



Technical Report:

**Power Sector Reform and Regulation in the
Context of Poverty**

Gloria Magombo – Energy Advisor

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TABLE OF CONTENTS

Abstract	3
General Acronyms List	5
1. Introduction	6
2. The Power Sector Reform	6
3. The Rationale for Pro-Poor Regulation	7
4. The link between poverty and energy	9
5. Role of Stakeholders of the Power Sector	10
6. Regulatory Institutions in the SADC Region	11
7. The Impact of Regulation on the Poor	12
8. Key Challenges to Pro-Poor Regulation	12
8.1 The Mandate of the Regulator	13
8.2 Regulating Prices	13
8.2.1 Subsidies	14
8.2.2 Tariff principles	15
8.2.3 How to Improve Pro-Poor Price Regulation	15
8.2.4 Source of Funding for subsidies	16
8.2.5 Smart Subsidies	16
8.2.6 Other regulatory interventions to improve financial efficiency	17
8.3 Regulating the Service Quality	17
8.3.1 Defining Service Quality Standards	17
8.3.2 How to improve Regulation of Service Quality	17
8.4 Regulating Informal Service Providers	18
8.5 Protecting Consumers	18
9. Pro-poor regulation in the European context.	18
10. Conclusions	19
11. Rethinking the classic regulatory model	20

Abstract

This paper seeks to look into the various issues associated with the power sector reforms, the rationale for pro-poor regulation, the link between energy and poverty and challenges related to pro-poor regulation.

The main driver for power sector reform in southern Africa was the dissatisfaction over the poor financial, technical and managerial performance of the state owned utilities for the provision of electricity services coupled with the governments' failure to mobilize sufficient investment capital for the development and expansion of the electricity sub-sector and the need to meet the millennium development goals of poverty reduction.

There is a link between access to modern energy services and poverty reduction. Modern energy services can enable poor communities to engage in activities that generate income. Electricity extends the working day through lighting and improves productivity through the use of machines and improved quality of life through access to education and improved health services. The Southern African Development Community (SADC) region still suffers from high levels of energy poverty through low access levels which are less than 40% in all countries except South Africa and Mauritius.

The SADC region embraced the power sector reforms with the hope to increase capacity through the introduction of competition and private sector participation. The reforms were partially implemented with all countries returning the monopolies of state owned vertically integrated utilities, changing power sector legislation and introducing independent regulators. The regulators are new and are in the process of developing relevant frameworks to create a conducive environment for investments and also ensure increase in access to modern energy services through pro-poor regulatory mechanisms.

The challenge of pro-poor regulation is that most poor citizens do not have access to modern energy services and hence fall outside the mandate of existing regulators. Those who do have access are cushioned through the use of subsidies. Subsidies are currently not targeted to deserving poor consumers but to all sectors of the economy through the continued use of sub economic tariffs. The regulators need to understand the poor, know their location and needs for them to develop relevant subsidy mechanisms which target the poor consumers and close the access gap. These subsidies can be through consumption for minimum basic amounts or applied to connection fees. Smart subsidies need to be implemented in areas with access gaps as a way of encouraging private sector to invest in new technologies and develop distributed networks through capital subsidies.

Regulators should understand that subsidies alone will not address poverty issues but it is necessary for regulators to develop incentives to encourage competition in the sector whilst allowing the existing utilities to be viable through the introduction of cost reflective tariffs. The tariffs should allow cost recovery which should be linked to efficient utility operations and optimum project implementation and investments.

The regulators should adopt a flexible approach to service quality in order to give incentives to service providers to cut costs and innovate whilst meeting minimum standards. Regulators should work with other agencies to ensure a coordinated approach to meeting the needs of the poor. Consumer protection is important however regulators should engage with the relevant poor consumers for their voice to be heard. The regulators should work with the relevant utilities to ensure that their payment cycles are

linked to income cycles of the poor through the installation of prepayment meters which will allow for frequent payment or quarterly payments based on need.

Finally, it is important for regulators to understand that subsidies will remain a major tool for cushioning the poor as developed countries with lower poverty levels still maintain them but what is important is that subsidies are properly targeted. The major regulatory barrier to access and poverty regulation will remain the poor policies which regulators need to change to ensure that the cost reflectivity tariffs are implemented to allow utilities to expand services and private sector participation. Investors will always require credible regulatory regimes that allow for stability and predictability over time coupled with limited discretion of independent regulators.

General Acronyms List

AFREC	African Energy Commission
AFUR	African Forum of Utility Regulators
ESI	Electricity Supply Industry
EU	European Union
IPP	Independent Power Producer
LPG	Liquefied Petroleum Gas
MDGs	Millennium Development Goals
NEPAD	New Partnership for Africa's Development
PV	Photovoltaic
REEEP	Renewable Energy and Energy Efficiency Partnership
RESCOs	Rural Electricity Service Companies
RSA	Republic of South Africa
SADC	Southern Africa Development Community
SAPP	South African Power Pool
SOE	State Owned Enterprises

Regional Regulators

CNELEC	National Electricity Council of Mozambique
ECB	Electricity Control Board, Namibia
ERB	Energy Regulatory Board, Zambia
EWURA	Energy and water Regulatory Authority Tanzania
IRSE	National Electricity Regulator
LEA	Lesotho Electricity Authority
MERA	Malawi Energy Regulatory Authority
NERSA	National Energy Regulator of South Africa
ORE	Office of the Electricity Regulator Madagascar
RERA	Regional Electricity Regulators Association of Southern Africa
ZERC	Zimbabwe Electricity Regulatory Commission

1. Introduction

It is important to note that over the past 10 years the region has had a lot of growth economically which has translated to the need for new infrastructure and expansion of infrastructure services to all communities including the poor rural communities. With the economic growth there has been need to review the policies in view of expanding access to modern energy services to the majority of the population and the recognition that facilitating the participation of private sector in the provision of infrastructure will allow government to concentrate in the provision of social requirement.

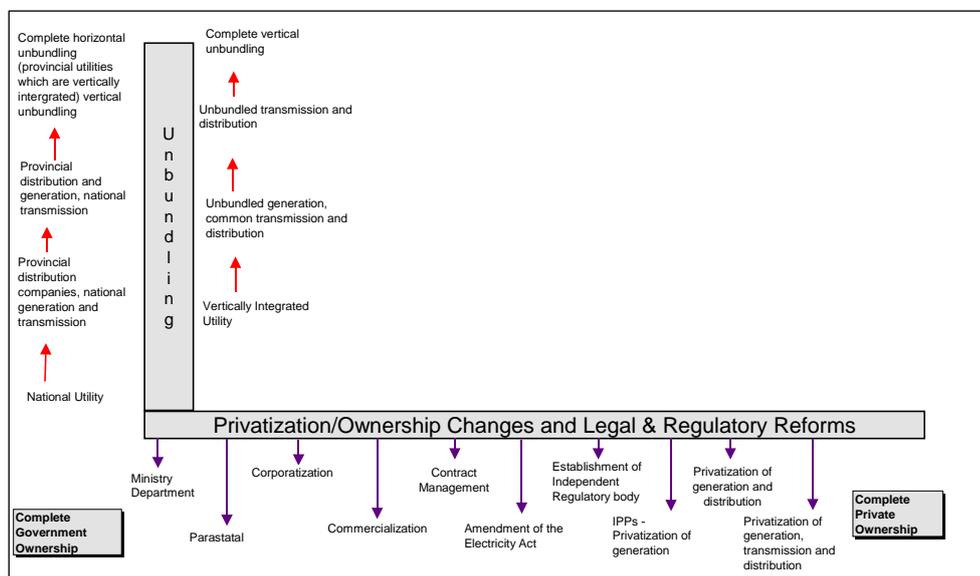
Most governments in developing countries have made commitments to reduce poverty by establishing effective development programs so as to meet the Millennium Development Goals (MDGs). Whilst there are no MDGs specific to electricity services, it is important to note that access to modern energy services especially electricity is closely correlated to economic development. This need to increase access has triggered an investment crisis for most governments which led to the adoption of power sector reform.

The power sector reforms were also necessary due to the fact that state owned enterprises (SOEs) were strapped of resources due the government pressure to keep prices of electricity below cost and need for them to employ more people than they needed to increase employment rates. The SOEs were seen as wasteful and inefficient and failed to expand services especially to rural communities and urban poor.

2. The Power Sector Reform

Fiscal pressures and successes of pioneers of privatization of infrastructure services provided governments with a new paradigm. Many governments in the 1990s adopted the power sector reforms as advised by landing institutions which successfully assisted the developed counties to privatize infrastructure provision. The reforms in their standard textbook context were meant to result in the introduction of the competition in the provision of electricity services. The process was supposed to unbundle the SOEs into generation, transmission and distribution companies, commercialize them and then privatize these firms and introduce competition were possible. The reform also bought in new electricity legislation and new institutions in the form of independent electricity regulators vested with the authority to oversee the creation of competitive electricity markets.

Power Sector Reform options



Typical power sector reforms involve changes in ownership and or management of the sector, which can result in privatization of assets and establishment of independent regulator. However changes in ownership are often seen as the ultimate aim but this is preceded by a process of commercialization of state owned enterprises. The commercialization seeks to improve the financial performance of the SOEs by making them operate with commercial objectives rather than social objectives without change of ownership. This has been the preferred option of reform in the SADC region with the commercialized SOEs being corporatized so as to ensure that they run under the same legislation as private companies and are required to pay dividends and taxes to government. However in reality, only a few of the corporatized and commercialized SOEs are breaking even and hence the majority have continued to be depending on government subsidies. It is important to note that no state has fully privatized the electricity supply sector but most countries have opted to open up the generation and secondary transmission to private sector participation through introduction of independent power producers and independent transmission companies. This often referred to as the hybrid reform model.

The other form of participation of the private sector has been through management contracts. Private participation can also include the following:

- ✓ Service contracts;
- ✓ Lease/affermage contracts; and
- ✓ Concession agreements.

3. The Rationale for Pro-Poor Regulation

The main drivers for the adoption of comprehensive power sector reform in the African context were:

- ✓ The dissatisfaction over the poor financial, technical and managerial performance of the state owned utilities for the provision of electricity services;
- ✓ The failure by government to mobilize sufficient investment capital for the development and expansion of the electricity sub-sector; and
- ✓ The pressure to meet the MDGs by reducing poverty.

Poverty is complex and has various causes and relative definitions. Poverty is multi dimensional simply known as a state of human deprivation from basic needs not just income. Some of the definitions that are widely accepted are:

- ✓ Poverty is the deprivation of common necessities such as food, clothing, shelter and safe drinking water, all of which determine our quality of life. It may also include the lack of access to opportunities such as education and employment which aid the escape from poverty and/or allow one to enjoy the respect of fellow citizen (Wikipedia).
- ✓ The state of living on less than \$2 a day, according to the World Bank. Poverty can also represent a lack of opportunity and empowerment, and bad quality of life in general.

Having indicated that poverty is deprivation of common basic necessities like access to modern energy services. The southern African continent remains poor with the majority of its population being categorized as poor as access to electricity still remains low also their income levels remain low. The table below indicates the level of access to population in a number of SADC Member States as of 2007.

	Country	Access to electricity % of population (2007)
1	Angola	12
2	Botswana	22
3	Democratic Republic of Congo	7
4	Lesotho	5
5	Madagascar	8
6	Malawi	5
7	Mauritius	100
8	Mozambique	7
9	Namibia	34
10	South Africa	66
11	Swaziland	Not available
12	Tanzania	11
13	Zambia	12
14	Zimbabwe	40

Source: World Bank (PPIR2007)

Within the region only Mauritius has achieved total electrification and high levels of access by its households and South Africa had achieved over 65% and the rest of the member states have less than 40%. This picture changes drastically if comparisons are made between the urban and the rural areas. However, recent statistics were not available but the REEEP training module on regulation states the following discrepancies:

Urban Versus Rural Electricity Access levels

Country	Urban	Rural
Mozambique	<20%	<2%
Malawi	<40% (38)	<2%
United Rep of Tanzania	<40% (39%)	<4%
Zambia	<50% (48%)	<5%
Zimbabwe	<85% (83%)	<20% (19%)
South Africa	<80% (78)	50%

The other reasons why the African countries needed to reform were the following:

- ✓ To introduce competition into the power sector-introduce more players especially independent power producers with the aim of reducing the prices of electricity services;

- ✓ To achieve Tariff Reforms – adjust tariffs to reduce subsidies and make prices cost reflective;
- ✓ To minimize government regulatory role- to shift the regulatory role from government ministry or department off energy to an independent regulator. This would ensure a level playing field for the players and remove the contradiction of between government roles related to socio economic development; and
- ✓ To amend the Electricity Acts - to ensure that there is a sound legal basis for the reform and to facilitate the entrance of private producers in the provision of national infrastructure.

The African countries have had the most need to attract new investments due to the current low access levels and lack of sufficient capacity to meet increased demand. However, the power sector reforms have been slowest in sub-Saharan Africa. A recent survey carried out by RERA on the status of the power sector has indicted that although all the countries within the Southern African Development Community (SADC) region have introduced some form of power sector reform in the past fifteen years, most of the reforms have not been successfully completed or implemented. Thirteen out of fourteen SADC Member States have enacted new power sector legislation and introduced the possibility of some private sector participation in power. Twelve out of fourteen have introduced some kind of regulatory oversight in the form of energy or electricity regulatory authorities with two states working on institutional set up. Some countries have envisaged fully liberalized markets and unbundled utilities but none has fully implemented such structures. The regulators are mostly new and continue to evolve to take on more regulatory responsibilities over the energy sector without due consideration of their current capacity to effectively execute the existing mandates.

In all fourteen countries the sector is dominated by national electricity utilities which are vertically integrated and state owned. In cases where private power producers do exist, the national utilities are single buyers effectively diluting many of the policy objectives.

Electricity tariffs are regulated in all countries. Although there are different opinions on whether revenue recovered is sufficient to meet all the operational costs of the utilities or not, it is generally believed that the revenue is sufficient to cover *operational costs*. This is due to the fact that most of the utilities have old fully depreciated plants and infrastructure. However the sub-economic tariff regimes have led to the failure by most state utilities to invest in new capacity resulting in the 2008 power crisis. Some countries like Madagascar have endured the power crises much longer.

4. The link between poverty and energy

Energy is a basic need for human beings with is used for cooking, lighting and space heating. In Sub Saharan Africa, in 2005, more than 89% still used biomass as the form of basic energy especially for cooking in the form of forest waste, wood or charcoal. Women and children are disproportionately affected by the lack of modern energy services. It is they who collect traditional fuels in remote areas, carry large loads and tend primitive fires. As a result they suffer animal bites, fatigue, smoke inhalation, and burns. The reduction in collection of traditional fuels and the improvements in indoor air quality made possible through the availability of modern cooking fuels have a huge positive impact on the lives of women and children. Poor people save a lot of time by shifting to modern energy services—making time available for productive pursuits, education, and leisure. This time would otherwise have been required to collect traditional fuels, and in less productive manual effort.

Modern energy services can enable poor households to engage in, and extend, activities that generate income. Electric lighting extends the working day, electric machines (such as sewing machines and looms) increase productivity, cooking fuels like kerosene and liquefied petroleum gas (LPG) enable households to increase the amount of food for sale. Modern Energy is also used for refrigeration, drive motors, and obtain services like communications (telephones) and entertainment (televisions, radios).

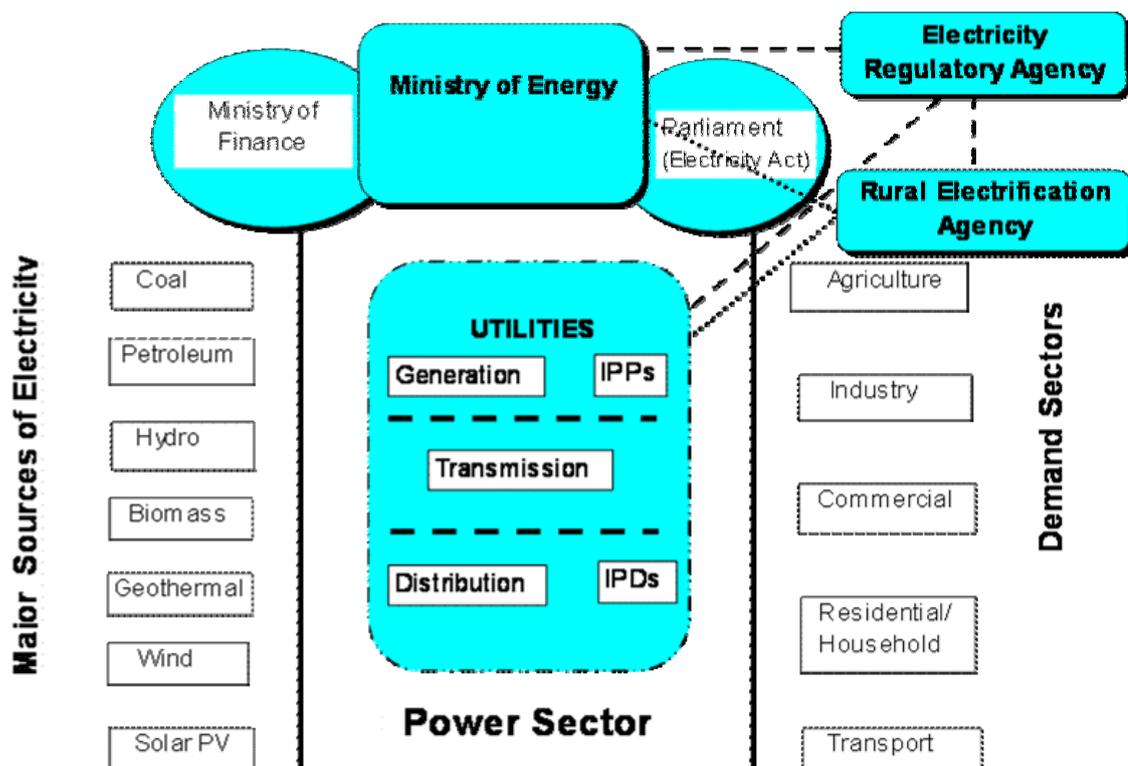
All social services are more effectively delivered and benefits are enhanced when modern energy services are also available. Primary and secondary health clinics need energy to store vaccines, operate medical equipment, and function after dark. Educational attainment is greater in households with electricity than in those without. Provision of clean water can depend critically on energy for pumping and treatment.

Much economic activity would be impossible without energy, and economic growth that raises incomes (or reduces income poverty) is strongly correlated with increased energy use. Energy is used in the production process of nearly every sector. Adequate quantity and reliability of energy supply are crucial to the ability of countries to compete for new export markets.

Government borrowing and contingent liabilities of guarantees for investments in energy infrastructure are often a source of macroeconomic and fiscal instability. The poor are most vulnerable to such shocks.

5. Role of Stakeholders of the Power Sector

The typical current structure of the sector is illustrated below:



Typical Institution Structure of the Power Sector

The critical stakeholders within the power sector are government, utilities, regulators, fuel suppliers and the consumers who play various roles:

- *Role of Government*

The government defines policy objectives. These include facilitation of the development of the relevant legislations and the regulations for the power sector and social development objectives e.g. target levels of access for rural and marginalized communities.

- *Role of the Regulator*

The regulator's role includes the development of relevant regulations to implement and enforce government policy. Some of their functions include:

- ✓ Setting service standards for the licensed utilities;
- ✓ Defining economic regulation frameworks and tariff setting processes;
- ✓ Defining customer rights and obligations; and
- ✓ Creating conducive climate for investments in the sector.

The regulators role involves the balancing the interests of government, service provider or investors and of the consumers.

- *Role of the Sector Utility*

The utility's role is to supply the electricity service to customers in a sustainable manner. Expand service provision to meet demand. This will include expanding access to marginalized and poor communities as part of government social objective to boost socio economic development.

- *Role of Private Infrastructure Service Providers (including Independent Power Producers (IPPs))*

The role of independent service providers is to generate electricity or supply infrastructure services to consumers in a profitable manner. This will include service expansion to meet demand.

- *Role of the Consumers or Customers*

The consumer's role is use the service (efficiently), pay for the regulated tariff, contribute to policy formulation, standards development and general ensure good governance in the sector.

6. Regulatory Institutions in the SADC Region

The SADC region has embraced power sector reforms. The various countries have redesigned their regulatory governance. Over the past 15 years the SADC region has introduced new power sector policies and legislation (laws and decrees) whilst introducing new regulations. This as resulted in the establishment of energy or electricity regulators, commercialization and or corporatization of public utilities with the opening up of the sector to include private investors main at generation level. To date ten (10) of the 15 countries have established Regulatory institutions and these are:

- ✓ National Electricity Advisory Council (CNELEC) of Mozambique;
- ✓ Electricity Control Board (ECB) of Namibia;
- ✓ Energy Regulation Board (ERB) of Zambia;
- ✓ Energy & Water Utilities Regulatory Authority (EWURA) of Tanzania;
- ✓ Institute for Electricity Sector Regulation (IRSE) of Angola;
- ✓ Lesotho Electricity Authority of Lesotho;
- ✓ Malawi Energy Regulatory Authority (MERA) of Malawi;

- ✓ National Energy Regulator (NERSA) of Republic of South Africa (RSA);
- ✓ Office of the Electricity Regulator (ORE) of Madagascar; and
- ✓ Zimbabwe Electricity Regulatory Authority (ZERC) of Zimbabwe.

Six of the ten regulators are electricity regulators only, three are energy regulators whilst only one regulator is multi-sectoral.

Between 1996 and 2000, the few countries which had established regulators began to lobby for the formation of a regional association which would help to share information, built capacity and harmonize the regulatory frameworks in the region. The Regional Electricity Regulators Association of Southern Africa (RERA) was established by the SADC Ministers responsible for energy as a formal association of electricity regulators in Maseru, Lesotho on July 12, 2002. The Association was established in terms of the SADC Protocol on Energy (1996), the SADC Energy Co-operation Policy and Strategy (1996), the SADC Energy Sector Action Plan (1997), the SADC Energy Activity Plan (2000) and in pursuit of the broader initiative of the New Partnership for Africa's Development (NEPAD) and the African Energy Commission (AFREC).

RERA was officially launched in Windhoek, Namibia on September 26, 2002 and its mission is to facilitate harmonization of regulatory policies, legislation, standards and practices and to be a platform for effective cooperation among energy regulators within the SADC region.

RERA has grown from four members in 2002 to nine members in 2009. The ORE of Madagascar is the only regulatory institution which is still to become a member of RERA however they do attend meetings as observers.

7. The Impact of Regulation on the Poor

Regulation can contribute to poverty reduction directly and indirectly. Some of the direct impacts are through the following regulatory interventions:

- ✓ Affordability of services- Price regulation and subsidy design;
- ✓ Assessment of the impact of policy on poor;
- ✓ Designing regulatory mechanisms and methods that improve service provision and access for poor; and
- ✓ Understand the needs of poor, know who the poor are and where they located while identifying and developing frameworks to reduce the barriers to access – consumer protection mechanisms.

Indirectly, regulation can impact positively on the poor by ensuring the following:

- ✓ Being efficient (least resource cost) and effective (achieving intended goals)
- ✓ Promoting economic growth policies. Good regulatory interventions should be able to create an enabling environment for private and public sector investments in infrastructure.

8. Key Challenges to Pro-Poor Regulation

In the region, regulators are still fairly new and are learning institutions. There is a lot which needs to be incorporated and reviewed in the current regulatory framework to cater for the poor and address issues of the poor not as piecemeal interventions but develop comprehensive strategy which encompasses all aspects related to poverty. In order to

understand the full aspects of pro-poor regulation, it is important to review the following challenges which relate to:

- ✓ The mandate of regulators;
- ✓ Regulating Prices;
- ✓ Regulating the Service Quality;
- ✓ Regulating Informal Service Providers; and
- ✓ Protecting Consumers.

8.1 The Mandate of the Regulator

The existing regulatory arrangements are such that regulators are entrusted with regulating utility service providers yet in most countries the poor fall outside these services. The legal mandate of regulators is defined by law or statutory instruments which create them. The link between the poor and the regulator is then through the regulation or simple monitoring of service expansion through setting access targets. In most cases the targets to increase access are too ambitious and are not supported by relevant resources especially funding to ensure these are met. It is important for regulators to make sure that expansion is linked to sustainable development. Sustainability is critical in that it ensures that all new expansion projects are done in a manner that has minimum negative impacts on the environment but maximizing benefits to the economy and social status of all citizens across generations.

The key questions that regulators need to address in their frameworks on are:

- ✓ Are they sufficient incentives in place to increase access to modern energy services by the poor?
- ✓ Is there adequate funding in place?
- ✓ Does the regulator have tools and instruments to regulate access targets?

There is need for regulators to prioritize pro-poor access in setting their regulatory objectives at inception. This will ensure that all relevant regulatory framework have provision for improving access and affordability by the poor.

8.2 Regulating Prices

Price regulation is one of the important forms of regulatory interventions with direct impact on the poor. There is a common belief among stakeholders, especially politicians, that charging the lowest tariff is the more direct way to benefit the poor. Most governments have associated access to modern energy services with social and economic development hence the need to subsidize various consumers' categories as away to achieve this. Government policies have directed the following initiatives:

- ✓ Poor domestic consumers are subsidized as a means to redistribute their merger income to other needs like meeting food and shelter requirements; and
- ✓ Industrial customers are subsidized as a way to make them competitive or provide incentives to potential investors to invest in these industries.

It becomes very difficult for the utilities to meet their obligations to supply efficiency when the majority of their customers are subsidized by government which always struggle to meet the full cost of subsidy due to other social priorities. It is important for regulators to understand the various forms of subsidies.

8.2.1 Subsidies

Utility subsidies remain the main tool used by governments in developing countries to ensure affordability of services and to increase to the poor. These subsidies are applied to consumption where a certain amount of energy consumed is charged at a low rate or connection fees where part of the capital costs are covered by government and can be targeted or untargeted. A lot of authors have argued that subsidies if targeted are can be effective. Unfortunately a lot of SADC countries have indiscriminately applied subsidies to all sectors through failure to charge cost reflective tariffs. In some of the countries where tariffs are close to cost reflectivity, payment discipline is poor and there is no effective disconnection policy for failure to pay or illegal connections especially in the densely populated informal settlements.

Consumption subsidies are applied in more than 90% of the countries in the SADC region. A life line tariff for consumption of the first 0-100kWhs is used as a way to cushion the poor and ensure them access to minimum service level. Unfortunately this lifeline is usually also applied to all domestic consumers including the rich who can afford to pay the full cost of supply. The lifeline is applied in the form of an increasing block tariff in which prices are increased as consumption increases. In some countries a fixed charge is applied to all consumers with the combination of increasing block tariff which results in the average higher price for the low consumption and low average price for intensive users' thereby discouraging efficient use of electricity. The other common consumption subsidy is targeting service level which can be achieved through the following mechanisms:

- ✓ Free electricity up to 50kWhs per month to the poor households;
- ✓ Low rates for rural consumers;
- ✓ Low tariffs for agricultural consumers;
- ✓ Low tariffs for mining industry e.g. Copper Mines in Zambia up 2008 were paying sub-economic tariff as part of government initiative to encourage investment and private sector participation in the sector;
- ✓ Social tariff for special class- usually targeted to identified vulnerable or poor consumers; and
- ✓ Discounts for pensioners.

The other targeted subsidy is the one related to connection fees. Electricity connection is expensive and tends to be the biggest barrier to access especially in rural communities. Connection fee are high because rural communities are sparsely populated and need longer distribution lines and transmission lines which are very expensive to construct. In most SADC countries, governments subsidize connection through provision of the backbone infrastructure and partially subsidizing connection fees by offering low interest loans. Development agencies have funded a lot of rural electrification programs that's contributing towards the reduction of connection cost. Some other mechanism used is allowing consumers to contribute materials or labor towards their connection costs. The traditional approach to subsidies has resulted in failure to expand access and in a lot of developing countries with some of the issues summarized in the table below.

Policy	Problem
Government subsidizes utility to make service affordable	Many poor people are not connected so they do not benefit
Tariffs are kept below cost	Utility can not provide good service or finance expansion- poor people do not get access
Service to poor is provided by cross subsidy	Private utilities avoid serving poor as they over recover from other consumers or other services are not affordable by the poor as industrial and commercial consumers pass through the cost to their own customers

8.2.2 Tariff principles

It is important for regulators to have tariff principles from which they will base their tariff reviews and use to design targeted subsidies. One key principle is whether or not there has to be consideration for full cost recovery. The regulators need to determine and advise on the methods used to ensure affordability by the poor. In some countries the principles are enshrined in the law or are part of the policy which the regulator has to implement. Some examples of tariff principles are as follows:

- ✓ Cost reflectivity –the service provider charges a tariff that is related to the cost;
- ✓ Fairness/Equity –all consumers pay for the cost they impose on system;
- ✓ Reduction or gradual elimination of subsidies;
- ✓ Affordability by the poor and vulnerable through subsidy provision;
- ✓ Price Reliability-prices remain stable and are predictable over time; and
- ✓ Simplicity and adaptability - tariff design is simple and adaptable.

8.2.3 How to Improve Pro-Poor Price Regulation

For regulators to improve price regulation to ensure affordability by the poor it is important for them to understand who the poor are and what their needs are. Armed with knowledge of the needs the regulators can design mechanisms to cushion the poor and ensure affordability in conjunction with other stakeholders. These include the following:

- ✓ Improved subsidy design to include cost recovery;
 - Cross subsidy by service provider. The service provider will spread costs between customer categories in a way that ensures full cost recovery.
 - Direct subsidies to service provider by government to cater for the identified poor consumers.
 - Targeted subsidies – regulators should ensure that subsidy levels are known and are targeted to deserving customers only.
 - Use connection rather consumption subsidies.
- ✓ Analysis have shown that removing the barrier through subsidizing connections is a more effective way to increase access coupled with charging the correct prices for consumption to encourage efficient use;
- ✓ Improve targeting;
 - Regulators should continuously evaluate the impacts of subsidies based on the ability to pay and ensure that the various blocks if subsidizing consumption are priced correctly. Also subsidy design should ensure that the deserving cases have access as current inclined tend to benefit the rich and discourage in some cases efficient use.

- ✓ Improve metering system;
 - Use of prepayment meters has been successful in ensuring payment discipline and encouraging efficient use of resources. Where time of use tariffs are used poor consumers can adjust their usage to meet off peak periods as a way of self regulating.
- ✓ Willingness to pay;
 - The regulators need to develop economic evaluation methods to evaluate willingness to pay and affordability. The poor are willing to pay as the costs of alternative energies are more costly in the long run. Access to modern energy allows the poor to engage in income generating activities, through the use of machines such as sawing machines or looms. Women can produce school uniforms which they sell to their communities instead of spending time looking for fire wood.
 - Affordability tends to be subjective as it evaluates the contribution of energy cost to total income. In developed countries it can be less than 10% whilst for poor communities and developing countries it can be more than 50% in some communities. However, this has to be evaluated in the context of what would be the alternative lifestyle and hence the need for government to design appropriate subsidy mechanisms.
- ✓ Match income cycles of the poor with payment for services;
 - It is important for regulators to understand the economic activities of the poor and match income cycles to payment cycles. Most poor would prefer to pay more frequently and prepayment meters will be convenient. Others like farmers might on the other hand be able to pay seasonally after they have sold their produce to markets.
- ✓ Policy Interventions;
 - Regulators need to continuously evaluate your impacts of their interventions. The question to ask at all times is - are the current mechanisms improving the access of the poor? If not, what needs to be done and consult the poor all the time?

8.2.4 Source of Funding for subsidies

It is important to note that subsidies will remain necessary in the developing countries for a long time due to the high levels of poverty in these countries. The main sources of subsidy are:

- ✓ Government who provide grants and loan guarantees to utilities or take over of debt;
- ✓ Other consumers through cross subsidies;
- ✓ Development agencies through funding of rural electrification programs; and
- ✓ Not funded at all which results in poor service and failure to expand services.

8.2.5 Smart Subsidies

Smart subsidies are a process used to provide the minimum required capital subsidy to bridge a defined access gap using a comprehensive bidding process known as least cost subsidy auction. Smart subsidies have been successful in the telecommunications due to good regulatory practices in the sector which include good price regulation (minimum regulation), flexible licenses and allows for innovation. The telecommunication sector allowed licensees to venture into other ventures which complemented their business case. In the power sector smart subsidies are an option which has been applied to rural electrification especially through implementation of non grid options:

- ✓ Dealer model (solar photo voltaic);
- ✓ Concession model – use Rural Electricity Service Company (RESCOS); and
- ✓ Retailer model.

8.2.6 Other regulatory interventions to improve financial efficiency

Other than using subsidies in various forms there are other interventions which regulators can use to improve access by the poor. These include:

- ✓ Improved operational efficiency of utilities- this will reduce losses and improve output at least cost;
- ✓ Cost reduction- is critical to ensure fair pricing;
- ✓ Reduced capital costs through better planning and project management- this will result in optimum investments and ability to implement projects most of which have not moved beyond plan status;
- ✓ Increased revenue collection will improve liquidity in the service providers;
- ✓ Increase Competition -Corruption associated with the exclusive public or monopoly; provision of energy services increases energy's cost. Poor people are disproportionately affected, since they have the least ability to bear the increased cost. Therefore, increased competition through more players that increases the choice of energy providers for consumers can benefit the poor; and
- ✓ Encourage use of alternate technologies – regulators should encourage use of new and or renewable energy as an alternative to current conventional sources. The regulators should advise governments on creating policies for implementation of renewable technologies which includes introduction of regulatory mechanisms like the use of feed in tariffs and mandatory quotas.

8.3 Regulating the Service Quality

8.3.1 Defining Service Quality Standards

One of the key roles of regulator is to set service standards that customers want. The key questions to answer by regulators are the following:

- ✓ Are the quality of supply standards well defined?
- ✓ What is the cost of meeting these standards?
- ✓ Is the cost of meeting standards a barrier for poor consumers?
- ✓ Is this quality defined by customers?

Most new regulators find that defining industry standards is done prior to their existence by the utilities who are the regulators prior to reform. The regulators adopt these standards which are defined mainly by the equipment suppliers and are based on international standards. The regulators simply adopt these standards and most of them do not ask customers what they would prefer and how these standards have affected service quality from their view. Meeting quality standards is very costly and impacts on the cost of supply. Regulators have to be challenged to review standards in line with customer requirements and balance customer requirements, equipment capabilities and costs.

8.3.2 How to improve Regulation of Service Quality

The regulators need to review the current standards continuously to ensure that they are in line with best practices, meet the consumer requirements and can be achieved at least cost. To bridge the access gap there is need to be flexible and use where possible light

handed regulation. This can be achieved by not compromising safety but making sure the regulatory framework allow them to achieve the following:

- ✓ Adapt standards and encourage innovation. In this regard regulators should consider cost of meeting standard and compare it with the benefits which will achieve.
- ✓ Use penalties for failure to meet standards when appropriate. Regulators should work with various stakeholders to develop standards to use for benchmarking and where appropriated allow service providers to self regulate.

The challenge for most regulators remains their ability to monitor the utility performance coupled with ability to ensure compliance. In a previous survey on the Status of the Electricity Supply Industry, most countries indicated that the standards are well defined but most regulators do not have the requisite tools to monitor compliance or enforce compliance to defined standard due to the monopolistic nature of utilities.

The critical issue is that regulators need to adopt flexible approach to service quality in order to give incentives to service providers to cut costs and innovate whilst meeting minimum standards.

8.4 Regulating Informal Service Providers

Regulators usually have challenges of regulating the informal service providers of alternate services especially in the water sector and in some countries in rural service provision. Most of the alternate service providers are not licensed as in some countries rural service providers are regulated by other agencies like the Rural Electrification Agency. What is important is that the regulators recognize the role played by the informal service providers and depending on the legislation decide on what critical aspects to regulate. The regulators also need to review if the existing rules give incentives to alternate service providers to fill in the access gap and consider the role of main service provider which can be partly regulatory or as provider of last resort. The issue of incorporating other service providers requires regulators to develop a competition framework which allows a wide range of service providers.

8.5 Protecting Consumers

Poor customers often lack a formal mechanism to relay their complaints and obtain redress. A lot of people who claim to be advocates of the poor do not necessarily address poor concerns. The major challenge for regulators is to organize consumer groups which include the voice of the poor and unconnected citizens with good feedback mechanisms. It is critical for regulators to develop localized regulation mechanisms especially for informal sector which can be achieved by using existing governance structures. Rural areas usual have district councils or other local government structures which regulators can work with to address access and quality of supply issues. In summary regulators therefore need to develop mechanisms to address complaints from all customers including the most marginalized.

9. Pro-poor regulation in the European context

The pro-poor regulation applies to all economies including the developed countries. In a presentation at the African Forum for Utility Regulators (AFUR), Eric Dyevre highlighted that in the European Union (EU) legal framework directive provides for universal access and public service obligations including customer protection. In 2000, France introduced a social electricity tariff which benefited over 720 000 vulnerable customers by 2008 funded

through the solidarity fund financed by electricity suppliers and from the universal access fund. The EU customer service charter was developed in 2007 which defined special needs customers and the need to address energy poverty.

EU legislation states that the energy regulators will contribute to 'ensuring high standards of universal access and public service, to the protection of vulnerable consumers, and to the full effectiveness of consumer protection measures'. To this effect, EU regulators have done the following:

- ✓ Status review on the definition of vulnerable consumer;
- ✓ Identify their share of population; and
- ✓ Reviewed definitions of suppliers of last resort.

10. Conclusions

Energy Regulators in general have mandates to regulate energy or electricity sector services with their objectives predefined by the legislation which brings them into being. New regulators have problems in setting own priorities in terms of pro-poor regulation and are overwhelmed by scale of challenge as the poor in most SADC countries form the majority of the population. Pro-poor regulation is usually their least priority as in most countries they are created through a reform process and usually find tariff reviews at the top of the agenda as governments seek to improve the investment climate as a priority due to electricity capacity deficits.

Regulators need to develop relay mechanisms that allow them ability to perform regulatory tasks on the ground. To be effective regulators, they need to gather information on who are the poor, where the poor are located, how they get services and what are their preferences. To achieve this, regulators need to promote relationships between various stakeholders to develop pro-poor regulatory arrangements. Poverty is complex and for regulators to improve service delivery for the poor, they might mean change in regulatory frameworks, policy etc. Regulators need to create partnerships as a way of dealing with pro-poor regulatory constraints as they can not resolve issues related to affordability and access by the poor on their own. In the active engagement of various stakeholders, regulators should remain neutral arbiters within the sector and develop mechanisms to avoid regulatory capture.

There is usually common belief that subsidies will resolve the issue of access by the poor. Subsidies should be well defined, transparent and targeted. The type of subsidy applicable should be defined by policy. Analyses by various writers have shown that connection subsidies are more effective than consumption subsidies as they tend to encourage efficient use of subsidized service. It is important to recognize that subsidies alone do not remove the barriers to access by the poor. Other regulatory measures need to be put in place to improve the utility efficiency both technical and financial by cutting cost and increasing revenue collection.

Regulators need to work hard to remove the regulatory barriers they impose themselves to access by the poor which relate to the following regulatory practices:

- ✓ Poor pricing policies which allow for continued existence of sub-economic tariffs;
- ✓ Poor subsidy design;
- ✓ Lack of incentives for entrepreneurial solutions;
- ✓ Avoid top-down approach to stakeholder engagement; and
- ✓ Look at citizen issues not customer, thereby protecting the interests of the marginalized poor.

Finally what is important to ensure credibility of regulators is consistency in implementation of sound regulatory mechanisms. Regulators should create an environment which creates competition in the sector and work with other stakeholders to create incentives to attract new and continuous investments. This will ensure expansion of services and increased access by the poor and marginalized. This should be underpinned by regulatory frameworks which allow players to be innovative and cost efficient so that the prices to all consumers especially the poor remain fair at all times.

11. Rethinking the classic regulatory model

In the early nineties the World Bank in its Policy Paper (1993) on the Role of the Electricity Power Sector stated that “A requirement of all power lending will be explicit movement toward the establishment of a legal framework and regulatory processes satisfactory to the Bank...this requires countries to set up transparent regulatory processes that are clearly independent ...”.

Ten years later in 2004, in its Operational Guidance for World Bank Group Staff in Public and private sector roles in the supply of electricity services there was reviewing in the classic regulatory model based on experience and best practices. The World Bank went on to advocate for the governments to monitor performance of regulators and reduction of their discretionary powers by stating the following “... a credible regulatory system requires more than a formally independent regulatory entity...other transitional arrangements may need to be established... including limiting the amount of discretion that regulatory bodies have in setting prices and key parameters”.

This rethinking of the regulatory independence in pro-poor regulation should be looked at as a way of enhancing the regulators sphere of influence and also realisation that regulators need to work with other stakeholders to improve access to the poor through the creation of an enabling investment climate.

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