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**PAPER ON ZAMBIA'S EXPERIENCE WITH POWER
SECTOR REFORM**

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1.0 INTRODUCTION

Since 1991, the Government of the Republic of Zambia (GRZ) has pursued policies of economic reform such as liberalization and creation of a market economy, turning away from the command-type of economic management. This reform has included the Power Sector especially after government promulgated the National Energy Policy in 1994. Before discussing the reform, the paper briefly outlines the background of power sector in Zambia.

2.0 BACKGROUND TO THE POWER SECTOR

2.1 Zambia is endowed with many types of energy sources including woodlands and forests, hydropower, coal and new and renewable sources of energy. Woodland and forests are estimated to cover about 66% of the total land area with the standing stock and annual growing stock being equivalent to 4.3 billion and 120 million tones, respectively. The hydropower resource potential is estimated at 6,000 MW. However, the total installed capacity is about 1,700 MW. Hydroelectric plants represent 92% of the installed capacity and accounts for 99% of electricity production. Proven coal reserves are estimated at 30 million tones with several hundred million tones of probable reserves.

2.2 Petroleum is the only energy source that is imported. Total imports in 1999 amounted to 421,100 metric tones of crude oil. A limited small amount of white products are also imported in the country. Solar radiation averages 4.5 kWh/m²/day with up to 3,000 sunshine hours annually. Wind speeds are however low, averaging 2.5m/s and 10m above the ground. The total energy supply averages 4.5 million tones of oil equivalent (toe) annually. For the households, wood fuel is the largest source of energy.

The Ministry of Energy and Water Development has the overall responsibility to develop, articulate and implement policy on energy. The National Energy Policy (NEP) document adopted in 1994 seeks to promote optimum supply and

utilization of energy, especially indigenous forms. The policy also seeks the facilitation of the socio-economic development of the country and the maintenance of a safe and healthy environment. The Department of Energy is the chief advisor to the Minister of Energy and is the government's executing arm of all policy related matters on energy. The Zambia National Oil Company Limited (ZNOCL), a Government owned company, which was responsible for importation of spiked crude petroleum products, and bulk sale of petroleum products to oil marketing companies (OMCs) was liquidated in early 2002. Today, importation of oil feedstock is the responsibility of the Indeni Petroleum Company.

The TAZAMA Pipelines Limited is responsible for transporting spiked crude petroleum from Dar-es-Salaam (Tanzania) to Ndola (Zambia) through a 1,701 Km pipeline. Zambia and Tanzania jointly own the company through a shareholding structure (Zambia 67% and Tanzania 33%). The INDENI Petroleum Refinery Company Limited in Zambia is responsible for refining the spiked crude petroleum into finished products. The refinery, located at Ndola has a design capacity to process 1.1 million tones of spiked crude per annum. Zambia, Totalfinael of Italy and private shareholders own the refinery on the 45-50-5% basis. The following OMCs operate in Zambia: BP (Z) Ltd. AGIP, Total, Mobil, Caltex, Engen, Ody's and Kobil.

- 2.3 In the electricity sector generation of power in Zambia is dominated by hydro. The country has hydro generating potential of about 6000 mega watts (MW). However, the country's installed capacity is only about 1,700 MW. This capacity mainly consists of three large power stations at Kafue Gorge (900MW), Kariba North Bank (600MW) and Victoria Falls (108MW).

The existing Zambian electricity industry is characterized by three main players: ZESCO, which is a vertically integrated state-owned utility, the Copperbelt Energy Corporation (CEC), a privately owned Transmission and Distribution Company and the Lunsemfwa Hydro Power Company, LHPC. The LHPC facilities have a total installed capacity of 38 MW.

The Zambezi River Authority is the successor to the Central African Power Corporation (CAPCO) and is jointly owned by Zambia and Zimbabwe on a 50-50 basis. It is responsible for monitoring and managing the use of the Zambezi river water for generation, where it forms a common border between the two countries.

The Energy Regulation Board (ERB) was established through the Energy Regulations Act No. 16 of 1995. The ERB is the sole licensing authority for operators in the energy sector and is responsible for close monitoring and supervision of such operators. It seeks to promote competition and ease of entry into the energy sector as well as safeguarding consumer interest.

- 2.4 Zambia plays a strategic position in the Southern African Power network. The country has an integrated network at national and sub-regional level that has a great potential to facilitate electricity trading in the region. Presently, Zambia is a net exporter of electricity and conducts its trade with Democratic Republic of Congo to the North, Namibia and South Africa to the South. Preparatory work for the interconnection between Zambia, Tanzania and Kenya are almost complete. Construction of the 690km 330kV line between Zambia and Tanzania, which will be capable of transferring up to 400 megawatts of power, is due to commence before the end of 2005. This will further enhance regional trade between Zambia and the East African Region.

3.0 **POWER SECTOR REFORMS**

In discussing the power sector reform, focus will be on the electricity sector. Power sector reform in Zambia, like in many African countries has been driven by several forces:

- 3.1 One of these is the need for the sector to contribute more to economic development and poverty reduction. For example, one of the challenges facing Zambia is using energy as a vehicle for poverty reduction. According to the Central Statistical Office, in 1998, only 48% of urban households had access to electricity while only 2% of the rural population has such access. In its recently adopted, Poverty Reduction Strategy Paper, the Government of the Republic of Zambia (GRZ) intends by 2010, to raise the electricity access rate for the urban households to 70% and raise it considerably for the rural areas.
- 3.2 Another important force has been the lending conditionalities of the international financing institutions. Since 1993, reform has been a World Bank condition for lending to the power sector. These lending institutions have cited mismanagement, poor operational performance, and distorted tariff structures resulting in poor economic efficiency and low returns on investment.

In this regard, the lending institutions have pushed for reform including privatization of the government owned utilities to foreign investors.

Reforms implemented so far are the following:

3.3 **National Energy Policy**

In 1994, the Zambian Government promulgated a National Energy Policy (NEP). One of the main objectives of the NEP with respect to the power sector is to develop the largely untapped hydro potential for power generation to meet domestic demand as well as the regional market. An important strategy identified to achieve this objective is to open up the power industry to the private sector by abolishing the monopoly enjoyed by the state utility, ZESCO, and to generally set the power industry on a commercial footing.

3.4 **Removal of Monopoly and Establishment of a Regulating Board**

In seeking to implement this strategy, the Government of the Republic of Zambia (GRZ), in 1995, repealed the Zambia Electricity Supply Act, which had entrenched the monopoly of ZESCO. In addition, a new Act that provides for the establishment of an Energy Regulation Board (ERB) was enacted. The Board, which among other things is the sole licensing authority for operators in the energy sector, became operational in 1997.

3.5 **Rural Electrification Levy**

In 1995, the Government introduced a rural electrification levy on every electricity bill paid by those already connected to the national electricity grid. The levy constitutes 3% of the value of every electricity bill. Despite the introduction of the levy, not much progress has been made in providing electricity to rural areas, mainly due to the following reasons:

- The cost of extending the grid to remote areas is very high. Since the load demand for most rural areas, is very low, the cost of most projects cannot be justified even from the social perspective.
- Since the levy of the fund is usually low, preference is given to economically productive areas. Household connections are not financed by the levy.

Given the above constraints, it was realized that success in electrifying large parts of the population through conventional grid services would not be attained. Although electricity from stand alone systems could be an option, the poor distribution and the lack of maintenance coupled with high fuel costs makes electricity from stand alone systems such as diesel generators both expensive and unreliable.

3.6 Rural Electrification Authority

In order to be able to reach large sections of these rural communities, new methods, other than grid electrification, have to be found. One such alternative is through the establishment of the Rural Electrification Authority (REA) in charge of developing and implementing rural electrification master plans for the systematic electrification of rural areas. Thus in 2003, the Government of the Republic of Zambia established the REA through an Act of Parliament. The functions of the authority include: developing mechanisms for the operation of a grid extension network for rural electrification as well as applying a smart subsidy for capital costs on projects designed to supply energy in rural areas. The rural electrification program also contemplates the use of solar technology that has been applied so far only in pilot projects, with encouraging results.

3.7 Attempts to Unbundle

In 2002, the Energy Regulation Board (ERB) proposed a program to restructure the Electricity Supply Industry (ESI) through the unbundling of the generation, transmission and distribution functions, placing them under private management. Privatisation of ZESCO also became one of the objectives set in agreement with the IMF in order to reach the HIPC completion point. However, in April 2003, the government announced that ZESCO would be commercialised, leaving aside the proposal of unbundling the company. Further, in 2004, the government merged ZESCO with the Kariba North Bank Company.

3.8 Commercialisation of the Zambia Electricity Supply Corporation (ZESCO)

Over the years ZESCO'S electricity system has not performed very well. This was due to a number of factors as outlined below:

- Sluggish growth in the economy

- Impact of delayed sale and poor performance of the then Zambia Consolidated Copper Mines (ZCCM), and
- Failure by ZCCM to pay their electricity debt to the power company (ZCCM was the single largest consumer)
- Huge debts incurred by government and local authorities

Thus in April 1996, the Government of the Republic of Zambia (GRZ) entered into a performance contract with ZESCO. The performance contract was later revised to cover the period from April 2000 to March 2003. The short and medium term objectives of this performance contract were to:

- Improve ZESCO's financial viability
- Improve quality of supply
- Improve customer service management
- Improve safety and health in the provision of electricity

The road map towards commercialisation involves the appointment of a board of directors independent from government interference and the implementation of a broader energy policy framework. Further, Commercialisation of ZESCO entails improvement in efficiency and ensuring financial viability of ZESCO through capacity building measures and a plan based on corporate autonomy and management accountability, which would enhance the Company's resource mobilization. Performance under this new arrangement will be reviewed periodically.

Another government priority is to unlock the country's huge hydropower potential, by attracting foreign investment. This makes the need to restructure the industry and eventually un-bundle generation from transmission and distribution pressing.

3.9 **Establishment of ESCOS**

With about 60% of the Zambian population living in rural areas and only 2% of the rural population having access to electricity, the Government has prioritised rural electrification. A pilot project intended to develop a mechanism for providing electricity services to rural households is currently using Solar Home Systems (SHS), which are run by rural based Energy Service Companies (ESCOs). The established ESCOs are in Nyimba, Chipata and Lundazi in the Eastern Province of Zambia. However, the scope of this pilot project is limited, as only about 400 Solar Home Systems have been installed under this scheme. At current service fee levels of about K25,000 (about US\$6 in 2005) , there is great market potential for commercial driven SHS, though the initial capital cost of these systems has inhibited its wider application.

3.10 **New Projects**

The long-term development options of the Zambian electric power system in the period up to 2015 involve the development of the Itezhi-Tezhi and the Kafue Gorge lower. Though at the same time it is very important to proceed with the scheduled rehabilitation works of Victoria Falls, Kariba North, and Kafue Gorge power stations in order to bring their operational characteristics back to design parameters. Their rehabilitation, together with the immediate construction of Itezhi-Tezhi, is expected to help the system to overcome potential shortfall situations in the period until the commissioning of Kafue Gorge Lower. These shortfall situations may occur in the period 2004 2007 in the case of dry or very dry hydrological conditions.

The strengthening of the transmission lines and interconnections with the neighboring countries and SAPP Power Pool is one of ZESCO's priorities in the immediate future. The improved transmission capabilities will not only improve the reliability of supply of domestic consumers, but will also enable electricity exports during the favorable hydrological conditions. In this vein, preparatory work for the interconnection between Zambia, Tanzania and Kenya are complete.

Construction of the 690km 330kV line between Zambia and Tanzania, which will be capable of transferring up to 400 megawatts of power, is due to commence before the end of 2005.

4.0 **RESULTS AND LESSONS FROM THE REFORM PROCESS**

Energy sector reform in Zambia is underway and will continue for quite sometime in the future. Consequently, many results and lessons from the process are yet to be realized and learned. However, it is possible, on the basis of the Zambian experience and that of many African countries which have been implementing these reforms, to note some important outcomes, problems being experiences and to discern important trends.

4.1 **Positive Outcomes**

The promulgation of the National Energy Policy in 1994 and the 1995 repeal of the Zambia Electricity Supply Act that had given ZESCO monopoly in the electricity sector have been progressive and positive moves. The setting-up of the Energy Regulation Board to licence and monitor operators as well as create a level playing field for all actors in the sector has positively impacted on the sector through consideration of interests of all stakeholders. The introduction of the Rural Electrification Levy and subsequent establishment of the Rural Electrification Authority has increased interest in and pressure towards rural electrification.

The commercialization of ZESCO has gone some way in reducing debt owed to the utility especially that from government. Finally greater attention has now been focused on the energy sector and its attendant benefits for the country.

4.2 **Problems Encountered**

4.2.1 Weak Negotiating Position

Most African governments are already heavily indebted to potential financiers and thus vulnerable to any conditions they set. The World Bank has generally provided prescriptions on how to reform, characterised by a requirement to privatize. Once a country has agreed to implement the recommended reform, the Bank advances loans to effect the reform. Part of the loan extended to reforming countries is earmarked for commercialization or effectively restructuring power utilities to make them attractive to the private sector.

4.2.2 Private Sector Participation

Privatization is proving not to be the solution to attracting the private sector into most of the African power sector. The private sector is attracted by assured profitable returns on investments. This entails large demand for power, a prerequisite unmet by most countries, since electrification levels are low and per capita consumption of those connected is limited by poverty and low industrial activity.

And, where foreign private investment have come in, offers made by private and other companies have not always reflected the real values of the assets being acquired.

4.2.3 Foreign and Local Participants

Terms of operation of the utilities have often favoured foreign investors with power purchase agreements spanning extended periods and at very favourable tariff rates. Throughout Africa, foreign companies are increasingly dominating the electricity sector. Most of these foreign companies are financially stronger than the host governments. They are often indirectly linked to their home governments and can be used to advance the political interest of those governments in countries they invest in.

4.2.4 Competition

One of the rationales for privatization 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, in which foreign private monopolies have replaced the government-owned monopoly structure. In some cases, financing institutions have facilitated acquisition of national utilities by other foreign “national monopoly utilities”.

4.2.5 Regulation

The establishment of a regulator has been advocated to facilitate transition towards private control and regulate the industry. Many of the regulatory agencies have, however, been established after or concurrently with restructuring, and so could not offer guidance but have instead only been conforming 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 of them lack independent sources of funding.

5.0 CONCLUSION

The need and important of energy sector reform in Zambia and indeed most developing countries in Africa is not debatable. Though several positive outcomes have been observed, there are also many serious problems that must be tackled. However, we believe it is **possible to reorient** the process to take into account factors that need addressing to ensure energy sector reform benefits the developing country and its people and the investors. For this to happen, all key stakeholders – including the international financing institutions, private sector companies and governments – would have to cooperatively renegotiate equal and fair terms. This would entail establishing, in the initial stages, forums for discussion where all could openly present their needs and problems, with the joint aim of designing a cooperative strategy on how to address sustainable development objectives that benefit all stakeholders.

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