

Rural electrification: delivery or development?

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1. Introduction

This paper reports on policy insights developed during the first phase of the EDRC research project on *The role of electricity in the integrated provision of energy in rural areas*. This phase was designed to develop an understanding of present rural electrification practice, and rural energy and development needs. The research also highlighted some key policy questions for rural electrification in South Africa.

The paper shows that South Africa embarked on a large-scale rural electrification programme *before* it clarified fundamental policy questions relating to the intended role of publicly subsidised electricity supply in rural areas. The growth in the proportion of rural connections in the national electrification programme is the unintended result of the structure of available financing mechanisms and utility incentives operating in the electricity supply industry at present. A restructuring of rural electrification financing is required to enable appropriate prioritisation of electrification projects nationally, and to ensure a demand-led planning process.

2. Background

South Africa's national electrification programme has steadily grown from the first tentative steps in 1989 to reach a total connection rate of 478 676 per annum by the end of 1995 (National Electricity Regulator 1996). Eskom's early electrification initiatives occurred before the political changes that swept across South Africa during the first half of the 1990s, and rapidly grew to a national programme involving Eskom, local authority distributors and former homeland distributors. With the drafting of the Reconstruction and Development Programme of the Government of National Unity, the target of 2.5 million household connections was set for the end of 1999 (ANC 1994), which is equivalent to about 450 000 connections per year. The RDP also proposed that government should:

- provide concessionary finance for the electrification of poor households in remote rural areas;
- establish a national electrification fund, underwritten by government guarantee to raise bulk finance for electrification; and
- establish a national domestic tariff structure.

Once committed, Eskom management moved rapidly to re-orientate the organisation to implement the programme. It put sophisticated project management systems in place and grappled with the challenges of appropriate technology, system design and community consultation. Despite initial limited success with raising external finance, large monopoly suppliers such as Eskom and Durban Corporation increasingly resorted to funding the programme from internal reserves.

The establishment of Eskom's electrification programme coincided with the early days of political transition and rapidly gained a high political profile. This is partly attributable to Eskom's communications department which, in the context of the increasing political uncertainty senior management was confronted with during this time, moved rapidly to capitalise from Eskom's leading role in national electrification and coined the phrase: 'Electricity for all'. The use of this slogan created high, probably unrealistic, public expectations about the potential rate and coverage of the programme. Although its use was discontinued when the full financial implications of following the letter of such a policy became clear, Eskom publicly set itself the target of 1.75 million connections by the end of 1999 (or 300 000 annually) as part of its contribution to the RDP (Eskom 1996).

Figure 1 gives an indication of the remaining rural¹ and urban household electrification backlog in South Africa at the end of 1995.

¹ It has not been possible to determine a commonly agreed definition of the distinctions between settlements in rural areas and those in urban areas. The NER database generally defines urban areas as falling within a formally proclaimed local authority area before the 1995/6 local government elections. Many 'rural' areas fall in densely populated functionally-urban areas, adjacent to formally proclaimed local authority land. The numbers for rural areas in Figures 1 and 2 are thus probably overstated.

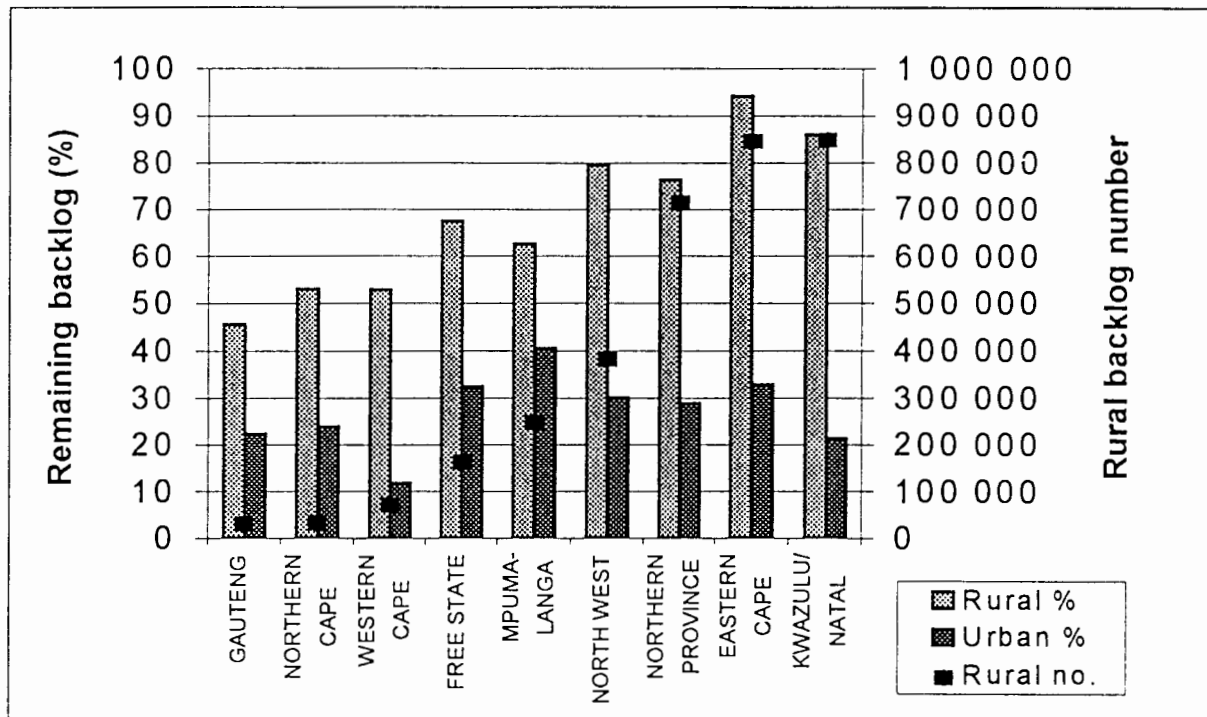


FIGURE 1 Electrification backlog as at December 1995
 Source: National Electricity Regulator

Figure 2 shows the number of urban and rural connections made in 1994 and 1995. Of the 418 918 connections made in 1994, 33 per cent (138 429) were in rural areas. It is important to note that this proportion increased to 56 per cent (258 346) of a total of 463 633 connections in 1995. These figures confirm that South Africa has embarked on a large-scale rural electrification programme over the last two years.

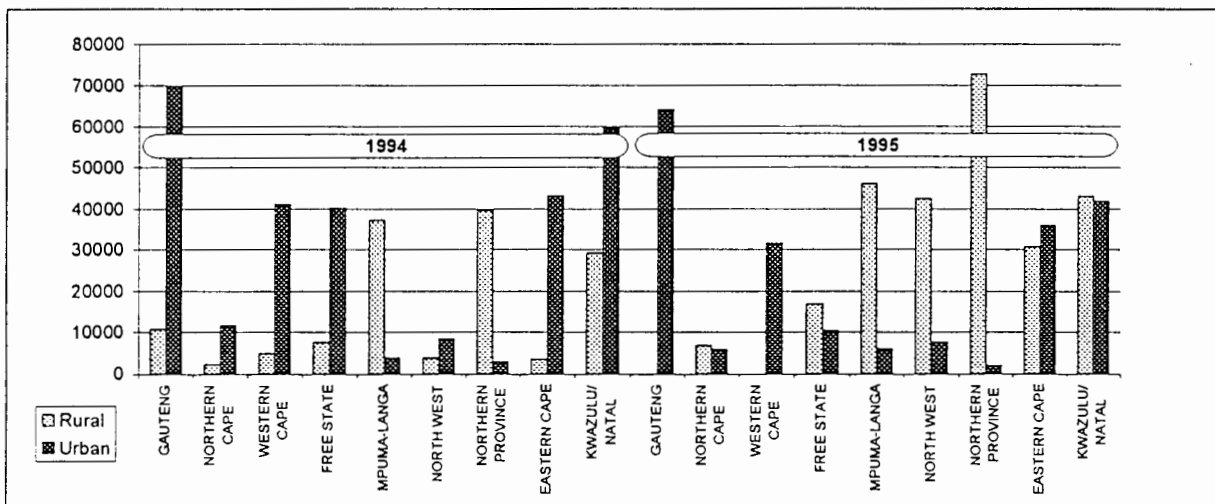


FIGURE 2 Electrification connections in 1994 and 1995
 Source: National Electricity Regulator

3. Present practice and emerging policy challenges

In this section rural electrification practice over the last two years is reviewed, to point to emerging policy challenges for this large-scale public expenditure programme.

3.1 Institutional and financing arrangements

The structure of the South African electricity supply industry has been the topic of much investigation and policy debate in recent years. More than 400 distributors supply grid electricity in South Africa; while most of these are municipal electricity departments, Eskom has become the single largest distributor in South Africa. With the re-incorporation of the homelands and the integration of old homeland electricity distributors into Eskom, Eskom has also become the only prominent distributor in rural areas. Durban Electricity is the only other distributor that has a significant involvement in rural electrification.

Non-grid electrification of rural institutions is in the hands of national agencies. The Independent Development Trust (IDT) has embarked on a programme of electrifying clinics. Where it is financially viable, the IDT funds grid extension to supply clinics located close to the existing grid. In areas where grid-electrification is not available or feasible in the near-term, photovoltaic (PV) or diesel systems are used. Eskom has begun a school electrification programme, using grid and photovoltaic supply options. Funds for this are sourced outside of Eskom from government (RDP funds) or other funders such as NORAD.²

As far as the alternatives for rural households located outside of grid-extension areas are concerned, small PV systems constitute a feasible option. Households will, however, be confronted with the problem of financing the large up-front costs of PV systems. In response to this problem the Department of Mineral and Energy Affairs recently established REFSA (Pty) Ltd 'to finance renewable energy installations to private households' (Botha 1995). REFSA will be funded by grants from the national budget and other donors and will initially primarily aim to support household solar system dissemination.

The predominance of Eskom in rural areas can be explained by a combination of factors which include: the inability of other distributors to finance rural electrification projects; the recent incorporation of the homeland distributors by Eskom; the limited supply rights that Eskom has in urban areas; Eskom management's commitment to its self-adopted RDP targets; and its access to retained earnings to fund rural electrification. Initially Eskom conceptualised the electrification programme with urban areas in mind. In an attempt to find urban areas to target, Eskom entered into numerous agreements with local authorities to electrify the townships in their areas. However, with the restructuring of local government and increasing political manoeuvring between Eskom and local government around ESI restructuring issues, Eskom decided to avoid electrifying townships in cases where the new local authority insisted on retaining the supply to the profit-making commercial and industrial customers in the local authority area. In order to achieve its connection targets, Eskom was subsequently increasingly forced to target rural areas falling outside the jurisdiction of municipal distributors.

Although Eskom was initially able to raise limited loan financing for its national electrification programme, it has not been able to borrow money for any rural electrification projects. Rural electrification projects are funded from Eskom's retained earnings, with little expectation that the investment will be recovered or even that operating costs will be fully covered. Eskom's funding of its grid-based rural electrification programme is thus largely based on a cross-subsidy from the rest of its present and future customer base.³ Eskom is thus saddled with the responsibility of raising large amounts of 'tax' revenue from electricity customers and allocating it to potential rural electrification projects. Although these subsidy funds are raised from all electricity consumers in South Africa they are only available to Eskom - and effectively only to newly connected customers supplied by Eskom. Unconnected households in the supply areas of other distributors do not have access to these subsidy funds, nor do remotely situated households which might wish to purchase non-grid supplies, such as photovoltaic systems. These problems with the institutional structure of present rural electrification financing mechanisms point to the need to make subsidy finance more widely accessible throughout South Africa for supplying grid and non-grid installations.

² The Norwegian Agency for Development Co-operation.

³ See Davis (1996), for a discussion of the financial impacts of rural electrification.

3.2 Planning and delivery systems

Eskom is the only utility that allocates public resources to rural electrification on a national scale. In the absence of any clear government policy, Eskom has experimented with a number of electrification planning approaches in the past, such as the equitable sharing of electrification targets between provinces and the use of stakeholder forums to prioritise projects.⁴ More recently, inspired by an improved understanding of the large financial burden that the programme is placing on Eskom, it adopted a least-cost approach to project prioritisation. If this approach is adhered to in 1996 it will result in connection patterns that differ significantly from those of 1995 and probably place Eskom's electrification managers working in the most needy (and costly) rural areas in Kwazulu/Natal, the Northern Province and the Eastern Cape, under increasing pressure in their attempts to allocate a shrinking capital budget. It remains to be seen if this conservative approach will succeed in the absence of supportive government policy.

In recognition of the fact that it is investing public funds, for development reasons, in a financially loss-making programme, Eskom developed a set of criteria to be used in the financial and economic cost-benefit analyses of prospective projects. But in practice it has not allowed financial and economic viability criteria to constrain its aim of meeting its annual connection targets. A recent Eskom review of thirty electrification projects revealed that more than sixty per cent did not conform to its economic cost-benefit criteria (Matlhare & Steyn 1995).

Electrification planning and development co-ordination are being hampered by the absence of legitimate representative structures in rural areas. This has further transferred to Eskom a disproportionate responsibility for politically laden prioritisation and resource allocation decisions. With its need to finalise plans and expedite delivery Eskom generally chooses to negotiate with any remotely representative body. It will assist in the establishment of an electricity committee if no functioning community representative structure exists. This rushed approach tends to reinforce existing power relations in communities and could thus potentially limit the benefits of the project to the least powerful members of the community – such as the very poor, and women.

The present structure of the incentives that motivate Eskom is such that Eskom is primarily concerned with the achievement of its performance targets. This has meant aiming to maximise the number of connections it delivers and, more recently, to reduce the capital cost of connections as a secondary performance indicator. Rural electrification is still generally approached as a sector-specific service delivery programme. In practice this means that project selection and planning is poorly integrated and co-ordinated with other development activities and needs in rural areas, resulting in projects that realise fewer benefits to communities and lower returns to the utility.

International experience seems to suggest that rural electrification projects can result in net benefits in areas where the quality of the existing infrastructure is reasonably good, where is evidence of economic growth and increasing household income, and for which there are existing plans for additional development activities (Davis 1995). To ensure that rural electrification projects are implemented in such areas, an electrification planning system will have to be devised that considers these factors and measures success by using performance indicators that are reflective of broader development objectives rather than connection targets alone.

3.3 Project selection

In the light of the discussion above, this section discusses the kind of areas and projects that are presently prioritised and points to a number of policy challenges to improve project selection.

With the present incentive regime under which Eskom management operates, Eskom tends to target areas where it can provide the most connections at a reasonable cost. With this approach, the 'value' of household connections is given the same weighting as connections which enable the provision of a public service, or support productive economic activities. Electricity supplies to support services such as public lighting or water pumping are thus not prioritised under a connection target incentive system.

A notable exception to the relatively low priority that social services received in the electrification programme is the electrification of schools and clinics. Eskom supplied 893 schools (746 in rural areas) and 37 clinics (31 in rural areas) with electricity in 1995 (Hambly 1996). The IDT funded the provision of approximately 35 photovoltaic systems for rural clinics in 1996 (Morris 1996). The

⁴ See Thom C, Davis M and Borchers M (1995) for a description of Eskom's electrification planning practice.

emphasis on school and clinic electrification is a direct response to a call for the electrification of all schools and clinics in RDP documents (ANC 1994). Because of the IDT's role in improving the infrastructure of clinics in rural areas, Eskom has tended to focus its efforts on the electrification of schools (although not exclusively). The wisdom of a policy which results in the allocation of such large amounts of public resources to school electrification, while more basic infrastructural problems – such as buildings and teacher housing – remain unaddressed, should be investigated. Again, this bias in social infrastructure development is the result of policy that specifies a single performance target without specifying overall development objectives for the sector.

Despite the apparent bias towards households, the seemingly obvious electrification opportunities presented by farmworker houses on commercial farms have not received high priority, while Eskom seems to focus its rural electrification efforts on the former homeland areas. With electricity supplies to farmers, Eskom's responsibilities traditionally only went as far as the transformer, at which point a three-phase low-voltage supply is provided; the remainder of the reticulation infrastructure on the farm typically belongs to the farmer. Concerns about the ownership of the further investment required for farmworker electrification, the need to use the farmer's reticulation infrastructure, and respect for the farmer's rights as the land owner, are the primary reasons for Eskom's reluctance to pursue this opportunity. More recently, Eskom electrification managers have indicated that Eskom is investigating the possibility of increasing their role in farmworker electrification and adjusting its management incentive structure to achieve this end. As with the rest of the rural electrification programme, little formal government policy exists to guide Eskom in the execution of its responsibilities for the electrification of farmworker houses.

The selection and design of rural electrification projects involves decisions about the allocation of public resources that require wide-ranging assumptions about public sector priorities for rural development. Utilities are poorly placed to make such decisions on their own and have to be guided by a national policy framework for project selection and planning.

3.4 Tariffs and supply options

Most rural electrification schemes continue to rely on conventional 22kV grids and provide 40 Amp supplies to households. Customers pay Eskom's low connection fees⁵ and are charged on the prepayment tariff. The technology and supply options developed for the urban context are now being used in rural areas, resulting in rapidly increasing costs as more sparsely populated settlements are being electrified. It has become clear that new and appropriate strategies are required to lower electrification costs in rural areas. Such strategies will either involve the use of improved lower cost technology and designs, or entail a lowering of the level of service. In the likely event of opting for a reduction in service levels to lower costs, new marketing and pricing strategies will be required to mediate customer demands for equal service and to share in the benefits of reduced costs.

In an attempt to develop more appropriate supply options, Eskom recently implemented two pilot projects to test the acceptability and cost savings of providing 2.5 Amp current limited supplies. Although 2.5 Amp supply saves costs, it provides a lower level of service and could encounter community acceptance problems. Poor customers, with low consumption levels, receive a subsidy for their electricity supply by being charged connections fees and tariffs that are lower than the actual cost of supply. With the prevalence of the pre-payment single energy rate tariff (c/kWh), which suggests to the customer that costs are directly related to consumption, the introduction of a flat rate tariff could raise concerns in communities about potential cross-subsidisation from (possibly poorer) customers with lower consumption to higher consumption customers.

Attempts to find appropriate pricing strategies for a wider range of domestic supply options are presently underway. These are discussed in more detail below.

3.5 Costs and benefits

Davis (1996) has shown that rural electrification will require large investments with average capital costs per connection of R4 740 over the life of the programme, with a clear trend towards higher costs as the programme progresses. The programme will not be financially viable and will require ongoing subsidies in the order of R30 per customer per month or 15c per kWh.

⁵ Presently set at R50 per connection.

While an electricity connection clearly increases the range of options available to rural dwellers in meeting their energy needs, little is known about the overall benefits customers in rural areas gain from an electricity supply. Energy consumption figures indicate that poor domestic customers are generally not able to make substantial use of the electricity supply that has been provided (Davis & Ward 1995). Although the determinants of consumption patterns are not fully understood, research seems to suggest that, amongst other factors, the large up-front cost of appliances effectively excludes many rural customers from reaping the full benefit of an electricity service. An improved understanding of where the optimal benefits of rural electrification will be realised in South Africa is required to enable appropriate government policy formulation.

4. Governance and the policy imperative

South Africa is in the position of implementing a large rural electrification programme for which it is poorly prepared. While it was possibly acceptable for government to leave policy development for electrification in urban areas to Eskom and local government, this is not appropriate for rural electrification. For urban electrification, the technical and policy challenges are relatively manageable, while it was expected that the programme would be financially viable and the realisation of net benefits would be beyond question.⁶ In this context electrification was approached as a straightforward service delivery process and could be sufficiently dealt with by Eskom, guided by the ethos of 'customer service' and the normal financial viability concerns of a commercialised utility, or, arguably to a lesser degree, by local authorities with years of experience of urban household electricity supply.

A growing body of international experience suggests that this approach will not suffice for rural areas in developing countries. Many questions have been raised about the overall social and economic benefits of investments in grid electrification programmes compared to investing public funds in other development projects. This experience seems to point towards developing an approach where planning for rural electrification is undertaken with much closer reference to the overall development objectives of a country and for each particular location.

Despite the fact that more than 250 000 rural houses were connected in 1995, requiring an investment of more than R750 million, the South African government has not yet established a national policy framework for rural electrification. There is no statement of what the overall objectives of this major public investment programme are. Nor are there any criteria to measure its success, or to evaluate the efficacy of public spending on this sector rather than on other development and basic needs programmes.

This situation can largely be explained by the nature of present funding arrangements and the effect of the incentives acting on utilities. Eskom undertakes the largest share of rural connections in an attempt to meet its target of 300 000 connections per annum, as explained above, and finances these connections primarily with cross-subsidies from other customers. Eskom is poorly equipped to undertake this highly political task of allocating public resources to loss-making projects that are undertaken for development reasons. Its mandate in the Eskom Act (40 of 1987) and its governance structure were intended to establish it as a commercialised utility operating at arm's length from government, to provide an electricity service 'in the most cost-effective manner' (section 3). Eskom governance and management systems were not designed for the task of allocating public resources in rural areas where project selection and implementation require a sensitivity to the development objectives and processes in each locality.

In the final analysis, if the incentive structure under which senior managers operate promote it, a monopoly utility such as Eskom could continue indefinitely with the current system of 'taxing' electricity consumers nationwide to deliver high numbers of rural connections without questioning the real comparative development benefits of this course of action. Nowhere else in South Africa would a public body be allowed to allocate such large amounts of public resources without extensive checks and balances and effective parliamentary accountability. Because these funds are not appropriated by parliament, and are not contained in the budgets of a government department, there

⁶ More recent investigations suggest that neither urban nor rural electrification will be financially viable with an average negative NPV of approximately R2 280 per urban connection and R3 500 per rural connection (Davis 1996).

is no effective accountability by a government department for rural electrification. This explains the silence from government on electrification policy matters.

4.1 Funding rural electrification and establishing policy

The link between the responsibility for the *subsidisation* of rural electrification, and political responsibility for *policy making* suggests that funding responsibilities should be situated much closer to government to enable clear policy on rural electrification to be established. Eskom electrification planning managers have realised for some time that Eskom is poorly placed to deal with electrification resource allocations and have called for government to establish a national electrification policy – particularly for rural electrification.

Rural electrification policy can only be truly developed with integrity once government faces both sides of the economic scarcity problem when resources are sourced and when allocation decisions are made. This means that the *sourcing* of subsidy funds should be done in a transparent manner, such as by means of an explicit tax, to ensure as far as possible that all affected parties and government have taken the opportunity cost of decisions into account. When *allocation* decisions are made, government should ideally also have the option of spending the funds on other priority areas, to ensure that where funds are allocated to rural electrification this is done on the basis of a thorough political prioritisation process and, in consideration of opportunity costs. To establish this more appropriate funding process, electrification funding responsibilities will have to be transferred from Eskom to government. Government could conceivably meet this funding responsibility by establishing a national electrification funding agency to manage an electrification fund.

4.2 Clarifying the role of electricity in rural areas

The primary aim for government policy on rural electrification will be to establish the objectives for the programme in South Africa. Essentially this begs the question as to what the most appropriate role for publicly subsidised electricity should be in rural development. The pertinence of this question becomes apparent when the large and growing financial demands of the programme, and the relatively low consumption and demand levels are considered.

The planning and delivery of electrification in rural areas has been approached in a similar way as in urban areas, on the implicit assumption that it will result in similar benefits. Against the background of higher and increasing costs and lower consumption rates, the value of a sectorally based service delivery approach to electrification in rural areas becomes questionable. It seems that electrification benefits could be increased if electrification is more carefully targeted and closely co-ordinated with existing or planned development activities where electricity has clearly identified beneficial uses. Typical examples would be community and agricultural water provision, agricultural manufacturing schemes, public facility lighting, and appliance use in clinics, schools and community centres. For this to happen, electricity service needs have to be identified in terms of such activities and planned for as part of the provision of other services and productive investments. This will clearly involve a broader approach to planning, compared to urban areas where household electrification is a more obvious priority.

Based on these explicit objectives, clarity will thus also have to be provided as to what degree subsidy funds will be made available for grid or photovoltaic household electrification in rural areas. Under these circumstances photovoltaic supplies could become a significant option for publicly financed household electrification in rural areas.

4.3 Tariff and supply options

Eskom electrification planners have realised that the increasing costs of a conventional approach to rural electrification will soon render the programme unsustainable and have begun experimenting with lower capacity supply options for rural areas (discussed above). Essentially this approach involves presenting customers with a suite of capacity-differentiated supply options and a choice of associated tariffs and connection fees. Customers with lower electricity consumption requiring lower capacity supplies pay lower subsidised tariffs and connection fees, while higher consumption customers, requiring larger capacity connections, pay full costs and contribute towards subsidising lower consumption customers. A number of different tariff structures are used to make up the suite of capacity differentiated tariffs. In general the lower-end tariffs are structured to subsidise low consumption, but automatically cover full costs and contribute towards subsidies as consumption increases. Higher consumption customers will have an incentive to choose the higher-end tariffs that

include more moderate subsidy contributions than the lower end tariffs at similar high consumption levels. It is intended that the bottom end of the suite should include current limited supplies.

Capacity-differentiated supply options could be used in conjunction with limits on capital subsidies per connection, to ensure equitable and efficient resource allocation. In practice, subsidy limits might exclude higher-end supply options from the suite of options, and in remote rural areas result in the exclusion of all but the lowest option.

Presently the proposed suite of capacity-differentiated tariffs and supply options includes only grid based options. Areas where photovoltaic supplies or other non-grid options are most appropriate will thus either receive expensive grid supplies or be left to fend for themselves, without institutional support or subsidies, if they would want to obtain a non-grid supply.

The transfer of funding responsibilities to a government electrification funding agency would overcome most of these problems by allowing resources to be rationally allocated through making appropriate technology choices.

4.4 Institutional roles and planning

The policy initiatives discussed above would require institutional roles in electrification funding, planning and delivery to be reassigned. Some of the policy changes that necessitate such institutional change include:

- a shift in emphasis towards demand-led development co-ordination rather than a sectorally-led service delivery approach;
- the transfer of most electrification funding responsibilities from Eskom to government; and
- the use of a wider range of supply options which would include a large role for off-grid (typically photovoltaic) systems.

Electricity delivery will require the co-operation of a range of players to establish public policy, identify electricity needs at a local level, provide subsidy funding, undertake planning and implementation, maintain services, provide customer support, and collect user payments. In practice, a compromise would have to be found between establishing a development based demand-led planning and prioritisation process, and the necessity of achieving economies of scale through systematic utility supply-side planning within the constraints of the network characteristics that grid supply entails.

The discussion thus far suggests that government should play a larger role in rural electrification. National government should be the leading funding agency and establish a national policy for rural electrification. At a local level it is necessary to establish representative structures that can take primary responsibility for development co-ordination. It seems that the second-tier structures of local government can play this role. At this stage it is unclear what role provincial government should play in rural energy supply – it could possibly step in to support local government with capacity-building and provide basic support where local structures are too weak or do not yet exist.

It will be necessary to establish non-grid supplies as an integral and legitimate part of the supply options. Workable financing solutions for non-grid supplies and adequate institutional capacity to ensure effective marketing, implementation, maintenance, customer service and revenue collection remain to be established; REFSA could possibly be developed to play this role.

Local government probably needs to be allocated the formal responsibility for ensuring sustainable energy use and supply in rural areas by means of provincial or national legislation. This will ensure that the provision and use of other energy carriers receives sufficient attention.

If government establishes a new funding agency to execute its electrification funding commitments this body could in practice play a key role in establishing a proper place for all players in the planning and prioritisation process.

5. Summary and conclusion

- * South Africa has embarked on a large rural electrification programme without establishing government policy to clarify the objectives of the programme and guide roleplayers effectively. Government will have to gain control over the funding of the programme and establish a coherent

policy framework to ensure that rural electrification is appropriately prioritised and that it delivers the maximum benefits.

In the absence of a clarified policy framework it would be inadvisable to sustain the rapid increase in rural connections of the last two years. High costs and the uncertainty that prevails about the comparative benefits of indiscriminate public spending on rural electrification suggests that a more conservative approach should be followed until a national policy framework on rural electrification can be established. The significant number of rural projects implemented over the last two years have the benefit of providing the opportunity to evaluate the costs and benefits of such projects, and will thereby assist with policy development.

Policy challenges that will have to be addressed include the following:

Establishing clear objectives

In the light of the above discussion, a clear statement is required of the objectives that the programme is intended to achieve. In the rural context it is necessary to clarify the priority that productive activities and community services will receive and indicate to what degree subsidies should be used for household supplies. A clear, objective statement will assist greatly in establishing realistic political expectations around electricity supply and assist planning negotiations between utilities, communities and funders.

Restructuring financing arrangements

The necessary fiscal measures will have to be established to transfer available subsidy funds to a government funding agency from where funds can be made available for grid and non-grid projects alike. An electrification funding agency's institutional capacity will have to be established to ensure appropriate resource allocation, and to use the government's financial leverage to ensure effective planning and implementation procedures.

Clarifying selection criteria

Government's rural electrification objectives and prioritisation will have to be translated to a set of explicit project selection criteria to enable recipient communities and utilities to prepare project proposals for government funding.

Resolving pricing policy

National tariff and connection policies will have to be established, along the lines discussed above, to indicate cost differences in supply options. This will enable customers and utilities to choose appropriate supply options and contribute to finding an appropriate balance between equity and affordability objectives.

Clarifying roles and responsibilities

Government will have to clarify the roles and responsibilities of all possible stakeholders including communities, local government, utilities and the private sector, in the prioritisation, planning, co-ordination and implementation of projects. A critical challenge for rural electrification will be to ensure that institutional responsibilities are arranged in such a way that electrification planning is demand-led, by linking it to the planning for other development activities.

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