depend on the *existing* level of development in an area. The higher this existing level of economic activity, the greater the impact of electricity. However, electricity would have very little impact if introduced in areas where little economic activity exists already (Foley 1990).

## 2. Key planning issues

In this section planning issues which are of particular importance with respect to electrification in rural areas, will be discussed.

### 2.1 A rural development framework for rural electrification

A national rural development framework for rural electrification, which sets out the role of electrification in rural development, as well as the specific development objectives of rural electrification programmes, and with this identifies priorities for rural electrification on the basis of development priorities, is urgently required.

At present, the focus of the national electrification programme is on the electrification of households, and, in rural areas, specifically households in the former homelands. In addition, schools and clinics have been identified as priorities for rural electrification. It is not clear *on what grounds* these have specifically been identified as priorities, rather than farmworker households, for example, or water supply in rural areas, or small-scale agriculture. Certainly the priorities have not been established by Eskom alone, as the national government has emphasised the electrification of schools and clinics in addition to household electrification. One could question the priority placed on schools electrification in particular, as electrification is probably one of the least critical inputs to improve the quality of education in South Africa. On the other hand, the virtual absence of small-scale agricultural and water pumping needs from current programmes probably need to be reviewed urgently.

Furthermore, no specific objectives have been formulated for the national electrification programme, or the schools and clinics electrification programmes conducted by Eskom. These programmes are essentially electrification programmes and not development programmes. The aims have been defined in terms of numerical targets, and not in terms of particular development needs. For example, schools are being electrified without a clear understanding of the facilities which will realistically be provided to these schools in the

future. In the case of off-grid electrification this is of particular concern, as the system design load can have a significant impact on the costs of an installation.

### 2.2 Coordinated rural development and electrification planning

As discussed above, rural electrification which is conducted in isolation from other development initiatives is bound to have very little development impact in rural areas. However, very little effective coordination between rural development and electrification planning is taking place at present. The national electrification programme is not located within an integrated development programme, but is mainly driven by the electricity distribution industry, and Eskom in particular. Although attempts are made to involve other parties concerned, such as the Departments of Health and Education in the electrification of schools and clinics, the electrification programme is much further advanced than programmes to improve services in some other sectors, with the result that very little coordinated planning is taking place. Small-scale agriculture in particular is at danger of being marginalised by the current electrification programme because of the underdeveloped state of planning for this sector. This situation is compounded by the fact that government structures to facilitate development coordination at provincial level are still in the process of being established. In this context the appropriateness of national electrification targets which have to be met irrespective of progress in other development sectors, needs to be questioned.

### 2.3 An integrated energy planning framework for rural electrification

As discussed above, electricity generally does not meet the bulk of the energy needs of rural households which have been electrified. Broad-based or integrated energy planning is required to ensure that the energy needs and problems in rural areas are addressed in a comprehensive and consistent manner (Thom et al 1995a). Some energy programmes have been initiated to address broader energy needs, such as the social forestry programme presently funded and managed as part of the IDT's Rural Energy Programme. However, these programmes generally have a limited scope, and energy service provision in rural areas is still characterised by a piecemeal approach.

A national policy framework to facilitate integrated energy planning in South Africa is thus required, which identifies the specific role of electricity in meeting energy needs in rural areas in relation to other fuels, amongst other things. The respective roles of grid and off-grid electricity in rural areas also need to be addressed - the planning of off-grid electrification is currently hampered by the lack of clear national criteria for identifying areas which are to be electrified by the grid.

A recent aspect of Eskom's rural electrification policy has been a commitment to 'integrated energy planning', whereby other supply and demand strategies are considered as alternatives or complements to electrification. This is gaining particular importance in the light of the proposals to provide load limited supplies in a significant percentage of the areas which will be electrified in the future. However, it is unlikely that such an approach could be driven successfully by an organisation aligned with a particular energy carrier, as is the case with Eskom.

## 2.4 An institutional framework for electrification planning

Another significant problem is the lack of an institutional framework for electrification planning, with clear roles for different players in this field, including government structures at national, provincial and local levels. The role which local government in rural areas could play in electrification planning and development coordination generally, requires specific attention (see below).

At present electrification planning for rural areas is essentially conducted by the Independent Development Trust (IDT) and Eskom, both of which are public sector institutions with very specific missions. The IDT was formed to address poverty and the needs of the poorest, for which it utilises grant funding from the state. Eskom, on the other hand, is a public utility which has been charged with the cost-effective supply of electricity to South African consumers, and finances itself through the capital and money markets.

Eskom in particular, being responsible for two-thirds of the national electrification programme, is planning what is in fact a government-sanctioned and highly subsidised national programme, and is effectively developing national electrification policy for rural areas, with very little direction from national government. However, Eskom is not an appropriate institution to take responsibility for rural electrification policy and planning. The utility itself has indicated that it expects of government to provide a framework for rural electrification planning. However, in the absence of the necessary institutional and regulatory arrangements which will enable government to set rural electrification policy and to oversee its implementation, some vital decisions are being made within Eskom - for example with regard to targets for reducing capital costs, which could have far-reaching implications for rural electrification in the future.

## 2.5 Decentralisation of planning concerning rural electrification

A decentralised approach to development planning in rural areas has far-reaching implications for rural electrification planning, although these have not yet been fully explored. Matters of particular importance include implications for the way in which the financing of rural electrification projects is structured, as well as the potential role of rural local government with respect to electrification planning (Thom et al 1995a). Control over financing is an important element of control over planning, and therefore requires considerable attention, particularly in light of the unequal relations of power that generally exist between rural communities and powerful outside agencies such as Eskom. Generally the objectives of a decentralised approach would be to provide for greater control by rural energy users over the allocation of resources for electrification, but at the same time, to prevent the concentration of these powers in a particular section of rural society, which excludes the poor, and women in particular (Thom et al 1995a).

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