

Some Public Benefit Policy Aspects in Reforming the Power Sectors in East and Southern Africa

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Preface and Acknowledgment

Over a period of several years, two groups of researchers from countries in the East and Southern African region carried out energy policy studies within the African Energy Policy Research Network (AFREPREN), one on power sector reforms and the other on energy services to the urban poor. As a resource person to both groups, I was closely involved in this effort, providing guidance and commenting on the successive drafts of the studies as they were produced. The first round of research on power sector reforms (PSR) was published as a book in 1999 (Bhagavan 1999). The first round on urban energy and the second round on PSR have recently been completed. The present paper relies heavily on three PSR and two urban energy country case studies (please see the section on References for details): Ethiopia (PSR Mengistu Teferra), Tanzania (PSR Edward Marandu and urban energy Maneno Katyega) and Zimbabwe (PSR Dorcas Kayo and urban energy Ikhupuleng Dube). It gives me great pleasure to acknowledge the discussions I have had with Dorcas, Edward, Ikhupuleng, Maneno and Mengistu during the course of their research work, and the support provided by the Swedish International Development Cooperation Agency (Sida) for writing this paper within SEI's 'Sustainable Energy and Development Outreach Activities Programme' .

Abbreviations

AFREPREN	African Energy Policy Research Network
CSO	Zimbabwe Central Statistical Office
EELPA	Ethiopian Electric Light and Power Authority
EEMCO	Ethiopian Electric Power Corporation
ERA	Electricity Regulatory Agency
ESA	East and Southern Africa
IPD	independent power distributor
IPP	independent power producer
IPTL	Independent Power Tanzania Ltd
LRF	legal and regulatory framework
LRMC	long run marginal cost
MME	Ministry of Mines and Energy
NEP	National Energy Policy
PIP	Performance Improvement Programme
PSR	power sector reforms
RE	rural electrification
REF	Rural Electrification Fund
TANESCO	Tanzania Electric Supply Company
TPL	Total Poverty Line
Tshs	Tanzanian shillings
ZESA	Zimbabwe Electrical Supply Authority

1 Introduction

The first set of policy studies by AFREPREN researchers on power sector reform in some countries of the East and Southern African region was published in 1999 (Bhagavan 1999). In my “Introduction” to that book, I summarised the policy findings that emerged from those studies. As a starting point for the present paper, I can do no better than to reproduce below some of those earlier conclusions:

“The overall thrust of the reform process must be to distance the power sector from the (personal) concerns and interests of the political class and the state bureaucracy. In parallel, one must introduce and institutionalise incentives to both managers and workers to provide more efficient electricity services to the customer. The first step in this direction is to transform the power utility into an independent and self-contained corporation, but formally still under state ownership. As the corporate culture takes root and management becomes used to taking and implementing its own decisions without constantly having to look over its shoulder at government, commercialisation should be introduced. Commercialisation will impose the disciplines of commercial law and responsible regard for what the market expects and tolerates.

Neither corporatisation nor commercialisation will produce the expected results without the right kind of management in charge. A management that is essentially one of top bureaucrats wearing other hats is unlikely to be the answer. Competition to run the corporate utility should be promoted, and management contracts issued with built-in incentives that fetch a premium for good performance. Where the requisite managerial expertise is not yet available locally, there should be an openness to recruit internationally. Under such conditions, there are good prospects for turning around the fortunes of hitherto loss-making utilities and making them attractive to private investors.

At this stage, the hitherto vertically integrated utility is ripe for unbundling into its three parts: generation, transmission and retail distribution (sales). In contemplating the privatisation of the unbundled parts, it is necessary to distinguish between “competition *in* the market” and “competition *for* the market”.

For private investors to find it attractive to compete *in* the market for existing generation, there needs to be excess capacity in the system (surplus of supply over demand), several generating units with comparable costs, and a sophisticated load dispatching centre that can switch from one generator to another at a moment’s notice, depending on the price offered on the daily market. These conditions do not yet obtain in sub-Saharan Africa.

But competition *for* the market in generation is certainly a realistic proposition in sub-Saharan Africa, given the incidence of shortfall in capacity (demand exceeds supply). The hitherto most common and successful form of introducing private investment into the power sector is in the independent power producer (IPP) in thermal generation. Competition here would be characterised by a ‘trade-off’ between the lowest possible price for supply, on the one hand, and adequacy and reliability of supply on the other.

Grid transmission is a ‘natural’ monopoly. Its privatisation is neither possible in countries with small systems nor desirable. It would have to be retained in the public domain, but placed under the purview of the power sector regulator to ensure that it does not abuse its monopoly.

In the distribution area, however, competition *for* the market by privatised distributors is certainly feasible. Given access to some initial capital, this is an area where much headway

can be made relatively quickly through the acquisition and deployment of managerial and organisational skills. Incentives should be built in for the management to find it worth competing seriously for the market, coupled with periodic monitoring of their performance by external evaluators.

Given the fact that even under a reformed scenario there are likely to be only a few actors in the power sector, an independent regulatory body is indispensable. It should be distanced from the government and insulated against political, corporate and other pressures. The commissioner (regulator) must be given a longish term in office, made accountable only to parliament, and (except for illegal acts) should not be removable during the contracted period of office. The two most important areas for the regulatory body to preside over are (1) price (tariff) setting, balancing cost recovery and fair returns; and (2) adequacy and reliability of supply”.

2 Illustrative Cases of Challenges Confronting the Reform Process

Of the several countries studied by AFREPREN researchers, I have chosen three for presentation in this section, for they are representative of the challenges facing the East and Southern African (ESA) region: Ethiopia, Tanzania and Zimbabwe. What follows are highly summarised descriptions and analyses of the main features of the reform process, with special attention being paid to rural electrification and provision of power to the urban poor.

With some exceptions (e.g. South Africa, Zambia and Zimbabwe, with urbanisation rates of over 30 per cent), in most countries of the ESA between 85 and 90 per cent of the population lives in the rural areas. The table below provides a feel for the extremely limited levels of electrification in ESA.

Percentage of rural and urban households with access to electricity

Country	Rural Households	Urban Households
Botswana	2	27
Ethiopia		13
Malawi	0.3	30
Mozambique	0.6	17
Tanzania	1	36
Uganda		23
Zambia	1.4	25
Zimbabwe	18	80

2.1 ETHIOPIA (Teferra 2002a and 2002b)

Summary of the main features of the reform process

In the mid 1990s, the Government of Ethiopia set up a task force to conduct a study on reforming the sole public sector utility, the Ethiopian Electric Light and Power Authority (EELPA). Based on the study’s recommendations, the government transformed the EELPA in 1997 into a public sector *commercial* enterprise named the Ethiopian Electric Power Corporation (EPCO),

and also created the Electricity Regulatory Agency (ERA). Whereas EELPA was part of the Ministry of Mines and Energy (MME), the EEPKO was made formally autonomous with a Board of Management accountable directly to the Prime Minister's Office. However, the ERA was placed under the control of the MME.

Four government directives provide the basic legal and regulatory framework for the reform process (Teferra 2002a and 2002b):

- The Ministerial Council Regulation of 1997 creating the EEPKO
- The Electricity Proclamation issued in July 1997 establishing the ERA
- The 1998 Proclamation on the scope of private sector participation in power generation
- The Ministerial Council Regulation issued in May 1999 on power supply operations

EEPKO is a limited liability company, but under government ownership. It has de facto monopoly on power generation, transmission and sales¹. In theory, it ought to be run as an autonomous company on commercial lines (e.g. cost-effectiveness and profitability), but in practice, it is dependent on the government for injections of finance and subject to political constraints. An important feature that distinguishes EEPKO from its predecessor EELPA is decentralisation of management, which makes it possible for the various regional (provincial) offices of EEPKO to undertake certain power supply activities on their own initiative without having to obtain approval from the head office, provided the activities do not contravene the objectives, policies and rules of the corporation.

ERA's mandate is to "promote the development of efficient, reliable, high quality and economical electricity services". Its powers and duties are, among others, to:

- supervise and ensure that the generation, transmission, distribution and sale as well as import and export of electricity are carried out in accordance with the Proclamation as well as regulations and directives issued (by the government);
- determine the quality and standard of electricity services and ensure the implementation thereof;
- issue certificates of professional competence to electrical contractors;
- issue, suspend and revoke licence for the generation, transmission, distribution and sale as well as import and export of electricity in accordance with the Proclamation as well as regulations and directives issued;
- study and recommend a tariff and, upon approval, supervise the implementation thereof."

Rural electrification

Rural electrification (RE) does **not** feature explicitly either in the legal and regulatory framework (LRF) or in the mandates, duties and responsibilities of EEPKO and ERA. Neither of these two entities has involved itself, so far, in any direct and noteworthy fashion in RE.

In fact, the ERA has not yet acquired the capacity to discharge its main duties and responsibilities, let alone to go beyond them to consider RE.

Even if it wanted to, EEPKO would be unable to involve itself in RE, unless it departs from the commercial criteria of cost effectiveness and profitability. Even in the main urban areas, with a grid network in place, the present tariffs, determined by a "cost plus" approach², put

¹ EEPKO's total installed capacity is 453 MW (2000).

² EEPKO's tariff combines the marginal cost of supply with an "acceptable" rate of return.

electric power beyond the reach of the urban poor. Providing power to rural areas, or even to small towns not in the vicinity of the grid, calls for substantial new investment and operational expenses, whether in connecting them up to the grid or in installing stand-alone generators. To recover these costs, rural tariffs would have to be substantially higher than urban ones, which is wholly unrealistic given the dire poverty of most rural households. Substantial subsidies would help to overcome this barrier, but that policy is not within the realms of possibility, under the conditions set by multilateral lending agencies and bilateral donors.

With EEPCO effectively ruled out of RE, at least for the time being, we look at the question of whether conditions prevail that would make RE a realistic proposition for *local* private investors and entrepreneurs (i.e. Ethiopian nationals). Given the uncertainty about, and the expectation at best of only very modest levels of, potential returns on investment, it is safe to assume that RE is wholly unattractive to *foreign* private investors. Under the new investment law enacted in 1998 (Teferra 2002a and 2002b), foreign investment in the power sector is restricted to hydropower generation, while local investment is permitted in power generation through hydropower (unlimited capacity), thermal (up to 20 MW) and renewable sources, and in the distribution and sales of the power that the investor himself generates. Transmission and distribution of power through the national grid is wholly reserved for EEPCO.

In some “small towns” of population less than 2,000, which are classified by the authorities as “rural centres”, local investors have been producing and selling diesel-generated power³. While this private sector activity is apparently unconnected with the reform process, it is strongly influenced by the availability of loans and credits by local banks and financial institutions, both private and public. Borrowers have to meet the following terms and conditions:

- feasibility study on the financial viability of the venture;
- legal licence to operate the venture;
- an investment permit certificate from the Investment Office of Ethiopia or its subsidiaries;
- financial statements indicating assets and liabilities of the borrower; and
- a collateral covering the full amount of the loan in the form of bank deposits, bonds, shares or property, or combinations of these.

The interest charged goes up from 10.5 per cent for short-term loans to 12.5 per cent for long-term ones. Total investment, installation and initial operational costs involved in setting up a diesel power supply system of a few hundred kW capacity for a “rural centre” with a population of a few thousand is estimated at less than about 2 million Birr (approximately 240,000 US\$ at the Feb 2001 exchange rate of 8.25 Birr to a dollar). While the banks are, in principle, willing to lend these magnitudes (their upper limit being well over 10 million Birr), the reality may well be that the relatively onerous lending terms and conditions effectively keep out all but a few “resource strong” entrepreneurs.

Although the LRF that underlies the reform process says nothing about incentives to promote local private investment in the power sector, the 1996 investment proclamation exempts investors from customs duties and other taxes on imported equipment and goods deemed essential for the power venture, as well as waiving income tax on returns during the first three to eight years depending upon the geographical location of the power generation and supply system.

³ As of 1999, a total of 332 towns had no electrical supply. Of these, 243 had a population of between 2,000 and 5,000, 73 between 5,000 and 10,000 and 16 over 10,000.

Rather than opting for power generation and sales right from the start as independent power producers and distributors (IPPs and IPDs), local entrepreneurs may want to begin as IPDs by buying power in bulk from EEPSCO and then retailing it to rural households, assuming of course that the grid traverses rural neighbourhoods. Here again, the reform proclamations and ministerial regulations say nothing about the right of entrepreneurs to bulk purchase of power from EEPSCO. In effect, the matter is left to the discretion of EEPSCO. But as Teferra argues, there is at present no indication that EEPSCO would be willing to enter into such arrangements with RE-oriented entrepreneurs⁴.

The price per kWh that local entrepreneurs want to charge their customers would have to be approved by the ERA. If the price charged were computed on the basis of a “cost plus” approach, as EEPSCO does for instance, the ERA would have no objection. But the moot question is whether such a pricing level is affordable by rural households. Should the answer be in the negative, RE through private sector initiative may get nowhere.

There are indications that parts of the rural population would be willing and able to pay a comparatively high charge. Teferra (2002a) reports that households in the rural township of Gundo Meskel were paying about 12 US cents per kWh to the local “stand alone” IPP, a rate twice the LRMC tariff of EEPSCO. At an average monthly consumption of about 16 kWh, the monthly electricity bill for a household amounted to about 2 US\$. Assuming the World Bank’s universal poverty standard of “a dollar a day” income, this bill would account for 6 per cent of the household’s monthly income.

According to Teferra (2002a and 2002b), the technical and managerial skills required for setting up rural power supply systems are available in Ethiopia, if one takes into account the EEPSCO, the stock of qualified professionals outside the utility and the tertiary level educational and training institutions in the country. However, the required electrical equipment is not available in the local market and can only be accessed through EEPSCO. The cooperation and help of EEPSCO are thus indispensable, but there is no government policy directing EEPSCO to render the assistance⁵.

2.2 TANZANIA (Marandu 2002a and 2002b, and Katyega 2002)

Summary of the main features of the reform process

The legislation that governs the power sector in Tanzania originates in the 1931 Electricity Ordinance, which has since undergone a few amendments, the last being in 1957. No new energy policy has been explicitly proclaimed since the last one issued in 1992. Over the last ten years, there has been talk of replacing the Ordinance by a new Act that will provide a consistent and comprehensive legal and regulatory framework for reforming the power sector, but without as yet being translated into action. However, the first sign of the reform process can be discerned in the 1992 regulation that formally lifted the monopoly of the sole public sector utility Tanzania Electric Supply Company (TANESCO) over power generation⁶. This

⁴ However, under existing regulations, EEPSCO allows for, and actually has, agreements with industrial enterprises to make bulk supplies of high voltage power.

⁵ There is a government policy to electrify towns of over 2,000 inhabitants (called “wereda” towns), and EEPSCO has been called upon to implement it. Some would argue that this is a step in the direction of RE, as the “wereda” towns could be regarded as being part of the countryside. In this context, the interesting and important question is whether EEPSCO can implement this policy without violating its commercial principles and requiring substantial financial input from the government.

⁶ TANESCO’s total installed capacity is 655 MW (1998).

measure opened the way for independent power producers to generate electricity and sell it either to TANESCO or directly to consumers within reach. Cross-country and intra-urban transmission by the national grid still remains a monopoly of TANESCO.

Over the last few decades, half-a-dozen sugar estates (plantations-cum-factories), a coalmine, a sawmill and a wattle extraction factory have been producing power⁷ *for their own use*⁸ and therefore could not be characterised as IPPs in the sense in which the concept has emerged in the reform literature. But after 1992 they could be, since they were then allowed to sell their excess power, if any, to TANESCO or others, as for instance the Kiwira coalmine and the Iringa wattle factory do to TANESCO⁹.

Since 1992, only four IPPs have emerged: *Songas* (project initiation in 1995¹⁰, planned capacity 112 MW, 10 per cent of investment is by the Tanzanian state, the rest being Canadian private), *Independent Power Tanzania Ltd* (IPTL¹¹, a Malaysian-Tanzanian joint-venture, project initiation 1996, 100 MW, 30 per cent Tanzanian private, none by Tanzanian state), *Urambo*¹² Electric Consumer Cooperative (rural township, 0.1 MW, 100 per cent local private) and *Mbinga* Electricity Cooperative Society (rural township, 0.3 MW, 100 per cent local private).

The second sign of reform is the steep increase by TANESCO of the tariff it charges from about 11 Tanzanian shillings (Tshs) per kWh in 1990 to about 72 Tshs in 2000 (US cents 5.6 and 9, respectively, at exchange rates of 195 and 800 Tshs to a dollar) to industrial and commercial enterprises. This is based on the long run marginal cost (LRMC) calculation.

But supplies to households are *subsidised*, on a “block tariff” scale, as follows: for the first block of 100 kWh consumed *per month*, the so-called “lifeline” tariff of approximately *one-third* the LRMC tariff is charged, for the next block of 100-500 units, approximately half the LRMC, and thereafter the full LRMC (excluding service and VAT charges).

In a bid to overcome the grave and persistent problem of unpaid bills and grossly out-of-date meter readings, TANESCO is installing prepaid meters in urban households. There are hearsay reports about prepaid meters being tampered with in order to tap power free of charge.

As of 2002, TANESCO was still entirely under the control of the Ministry of Mines and Energy (MME). The government, through the MME, still takes all the main policy decisions in the energy sector as a whole, including those on electricity tariffs, issuing of licences to potential IPPs and IPDs, rural electrification, power supply to the urban poor, etc.

In collaboration with the World Bank and the IMF, the Tanzanian government produced and published the following timetable for the various stages in the reform process (Marandu 2002a). It has not been possible to find out to what extent it has been implemented.

⁷ In part by bagasse and sawdust fired “co-generation”.

⁸ With the exception of one sugar estate, none have any Tanzanian private investment.

⁹ A number of enterprises and households have installed diesel-fired sets to produce power for their own in-house consumption (so-called “gensets”). These cannot of course be regarded as IPPs. No record is available on the number, geographical location and capacity of gensets.

¹⁰ The work on Songas was apparently halted, pending the resolution of the IPTL dispute (see footnote 11).

¹¹ IPTL’s initial power purchase agreement with the Tanzanian government that would have allowed it to charge TANESCO 21.5 US cents per kWh (over twice the then prevailing TANESCO tariff of 9 US cents) led to an international outcry and charges of lack of transparency in how the agreement was reached. Under pressure from the World Bank and bilateral donors, the project was suspended in mid 1998 and the matter referred to the International Centre for the Settlement of Investments. A settlement was reached recently, with IPTL accepting a substantially lower tariff level.

¹² Established with Sida’s grant-in-aid for the purchase and installation of the diesel generator and the local grid, TANESCO’s technical assistance (including repair, maintenance and servicing), and SEI’s project management assistance.

Timetable for power sector reforms in Tanzania

Set up administrative teams	Feb, 2000
Defining needs from external consultant	Jan–Feb, 2000
Finalize TORS for restructuring and trading arrangements	Feb, 2000
Qualify consultants	June, 2000
Evaluation and appointment of external consultants	Aug–Oct, 2000
Approval	Not specified
Implementation of restructuring of TANESCO	3rd quarter, 2001–2nd quarter, 2002
Establish regulator	Not specified
Recruitment of privatisation advisor (investment and legal)	3rd quarter, 2001–2nd quarter, 2002
Preparation of sale strategy	1st quarter, 2002
Preparation of legal changes	1st quarter, 2002
Approvals	2nd quarter, 2002
Preparation of memorandum	3rd quarter, 2002
Obtain expressions of interest	4th quarter, 2002
Qualify investors	4th quarter, 2002
Finalize transaction agreements	1st quarter, 2003
Bid submission	2nd quarter, 2003
Bid evaluation	2nd quarter, 2003
Completion of contracts	2nd quarter, 2003

Power supply to the urban poor and the rural areas

About 35 per cent of the urban population has access to mains electricity. No reliable recent figures are available on the proportion of the urban households that are officially classified as poor, i.e. falling below the official poverty datum line of a *monthly household income* of about 55,000 Tshs in 2000 (US\$ 70). But the rough estimate quoted by Katyega is about 40 per cent, the rest are defined as “non-poor”. It is estimated, rather vaguely, that a third of the poor urban households are electrified.

In his detailed empirical study of energy consumption by poor households in Dar es Salaam, Katyega found that the surveyed households spend between 35 and 40 per cent of their monthly income on energy consumption (which encompasses fuelwood, charcoal, kerosene, mains electricity and batteries), with mains electricity accounting for 10 to 15 per cent of the total monthly energy expenditure. On average, a poor urban household in the Dar es Salaam area consumes about 80 kWh per month, which falls well within the “lifeline” tariff block. The surveyed households make it plain that, were it not for the subsidised “lifeline” tariff, they would have to forego even the minimal magnitude of power they consume.

TANESCO has **not** attempted to install prepaid metres in the poor households, presumably because they cannot afford the cost of installation, which was about US\$ 120 in 2000 (nearly twice the monthly income of a poor household).

Less than two per cent of the rural population has access to electricity. No recent reliable figures are available for what it pays for its power. Reports from the Urambo and Mbinga rural townships indicate that the inhabitants seem willing to pay the high rates set by the cooperatives (substantially exceeding TANESCO’s lifeline tariff).

It is difficult to imagine TANESCO being able to combine the cost-effectiveness and profitability criteria of the power sector reform (PSR) process with the supply of power to the

rural areas and the urban poor at the prices they can afford. In addition to the tariff barrier, the poor households have to find ways of paying for the initial cost of connecting up to the mains supply, an expense that presents another high barrier.

One intention of the 1992 deregulation of power generation was to encourage local entrepreneurs to invest in supplying power to rural households. That measure, in combination with the National Investment Act of 1991, should have prompted the entry of at least a few local middle-level entrepreneurs into the power sector. That this has not happened may well be due to the difficulties faced by potential investors in obtaining loans from both the public and private sector banks and financial institutions. The study by Marandu (2002a and 2002b) indicates that the private sector lenders provide only short-term loans, which in effect rules them out. While the public sector institutions are willing to undertake long-term lending, the terms and conditions they set are experienced as being too demanding by all but the most “resource-strong” local entrepreneurs. Typically, the public sector lending institutions charge an interest rate of 25 per cent per annum on loans repayable within eight to ten years, limit their lending to about a quarter of the core capital of the proposed venture and insist on 100 to 150 per cent collateral cover (usually a combination of real estate property, insurance policies and current account credit balances).

As in the case of Ethiopia, Tanzania too seems to have adequate technical and managerial skills to set up IPPs and IPDs of modest capacities (a few megawatts), if one includes the skills available at TANESCO in the overall picture.

There is no evidence of the government having earmarked budget allocations for specifically promoting power supplies to the urban poor. Apart from the lifeline tariff subsidies mentioned above, no attempts been made to incorporate elements that specifically benefit the poor into the design and implementation of urban power supply projects. Policies on the provision of power to the rural areas and to the urban poor remain, for all practical purposes, outside of the ambit of the PSR process. The latest plans for rural electrification are a testimony to this.

2.3 ZIMBABWE (Kayo 2002a and 2002b, and Dube 2002)

Summary of the main features of the reform process

The power sector in Zimbabwe continues to be governed by the Electricity Act of 1985, which established the Zimbabwe Electrical Supply Authority (ZESA) as the sole public utility with virtual monopoly of generation, distribution and sales of electricity. It was amended in 1996 to allow for the formation of the Zambezi River Authority, under which Zimbabwe and Zambia share the responsibility for the running and maintenance of the Kariba Dam hydroelectric station. Through ZESA’s Board and the Minister in charge, the government exercises control over all the decisive aspects of ZESA’s operation and development: tariffs, expenditure, investment, procurement and senior level staffing.

ZESA’s installed capacity is 1,960 MW, but its actual production capacity is 1,620 MW. Since the current maximum demand stands at about 2,030 MW, the shortfall of 410 MW is imported from the Democratic Republic of Congo, Mozambique, South Africa and Zambia.

The Electricity Act permits private sector producers to generate up to 100 kW without seeking permission from the government. Anything above that level requires government approval and licence. At present, ten private sector entities together have an installed capacity of about 60 MW, of which 58 MW are accounted for by two large co-generating sugar estates (Triangle 32 MW and Hippo Valley 26), and about 1.3 MW by mini-hydro generation by

eight non-governmental welfare organisations. Triangle sells 11 MW to ZESA via the national grid. The rest of the private production is for own-use or welfare use, including the very low wattage (45Wp) productions by a very large number of solar photovoltaic generators¹³ and a few wind power generators.

Bulk purchase of power from ZESA by potential IPDs for onward retailing is not permitted under the current Act.

In 1993, with the assistance of Electricité de France, a Performance Improvement Programme (PIP) aimed at ZESA was designed. Its implementation produced some positive results. ZESA's system and distribution losses went down for a few years, and efficiency in collection of outstanding bills and customer servicing kept rising until 1998. But by 1999, the PIP had run out of steam.

Two failed attempts at partial privatisation could be regarded as *precursors* to the reform process: the privatisation and expansion of ZESA's Hwange coal-fired power station and the setting up of a new coal-fired power station at Gokwe North. The former was intended as a joint venture between the YTL Corporation of Malaysia (51 per cent) and ZESA (49 per cent), while the latter involved the UK-based multinational Rio Tinto Corporation. Both projects were conditional on the government accepting a power purchasing agreement at an estimated LRMC tariff of 6 US cents per kWh (computed with the high voltage industrial, mining and commercial sectors in mind, in contrast to the prevailing tariff of about 3.5 to US cents) The negotiations, based on some variations on the proposed investment and the rate of return, went on from 1996/1997 to 2000, but were finally abandoned in early 2000, primarily because of the unwillingness of the government to accept the LRMC tariff.

The power sector reform proper was initiated with the publication of a government White Paper in 1999, setting out a reform scenario. It envisages a stage-wise restructuring and unbundling, leading first to the creation of commercialised public-sector "business units" out of ZESA's generation and distribution activities, followed by revision of tariffs to make the "business units" economically viable and culminating in privatisation of the "business units". However, transmission is to be retained as a government monopoly. The White Paper further proposes establishing the Office of the (Power Sector) Regulator and a new Rural Electrification Fund to replace the existing one. Although tabled in Parliament in 1999, the White Paper and the associated Bills, *which constitute the proposed legal and regulatory framework*, are still awaiting passage.

Rural electrification and power supply to the urban poor

Nearly a third of the total population is urbanised. The Zimbabwe Central Statistical Office (CSO) sets the Total Poverty Line (TPL), for the year 2001, at a monthly household income of Z\$ 6000¹⁴ (which is not taxed). Households that fall below the TPL are classified as poor. Using this measure, the CSO estimates that about 75 per cent of the rural households and 40

¹³ Kayo (2002a) states that the World Bank/UNDP Global Environment Fund (GEF) project "provided loans and equipment for installation of over 11,000 (photovoltaic solar panel) systems of 45 Wp. Fifty-five (local) private companies carried out installations and this created a lot of employment opportunities. The project was implemented by the (government's) Department of Energy over a period of five years. (The local private companies) also manufactured (and installed) the solar (systems') accessories (such as) batteries, charge controllers and lights, solar water pumps, solar water heaters, solar fridges and freezers, etc. ----- The solar industry in Zimbabwe is well established and the private companies involved have formed a Solar Industry Association".

¹⁴ Equivalent to US\$ 120, at the 2001 official exchange rate of Z\$ 50 to 1 US\$".

per cent of urban ones are poor (Dube 2002). About 18 per cent of the rural and 80 per cent of the urban households have been electrified (Kayo 2002b).

The monthly average energy consumption by poor households (averaged over both rural and urban, covering woodfuel, kerosene, mains electricity and batteries) accounts for about 12 per cent of their monthly income. A poor *urban* household spends, on average, 6 per cent of its monthly income on mains electricity, if it is connected to a conventional meter with normal subsidy; this figure would however climb to 10 per cent if the supply were routed through a pre-paid-meter that charges the higher, less subsidised, rate of Z\$ 2.25 per kWh (see tariff table below).

Following the studies that ZESA conducted in 2000 on the differential patterns of electricity consumption by households by income groups, the utility introduced the following “lifeline/block tariff” scale in 2001, which continues the policy of subsidising power consumption by the poorer households whose monthly consumption remains well below 300 kWh. Beyond that point, which is where the higher income groups would find themselves, the rates charged begin to approach ZESA’s estimated LRMC rate of US cents 7.5 per kWh for the household sector. The following table applies to all households, both rural and urban, irrespective of their geographical location:

Monthly household consumption in kWh	Zimbabwe cents	US cents (at the 2002 official exchange rate of 5.55 Zc to a USc)
Fixed charge	1337	239
First 50	142	2.5
51–300	157	2.8
301–1000	368	6.6
Above 1000	382	6.9

For non-electrified poor households wanting to access the mains supply, the initial connection cost (so-called “upfront” cost) would be a big burden. It stands currently at about Z\$ 12,000 (twice the average monthly income of a poor household), which would go up by another Z\$ 2,200, if a compact distribution board were involved. *Dube’s study identifies the “upfront” cost as perhaps the biggest hurdle in extending electrification among the poor.*

At independence in 1980, the Zimbabwe government initiated a rural electrification programme. After ZESA was established in 1985, the utility was charged with the task of implementing it out of its own budget revenue, in the rural centres chosen by the government, irrespective of the economic viability of the individual projects. This, in combination with the added burden of subsidising the tariff charged to the rural consumers, led to mounting losses. ZESA suspended the programme in 1990, resuming it only in 1993, after the government published a rural electrification policy and a Master Plan, backed up by a Rural Electrification Fund (REF) financed out of a one per cent levy on all customers of ZESA. Notwithstanding these moves, by the year 2000 only 14 out of a planned 54 projects had been implemented. As of April 2000, the REF had an unspent balance of Z\$ 450 million. The reason advanced is that there is a shortage of local contractors who can undertake the civil and electrical engineering work involved in connecting the rural centres to the national grid.

Apart from the few mini-hydro and wind power generators mentioned above that are run by non-governmental welfare organisations, local private investment in “stand-alone” generation for supplying power to rural households is virtually nil. Kayo’s study (2002a), based on

interviews with public and private sector banks and financial institutions and members of the business community, identifies the following barriers: the lending institutions are willing to lend quite large sums of money (maximum of 100 to 200 million Zimbabwe dollars, which translate into 1.8 to 3.6 million US\$, at the 2002 official exchange rate of 55.5), but at interest rates ranging from 25 to 40 per cent depending on the lending institutions, repayable over a few years time, provided the borrower furnishes 100 per cent collateral and personally contributes 25 to 30 per cent of the venture capital. The local potential investors regard all these conditions as being too hard to meet, which presume a secure rate of return of about 20 per cent on the investment, a highly unrealistic target for rural electrification ventures¹⁵.

The government of Zimbabwe has explicitly restated the priority it attaches to rural electrification (RE) by incorporating policies and measures for the continued promotion of RE into the National Energy Policy (NEP, issued in 2000) and the proposed LRF for PSR. But the provision of energy to the urban poor, in particular electricity, has not been so favoured so far. When it comes to the urban areas, the NEP's focus is on the energy policies and measures that would *directly* promote economic growth and development, i.e. the energy needs of the manufacturing and service sectors and the intra- and inter-urban transport sectors. *That said, all these moves are at present in abeyance, pending the resolution of the deep political and economic crises that have gripped the country.*

3 Some Policy Aspects Relating to Public Benefits

The three country cases we have looked at highlight the pressures and dilemmas that confront the governments of East and Southern Africa (ESA) as they proceed along the path of power sector reform. Compelling the governments is the need, on the one hand, to put an end to the long lasting propensity of the sector to lose a great deal of money, and, on the other hand, to find the capital, technology and skills to increase the woefully low supply of power. Ending the monopoly of the public sector utility, and embarking on its step-wise commercialisation and privatisation, are admitted as being necessary for meeting the need. An autonomous public regulator, with the mandate to set tariffs that permit a reasonable return on investment and to ensure that certain standards are adhered to by the sector in the quality of energy services it has undertaken to deliver, is also seen as indispensable. While the governments may accept all this in principle, they are far from being enthusiastic in making it happen. Rearguard action by vested interests to preserve as much of the "old order" as possible is the rule, rather than the exception.

For democratic and socially committed governments, there is the additional formidable challenge of squaring the circle of ensuring access to electric power by the rural and urban poor with profitable tariffs for the providers of power. Since the poor are an overwhelming majority, this public benefit challenge ought to take a central place in the reform process, in particular in shaping the legal and regulatory framework. With some notable exceptions, the striking thing about the ESA region is that the objective of provision of power to the poor is not even handled as one part of the reform process, let alone being given a prominent role. In so far as they are being seriously addressed, rural electrification and provision of power to the

¹⁵ From Kayo's study (2002a), one can infer that a one megawatt (1MW) mini-hydro unit to supply power to a number of rural households would today require an investment of the order of 3 million Z\$ (54,000 US\$), assuming a 20 per cent rate of return and a payback period of eight years.

urban poor are treated as “stand-alone” programmes separate from the reform process. One may object strongly that this is a travesty of the truth by pointing to the subsidies built into the tariffs that apply to poor households. But the fact of the matter is that with attractive returns on investment at the heart of the reform process as presently conceived, the subsidies to the poor are doomed. By and large, the ongoing reform process and the policies to benefit the poor are counteracting one another in the decisive question of allocating resources.

In theory, there are two ways of squaring the circle, one in the medium-term and the other long-term. The latter has to do with integrating the strategies for raising the income of the poor into the reform process, which involves large macro-economic questions that we cannot touch upon here. The medium-term one is to integrate into the reform process strategies designed to encourage middle-level entrepreneurs to enter the field as independent power producers and distributors. This is a more tractable proposition than the long-term one.

The policy research studies that we referred to in the Preface provide empirical evidence of a willingness and a differential ability, on the part of the poor, to pay relatively high charges for electric power, because of the high value they attach to it. So there is a potentially lucrative market here for the middle-level entrepreneurs to tap into, provided they can access the capital, technology and the skills required to set up small-scale “stand-alone” generators. The studies indicate that while the technology and the skills can be accessed through local agencies and institutions relatively easily, it is the difficulty in obtaining investment loans at realistic and affordable terms and conditions that has slammed on the brakes. A central objective of the reform process should therefore be to find ways to encourage the local banks and financial institutions (both public and private) to soften their terms and conditions for lending towards power projects earmarked for providing power to the poor.

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