

Power sector reforms in Sub-Saharan Africa: some lessons

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Over the last decade power sector reforms have been implemented to varying degrees across African countries. However, the full reform model has not been implemented in any country. This paper discusses an overview of the African experience with electricity reform. It discusses the drivers and rationale for reforms and summarizes reform status. The paper concludes that reforms have not met the expected objectives of attracting investment, moving toward competition and achieving rural electrification. While the literature highlights the shortcomings of a uniform reform model, country experience does not, as yet, reflect this new understanding.

1. Introduction

1.1 Power Sector reforms in Africa

Over the last decade power sector reforms in Africa have been implemented to varying degrees across the countries. The typical reform model involves corporatisation, commercialisation, restructuring and eventually privatization and competition. But this process has not been fully implemented in any country. State-owned utilities are transferred to private and public-owned companies without restructuring. The companies dominating the market are powerful multinationals and public monopolies. In some cases state-owned utilities are unbundled into generation, transmission and distribution but the ownership and management remains under state control with private participation occurring through independent power producers. As such competition has hardly been registered. Understandably, market sizes remain too small to support competition.

The typical reform tended to neglect rural electrification and it was only during implementation that the need for targeted programmes is being realized. As a result the governments are using different modules including establishing rural electrification programmes, agencies and funds.

This paper discusses some of the emerging lessons as reforms continue to be implemented. A brief overview of the electricity sector in sub-Saharan Africa is presented in the following sub-section. Section two discusses the drivers and rationale for reforms and also provides the reform status across select countries. The lessons to be learnt under reforms are discussed in section four and these are presented on the basis of expectations from the reforms and where possible country cases provided for emphasis. The paper ends with a brief conclusion highlighting the need to consider the lessons in the future.

1.2 Electricity in Africa

Africa had an estimated population of about 832 million in 2002, approximately 80% of India's population [IEA 2004]. Despite being endowed with abundant, diverse renewable and non-renewable energy resources the majority of Africa's population suffers modern energy poverty. Biomass is the predominant form of energy accounting for 70-90% of the energy balance in most African countries. The IEA (2002) estimates that the absolute number of people relying on traditional fuels will increase from 583 million in 2000 to 823 million in

2030. More than 500 million people in Africa remain unelectrified. By 2030 sub-Saharan Africa (SSA) will host most of the people without electricity, accounting for 650 of the 823 million unelectrified world-wide. Consumption levels are markedly low. In 2002 the average electricity consumption in the continent was 514 kWh per capita; consumption in the USA was twenty six times greater [IEA 2004]. The per capita consumption of modern energy in SSA is not only relatively low but has hardly changed between 1990 (at 238 kgoe) and 1997 (at 248 kgoe). Paradoxically Africa is a major exporter of energy, mainly fossil fuels, and its share is growing.

Production and use of energy is very uneven across the continent. Oil and gas are concentrated in Northern and Western Africa and mainly in a few countries: Algeria, Libya and Nigeria. Other countries with significant oil and gas reserves are Angola, Equatorial Guinea, Gabon and Congo. More recently, some countries are reporting smaller but significant oil and gas reserves. These include Sudan, Cameroon, and Tunisia for both oil and gas, while Mozambique, Namibia and Tanzania for gas reserves only. Coal reserves are dominant in the Southern region, of which over 95% are in South Africa. Geothermal energy deposits are limited to Eastern Africa along the Rift valley where only Kenya has developed these to any reasonable level. Africa has vast amount of hydro resources. However less than 10% of the potential has been exploited. Inga dam has the highest potential for hydropower development with a technically feasible potential of 77400 GWh/yr, out of which only 7.5% has been developed. The total installed hydro capacity in Africa in 2001 was about 20.3 GW with a total hydro production capability of about 76,000 GWh/year [Hydropower and Dams 2001]. Of the total 20.3 GW of hydropower currently installed in Africa, about 23% is located in North Africa, 25% in West Africa and the remaining 51% is located in South/Central/Eastern Africa.

Africa's electricity sector remains largely underdeveloped due to lack of capital for infrastructural development in power generation, transmission and distribution systems. Reforming the sector has been recommended as a strategy to spur and sustain development of this sector. However experiences so far have been mixed. This paper attempts to provide an overview of the status of power sector reforms in Sub-Saharan Africa and the lessons learned so far.

2. Power sector Status

2.1 Drivers and rationales for reforms

Power sector reforms have been driven by the need to attract much desired investments, pressure from multilateral agencies and donors, and a desire to curb losses emanating from financial and technical mismanagement. Investments into the sector have been dwindling at a time when projections indicate dire need for substantial increases. IEA (2002) projects that Africa will need to significantly increase investment in electricity sector, totaling approximately USD 0.21 trillion over the next 30 years, to meet projected demand² and improve prevailing service. Fay and Yepes (2003) estimate an investment requirement of about USD 3.2 billion per annum for new investments and USD 2.9 billion for maintenance between 2005 to 2010 in generation alone to meet the projected demand gap.

Reform has hence been recommended largely by the international financing institutions as a strategy to access private sector financing for the sector. To realize this objective, the World Bank has made power reform a condition for lending to African governments since 1993 [World Bank 1993].

Although the standard reform models often do not include attention to rural electrification, the pitiful levels of access to electricity have been used as a rationale for reforms. Overall little progress seems to have been made as electrification levels remain dismal (see Table 1). Recent studies aiming to determine the impact of reform on expanded access especially on the

poor have indicated minimal achievements if any [Clark et al 2004; Karekezi and Kimani 2004; Davidson and Mwakasonda 2004].

Table 1: Electricity access levels in select countries

	Electricity access levels %		
	Overall	Rural	Urban
Ghana	49		
Mali	12	1	42
Namibia	34	12	75
South Africa	70	50	85
Tanzania	10	2	39
Uganda	5	1	20
Kenya	15		
Ethiopia	10		
Zimbabwe			80
Eritrea		2.1	
Zambia		2	
Mauritius			100

NOTE: The definition of electricity access or electrification levels varies across studies. Hence the figures should be used only as indicative and not necessarily for comparative purposes.

Sources: Karekezi 2002; Clark et al 2004; Karekezi and Kimani 2004; Wodle-Ghiorgis 2002.

2.2 Reform status

Reform was mainly aimed at transforming the typically government-owned monopolistic utilities to a standard model characterized by vertical and horizontal unbundling of generation, transmission and distribution, dominated by private participants, and organised around competition in an independently regulated environment. After a decade of reform this standard reform model has not been fully implemented in any African country. Generally most reforms have been preceded by an amendment of the Electricity Act to allow for change in utility structure and management. The levels of progress and the paths of reform vary across countries though none of the countries have fully privatized the utilities. A study of seven SSA countries found that only one of the countries, Uganda, had fully unbundled. Attempts have however been made to commercialize and corporatise, with Tanzania and Mali adopting management contracts [Clark et al 2004]. In some cases the reform has been limited to concessioning or privatizing parts of or the whole industry. Cote d'Ivoire and Togo, for example, have privatized their utilities without restructuring, under a 20-year concession [Jerome and Ariyo 2004]. Zambia is unique in that only the transmission and distribution in the copperbelt mines were privatized in 1997, by selling them to the Copperbelt Energy Company, a joint venture between National Grid and Midlands Power International (both UK companies) (see Table 2).

The stability and sustainability of reform processes remains uncertain. Notable have been the reversals in the reform process where contracts with private participants are nullified and the utility reverts to government ownership. In Guinea, after establishment of a private company, SOGEL, in 1995, re-nationalisation of the same occurred in 2002 [OECD 2004]. In Cameroon the government has been forced to return to investment in the sector even after privatization after having realized that private sector cannot be relied on for long-term investment.

With reform a need for dedicated rural electrification agencies (REA) is being revisited. It is however worth noting that a number of countries such as Ghana, Kenya, Tanzania, South Africa and Namibia had initiated special rural electrification programmes prior to reforms. In

many cases the new Electricity Acts advocate an REA though this has not yet been implemented in all cases. The Tanzanian 2003 policy calls for establishment of a REA and a Rural Energy Fund, both Mali and Uganda established an REA in 2003, and Zimbabwe's 2002 Act advocates an REA [Clark et al 2004; Davidson and Mwakasonda 2004].

New players have entered into the sector albeit not in the manner or to the level originally envisaged. Most of these entrants into rural areas implement largely donor funded solar home system electrification programmes as evident in Ghana, Namibia, Mali and South Africa [Clark et al 2004].

Table 2: Progress in Power Sector Reform in select countries

Country	Unbundling	Management contract	Concessions	Transfer vertically integrated to Private sector	IPPs
Cameroon	No			20 years in 2001	Yes
Cote d'Ivoire	No			20 years in 1990	Yes
Zambia	No	Yes			
Guinea				10yr Lease in 1995 but contract ended 2002	
Tanzania		Yes -2 yrs in 2002 and now renewed for 2 yrs			Yes
Uganda	Yes (fully) 20-yr generation concession to Eskom in 2002		Privatized generation and distribution		
Togo				5 yr in 2000	
Zimbabwe	No	1992 a performance improvement prog was implemented by EDF			Yes
Kenya	into two state-owned (generation company and distribution and transmission company)				Yes
Gabon				20 year concession awarded to Vivendi in 1997	

Sources: Clark et al 2004; Karekezi and Kimani 2004; Wodle-Ghiorgis 2002; Jerome and Ariyo 2004.

3. Lessons of the reform process

3.1 Private sector participation

Privatisation is proving not to be the solution to attracting private capital to most of the African power sector. Between 1990-2001 investment in the electricity sector accounted for only 13% of the USD 23 billion invested by the private sector. The private sector is attracted by assured profitable returns on investments. This entails large demand, a prerequisite unmet by most countries, since electrification levels are low, existing generation capacity is minimal, and per capita consumption among the connected is limited by poverty and low industrial activity. The lack of interest by the private sector is also demonstrated by the low number of bidders in many cases. For example in Cameroon AES Corporation was the sole bidder in the sale of the Cameroonian electricity company in 2001. After two years of aggressive privatisation efforts Senegal failed to get the private sector to take over Senelec, for example (see Box 1). Consequently Senegal incurred financial losses through power shortages, since the process meant that no generation capacity was added despite increased demand. In desperation, many consumers purchased diesel- or petrol-operated generators – so that power outages in Dakar were characterised by the noise of these generators engines paraded along the pavements.

Côte d'Ivoire, Namibia and Tanzania had different experiences. In Côte d'Ivoire the management contract, won by a consortium of Electricité de France and SAUR, a French water distribution company, took only a few months of negotiation with the government [Plane 1999], mainly because the consortium was sure of making profits, partly due to the relatively high consumption levels. (Côte d'Ivoire had a generation capacity of 1100 MW in 1999 while by 2000 Senegal had an installed capacity of 422 MW and a peak power demand of 241 MW). In Namibia, a private operator awarded a concession distribution contract in 1996 to serve the densely populated central northern area managed to triple its customer base within five years. The contract was however terminated due to politically motivated factors. In Tanzania, NetGroup Solutions Pty managed to increase number of customers by about 79000 from a base of 450947, over a four-year period, after being awarded a management contract which was renewed for a further two years [Clark et al 2004].

Offers made by the private sector for utility shares have not always reflected the real value of the assets. In Mauritania, for example, government was forced to plead with the World Bank to relax privatisation conditionality to save the Societe Mauritanienne de l'Electricité et de l'Eau (Somelec) from being acquired by the Office National d'Electricité (ONE), Morocco's government-owned utility, at an extremely low price [AEI 2002b]. Revisions by the companies towards even lower prices than originally proposed do occur. AES for example revised the proposed price of \$80-90 million down to \$70 million for a 56% share of Sonel, the Cameroonian utility [AES 2001]. So urgently is the privatisation agenda advocated that the World Bank loses no time at all in encouraging countries to adopt it. For example, Rwanda was expected to privatise Electrogaz, the national water and power company in early 2003, barely a year after the end of its political crisis [AEI 2002c]. Prior to the political turmoil, privatisation was planned to have been completed by October 2000 after Cabinet approval on 24th May 2000 – in literally less than half a year [Electrogaz 2001].

Box 1: Senegal: Attempts to privatise the power sector

As a result of increasing pressure from the World Bank, in 1998 Senegal was forced to embark on a fast-tracked reform of the power sector – a reform mainly characterised by privatising the electricity utility Senelec. In acknowledgement, the World Bank approved a \$100 million credit for a programme to improve Senegal's energy sector through a comprehensive set of reforms explicitly aimed at opening up the power sector to private investment. Parliament enacted two Acts (98-29 and 98-06) which authorised the creation of a regulatory body and the transformation of Senelec into a stock company, thus enabling its privatisation. The Commission for Regulation of the Electricity Sector was established in

1999 to oversee transition and regulate the sector. In 1999 a consortium of Hydro-Quebec of Canada and Elyo, a subsidiary of the French company Suez Lyonnaise des Eaux, acquired 34% of Senelec's shares, with 10% going to employees and 15% to the local private sector, while the state retained the balance as the majority shareholder. The consortium was, however, granted full management powers. Twenty months later the government was forced to re-possess the shares from the consortium as it had proved incapable of increasing generation capacity as per the contractual agreement. Senegal was not, however, released by the World Bank from the privatisation condition. In 2001, after a second tender process, two companies were short-listed: Vivendi Environnement (of France) and AES Corporation (of the USA), both of which were experiencing financial difficulties. AES offered \$77 million and Vivendi \$40.9 million for the stakes. After ten months of negotiation, it was evident that the companies could not raise the investments. The fall in value of AES stock – worth just \$4 in July 2002 compared to \$20 in January 2002 – prevented the group from raising the money needed to acquire a 51% stake in the Senegalese utility.

Meanwhile power shortages were rampant; consumers suffered as much as eight continuous hours of outages per day in October 2001, for example. Finally, out of frustration, in August 2002 the government called off the privatisation of Senelec. The utility's first subsequent activity was to set in process the acquisition of two 15 MW generators at a unit cost of \$8 million to help address the generation shortfall. The deal is financed through a loan of \$8.6 million from the West African Development Bank and \$6.4 million from Banque de la Communauté Economique des Etats d'Afrique de l'Ouest, with the balance met by Senelec itself. It is planned that the generators will be operating by the beginning of 2003.

Sources: World Bank 1998; AEI 2002a; AEI 2002d.

In spite of the problems associated with privatization, the pressure to privatize continues even where the government-owned utility has demonstrated commendable progress in financial and technical management. This is the case in Kenya where both KenGen, the principal generator, and Kenya Power and Lighting, the distribution company, both of which are government-owned, are slated for transfer to a foreign management company by the end of 2005, even though their performance has been clearly quite good.

3.2 Foreign and local participation

Terms of operation of the utilities have often favoured foreign investors with power purchase agreements spanning extended periods and at very favourable tariff rates. In Kenya, the security package for the forthcoming independent power producer at Kipevu II consists of an escrow account holding one month's payments (around 140% of what is required) and a letter of credit for a further three months. The 140% coverage ratio is augmented by a letter of understanding from the Kenyan government insulating the sponsors from force majeure risk [Bayliss and Hall 2000]. This unequal treatment between foreign and local players is further demonstrated by the transactions over the Songo-Songo gas-to-electricity project in Tanzania. The project involved development of gas fields and construction of a gas pipeline for a gas-operated 111 MW plant and supply of gas to a cement factory at a total project cost of \$325 million. AES was awarded favourable rates for this project that had not been extended to the local utility, and in US currency. Throughout Africa foreign companies are increasingly dominating the electricity sector. In Côte d'Ivoire, French companies own 51% shares of the company that manages generation, distribution and transmission and a foreign consortium owns a similar proportion of shares in Cape Verde [World Bank 2001]. The South African private company Eskom Enterprises is active in many African countries: it owns 51% of shares in the Lusumfwa hydropower company in Zambia; has a 15-year management and operation contract for the Manantali hydro station in Mali; will manage, operate and maintain Hwange power station in Zimbabwe had a one-year contract in 2001 to improve performance of the public-owned utility in Malawi. Though the Cameroonian government indicated one of its reform objectives as being involvement of the national private sector, none entered the sector [Pineau 2004].

Some of these foreign companies tend to be in stronger bargaining positions than the host governments, they enjoy the support of their home governments and can be used to advance the political interests of their home countries in countries they invest in³. The bargaining positions of host countries are potentially compromised by all this. The credibility, financial and otherwise, of the foreign companies dominating the African power market is, however, questionable – the financial ailments suffered by AES and Vivendi are clear examples of this, while the Enron debacle has shaken the electricity market. Problems with these companies have been widely reported, mainly because of their size, but many more smaller foreign companies are as un-creditworthy. Reports show that most of the 15 largest corporate beneficiaries of the World Bank energy and power projects from 1992 to 2002 are being investigated for alleged accounting irregularities, energy market manipulation, fraud, bribery and/or human right abuses [Green 2002]. Thus the extent to which the electricity power system is in the hands of foreign companies (see Table 3) raises important energy security questions.

Table 3: Select multinational companies involved in the electricity sector

<i>Company</i>	<i>Home country</i>	<i>Countries company is involved in</i>
ABB	Sweden	Lesotho, Côte d’Ivoire, Morocco
AES	USA	Uganda, Cameroon, Tanzania
Cinergy	USA	Kenya, Côte d’Ivoire
EdF	France	Guinea, Côte d’Ivoire, Mali, Morocco, Egypt
Endesa	Spain	Morocco
Eskom	South Africa	Uganda, Gambia, Zanzibar, Malawi, Mali, Zimbabwe, Libya
Hydro-Quebec International	Canada	Togo
Marubeni	Japan	Ghana, Tunisia
SAUR	France	Côte d’Ivoire, Guinea
Vivendi	France	Djibouti, Tunisia, Gabon

Source: Author’s Research.

3.3 Competition

One of the rationales for privatisation was to facilitate competition and thus eliminate monopolies. Increasing competition is normally lauded as a measure leading to lower consumer prices. But this has hardly happened – in fact the opposite situation has emerged where foreign private monopolies have replaced the government-owned monopoly structure. This is best demonstrated by the case of Cameroon, where AES has had full management control for 20 years (see Box 2). In some cases financing institutions have facilitated acquisition of national utilities by other foreign ‘national monopoly utilities’. EDF, a French monopoly in France, is, for example, a player in many African countries, including Cote d’Ivoire. In Mauritania, the Moroccan state-owned monopoly company, ONE, bid for Somelec, the Mauritanian utility. Clark et al (2004) note that except for the limited diversification in supply through IPPs, and small trade between SAPP members, competition does not exist anywhere in Africa.

Box 2: Successful privatisation? The case of Cameroon

In July 2000 the IFC launched an international call for bids for acquisition of 51% of Sonel, Cameroon's electricity utility responsible for generation, distribution and transmission. In 2001 AES was awarded 56% of Sonel's shares at \$70 million. AES was the only company out of five pre-selected firms to submit a financial offer to the government of Cameroon, which had stated that it had anticipated a purchase price of \$80-\$90 million. AES later revised this price. Despite the fact that one of the rationales offered by financiers for privatisation was to develop competition (in fact a regulatory agency on competition to insure an adequate level of competition was created in 2000), AES was awarded exclusive management responsibilities for generation, transmission and distribution assets for 20 years. This effectively entails transfer of monopoly and hence energy security from a government to a foreign-owned company. To compound this matter, Cameroon has limited bargaining power with AES, a company whose revenues (\$3.3 billion in 1999) are almost 40% of Cameroon's GNP (\$8.5 billion in 1999). This lack of bargaining power limits the options available to the Government of Cameroon when AES manages low rainfall seasons when hydro power generation is low, by having blackouts instead of generating from the more costly thermal plants.

Under the terms of the contract, AES will be required to increase the number of electricity subscribers in Cameroon to at least one million. There are currently just 400 000 subscribers. In March 2002, AES-Sirocco, the parent company of AES-SONEL, was reported to be on the verge of bankruptcy, and AES-SONEL has been accused of diverting funds to its parent. Frequent power outages have occurred since AES took over. The French Development Agency estimates that the power crisis has reduced growth by 1%.

Sources: DOE 2002; Pineau 2002; Pineau 2004.

3.4 Public Finances

Reform was expected to free public finances and improve the status of government coffers. This has hardly occurred. Where the utilities were expected to pay taxes, many governments have provided waivers. Volta River Authority in Ghana has never paid taxes. A newer limited liability company recently established has yet to make sufficient profits to warrant paying taxes though the contractual agreement requires the company to do so. Governments were expected to benefit by being freed from burden of taking or guarantee debts but this has rarely happened. In Mali, Ghana, Uganda and Tanzania, the government guarantees private companies debts to varying degrees [Clark et al 2004]. In Cameroon the government is investing in hydro power plants despite it being stipulated in the concession contract that AES-Sonel is responsible for investments. This is mainly due to the recognition that AES-Sonel will not take care of long-term development. [Pineau 2004].

3.5 Regulation

The establishment of a regulator has been advocated to facilitate transition towards private control and regulate the industry. Many of the regulatory agencies are, however, being established after or concurrently with restructuring and so cannot offer guidance but must instead conform to set structures. To perform effectively, a regulator has to be autonomous, but many of the regulatory agencies have to report to the respective Ministers of Energy, and most lack independent sources of funding. Kenya well demonstrates this problem where not only is the Electricity Regulatory Board placed under the Ministry of Energy but can be dissolved by the respective Minister as demonstrated on two occasions so far [Nyoike 2002; Nyoike and Okech 2002]. The Cameroonian electricity regulatory board has five out of nine members appointed by the government [Pineau 2004]. The regulators' decisions, particularly on tariffs, have not always been adhered to – a further indicator of the constraints on their power. After Uganda Electricity Board raised tariffs by as much as 158% [East African Standard 2001], consumer outrage forced the Ugandan President to intervene and seek tariff reductions. The Court of Appeal in Kenya has given consumers permission to challenge a

40% rise in power rates and tariffs approved by the Electricity Regulatory Board on request from KPLC [East African Standard 2002].

Regulators are also finding themselves politically compromised and hence not in a position to assert their authority. This seems to be the case in Namibia (see Box 3) where despite convictions by the regulator that the bidding company had insufficient technical competency and unreliable financial status the regulator awarded a licence to it in preference to an operational competitor.

Box 3: Competing political interests: Namibia's regulatory difficulties

In 1996, the private company Northern Electricity was awarded a tender by the Namibian government to distribute electricity to the northern areas. In recognition of the poor financial characteristics of rural electrification, the contracts between the company and Ministry of Local Government and Housing obligated the company to pay only a very small fee toward costs of infrastructure. However when the company started generating profits this contractual agreement did not change, resulting in resentment by affected local authorities. At the same time the governing structure changed towards decentralization, which empowered local authorities. This had the effect of politicising electricity provision. As part of restructuring a regulator was established in 2000. Tensions across the electricity stakeholders resulted in calls for a new tender to serve the north. The regulator issued a licence to a new firm, Nored (a joint venture between NamPower, the dominant utility, and several local and regional governments) and did not renew Northern Electricity's licence. This was in spite of a statement by the regulator that it did not feel Nored had sufficient technical expertise and financial resources to manage the contract it was granted.

Sources: The Namibian 2001; Econ One and EMCON 2002.

3.6 Tariffs, Technical Performance, jobs and social services

In most cases tariffs have risen after reform. In Mali the concession contract allowed for 45% increase above 2001 levels. However implementation has been politically difficult and instead government has continued providing subsidies to lower tariffs. In Tanzania tariffs have been increased to reflect LRMC but these are slightly lower than real costs since government provides generation cost subsidies to offset high costs associated with private power and thermal reliance. In Uganda a 30% tariff increment in 2001 caused such a public outcry that the president was forced to intervene by offering a temporary subsidy which has since been eliminated. Three years after privatization electricity tariffs in Cameroon continue to rise. Pineau (2004) comments 'since privatization, there is unanimous agreement in Cameroon that the electricity service quality has never been worse'. In an attempt to address the poor, various governments offer lifeline tariffs where the tariffs are subsidized through various measures. Mali and Tanzania offer lifeline tariffs for consumption below 50 kWh while the level is 30 kWh in Uganda. There are indications that the tariff hikes are hurting investment in Ghana, while in Mali the relationship between reform, prices and investment in access has not materialized [Clark et al 2004].

Reform has been successful in improving the quality of service to those connected. In Côte d'Ivoire, power outages decreased from 50 hours to 19 hours per month in four years – albeit at a high prices to the consumer [Girod and Percebois 1996]. Tanzanian records show improvement in quality and reliability of supply. In Ghana however consumers continue to complain of power outages and voltage dips [Clark et al 2004].

The number of consumers served is commonly used as a performance indicator. Efficiency is an input-output measure where, in the case of power sector, the output of an employee is measured by the number of consumers served. This would be reasonable if the employee had an influence on customers as is the case in developed countries where marketing strategies affect consumer choice of service provider and consumption levels. In many African

countries the potential consumer has no access to electricity. The international average performance indicators normally used as a reference assumes an electricity coverage that has scarcely been attained in Africa. There are hardly any additional customers whom an employee can persuade to seek services from the utility; furthermore the employee lacks the marketing facilities, such as a telephone infrastructure, necessary to reach potential customers. The circumstances of developing countries calls for certain allowances and makes certain indicators redundant.

Another indicator used is electricity sales per employee, measured in Watt-hours [Bacon 1995]. On average, per capita consumption in African households is ten times less than in developed countries, for a variety of reasons including lack of appliances and money to pay for current. Using an international consumption average per employee to rate performance provides a figure that does not reflect the specificities of the African situation. Advocates of privatisation have advanced the argument that it creates jobs. In reality not only are workers laid-off as restructuring occurs but many are poorly compensated. Retrenchment is justified on the basis of efficiency calculated as a ratio of customers to employees. The internationally accepted standard is about 160 customers per employee [Kwako 1997], but many developing countries have tended to have lower ratios and are thus considered overstaffed. Karekezi and Kimani (2001) note that by 1998 seven of the twelve reported sub-Saharan African countries had ratios ranging from 40 to 110 customers per employee, way below the international standard.

To soften the blow of job loss, companies offer workers 'voluntary' retrenchment packages which take a long time to implement and tend to be relatively inadequate. The Kenya Power and Lighting Company, for example, needed to pay KShs2 billion (\$250 million) to 1 700 workers it laid off in the first six months of 2002, but the payment process was protracted due to the company's financial problems. In Burundi, over a three-year period personnel were reduced from 1500 to 1000 – with the 500 being placed in private firms which were starting to carry out work previously done in-house, such as producing wooden poles and connecting new customers [Bacon and Gutierrez 1996]. The need to retrench is axiomatic for the private sector, as is often demonstrated by the speed with which retrenchments are embarked on after winning the bid. Shortly after acquiring the coal-powered power station in Johannesburg, Kelvin, a subsidiary of AES, retrenched about 480 workers [McInnes 2002]. Although the company was expected to retrench 50% of its workforce (4000 employees) to ensure cost effectiveness, only 360 employees actually left on a voluntary basis but the company has nonetheless made profits [Pineau 2004].

Due to the limited employment opportunities in Africa, the utilities cannot expect to dismiss employees without taking into consideration the national economic implications. The ratio of employed to unemployed remains low, meaning that the employed are forced to support the unemployed, so that getting rid of an employee in order to improve utility performance indicators has ramifications for the welfare of many. Privatisation can only be beneficial if it accommodates economic and social stability [Stiglitz 2002] rather than just the balancing of financial spreadsheets.

Social services such as schools and health centres that have benefited from electrification during the reform period have largely managed to do so through special subsidised programmes, many of which were established prior to reform. The objective to remove subsidies under reform actually threatens such social benefits.

3.7 Environment

While environmental concerns have gained attention globally, within the power sector reform frameworks they seem to be largely absent. Dependence on thermal power generation has been historically significant, accounting for about 76% of total generation in Africa, and this trend does not appear to be changing with reform. Investments are largely dictated by access to funds, ease of facility development, and profitability, and there is no longer any public

oversight to direct the type of capacity built. The private sector prefers to use conventional fossil fuel technologies since these are cheaper [Widagdo 2001]. Morocco, for example, completed development of the largest IPP in Africa in February 2001, 1356 MW, which will be operating on coal [IEO 2001]. Most of the IPPs that are planned and being implemented in Kenya use fossil fuels, and the two generation facilities that Senegal plans to build by mid 2003 are fossil-fuel based. About ten countries have high shares of hydro-generated electricity, but hydro-power is facing increasing pressure, with some international NGOs attempting to block hydro-power plants on the basis that they are environmentally destructive. A recent experience is Bujagali in Uganda where NGO protests delayed the commencement of the project on the basis that it would be environmentally destructive. In its response, the Government highlighted the need to increase access for Uganda to economically develop, a need which was noted as outweighing the potential environmental damage [Musumba 2002; ESG International 2001; Bosshard 2002].

3.8 Rural electrification

It is becoming increasingly evident that rural electrification is not financially attractive and hence can only be undertaken by the public sector or with public sector assistance. Hence countries are establishing or sustaining special programmes to address rural electrification. Tanzania has used a cooperative approach to increase access to electricity in rural areas where it is evident that government and utility support is crucial for the sustainability of the project (see Box 4). Ghana launched a Self-Help electrification programme in 1989 through which a total of 1700 communities have been connected [Clark et al 2004].

Box 4: Rural electricity cooperative in Tanzania

In June 1993 the community of Urambo, a village located 80 km west of Tabora, established the Urambo Electric Consumers Cooperative Society (UECCO) to generate, transmit and distribute electricity to the community after the Urambo District Commissioner decided to cease providing this service due to lack of funds. The cooperative acquired three 85KW diesel generators, only one of which was in operation but also in poor condition. With financial and technical assistance from both SIDA and Tanesco, two of the generators were rehabilitated and a new 108 kW generator was purchased. The new generator was only installed in 1998, however, due to delays by the Treasury office on formalities regarding exemption of import duties. Overall the main costs incurred by the cooperative are operation and maintenance, as all capital costs have been paid for. This cost-sharing approach has clearly facilitated the financial sustainability of the cooperative.

UECCO is run by voluntary community members. Operation and maintenance of power plants is done by two trained personnel paid by the cooperative and trained by Tanesco. The cooperative generates funds from membership fees, selling electricity and connection fees. Though its costs are lower than similar Tanesco establishments (mainly due to lower wages), its revenue covers only 75% of its total cost. The cooperative has adjusted tariffs to reflect cost of supply but as a result the consumption per consumer has decreased by more than 50% of 1994 levels. Monthly household consumption dropped from about 100 kWh in 1994 to 45 kWh in 1997 mainly due to the introduction of a metered tariff. Though the number of connected consumers increased from 67 in 1994 to 101 in 1997 the increased consumption was insufficient to meet costs. Potential industrial consumers do not join the cooperative, since power is only available in the evenings and the loads are not always sufficient to meet their needs. The cooperative has been successful in collection of bills – demonstrating 100% payment. By providing technical and financial support Tanesco has been quite instrumental in the success of the cooperative.

Sources: Salter L 1997; Gullberg et al 1999.

Population size, settlement patterns and their economic power offer real challenges to attracting private sector into rural areas. Some countries, such as Gabon, have bundled water and electricity services and sold the previously government-owned utility, Societé d'Énergie

et d'Eau du Gabon (SEEG) to Vivendi Environnement. However though electricity coverage targets were some of the aspects covered in contractual agreements – for example, serving 15 unserved isolated centres by 2000 the private company has not met them [Tremolet 2002].

Some countries, such as Senegal, Mali, Uganda and Cameroon, have established rural electrification agencies and funds. However these seem to depend largely on donor funding and consequently have not made significant progress in extending service to rural communities. [Clark et al 2004]. However most of the agencies are rather new and their impacts rather limited. Kenya established an agency prior to the commencement of reform but is committed to sustaining it under reform, albeit with amendments aimed at addressing its shortcomings.

4. Conclusions

Power sector reforms across most of Africa have not met the expected objectives. The sector has not been able to attract the investment capital needed and the bulk of the investment is guaranteed by governments. This is contrary to the expectation that government would be freed of financial responsibility.

Attracting the private sector has proved difficult largely due to the low levels of infrastructural development and customer base. The companies that have ventured into the market are large foreign-owned multinationals and public monopolies which dominate the sector. In many cases these companies have monopoly over the sector, a status not different to the pre-reform.

Competition has yet to be achieved and is in most cases compromised by the monopoly ownership. It is however unrealistic to have predicted competition as one of the main outcomes of reform since the market situation does not provide the necessary environment; market size is too small. To realise the target profit levels, tariffs have often increased by as much as 150% soon after the start of reforms. This not only negatively affects the poor but also businesses. In addition, to make utilities financially attractive laying off workers has been common practice.

Electrification levels have hardly improved with reform. However where service existed, the quality has improved though this is not universally true. In certain countries such as Cote d'Ivoire, the quality has deteriorated.

Though literature highlights an increased awareness of shortcomings of a uniform reform model, this thinking is not aggressively pursued at the country level. The pressure to privatise continues even where utilities have demonstrated financial and managerial accountability.

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² This projected demand for 2030 will leave the majority still unelectrified.

³ It is interesting to note that in the mid-1990s the US embassy, and high ranking US officials in Washington, were blackmailing the Mozambican government, threatening to cut off aid, unless a deal was signed granting Enron rights to Mozambican natural gas [Agencia de Informacao de Mocambique 2002]