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Zambia

Growth, Infrastructure, and investments

Role for Public Private Partnership

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ABBREVIATIONS AND ACRONYMS

| | |
|--------|---|
| AICD | Africa Infrastructure Country Diagnostic |
| BoZ | Bank of Zambia |
| CEC | Copperbelt Energy Corporation |
| CGE | Computer General Equilibrium Model |
| CPI | Consumer Price Index |
| CSO | Central Statistics Office |
| DRC | Democratic Republic of Congo |
| DSA | Debt Sustainability Analysis |
| DTIS | Diagnostic Trade Integration Study |
| EBZ | The Export Board of Zambia |
| EPZ | The Export Processing Zone |
| ERB | Energy Regulatory Board |
| EU | European Union |
| FDI | Foreign Direct Investment |
| FSAP | Financial Sector Assessment Program |
| FNDP | Fifth National Development Plan |
| FTA | Free Trade Area |
| FY | Fiscal Year |
| FZ | Free Zone |
| GDI | Gross Domestic Income |
| GDP | Gross Domestic Product |
| GNI | Gross National Income |
| GRICS | Government Research Indicator Country Snapshot |
| GRZ | Government of the Republic of Zambia |
| GSP | Generalized System of Preferences |
| GWI | Global Water Intelligence |
| HIPC | Heavily Indebted Poor Countries |
| HPI | Human Poverty Index |
| ICA | International Commodity Agreements |
| ICT | Information and Communication Technology |
| IF | Integrated Framework |
| IFC | International Finance Corporation |
| IFS | International Financial Statistics (IMF) |
| IMF | International Monetary Fund |
| INDECO | Industrial Development Corporation |
| KCM | Konkola Copper Mines |
| KDMP | Konkola Deep Mining Project |
| LCMS | Living Conditions Monitoring Survey |
| LIC | Low Income Country |
| LSMS | Living Standard Measurement Survey |
| LUSE | Lusaka Stock Exchange |
| LWSC | Lusaka Water and Sewerage Company |
| LWS | Lusaka Water and Sewerage |
| MAFF | Ministry of Agriculture, Food and Fisheries |
| MCDSS | Ministry of Community Development and Social Services |
| MCT | Ministry of Communication and Transport |
| MDRI | Multilateral Debt Relief Initiative |
| MDG | Millennium Development Goals |
| MICS | Multi-Indicators Cluster Survey |
| MLGH | Ministry of Local Government and Housing |
| MMMD | The Ministry of Mines and Mineral Development |
| MoF | Ministry of Finance |

| | |
|---------|--|
| MoFED | Ministry of Finance and Economic Development |
| MTEF | Medium Term Expenditure Framework |
| NAC | National Aids Council |
| NCC | National Council for Construction |
| NIS | National Information System |
| NLPI | New Limpopo Bridge Projects Investments |
| NPV | Net Present Value |
| NRDA | National Road Development Agency |
| NRFA | National Road Fund Agency |
| NWASCO | National Water and Sanitation Council |
| OAU | Organization of African Unity |
| O&M | Operational and Maintenance |
| OPPPI | Office of Promoting Private Power Investment |
| PAM | Program Against Malnutrition |
| PER | Public Expenditure Review |
| PPP | Public/Private Partnership |
| PPI | Private Power Investment |
| PPIAF | Private Power Investment of Africa |
| PPR | Participatory Poverty Research |
| PRSP | Poverty Reduction Strategy Paper |
| PSC | Public Sector Comparator |
| PSDC | Penang Skills Development Center |
| PSRP | Public Sector Reform Programme |
| PUSH | Program Urban Self-Help |
| R&D | Research and Development |
| RAMCOZ | Roan Antelope Mine Company of Zambia |
| RAP | Rights Accumulation Program |
| REER | Real Effective Exchange Rate |
| RISDP | Regional Indicative strategy and Development Plan |
| RMSM | Revised Minimum Standard Model |
| ROADSIP | Road Sector Investment Program |
| RPED | Regional Program for Enterprise Development |
| RTSA | Road Transport and Safety Agency |
| SA | South Africa |
| SACU | Southern Africa Customs Union |
| SADC | Southern African Development Community |
| SAP | Structural Adjustment Program |
| SAPP | South Africa Power Pool |
| SAUR | Société d'Aménagement Urbain et Rural |
| SIMA | Statistical Information Management and Analysis |
| SMB | Small and Medium Banks |
| SME | Small and Medium Enterprises |
| SNEL | La Société National d'Électricité-DRC |
| SSA | Sub-Saharan Africa |
| SWSC | Southern Water and Sewerage Company |
| TAZARA | Tanzania Zambia Railways Systems |
| UK | United Kingdom |
| UNESCO | United Nations International Educational and Scientific Organization |
| USA | United States of America |
| USD | United States Dollars |
| VAR | Value added Reseller |
| VAT | Value Added Tax |
| WBES | World Business Environment Survey |
| WDI | World Development Indicators |
| WEO | World Economic Outlook (IMF) |
| WWG | The Water Watch Groups |

| | |
|---------|---|
| WTO/WTO | World Trade Organization/World Tourism Organization |
| WSS | Water Supply and Sanitation |
| ZAIMCO | Zambia Industrial and Mining Corporation |
| ZAMSIF | Zambia Social Investment Fund |
| ZAMTEL | Zambia Telecommunications Company, Ltd. |
| ZCCM | Zambia Consolidated Copper Mines |
| ZCI | Zambia Copper Investments |
| ZCTU | Zambia Congress of Trade Union |
| ZDC | Zambia Democratic Congress |
| ZESCO | Zambia Electricity Supply Company |
| ZIC | Zambia Investment Center |
| ZIMA | Zambia Independent Media Association |
| ZIS | Zambia Information Services |
| ZNBC | Zambia National Broadcasting Corporation |
| ZNCB | Zambian National Commercial Bank |
| ZNTB | Zambia National Tender Board |
| ZRA | Zambia Revenue Authority |
| ZRL | Zambia Railways |

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Preface

The main purpose of this paper is to document and discuss infrastructure gaps, investment needs, and policy challenges in improving infrastructure services, with an emphasis on the role of Public Private Partnerships to access needed resources for investments in the various sub-sectors for accelerated growth and poverty reduction in Zambia. Zambia has made substantial progress in extending some infrastructure services, including telecom and roads, to its citizens. However, service delivery in other areas, such as water and sanitation, and electricity has been poor. With Zambia's annual growth increasing and demand for infrastructure services escalating, infrastructure bottlenecks are becoming more acute. Against this background, important, practical policy-relevant questions arise:

- What are the sources of this uneven progress in the infrastructure sector?
- Where exactly are the most pressing infrastructure delivery and financing gaps?
- How can these gaps be closed using a combination of effective policy and institutional measures and additional financing targeted at key bottlenecks?

This report addresses these questions. The energy, telecommunications, and water sectors regularly make press headlines in Zambia, and infrastructure is a common issue in major debates and political speeches across parties. These concerns of both press and politicians are two strong indicators that these sectors are a major concern for its citizens.

This paper is targeted at two main audiences. The first is the broader universe of policymakers, planners, regulators, and technical specialists directly concerned with the delivery of infrastructure services. For these readers, the note provides an overview of the physical, financial, social, and institutional conditions of the country that cut across sub-sectors. It compares Zambia's infrastructure performance in terms of access rates, affordability, quality, and financial viability of its services to those observed in comparable countries. This benchmarking exercise is useful to get a sense of the areas in which the scope for improvements is the largest and hence indicates policy areas that should probably be fine-tuned or significantly reformed. The second and related audience is the authorities. The note provides them with a sense of the foregone growth opportunities stemming from policy imperfections, an assessment of investment needs for accelerated growth, and how public private partnership can play a role in resource mobilization for the investment needs.

The paper takes stock of the most relevant infrastructure issues in the key sectors: energy, water and sanitation and telecommunications. It considers how they relate to growth, with particular emphasis on public expenditures and the roles of public and private sectors in the provision and financing of infrastructure. It provides a snapshot of the state of Zambia's infrastructure sectors—in terms of the stock, access and quality—and benchmarks them vis-à-vis similar income and regional peer countries based on key performance indicators. It offers a preliminary assessment of the investment needs, before identifying the institutional reforms needed to attract investment.

Executive Summary

Introduction

- i. **Upgrading of infrastructure can help maintain if not accelerate Zambia's economic growth.** Over the past few years, Zambia has made progress in many areas of economic development. This has rendered strong average annual economic growth of 5.5 percent for the last five years. Zambia can, by upgrading its infrastructure, enhance its opportunities for robust and high growth. This will require large amounts of investment, as the status of provision of infrastructural services is poor and has deteriorated over time.
- ii. **The absence of revenue adequacy has been one if not the main culprit regarding the deterioration of the performance of infrastructural service providers in Zambia.** The provision of services below cost has lead over the years to a serious backlog in maintenance of existing capacity and investment in new capacity. As a result, access to energy, water and sanitation, and fixed line connections has deteriorated.
- iii. **Access is only available to the upper echelons in Zambia.** Hence, the practice of keeping tariffs low as a means of providing affordable access for the poor has failed. A rethinking of how to ensure revenue adequacy of the utilities is needed to secure the economic and financial viability of the provision of services now and those needed in the future.
- iv. **Large investments in excess of 10 percent of GDP annually are necessary over the next three to five years to increase the provision of infrastructure such that growth can deepen and people can benefit from improved access.** A key issue to address is how Zambia can best tap the additional resources needed to meet its infrastructural challenges. Even though the recent revisions to the fiscal regime of the mining sector will provide significant additional resources to the budget, these will not be sufficient to finance the needed upgrades and expansion.
- v. **The involvement of private financiers is unavoidable to improve the provision of infrastructural services.** One option that is being considered is Public-Private Partnerships (PPPs). Zambia can benefit from further developing PPP schemes, but there is a need to resolve issues concerning tariff setting and access to the market. Several institutional and other policy issues will need to be tackled. For example creating the capacity to appraise investments in the sector and having in place a comprehensive and coherent legal and regulatory framework, while ensuring transparency in procurement are also needed.

Infrastructure, growth and investment needs.

vi. **Improving the provision of infrastructural service, quality as well as their quantity, could significantly increase Zambia's growth.** A recent World Bank study¹ suggest that GDP growth could have been 3.6 percentage points higher a year if Zambia would have had the level of provision of infrastructure as the leaders in Africa, i.e., South Africa or Mauritius.

vii. **Access to infrastructure services in water and sanitation and electricity have deteriorated over the last fifteen year with access to mobile phone communications being the positive exemption.** Access to electricity stood at a meager 13 percent nation wide, down from over 20 percent a decade and a half ago. This compares rather unfavorable to the rest of Sub Saharan Africa where access is well over 30 percent. In addition, access is clearly skewed in favor of Zambia's urban areas and those with relatively high incomes. Unfortunately, these outcomes are also true for access to improved water and sanitation as access declined over the same period by 15 and 9 points respectively.

viii. **The poor status of Zambia's overall infrastructure service provision is due in a large part because utilities are not allowed to charge cost recovery tariffs for service provision.** Often this is politically and/or socially motivated due to considerations of affordability and thus access by the poor. This policy has failed in Zambia, as access is a privilege of the well off and access across the income distribution compares unfavorable with the rest of sub-Saharan Africa. Not only has the policy of setting tariffs below cost not provided the expected access to the population in the lower echelons of the income distribution, it has also not provided the financial resources to maintain, let expand, the public supply of infrastructure, in particular in energy and water and sanitation.

ix. **Perhaps the single most important element of a policy to increase service provision and access is pricing reform.** A key priority is to devise a regulatory regime, which facilitates the move to cost-reflective tariffs and hence permits providers to attain revenue adequacy i.e. the revenue level necessary to be able to attract financing in order to maintain, replace, modernize, and, where appropriate, expand their facilities and service. The interests of users would be better served if providers were not unduly constrained by price controls that do not reflect the cost of doing business in the sector and the realities of the market i.e., if they are accorded price flexibility within boundaries determined by the avoidance of cross-subsidization and monopolistic pricing.

¹ Calderon (2007) and Calderon and Servén (2004)

x. **Tension between affordability of service provision and financial viability of providers requires explicit recognition that certain income groups within Zambia will not be able to pay for services when services are provided at cost and if provided access will require financial assistance.** However, it is preferable to provide subsidization directly from the budget then through cross subsidization within the utility providers themselves as the provider should squarely focus on operational efficiency of service delivery while the social aspects of access to such services is to be addressed the government itself.

xi. **Investments of over US\$1 billion a year or 10 percent of GDP per year over the medium term are needed to rectify the low access outcomes in Zambia.** The current level of public expenditure on infrastructure of around four percent of GDP a year are in adequate to maintain even current access levels taking into account increasing demand from the productive sectors, in particular the mining sector, and due to the rising incomes and populations growth. Even with the expected increases in mining revenues, due to the revisions to the fiscal regime for the mining sector, the public purse will not be able to finance the needed resources without adjustments in funding for other non-infrastructure related expenditure programs.

xii. **Zambia has not spent enough on infrastructure and its overall spending on infrastructure is declining over time.** In regional and international comparison, Zambia spends a relatively low amount on budgetary infrastructure services. The low level of infrastructure spending may provide a powerful explanation for the still disappointing performance of some of the infrastructure sectors. The downward trend for infrastructure capital expenditures is worrisome: In the period from 2004 to 2006 capital expenditures as reported in the central government's budget, decreased from 3.7 percent of GDP to 1.8 percent of GDP.

xiii. **Zambia could usefully use Public Private Partnerships as a means to tap the additional resources needed to meet its infrastructural challenges.** Other resources such as user fees, (domestic or external) borrowing by the operator, and/or recourse to public resources will remain inadequate to finance all what is needed.

Institutional and Policy Requirements for Public Private Partnership.

xiv. **Even though the benefits of Public Private Partnerships (PPPs) can be significant, they are not without challenges. Indeed, to reap their benefits a number of pre-conditions need to be satisfied.** Ensuring revenue adequacy and the manner in which one deals with the trade-off between tariff levels and affordability and access are important issues to make PPPs a success. Other challenges are particular in the areas of Zambia's policy, legal, and regulatory environment and capacity within the public sector to manage a PPP program effectively

xv. **The recent developed PPP policy in Zambia needs to be translated into primary and secondary implementation legislation and the consultation process should include infrastructure regulators e.g., ERB, NWASCO and the Communication Authority in light of their role in awarding license, setting tariffs**

and resolving tariff disputes. More attention needs to be paid to details that ensuring that there is seamless interface between the public entities interacting with the private sector in respect of PPP projects e.g., the contracting ministries and the proposed PPP Unit that is to manage the overall PPP program.

xvi. **It is important to realize that the implementation of a comprehensive legal and regulatory reform program will take time.** Such a program will need to look carefully at contract regulation, contract transparency and minimize contract disputes or contract breakdown focusing on effective court and alternative dispute resolution. While addressing these fundamental institutional issues, Government would need to develop transitional instruments that effectively mitigate policy risk that protects investors against breach of contract risk, because of an incomplete regulatory framework. These instruments may take the form of third-party policy guarantees, with or without counter-guarantee by the government. In particular, the Government might want to address more effectively the major concerns expressed by the existing PPPs on security/theft issues and their risk mitigation.

xvii. **It is imperative when designing the specific methodology and criteria to select PPPs that sufficient weight is given to all sectors in need of investment.** Currently the PPP program seems to be too much focused on the transport sector vis-à-vis other sectors that are also in need of investment i.e., power, telecom and water and sanitation.

xviii. **One of the main challenges will be to build capacity to screen and prioritize investment projects based on economic criteria, and to monitor and evaluate their implementation.** This central issue would require extensive capacity building efforts and the proposed PPP unit could play a crucial role in this endeavor. Therefore, it will be vital to quickly to resolve the issues of the PPP Unit location. It would be advisable that staff of such a unit has expertise that supplement capacities in line agencies that are in need of the PPPs. The unit should also be given the ability to have access to relevant information to effectively evaluate proposed PPPs, have transparent procedures for approval and defines clearly its role as selector, approver versus implementer and evaluator as to ensure clarity of checks and balances in the overall process.

xix. **Irrespective if the Ministry of Finance and National Planning is chosen to host the PPP Unit, it is strongly advisable to ensure that all contingent liability and quasi fiscal costs of PPPs are calculated ex ante and appropriately included in the Budget discussions.**

xx. **Simultaneously with attracting the private sector, restructuring and improving the performance of SOEs should be a key priority.** A number of studies quantified that even a relatively small improvement in operational efficiency could free significant resources. These resources could usefully assist in financing the investments needed in the sectors. One way of accomplishing improved SOE performance, is through performance-based contractual agreements. Such contracts are powerful instruments to help define sector development goals and resources, improve performance, and impose at

the same time a timeframe in which monitorable performance targets are to be achieved, while allowing increased managerial autonomy.

1. Infrastructure, Growth, and Investment Needs in Zambia

Introduction.

1. **Over the past few years, Zambia has made progress in many areas of economic development.** First, the Government of the Republic of Zambia (GRZ) articulated its development objectives in its Fifth National Development Plan (FNDP) or second Poverty Reduction Strategy Paper (PRSP) for the period 2006-10. Second, it regained control over its macroeconomic environment witnessed by a successful completion of the Fund's PRGF program in late 2007. Third, GRZ was able to complete the HIPC program agreed upon at the decision point, therefore reached HIPC completion in April 2005, and qualified for the Multilateral Debt Relief Initiative (MDRI) at the outset in 2006. These initiatives jointly reduce Zambia's external obligations by approximately US\$6 billion creating fiscal space for additional expenditure programs. Fourth, it has undertaken several reforms to strengthen public sector management as a means to better implementation of its FNDP/PRSP. Improvements were made in the areas of financial management, commitment control, and the introduction of an activity based budgeting system and a MTEF.

2. **Zambia is experiencing a robust growth period with positive broad based GDP growth for nine consecutive years.** GDP growth has been particularly strong in mining, construction and services. Consequently, the overall poverty headcount has declined from 73 percent in 1998 to 64 percent at the end of 2006. Even though this decline is less than needed to reach the poverty related Millennium Development Goal (MDG), the decline is a welcome outcome after many decades of decreasing incomes and increasing poverty. Real GDP growth is estimated to have equaled 5.7 percent for 2007. These positive growth and poverty developments are supported, and for a large part driven, by favorable external developments.

3. **Looking ahead, GRZ is aware that sustaining high levels of growth depends for a large part on the efficient provision of infrastructural services.** At the same time, the realization has set in that many traditionally public sector led investments in infrastructure require huge amounts of financial resources, which cannot be sourced from the public purse alone.² For that reason, GRZ included in its FNDP a program with the objective "to develop and implement an appropriate policy framework in order to facilitate effective private participation in the construction and maintenance of public infrastructure."³ This policy note is written in part to provide an analysis of the importance of infrastructure in Zambia and the challenges the country faces to expand

² See Chapter 37, section 2 of the FNDP

³ See Chapter 9, section five of the FNDP

infrastructure, as well as an input to the Government's working group assigned to develop the policy framework for public private partnerships. As such, it outlines some of the policy and institutional challenges; Zambia might face along the way in particular on the use of Public Private Partnerships to finance investments in infrastructure.

1.1. Infrastructure and Growth

4. **Contribution to Zambia's growth due to infrastructure development was a meager 0.6 percent for the period 2001-05 compared to 1991-95.** Calderon and Serven (2004) and Calderon (2007) estimate how much of the change in growth for the period 2001-05 compared to 1991-1995 can be attributed to changes in infrastructure (see table 1.1). Calderon (2007) study includes stocks as well as an assessment of quality of infrastructure (see box 1.1. for additional information). These include energy, water and sanitation, rural roads and information and communication technology (ICT). Even though Zambia registered impressive growth of around 5.5 percent annually for the period 2001-05 compared to a low 1.1 percent annually for the period 1991-95. Only 0.6 percent of the 3.7 percent difference in growth between both periods can be contributed to improved provision of infrastructure. Of this improvement, it is estimated that 87 percent comes from increases in stock and 13 percent coming from improvements in the quality of the services.

Table 1.1 Growth Changes due to Infrastructure Developments, 2001-5 vs. 1991-5

| in percentage | Infrastructure Development | Estimated contribution from Infrastructure Stock in: | | | | Estimated contribution from Infrastructure Quality in: | | | |
|--------------------------------|----------------------------|--|---------|-------------|-------|--|---------|-------------|-------|
| | | Total | Telecom | Electricity | Roads | Total | Telecom | Electricity | Roads |
| Zambia | 0.60 | 0.52 | 0.47 | -0.12 | 0.18 | 0.08 | 0.10 | -0.01 | -0.01 |
| SADC | 1.01 | 0.85 | 0.83 | -0.13 | 0.15 | 0.16 | 0.21 | -0.08 | 0.02 |
| Africa | 0.99 | 0.89 | 0.94 | -0.08 | 0.02 | 0.10 | 0.12 | -0.04 | 0.01 |
| Excl. mobile phone penetration | | | | | | | | | |
| Zambia | 0.09 | 0.01 | -0.02 | -0.06 | 0.09 | 0.08 | 0.09 | -0.01 | -0.01 |
| SADC | 0.29 | 0.14 | 0.13 | -0.07 | 0.08 | 0.15 | 0.20 | -0.07 | 0.02 |
| Africa | 0.22 | 0.13 | 0.15 | -0.04 | 0.01 | 0.09 | 0.12 | -0.03 | 0.01 |

Source: Calderon (2007)

5. **In Zambia most of the contribution to the improvement in growth performance has come from the mobile telecom sector.** Even though additional roads has contributed positively as well, it is clear from the data that the greater part of the 0.6 percent increase in growth, attributable to improved infrastructure, has come from the telecom sector and in particular from the mobile phone sector. Given the global revolution in the telecom sector, this positive contribution from the mobile telecom sector should not come as a complete surprise.

6. **The contribution to the revival of growth due to infrastructure is lower than elsewhere in SADC and Africa** (see table 1.1). SADC countries on average (including Zambia) and all countries in Africa have benefited more from improvements in their infrastructure than Zambia. Zambia compared to its peers in SADC and to all countries in Africa lagged in the estimated contribution coming from improvements in the stock of infrastructure as well as coming from improvements in quality.

Box 1.1: How to measure and disentangle Quantity and Quality of various infrastructure assets and its impact on growth

Assessing impact of infrastructure on growth. In many studies, the impact of infrastructure on growth is measured by a single infrastructural sector or various infrastructural sectors are combined into one indicator. The reason for such approaches is that the correlation between measures of infrastructural sectors is often highly correlated. For example, Calderon and Serven (2003) find that the correlation between measures of telephone density and power generation capacity is 0.94, while the correlation between main lines and roads or roads and power generation is close to 0.6. Henceforth it is difficult to obtain estimates of individual coefficients of variables representing different kind of infrastructure assets.

Calderon and Serven (2004) use a method called principal component analysis to disaggregate infrastructure indicators and their impact on growth. Synthetic indices are build following Alesina and Perotti (1996) and Sanchez-Robles (1998) that summarizes various dimensions of infrastructure and its quality.

Index of Infrastructure Stocks. The index for stocks is built up using data from:

- (i) Telecommunication sector: number of main telephone lines per 1000 workers;
- (ii) Power sector: electricity generation capacity in MW per 1,000 workers;
- (iii) Transportation sector: length of the road network in km. per square km. of land area.

Index of Infrastructure Quality. This index is constructed by using data from:

- (i) Telecommunication sector: waiting time for telephone lines in years;
- (ii) Power sector: the percentage of transmission and distribution losses in the production of electricity;
- (iii) Transportation sector: the share of paved roads in total roads.

Even though the indicator for quality of telecommunication sector is quite limited, data availability of better indicators across countries e.g. for the number of telephone faults per 100 main lines is severely limited. Data for selective SADC countries is listed below.

| | Telecom | | | Electricity | | | Roads | | |
|--------------|---|-------------------------------------|----------------------------|----------------------------|--|----------------------------|---|--------------------------|----------------------------|
| | Telephone (per 1,000 people) (all 2004) | Waiting list for main (fixed) lines | Last available observation | Consumption (MWh per 1000) | Transmission and distribution losses (% of output) | Last available observation | Total land density (road km/1000 sq. km of land area) | Paved (% of total roads) | Last available observation |
| Angola | 74.5 | 41.8 | 2006 | 123.8 | 14.5 | 2004 | 41.3 | 10.4 | 2001 |
| Botswana | 541.2 | 22.8 | 2006 | 1325.0 | 10.4 | 2004 | 43.2 | 36.5 | 2004 |
| Madagascar | 30.7 | 63.8 | 2005 | .. | .. | 2004 | 85.7 | 11.6 | 1999 |
| Malawi | 41.3 | 107.7 | 2006 | .. | .. | 2004 | 164.2 | 45.0 | 2003 |
| Mauritius | 862.5 | 22.6 | 2005 | .. | .. | 2004 | 992.6 | 100.0 | 2004 |
| South Africa | 825.1 | 9.2 | 2003 | 4884.8 | 6.1 | 2004 | 299.8 | 17.3 | 2001 |
| Zambia | 89.2 | 88.5 | 2002 | 692.0 | 4.0 | 2004 | 123.0 | 22.0 | 2001 |
| Zimbabwe | 78.9 | .. | .. | 795.1 | 15.1 | 2004 | 251.4 | 19.0 | 2003 |

The interested reader is referred to Calderon (2007) and Calderon and Serven (2004) for a complete description of the regression analysis. The results of the analysis on growth for Zambia are summarized in tables 1.1 and 1.2.

Social rates of return of infrastructure. A report by Canning and Bennathan (2000), using a sample of 52 countries, estimates rates of return to investment in electricity generating capacity of around 40 percent. For the 11 African countries in the sample, the average rate of return to generating capacity was even higher, 53 percent, and this rate was 6.5 times higher than the African rate of return to non-infrastructure capital. High rates of return were also found for investment in paved roads, the African average being 69 percent, around 2.5 times higher than the returns from non-infrastructure capital. This provides a first indication of the economic importance of infrastructure for economic growth. Although it is not strictly Zambia specific, it gives a good sense of the social return on infrastructure investment

7. **Zambia can by upgrading its infrastructure improve its growth performance and as such, its poverty reduction significantly.** Calderon (2007) developed a methodology, which allows counterfactual assessments of the growth performance of any African country based on simulations of alternative stocks and quality of infrastructure using the data for the period 2001-05. Relying on this approach, one can get an educated guess of the additional rate of increase in per capita GDP that Zambia could have achieved during the 2001-05 period, had the country enjoyed the level of infrastructure development of more developed countries (see table 1.2).

8. **The estimates indicate that Zambia could benefit the most from expanding the stock of infrastructure available.** The potential growth benefit of enlarging the stocks of each infrastructure sector could generate an estimated increase in growth that falls in the range of an additional 3.59 percent each year compared to the leader in Africa and 8.49 percent each year when compared the leader among East Asian Tigers.⁴ About 80 percent of these growth increases come consistently from increases in the stock of infrastructure with the remaining coming from improvements in quality.

Table 1.2: Potential growth improvements for Zambia due to infrastructure development (i.e. adjustment of the its level of infrastructure development to a representative level)

| representative level of: | Infrastructure Development | Estimated contribution from Infrastructure Stock in: | | | | Estimated contribution from Infrastructure Quality in: | | | |
|------------------------------|----------------------------|--|---------|-------------|-------|--|---------|-------------|-------|
| | | Total | Telecom | Electricity | Roads | Total | Telecom | Electricity | Roads |
| Leader in Africa | 3.59 | 2.95 | 1.21 | 0.76 | 0.98 | 0.64 | 0.90 | -0.83 | 0.58 |
| East Asia | 5.09 | 3.97 | 1.89 | 1.04 | 1.04 | 1.12 | 1.08 | -0.76 | 0.80 |
| Leader among East Asia Tiger | 8.49 | 6.91 | 1.94 | 1.19 | 3.77 | 1.58 | 1.19 | -0.57 | 0.96 |
| Western Europe | 5.62 | 4.25 | 1.91 | 1.16 | 1.19 | 1.37 | 1.17 | -0.72 | 0.92 |
| Leader among Western Europe | 6.80 | 5.23 | 1.85 | 1.70 | 1.68 | 1.57 | 1.19 | -0.58 | 0.96 |

Source: Calderon (2007)

9. **The need to prioritize sub-sectors of infrastructure.** It is important to point out that the evidence generated in the last few years has also contributed to the somewhat unexpected results on the relative importance for growth of the various infrastructure sub-sectors. International experience and recent empirical evidence consistently suggests that the strongest impact on growth comes from the telecom sector, followed by electricity and roads. This is not to say that this is the correct ranking for Zambia but it is important to recognize that prioritization is often needed to meet fiscal constraints. In that context, it is crucial not to underestimate the impact on growth and poverty reduction of the telecoms sector simply because it requires less public funding or has less of a spillover effect on social indicators e.g. health.

⁴ The leader of infrastructure development in Africa is South Africa in infrastructure stocks and Mauritius in infrastructure quality. The leader for East Asia tigers is South Korea in stocks and Hong Kong in quality.

10. **Telecoms, electricity and transport probably matter a lot more to the firms than to many residential users of infrastructure services.** Since jobs will come from growth and growth will come from investment, it is essential to incorporate the voices of firms. For now, firms in Zambia are expanding and economic activity is developing despite the lack of reliable and cost effective infrastructure. However, firms do so at a cost to Zambia's competitiveness and to Zambia's domestic users. In the case of electricity, firms are increasingly depending on high cost self-provisioning. Many firms own or share private generators despite the fact that this self-generated electricity is two to three times costlier than the one provided by the grid. Costs of electricity self generators are passed on to the product making electricity intensive sectors and therefore the country becomes as a whole less competitive and likely slowing down growth.

11. **The ICT sector in Zambia also has the potential to make significant contributions to economic growth.** The growth of the ICT sector will have a beneficial effect on other segments of the economy. Investment in ICT has been shown to increase productivity across the economy, improve access to information, and has the potential to improve the quality of governance.

1.2. Access to Infrastructure

12. Even though the growth analysis quoted does not include water and sanitation, **there is ample evidence that has underscored the role of safe water and sanitation in improving living conditions and thus human capital of those groups in society, whom are deprived of access to those services.** For example, Leipziger et al. (2002) find that a quarter of the differences in infant mortality and 37 percent of the difference in child mortality between rich and poor are explained by their respective access to clean water and sanitation services. Zambia's infant mortality has not improved since the beginning of the new millennium and stands at 102 deaths per 1000 live births, well above the regional average of 91.

13. **The broad conclusion emerging from an evaluation of access to water and sanitation and electricity is that access has deteriorated significantly over the last decade but also that access to services is highly skewed towards the rich and urban areas.** Even though in many country groupings in Africa access to services has deteriorated or stagnated, it is clear that the urban areas and the two highest quintiles in Zambia have disproportional access to water and sanitation and electricity services compared to all other country groupings in the region.

14. **The challenges to improve access to water and sanitation are not that different from improving access to electricity.** In both cases, increasing access initially is an issue of connecting new users and being able to charge them a cost recovery tariff or getting direct compensation from the government to make up for the financial loss that occur when connecting new customers at tariffs below cost. Without the latter, the financial incentive to connect new customers is non-existent. However, to expand access beyond a certain point new capacity will need to be created. In electricity sector in the form of new power generation plants and in the case of water and sanitation, through new production capacity through new intakes, treatment plants and trunk mains.

Table 1.3: Access to infrastructure by households in Zambia compared to its peers and across income distribution.

| | | as percentage of households | Early 1990s | Late 1990s | Early 2000s | Rural | Urban | Income Distribution | | | | | |
|--------------|-------------------|-----------------------------|-------------------|------------|-------------|-------|-------|---------------------|----|----|----|----|----|
| | | | | | | | | Q1 | Q2 | Q3 | Q4 | Q5 | |
| Water | Piped Water | Zambia | 31 | 21 | 18 | 3 | 46 | 0 | 0 | 0 | 15 | 77 | |
| | | MIC | 50 | 45 | 42 | 17 | 69 | 2 | 16 | 47 | 69 | 86 | |
| | | High Urbanization | 7 | 8 | 22 | 7 | 39 | 1 | 6 | 17 | 32 | 49 | |
| | | Southern Africa | 34 | 34 | 29 | 38 | 65 | 1 | 10 | 26 | 42 | 67 | |
| | | Africa Overall | 18 | 17 | 17 | 4 | 38 | 0 | 3 | 7 | 18 | 46 | |
| | Improved Water | Zambia | 49 | 37 | 34 | 7 | 83 | 0 | 3 | 14 | 60 | 94 | |
| | | MIC | 74 | 67 | 63 | 41 | 90 | 24 | 53 | 72 | 87 | 95 | |
| | | High Urbanization | 41 | 40 | 38 | 19 | 58 | 11 | 25 | 33 | 49 | 62 | |
| | | Southern Africa | 53 | 53 | 46 | 22 | 87 | 13 | 30 | 39 | 62 | 89 | |
| | | Africa Overall | 32 | 32 | 32 | 14 | 63 | 6 | 13 | 21 | 38 | 69 | |
| | Sanitation | Improved Sanitation | Zambia | 29 | 21 | 20 | 3 | 49 | 0 | 0 | 2 | 18 | 78 |
| | | | MIC | 40 | 41 | 39 | 9 | 71 | 0 | 3 | 30 | 79 | 93 |
| | | | High Urbanization | 21 | 27 | 26 | 9 | 50 | 1 | 5 | 15 | 38 | 74 |
| | | | Southern Africa | 34 | 32 | 33 | 15 | 66 | 1 | 8 | 30 | 56 | 75 |
| | | | Africa Overall | 16 | 17 | 20 | 8 | 40 | 0 | 3 | 10 | 23 | 53 |
| Flush Toilet | | Zambia | 27 | 21 | 18 | 2 | 47 | 0 | 0 | 1 | 14 | 76 | |
| | | MIC | 38 | 33 | 31 | 4 | 58 | 0 | 2 | 22 | 61 | 78 | |
| | | High Urbanization | 17 | 18 | 19 | 5 | 38 | 0 | 1 | 9 | 25 | 61 | |
| | | Southern Africa | 27 | 27 | 22 | 2 | 57 | 0 | 3 | 13 | 39 | 59 | |
| | | Africa Overall | 9 | 9 | 10 | 2 | 25 | 0 | 1 | 4 | 12 | 34 | |
| Electricity | Zambia | 23 | 20 | 13 | 3 | 45 | 0 | 0 | 0 | 15 | 84 | | |
| | MIC | 59 | 55 | 52 | 15 | 72 | 2 | 16 | 34 | 68 | 91 | | |
| | High Urbanization | 37 | 47 | 51 | 30 | 82 | 9 | 33 | 38 | 76 | 92 | | |
| | Southern Africa | 36 | 37 | 33 | 13 | 69 | 3 | 14 | 28 | 45 | 79 | | |
| | Africa Overall | 23 | 28 | 29 | 12 | 71 | 4 | 14 | 20 | 38 | 72 | | |

Source: AICD database; Calculations by World Bank staff based on household budget surveys.

1.3. Infrastructural Spending and Investment Needs.

15. **Zambia faces a basic fiscal trade-off.** One of the main issues facing the Zambian authorities is how to manage the availability of budgetary room without any prejudice to the sustainability of a government's financial position. This highlights the dilemma faced by Governments across Africa that has suddenly gained additional fiscal space because of the recent rounds of debt relief. This fiscal space was designed to allow the planned increases in investments, especially in infrastructure, which are needed for accelerating economic growth. However, it has also created strong demands for wage increases within the public sector.

16. **Zambia has not spent enough on infrastructure and its overall spending on infrastructure is declining over time.** Given its income per capita and limited country affordability, Zambia's infrastructure spending is low, suggesting that it might have to double its levels to close severe infrastructure gaps to help sustain rapid economic growth. In regional and international comparison, Zambia spends a relatively low amount on budgetary infrastructure services. This is substantially lower than social sector spending. The low level of infrastructure spending may provide a powerful explanation for the still disappointing performance of some of the infrastructure sectors. In the case of telecom, the issues are more nuanced as the private sector is expected to invest, in particular, in the expansion of the mobile sector. Consequently, the role of government is more related to providing a legal and regulator environment that is promoting private investment in the sector, while limiting its financial involvement to address universal access issues.

17. **The downward trend for infrastructure capital expenditures is worrisome,** in the period from 2004 to 2006 capital expenditures decrease from 3.7 percent of GDP to 1.8 percent of GDP. Table 1.4 below represents budget estimates of central government's expenditure on infrastructure as a share of GDP for years 2004-2006. Though this trend can be partially explained because of fiscal tightening, as total central government's capital expenditures also decreased for that period (from 8.7 percent of GDP in 2004 to 3.9 percent of GDP in 2006), this development is quite worrisome.

Table 1.4: Central government's expenditure on infrastructure
(estimates as a share of GDP for years 2004-2006)

| Infrastructure public expenditure | 2004 | 2005 | 2006 |
|--|-------------|-------------|-------------|
| Capital Expenditures | 3.7 | 2.6 | 1.8 |
| Current expenditures | 0.5 | 1.9 | 1.3 |
| Sum of Total expenditures | 4.2 | 4.5 | 3.1 |

Source: Minister of Finance and National Planning

18. **In addition, the share of government budget allocated to infrastructure capital spending shows a downwards trend in recent years.** Although the total share of government's expenditures on infrastructure has remained at around 15 percent of total government's expenditure, the share of capital expenditures on infrastructures has decreased considerably from 14 percent of total expenditures in 2004 to only 7.9 percent in 2006, as table 1.5 reports.

Table 1.5: Central Government Budget and Infrastructure Expenditures
(estimates in percentages)

| Aggregate CG Budget (GDP Share) | 2004 | 2005 | 2006 |
|---|-------------|-------------|-------------|
| Total expenditures | 26.7 | 25.7 | 22.7 |
| o/w capital expenditures | 8.7 | 7.0 | 3.9 |
| | | | |
| Infrastructure Spending (as a Share CG Budget) | | | |
| Total infrastructure Spending | 15.9 | 17.3 | 13.4 |
| Infrastructure Investment | 14.0 | 10.1 | 7.9 |

Source: Minister of Finance and National Planning

19. **Top priority in the budgetary infrastructure spending is allocated to the transport sector.** The sectoral allocation reported in table 1.6 shows that the transport sector is the main beneficiary of governmental allocation of budget, with almost 60 percent of the infrastructure budgetary allocation. There are almost no expenditures on the telecom sector apart from small amount reserved for internet backbone cable and rural phone installations in year 2006.

Table 1.6: Share of Sectoral Infrastructure Expenditures in the Central Government Budget

(estimates in percentages)

| | 2004 | 2005 | 2006 | Period Average |
|-----------------|------|------|------|----------------|
| Communication | - | - | 0.02 | 0.0 |
| Fuel and energy | 9.9 | 0.4 | 0.7 | 3.9 |
| Irrigation | - | 0.1 | 0.08 | 0.06 |
| Transport | 34.8 | 67.0 | 82.8 | 59.5 |
| Water supply | 55.3 | 32.4 | 16.4 | 36.5 |

Source: Minister of Finance and National Planning

20. **SOE spending finances the lion's share of infrastructure in Zambia in some of the infrastructure sectors.** The bulk of this public spending (approximately 4 percent of GDP) is realized through public spending in infrastructure disbursed through SOEs, such as ZESCO. This spending is financed through parastatals' revenues, loans from central government (direct or on-lending), and ad hoc transfers. Table 1.7 below summarizes expenditures of ZESCO, and Lusaka Water and Sewerage Company.

Table 1.7: Expenditures of SOE's Central Government Budget and Infrastructure Expenditures

| (estimates in percentages) | | | | | | | |
|----------------------------|-------|-------------------|-------------|-------------|-------------|-------------|-------------|
| | | as a share of GDP | 2001 | 2002 | 2003 | 2004 | 2005 |
| Electricity | ZESCO | Total | <u>3.38</u> | <u>3.93</u> | <u>4.35</u> | <u>4.26</u> | <u>3.63</u> |
| | | Capital | 0.54 | 0.98 | 1.52 | 1.60 | 1.48 |
| | | Current | 2.84 | 2.95 | 2.83 | 2.66 | 2.15 |
| Water | LWS | Total | <u>0.19</u> | <u>0.15</u> | <u>0.15</u> | <u>0.14</u> | <u>0.12</u> |
| | | Capital | 0.01 | 0.004 | 0.01 | 0.01 | 0.01 |
| | | Current | 0.18 | 0.14 | 0.13 | 0.12 | 0.10 |

Source: Minister of Finance and National Planning

Investment Needs

21. In each of the sub sectors significant investments are to be made to improve the stock and quality of service and consequently access and service delivery.

A. Water and Sanitation

22. Current projections for resources available for expenditures in water and sanitation in Zambia indicate that without substantial increases, the Millennium Development Goal (MDG) that aims to reduce by half the proportion of people without

sustainable access to safe drinking water is unlikely to be met. A costing estimate, undertaken by GRZ, shows that expenditures amounting to US\$362 million⁵ will be needed for the period up to 2015 to be able to meet the MDG in the rural areas alone. A detailed expenditure plan to improve the situation in urban areas is not (yet) available.

23. **It is well known though that improved access to water and sanitation services in the urban and peri-urban areas will require significant and rather lumpy investments.** For example, LWSC needs to expand its production capacity with a second pipeline to the Kafue river with an associated treatment plant and intakes. This investment alone equals approximately US\$150 million. Most likely similar investments in other urban areas in Zambia will be needed. The financing of the urban and peri-urban expansions are not secured at this stage.

24. **The financial needs to improve rural access can be, for a large part, met through donor funds.** Donors have indicated that up to US\$210 million can be made available to improve water and sanitation outcomes in Zambia up to 2010. However, financial sustainability will need to be secured through cost recovery tariffs while improvements will need to be made in institutional and financial capacity within local authorities and utilities to manage the increase access and usage that these expenditure programs are to accomplish. This includes strengthening of information systems such that one can evaluate and track the results of the expenditure programs.

25. As indicated **expansion of service provision, requires a decision by government on how to ensure that the cost of service delivery is fully covered.** The government can decide to ensure that tariffs reflect cost or decide that access to water and sanitation services is a service that should be subsidized. Until now, water and sanitation utilities, have not received a cost recovery tariff or an explicit subsidy from the government. This has led to a deteriorating asset position by the utilities. Note also that the stance taken by the regulator regarding increases in tariffs requires upfront performance improvements which in turn require upfront investment and thus capital that the utilities do not have access to.

B. Power.

26. **In order to meet the growing electricity demand, investments must be made in power generation and in transmission and distribution lines, including for new connections.** A recent World Bank study estimates that substantial investments are needed in the power sector in the countries that are a member of Southern Africa Power

⁵ The US\$362 million includes US\$260 million in capital investments, US\$45 million in operating cost at the district level, US\$11 million at the community level, and US\$18 million at the national level; and US\$27 million in sector development cost. Investment would start at approximately US\$30 million increasing to US\$50 million by 2015

Pool (SAPP)⁶ before 2015 to keep electricity access rates at today's level, that is merely, to meet the electricity demand growth that stems from reducing black outs, general economic development, and population growth.

27. **The study estimates that in the SAPP region almost 31.3GW of new capacity is needed, while a 28GW of existing capacity must be refurbished by 2015.** This together with investment in and maintenance of transmission and distribution lines will require a grand total of US\$64 billion in expenditures. It is clear that more ambitious targets for electricity access require even larger investments. However, the incremental cost of meeting more ambitious targets are relatively small compared to the cost of meeting market demand and reduction of black outs and keeping access rates constant.

28. **In 2005, Zambia's access to electricity was estimated to be around 12 percent for the country as a whole, with 2.9 percent of rural households and 45.1 percent of the urban households connected.** A World Bank study summarized in table 1.8, explores two different access scenarios: one, which keeps access at current levels, and one that increases it to 24 percent using GRZ targets for rural and urban access. These investment needs can be met through improved connectivity in particular with DRC or through increased generation in Zambia. It is clear that annual amounts of US\$430 to 630 million in investments between now and 2015 will be difficult to mobilize from the public purse or through donor funding and that public private partnership can contribute to closing the financing gap in the sector.

Table 1.8: Estimates of investment needs in generation, transmission and distribution until 2015.

| in US\$ millions | | Trade expansion | | Increase domestic generation |
|------------------|--------------------|------------------------------|-------------------------------|-----------------------------------|
| | | Maintain current access rate | Increase access to 24 percent | National targets for access rates |
| Generation | Investment Cost | 0 | 7 | 2310 |
| | Refurbishment cost | 319 | 319 | 319 |
| T&D | Investment Cost* | 2349 | 2679 | 1538 |
| | Refurbishment cost | 655 | 655 | 655 |
| TOTAL | | 3323 | 3660 | 4822 |

* Includes O&M costs of existing transmission and distribution.

Source: AICD database and AICD publications

⁶ The following countries are part of the Southern Africa Power Pool: Angola, Botswana, DRC, Lesotho, Mozambique, Malawi, Namibia, South Africa, Zambia, and Zimbabwe.

C. Telecommunications

29. **It is clear that Zambia has made great strides in widening access to telecommunication services in the mobile voice segment of the market with 46 percent of the population within the range of a mobile signal in 2006.** Even though significant progress has been made in the mobile voice segment in the last few years, the average is still well below 57 percent for Africa as a whole. In 2006, 14 inhabitants out of each 100 had a mobile phone subscription up from only 0.9 in 2000. It is also clear that in the fixed line segment, little or no investment has taken place and consequently no increase in access in this market segment has materialized: only 0.8 out of each 100 inhabitants have a fixed line connection.

30. **To quantify investment needs of the remaining uncovered areas in Zambia, a method developed by Navas-Sabater et al (2002) and Stern (2006) was used to estimate annual investment needs between 2007 and 2015 to reach universal coverage by 2015.** A distinction was made between areas with potential for commercially viable coverage and areas lacking potential for fully commercial coverage, with the latter broken down in areas with enough viability to support infrastructure operating cost but not the initial capital investments and areas lacking sufficient market viability to cover either capital or operating cost. These gaps are for convenience labeled efficient market gap, coverage gap respectively with the latter broken down in sustainable coverage gap and universal coverage gap.

31. **The analysis for Zambia shows that the efficient market gap in voice infrastructure, the un-served market segment that would be covered in a perfectly competitive world, includes 50.7 percent of the population, with the remaining gap of only around three percent falling under the coverage gap,** the un-served market segment that would require a subsidy of some kind to be covered. Of the three percent approximately one third would fall under the universal coverage gap. The relatively large size of the efficient market gap suggests that the private sector could be induced to cover the vast majority of Zambia's remaining uncovered population under economically conducive conditions and a favorable regulatory environment.

32. **Investment needed in voice infrastructure to provide universal access and to operate and maintain that infrastructure from 2007 to 2015 is estimated to amount to US\$39.5 million annually.** At least US\$ 28.7 million annually is needed to close the efficient market gap, while the remaining US\$10.8 million is needed to close the coverage gap. The investment needed to close the coverage gap is divided further into funding for sustainable coverage gap and the universal coverage gap. The sustainable coverage gap for Zambia is estimated to require US\$6.6 million of investment annually with the universal coverage gap requiring the remaining US\$4.4 million. Note that if one assumes that the efficient coverage gap will be financed by the private sector, that the public funding needed will be equal to investment cost under the sustainable coverage gap and the full cost of the universal coverage gap. For Zambia, the public funding gap is estimated to amount to US\$5.9 million annually.

33. In addition to the investments needed to provide universal voice services **additional investments are needed to provide (wireless) broadband services to all Zambians.** However, to provide broadband services to Zambia, will require investments in regional connectivity as well as linking with international fiber networks. Various submarine cable initiatives are under way to link Zambia and Africa with the global networks. To put in place a broad band infrastructure that would that would provide universal service through internet café or telecenter model, would require an additional annual investment of US\$23.4 million, of which it is estimated to be fully covered by the private sector.

D. Transport

34. The FNDP recognizes that **transport plays an important role as a catalyst for economic development by integrating Zambia such that people and goods and services can move location to achieve their full potential.** It is clear that a mine without a road or railway will find it difficult to export its minerals and a tourist will not be able to enjoy Zambia's wildlife without the means to get there. As can be seen from the data in box 1.1, Zambia's road infrastructure is quite a bit less developed than other countries such as South Africa, Zimbabwe, and Malawi, but in better shape than Angola, Madagascar and Botswana. The Government is well aware of the importance of transport for Zambia's growth and indeed made in each of its development plans roads a priority for investment. However, the availability of resources has always been a binding constraint. Investment needs for the road sector alone to maintain and expand selectively Zambia's road network have been estimated to cost approximately US\$185 million annually between now and 2010.

Table 1.9: Estimated investment needs in road transport

| Programme | 2007 | | | | 2008 | | | | 2009 | | | | 2010 | | | |
|--|--------------------|--------------|--------------|--------------|--------------------|--------------|--------------|--------------|--------------------|--------------|--------------|--------------|--------------------|--------------|--------------|--------------|
| | Cost in K Billions | | | In M US\$ | Cost in K Billions | | | In M US\$ | Cost in K Billions | | | In M US\$ | Cost in K Billions | | | In M US\$ |
| | GRZ | Donors | Total | Total |
| Road Infrastructure Management | 129.8 | 116.3 | 246.1 | 60.4 | 133.1 | 195.1 | 328.2 | 75.6 | 149.7 | 195.1 | 344.8 | 74.3 | 141.5 | 195.1 | 336.6 | 67.9 |
| Rural Road Rehabilitation | 100.0 | 0.0 | 100.0 | 24.6 | 100.0 | 0.0 | 100.0 | 23.0 | 100.0 | 0.0 | 100.0 | 21.5 | 120.0 | 0.0 | 120.0 | 24.2 |
| Tourist and National Park Roads | 50.0 | 0.0 | 50.0 | 12.3 | 70.0 | 0.0 | 70.0 | 16.1 | 100.0 | 0.0 | 100.0 | 21.5 | 100.0 | 0.0 | 100.0 | 20.2 |
| Road Infrastructure Rehabilitation (TMD) | 60.0 | 279.7 | 339.7 | 83.4 | 55.0 | 117.6 | 172.6 | 39.8 | 80.0 | 193.7 | 273.7 | 59.0 | 100.0 | 54.5 | 154.5 | 31.2 |
| Road Infrastructure Development | 147.5 | 0.0 | 147.5 | 36.2 | 95.7 | 0.0 | 95.7 | 22.1 | 111.7 | 0.0 | 111.7 | 24.1 | 131.7 | 0.0 | 131.7 | 26.6 |
| Rural Accessibility and Mobility* | 0.7 | 14.7 | 15.4 | 3.8 | 0.6 | 16.0 | 16.6 | 3.8 | 0.7 | 13.3 | 14.0 | 3.0 | 0.8 | 13.6 | 14.4 | 2.9 |
| Grand Total | 488.0 | 410.7 | 898.7 | 220.7 | 454.4 | 328.7 | 783.1 | 180.5 | 542.1 | 402.1 | 944.2 | 203.5 | 594.0 | 263.2 | 857.2 | 173.0 |

Source: FNDP (2006)

Summary

35. Adding up the investment needs to strengthen growth and improve access, **the average annual amount for the coming three years will be close to US\$1.0 billion or 10 percent of GDP.** It should be clear that it will be extremely difficult to source such amount of resources from the government's budget and that alternative ways, including increasing tariffs to cost recovery levels, should be looked into to ensure that Zambia can maintain its current growth momentum but also can provide at least a minimum of infrastructural services to its citizens.

1.4. Issues of Regulation, Tariff Setting and Affordability

36. **The orthodox advice given to policymakers in developing countries has emphasized the importance of carrying out regulatory functions with independence, transparency, and insulation from political influence.** Consequently, much of the discussion of regulatory reform has focused on the institutional foundations of regulatory effectiveness and non-discretionary governance. Clearly, the establishment of institutional mechanisms that impose procedural restraints on arbitrary administrative intervention provides an important signal to potential investors that their value will not be

subjected to political expropriation. This type of commitment that flows from features of the country's legal and regulatory systems effectively reduces investment risk and consequently the discount rate applied to net present value and cash flow calculations.

37. **However, while regulatory independence is important, it is by no means a panacea.** For any investment plan focusing on increasing access and/or expanding capacity to be viable, the fundamental sector economics, including pricing must be right. After all a pricing policy and performance orientation by the regulator that is not consistent with revenue adequacy, even if it is implemented by an independent regulator in a transparent manner will make it virtually impossible to find the financing needed and/or still repel investors. In the face of large investment needs, it is imperative that policy makers focus also on developing effective consultative processes and defining the substantive content of the sector's regulatory governance in order to create an economically attractive investment climate.

38. **Perhaps the single most important element of an investment-oriented policy is pricing reform.** A key priority in attracting private investment is to devise a regulatory regime, which facilitates the move to cost-reflective tariffs and hence permits operators to attain revenue adequacy i.e. the revenue level necessary to be able to attract financing in order to maintain, replace, modernize, and, where appropriate, expand their facilities and service. The interests of users would be better served if operators were not unduly constraint by price controls that do not reflect the cost of doing business in the sector and the realities of the market i.e. if they are accorded price flexibility within boundaries determined by the avoidance of cross-subsidization and monopolistic pricing. Increased pricing flexibility will enable operators to achieve revenue adequacy – generate increased cash flows and more effectively raise financing from external sources.

39. **Inefficient pricing policies were one of the most important causes for the secular deterioration in the performance of utility sectors in developing countries prior to the reform era of the 90ties.** Developing countries, unfortunately, are in a less of a position to afford the cost of resource misallocation and inefficiencies in production than their developed counterparts. Price controls are often imposed without due regard to their performance implications, subjecting the operating entities to considerable financial distress and substantially impairing their ability to maintain and expand service, especially in peri-urban and rural areas.

40. **The picture in terms of cost recovery for water and electricity is bleak.** In the water and electricity sector, the situation is bleak, as shown by the worsening of the financial performance of the utilities. At present water and sanitation services in rural areas covers recurrent costs through tariff revenues, while capital costs are covered by external grants and concessional loans. The tariffs for other services (electricity and urban water & sanitation) are not set at levels sufficient to cover recurrent costs, in addition only a fraction of their capital costs is covered by grants and concessional loans. As a result, these public utility companies operate in chronic deficit, affecting the quality of the services provided and their long-term sustainability. In the wake of another scale up in infrastructure investment attention needs to be given to ensuring that the benchmark rates of return that guide the levels for utility tariffs are set at an adequate level.

41. **Financial viability in the water sector is continuing to improve with six of the ten commercial utilities operating in Zambia reaching operational cost coverage by the end of 2006.** However, this is adversely affected by the non payment for services by government institutions. The arrangements that have been put in place for collecting the debt through the Ministry of Finance and National Planning are not working as well as one expected. Until there is a sure commitment from government to meeting its obligations for the services, it will be very difficult to meet full cost recovery in the water sector. The government could reduce on its infrastructure investment requirements to the water utilities by paying for water promptly to the utilities. It should also be clear that the non-payment by government agencies to the water utilities has led to the water utilities occurring payment arrears to ZESCO, further complicating the functioning of each of these utilities.

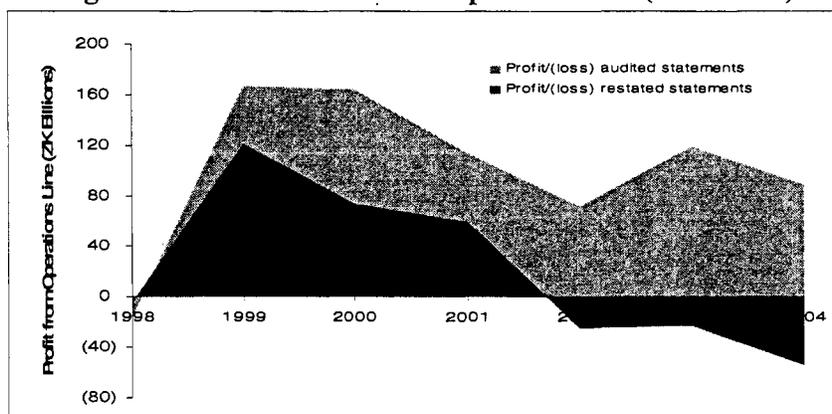
42. **In the energy sector, the combination of hydropower and excess capacity translates into low electricity tariffs for users.** In addition, ZESCO's lack of provision for the cost of replacement of its hydropower investments and under-investment in ongoing operations and maintenance expenditures further contributed to low prices. The combined result of the favorable endowment, and of dubious managerial decision-making was that over the past few decades Zambian users of power have enjoyed among the lowest electricity tariffs in the world, with prices to residences, business and mines (which accounted for about half of total power consumption) all paying below 3c (US) per kilowatt hour. In the power sector, one of the most energy intensive users in the Zambian economy, the mining, whose consumption (which accounted for about half of total power consumption) has been heavily subsidized.

43. **Long term agreements provide electricity to the mines at an exceptionally favorable price** (in particular, ZESCO sells the Copperbelt Energy Corporation (CEC) for 2c per KWh and CEC re-sells at 3c per KWh. According to the cost of service, ZESCO's full cost to serve current and expected new loads ZESCO's current average tariffs of US\$ 2.66 cents per KWh would have to step up by 45 percent to US 3.87 cents per KWh in 2008 and would have to continue increasing by about 6 percent a year thereafter. The average mining tariffs would require an increase of 28 percent to cover full cost to serve the mining loads, increasing from US\$ 2.34 to 3.01cent /KWh. This raises the question of whether the CEC supply contract and the new contracts with retail mining customers can be reopened and renegotiated. If tariffs are not increases, the current mining load could accumulate a deficit of US\$ 926 million over the next 10 years, unless the current pricing structure is rebased. Export prices would also need to be increased by about 15 percent.

44. **The Government has also continued to treat ZESCO as a provider of unremunerated services.** For instance, in the past year, ZESCO has complied with the Government request to install two diesel set generators in remote locations, where power costs them 25-30 US cents per kWh, but they are allowed to charge only 2.5 US cents per kWh. The main short-term threats to fiscal prudence are pressures for the budget to pay for the inefficient tariff policy and operations of the mining companies. Therefore, it is how responsibly Zambian government manages these pressures that will determine the success of its quest for continued strengthening of fiscal and the overall macro stability.

45. **The financial situation of the SOEs has substantially deteriorated.** ZESCO is a clear case in point as its financial performance has continued to deteriorate, as shown in Fig. 1.6. Without the debt swaps to boost income, ZESCO would have been incurring operating losses every year. ZESCO is currently unable to meet its obligations to its trade creditors from recurrent revenues, and has resorted to borrowing at high cost from commercial banks to meet working capital requirements.

Figure 1.1: ZESCO's financial performance (1998-2004)



Source: ZESCO and Bank staff calculations

46. **Different reasons contribute to the poor performance of ZESCO:** (i) low tariffs; (ii) imported electricity at much higher cost than existing tariffs to substitute for domestic production, due to unavailability of the generating units under the on-going rehabilitation and re-powering; (iii) recurring and increasing governmental agency arrears; and (iv) extension of diesel-based rural electrification at higher cost (US cents 25-30/kWh) compared to the tariff charged to rural consumers of US cents 2.5/kWh. As seen before, the 2003 commercialization roadmap included a provision barring ZESCO from Government bailouts for its losses, and government guarantee of its borrowings. Given ZESCO's weak financial position, these conditions effectively deny ZESCO any avenue for raising long-term financing to support its major investment programs.

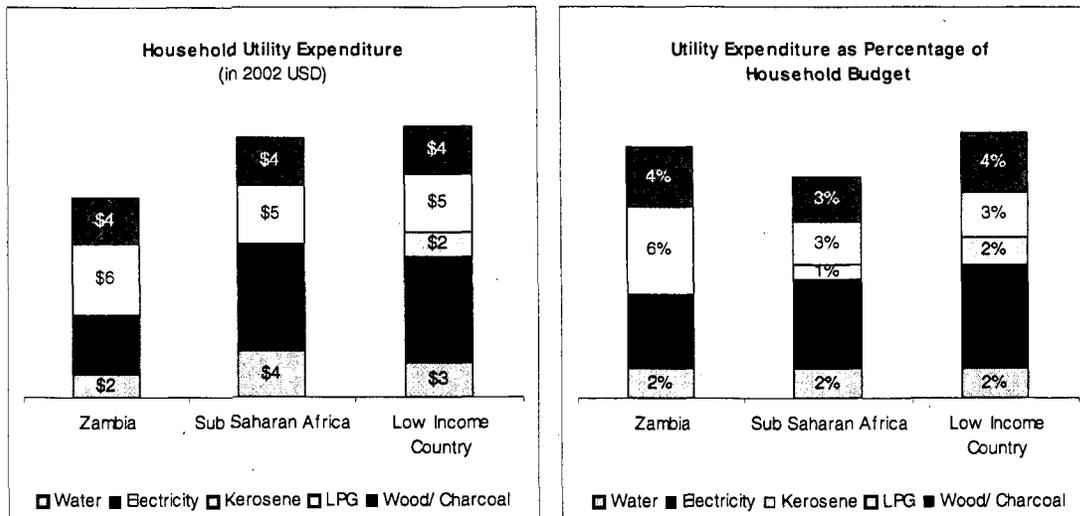
47. **For telecom, setting interconnection prices right would help bring mobile prices down.** Right now, there are several interconnection disputes in court. The current law does not give enough power to the regulator to settle these disputes. The new ICT bill (which has been pending for quite a while) would allow for easier settlement of telecom interconnect disputes. Agreement on cost based interconnection tariffs would also help bring prices down.

Affordability Challenges

48. **Total utility expenditure in Zambia is above average and account for a higher proportion of the household budget for regional peers.** Given that only a minority of households has access to the full range of modern infrastructure services, total expenditure on the aggregate utilities category can be a little misleading since most households only register expenditure on some of the services. Nevertheless, it is

interesting to examine the overall budget share dedicated to all infrastructure services and examine its variation across urban-rural areas and expenditure quintiles.

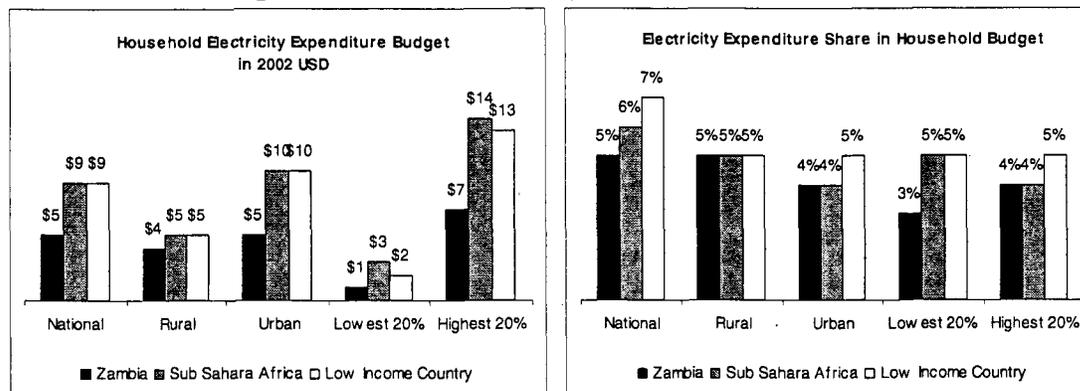
Figure 1.2: Household Utility Expenditure



Source: AICD WSS Survey Database, 2007

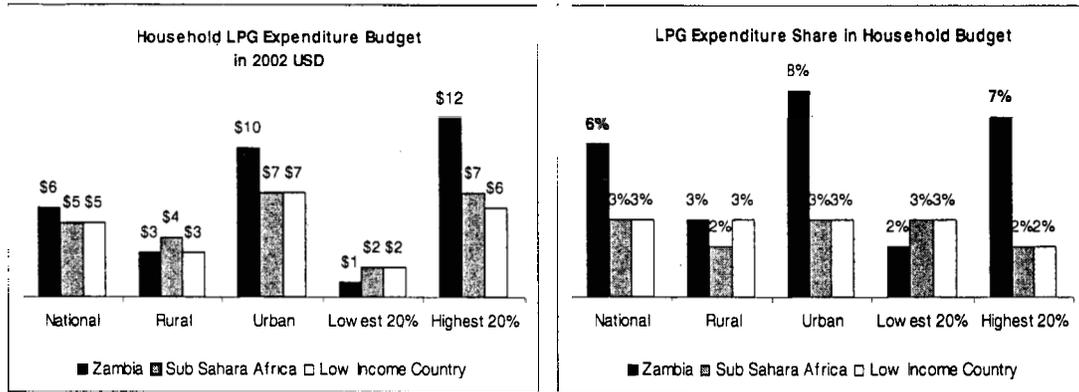
49. **The use of electricity is low for Zambia.** Household expenditure for natural gas and wood/charcoal dominates the one for electricity, both in terms of monthly expenditure in monetary terms as well as a percentage of the household budget. As shown in Figure 1.2-1.5, this trend is in contrast to both regional and income peer where the expenditure on electricity is almost twice in monetary terms and account for a higher percentage of household budget.

Figure 1.3: Household Expenditure on Electricity



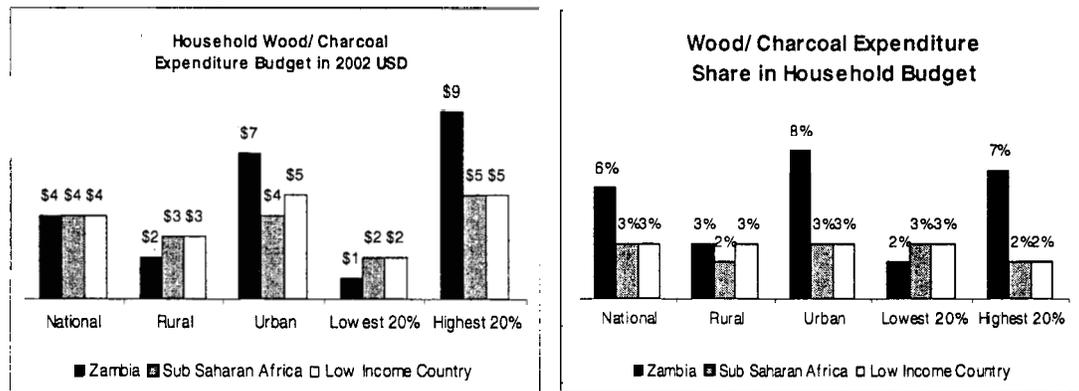
Source: AICD WSS Survey Database, 2007

Figure 1.4: Household Expenditure on LPG



Source: AICD WSS Survey Database, 2007

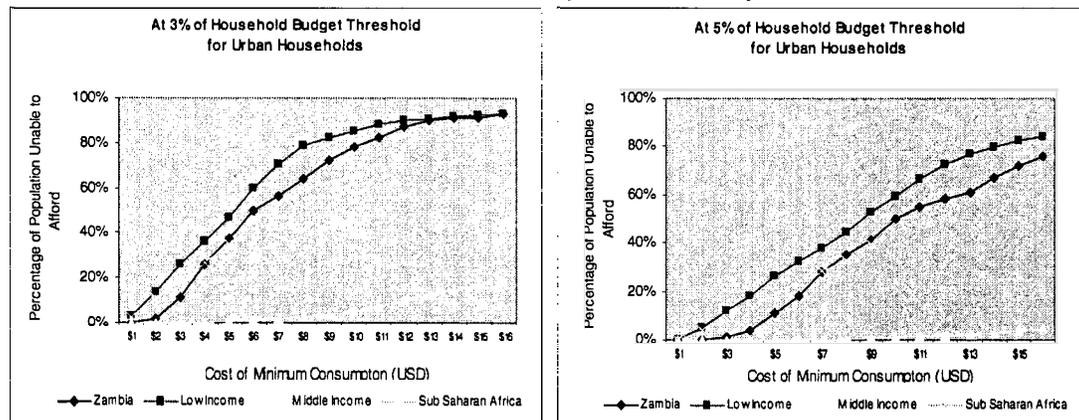
Figure 1.5: Household Expenditure on Wood/Charcoal



Source: AICD WSS Survey Database, 2007

50. **Zambia is one of the few African countries where this trend in urban rather than rural areas.** Figure 1.6 shows how electricity accounts for a substantially lower expenditure in the budget in urban areas, whereas both natural gas and wood/charcoal is substantially higher than for its regional and income peers.

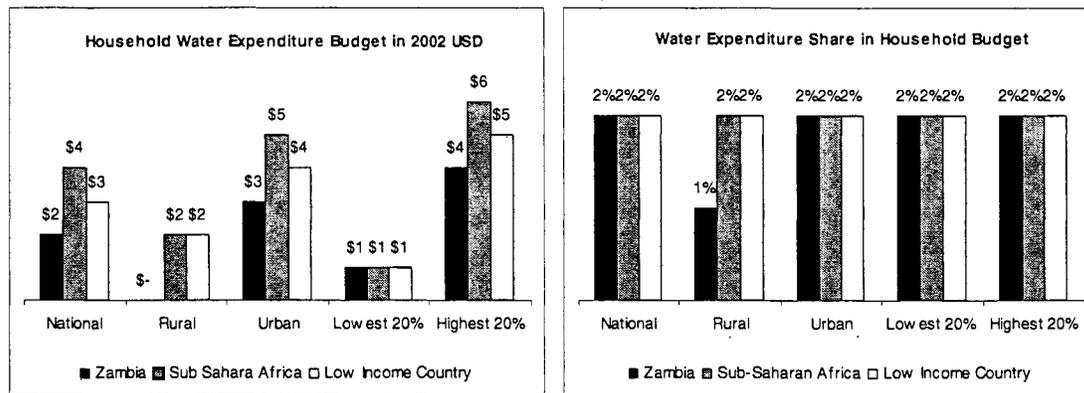
Figure 1.6: Utility Affordability



Source: AICD WSS Survey Database, 2007

51. **The survey data on income distribution provides the basis for calculating the tariff that would provide.** The household survey data on budget expenditures across households is used to estimate what percentage of households would hit the 5 percent affordability thresholds at different levels of absolute expenditure. Figure 1.7 below plots calculating the percentage of households that would fall beyond the 3 and 5 percent affordability threshold at any particular absolute monthly cost of service in Zambia vis-à-vis low regional and income peers. The vast majority of urban households (at least 70 percent and in some cases over 90 percent of households) would be unable to afford a monthly expenditure of US\$10.

Figure 1.7: Household Expenditure on Water

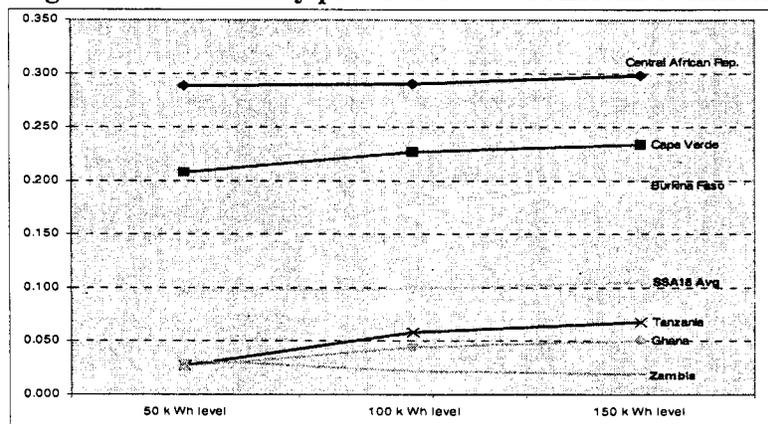


Source: AICD WSS Survey Database, 2007

52. **The Zambian case reveals several incentive issues.** Given that the Zambian consumers have reasonably good levels of service, low payment levels, and minimal penalties for nonpayment, they have very little incentive to reveal their willingness to pay for service delivery. Further, ability to pay information can be distorted as consumers have little incentive to report income and there is hardly any parallel or informal market from which ability to pay can be inferred.

53. **Zambia is one of the few countries in the Sub-Saharan countries where the tariff favors the largest consumer** since small consumers have to pay 46 percent more per kWh than the middle consumers and 72 percent more the large ones. This is due to the fact that Zambia’s electricity tariff includes a fixed charge that is high, as shown in Figure 1.8 In addition, ERB introduced a high “lifeline” consumption level for the lowest domestic tariff rate, which has contributed to ZESCO’s financial difficulties.

Figure 1.8: Electricity prices in selected African countries



Source: AICD and several country specific energy related publications

54. **The same holds for water.** Both the fixed fee and minimum consumption charge, where used as illustrated in Table 1.10 -- that is, the part of the water bill that they cannot control irrespective of their level of consumption -- place an enormous burden on low volume consumers, while high volume consumers actually reap the benefits of this policy.

Table 1.10: Structure of Tariffs Implemented by Water Utilities, 2007

| Utility | Type of tariff | Metering Ratio (%) | Minimum Consumption (m3) | Fixed charge | Number of blocks | Size of 1st block (m3) | Size of Nth block (m3) | Price of 1 st block (USD) | Price of Nth block (USD) |
|--------------------|----------------|--------------------|--------------------------|--------------|------------------|------------------------|------------------------|--------------------------------------|--------------------------|
| SWSC | IBT | | 6 | N | 4 | 10 | 50+ | 0.30 | 0.47 |
| LWSC | IBT | 33.3 | 0 | Y | 5 | 6 | 170+ | 0.25 | 0.55 |
| NWSC | IBT | | 0 | N | 4 | 6 | 50+ | 0.25 | 0.37 |
| MIC Average | 78.2 | | | | 4.4 | | | 0.23 | 1.50 |
| LIC Average | 66.4 | | | | 2.9 | | | 0.34 | 0.80 |

Source: AICD WSS Survey Database, 2007

55. **Un-metered consumers face a high fixed charges and connection fee.** However, those households without meters can escape the enforcement mechanism of the water utilities resulting in revenue loss. To capture the un-metered customers, there is a fixed charge that is typically levied on a monthly basis. For the CUs in Zambia both rates are significantly higher than in other countries, including Ghana and Nigeria (see table 1.11).

Table 1.11: Structure of un-metered tariffs

| Utility | Country | Type of tariff | Fixed charge (USD) | Connection fee (USD) |
|------------|---------|----------------|--------------------|----------------------|
| GWCL | GHA | Fixed Charge | 3.11 | 235.29 |
| FCT WB | NGA | Fixed Charge | 3.14 | 15.68 |
| Kaduna | NGA | Fixed Charge | 10.59 | 55.41 |
| Katsina WB | NGA | Fixed Charge | 5.45 | |
| SWSC | ZAM | Fixed Charge | 12.16 | 50.00 |
| LWSC | ZAM | Fixed Charge | 7.84 | |
| NWSC | ZAM | Fixed Charge | 6.53 | 235.29 |

Source: AICD WSS Survey Database, 2007

56. **Informal prices are very high.** The formal tariff may not provide an accurate reference of what consumers really pay. The informal prices are much higher than the formal ones. As Table 1.12 shows that, the unofficial price can be as more than nine times the official price in the capital city of Lusaka. Hence, increasing legal connections is key, as this will lower cost of service provision to the poor. In addition, this would also increase revenues and thus allow for improved financial performance as additional connections is an increasing returns to scale activity.

Table 1.12: Structure of Stand-post/Public Fountain Tariffs

| | Official Stand-post price (USD/m ³) | Unofficial Stand-post price (USD/m ³) | Official price at 4 m ³ | Ratio of Unofficial to official price | Ratio of Official Piped Water Price at 4m ³ to Official Stand-post Price |
|------|---|---|------------------------------------|---------------------------------------|---|
| SWSC | | | 0.30 | | |
| LWSC | 0.19 | 1.67 | 0.56 | 9.03 | 3.02 |
| NWSC | | | 0.25 | | |

Source: AICD WSS Survey Database, 2007

57. **Overall, consumption subsidies for electricity and water appear to be poorly targeted in African countries.** This is because access factors are important in determining the potential beneficiaries of consumption subsidies. As poor households tend to live in areas without electricity and water service, it is impossible for them to benefit from the subsidies. In addition, even when there is potential access to the network where the poor live, many among the poor remain not connected to the networks, either because they live still too far from the electric lines or water pipes, or because the cost of connecting to the network and purchasing the equipment required to use electricity and water is too high.

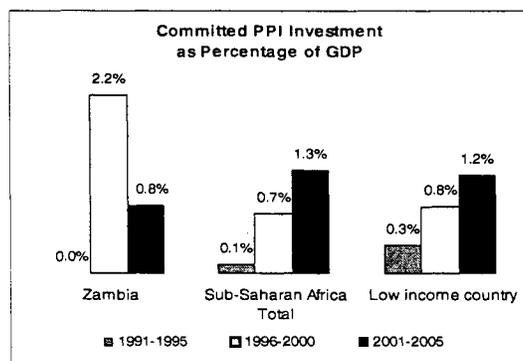
2. Benchmarking Zambia's Public Private Partnerships in Infrastructure

Introduction.

58. The key issue to address is how Zambia can best tap the additional resources needed to meet its infrastructure challenges. In what follows, the scope for enhancing private sector financing will be assessed against the past record in attracting private sector financing and the current plans to enhance private sector participation in infrastructure.

59. Despite a relatively late start, Zambia has made efforts to leveraging PPPs in infrastructure development since 1997 when the country made its first major PPI commitment. As shown in Fig. 3.1, in the period ranging from 1996 to 2000, Zambia's PPI commitment totaled US\$ 350 million, accounting for 2.2 percent of its GDP, well exceeding the SSA regional average of 0.7 percent and the low-income country average of 0.8 percent, and on par with lower middle-income country average of 2.5 percent.

Figure 2.1: PPI Investment Trends (1991-2005)



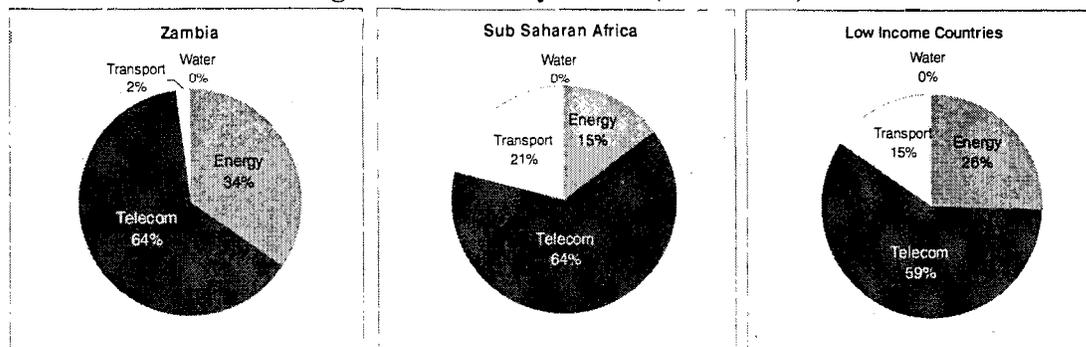
Source: World Bank/PPIAF PPI Database

60. However, the recent trend over the past five years reveals a decline in the significance of PPPs with a total of US\$200 million committed investment, accounting for 0.8 percent of the country's GDP. The most recent PPP transactions are also smaller in scale. This contrasts to the trend in other countries belonging to the SSA region and low-income countries that have experienced an overall growth in PPI investments. In 2006, Zambia recorded an additional US\$238 total committed investment made by CelTel, one of the two private cellular operators, accounting for 2.2 percent of the country's GDP.

61. No private investment has been targeted to the dominant operators of telecom, energy and water utilities. As Fig. 3.2 shows the bulk of Zambia's PPI investments (64 percent) focused on the telecom sector. The second sector to play the lion share in terms of investment (34 percent) is the energy sector, and only 2 percent to the transport sector. Little investment has been made to the water sector. In the SSA region and the low-income countries in general, PPPs had a similar focus on the telecom

sector, and to a lesser extent, on the energy sector. In contrast to Zambia, a much higher percentage of PPPs were committed to the transport sector in Sub-Saharan Africa and low income countries.

Figure 2.2: PPI by Sector (1997-2006)



Source: World Bank/PPIAF PPI Database

2.1. Sector by Sector Analysis

A. Telecom

62. **Investments in telecom only benefited the mobile segment of the market, with no (private or public) investment in the fixed line segment of the business.** Despite cellular telephony was introduced in Zambia by the dominant operator Zamtel in 1995, competition was introduced thanks to the emergence of greenfield operations in 1997 and 1998 respectively by Telecel (now MTN) and Celtel, as reported in Table 2.1 below which provides the details of the major PPI projects as recorded in the World Bank/PPIAF PPI Database.

Table 2.1: Zambia PPI Projects (1997-2006)

| Financial closure year | Project name | Project status | Type of PPI | Sector | Contract Period | Total investment commitments* |
|------------------------|--|----------------|-------------------------------|-------------|-----------------|-------------------------------|
| 1997 | Zambia Consolidated Copper Mines Ltd Power Division distribution | Operational | Divestiture (partial) | Electricity | na | 274 |
| | Lunsemfwa Hydro Power | Operational | Divestiture (full) | Electricity | na | 3 |
| | MTN Zambia | Operational | Greenfield project | Mobile | 15 | 151 |
| 2003 | Celtel Zambia | Operational | Greenfield project | Mobile | 15 | 360 |
| | Railway Systems of Zambia Ltd. | Operational | Concession | Railroads | 20 | 16 |
| | Zambia Mining Township Service Project water and sanitation services | Concluded | Management and lease contract | Water | na | 0 |

B. Energy

63. **Mixed attitude towards private sector participation.** Several attempts to privatize ZESCO were abandoned, due to both to global changes in the appetite of a strategic player but also to a growing domestic opposition to private sector involvement (see Box 1 for more details). As a result, in October 2003 the Zambian government

instructed its Office for Promoting Private Power Investment (OPPPPI) to terminate the ongoing efforts to attract through international competitive bidding private concessionaires for the largest of the Greenfield investments (the Kafue Gorge Lower investment), handing over responsibility for developing the investment to ZESCO, though recently new effort have been made to search for concessionaires.

Box 2.1: ZESCO: From Privatization to Commercialization Strategy

A sector roadmap was agreed by the Government in late 2000 (under the advice of IDA and the IMF), including the creation of functionally independent generation, transmission and distribution entities within ZESCO, with commercial arrangements between them, as an important and critical step in the transition process towards private participation in the sector. It was also agreed that if ZESCO management failed to achieve its performance targets by the evaluation endpoint (initially set at the end of 2005), an alternative route, involving a more active private role in managing and operating ZESCO, would need to be sought and embarked upon, in which case the trigger for HIPC completion point would be the issuance of bids for selling off the majority interest in ZESCO.

However, the political consensus on this shared vision of sector reform faltered after the elections of 2001. The revised Roadmap included the privatization of ZESCO through a two-stage process. The first stage was a concession agreement of not more than ten years, and the second stage was to be the sale or the concession of individual independent business units, as recommended in a USAID-funded study. In January 2003, ZESCO's concession advisors published a proposal to implement the Cabinet decision on the divestiture of Government's interest in ZESCO. But in April 2003, only three months after its commitment to IDA, the Government rescinded its privatization decision. There were several reasons for the Government's change in position, including a change in the global environment created by the pulling-out of strategic investors from developing countries and growing social and political opposition to privatization.

Since the HIPC end-point conditions were no longer acceptable to the Government, IDA and the IMF agreed to the Government's a revised commercialization Roadmap, which they hoped would achieve the same objective of improving ZESCO's financial performance. The actions to achieving this objective were outlined in a Commercialization Roadmap to be implemented in three phases, the Entry Point minimum conditions, including elimination of ZESCO's arrears, an Interim Point, to demonstrate the improvement of the regulatory environment, and an Evaluation Point at which the commercialization process would be evaluated.

The Commercialization strategy encompassed the revision of legal provisions of ZESCO, including an amendment to ZESCO's Articles of Association and the composition of its Board to ensure independence from political interference and to provide a mandate to operate on commercial principles, revisions to the Electricity Act and the Energy Regulatory Board (ERB) Act to revise ZESCO's regulatory environment, including greater autonomy and a separate act to allow ZESCO to enter into private as well as public partnerships. This was a major deviation from the original approach, and, therefore, the outcome could not have been expected to be similar. At the Evaluation Point, a decision was to be made, based on the assessment of ZESCO performance under the Roadmap as to whether ZESCO could achieve commercialization as expected or an alternative approach involving a more active private sector role was required. The adoption by the ZESCO Board of a ZESCO business plan was accepted. Delays occurred in the implementation of the roadmap due to recurrent arrears build-up by central government, parastatals, and water utilities, following the initial debt swaps.

64. **A common feature of the energy sector is that private investments have been attracted only for selected segments of the energy market.** The most important example of private sector involvement has benefited only part of the market is the Copperbelt Energy Corporation (CEC) that is an independent transmission and distribution company established in 1997, with 800 km of transmission lines and a long

term bulk supply agreement with the ZESCO. It supplies power to privatized mines and is building Zambia's second inter-connector with DRC. Long term agreements provide generated power to the mines at an exceptionally favorable price (in particular, ZESCO sells the Copperbelt Energy Corporation (CEC) for 2c per KWh and CEC re-sells at 3c per kwh. In addition, in the generation segment of the market, Lunsemfwa hydropower project is fully privately owned and has a capacity of 40 MW and is completely privately owned. It has all output contracted to the main national electricity integrated incumbent ZESCO in a long-term contract.

Box 2.2: PPP in Water and Sewer and Solid Waste Management - Mine Townships Services - Asset Holding Company Copperbelt Province -2000-2005

When the mines were privatized in Zambia in the late 1990ties, the new investors did not want to take on services or assets that were not directly associated with the mining business. In the Copperbelt area these assets included schools and other educational facilities, hospitals and clinics, water and sewerage services and solid waste management.

Under a World Bank project, a management contract was supported that took over the provision of water supply, sewerage services, and solid waste management for 5 mining townships that were owned and operated by ZCCM before the privatization of the mining assets. At the time this covered about 45,000 water supply connections or about 250,000 people. The ZCCM assets that supported these services were taken over by the Mine Township Services - Asset Holding Company (MTS -AHC), a subsidiary company that was 100% owned by ZCCM. The AHC contracted with an international private operator (under competitive bidding) to take over the operation and management of the water supply and sewage services and solid waste management for the five townships.

The private operator, SAUR International, worked under a performance contract. The main performance outcomes of the management contract were designed as efficiency gains and cost reduction. When the contract was established in 2000, the cost of operating the 5 townships was about US\$8 million and the revenues were about US\$4.5 million. Over the course of the contract, the AHC achieved nearly break-even with revenues matching costs. This represented a saving of about US\$11 million over the course of the 5 year contract. The cost of the contract was about US\$ 4 .5 million in fees and performance bonuses paid to SAUR, resulting in a net saving to GRZ of about US\$ 6.5 million that would have been necessary in subsidies to keep the water, sewer and solid waste services operating. Previously these subsidies had been absorbed under ZCCM.

GRZ did not wish to continue with the PPP option referencing the high cost of the contract even though they admitted the results were good. GRZ preferred to divide the AHC assets between the 3 existing municipally owned CUs in the Copperbelt Province.

Sources: Zambia - PAD Mine Township Services Project (2000)
Zambia ICR Mine Township Services Project (2006).

C. Water

65. **Currently, there are 10 licensed municipality owned service providers that cover 83 percent of the urban population of Zambia.** There has been only one public private partnership in the water sector, which was with S.A.U.R. (a French water company), which was asked to manage the water utility on the Copperbelt (see Box 2.2: PPP in Water and Sewer and Solid Waste Management). This PPP became operational in 2001 given that the private operator who bought the mines did not wish to provide water and sanitation services and as the newly established commercial utilities (CUs) in these

area were not ready to manage the water and sanitation facilities to the same level of efficiency. A management contract was therefore established with SAUR after a competitive transaction process, supported by the World Bank. The contract began in January 2001 for 4 years. A contract extension was agreed until August 2005 but was not extended.

D. Transport

66. **The Railway concession relied on heavily concessional financing and its success is hampered by regulatory obstacles. In case of railways, Zambia has two main railway systems, viz. the Tanzania Zambia Railway system (TAZARA) and the Zambian Railways.** TAZARA is jointly owned by the governments of Zambia and Tanzania, and its key function is the provision of passenger and freight services on the TAZARA line, including the right to determine, impose or levy rates, fares and other charges for its services, subject to the control and direction of the governments of the contracting states. The second system is the Zambia Railways Limited, which has been concessioned to the to Railway System of Zambia (private sector) with the objective of infusing much required capital into the company that was otherwise collapsing, and to enhance inter-modal competition and thereby reduce overall transport costs in Zambia.

67. **The twenty-year concession to manage the railway system, granted in 2003 to New Limpopo Bridge Projects Investments (NLPI) and Spoornet, highlights significant problems related to the inadequacy of the regulatory framework specific issues like rail track access charges, track safety and regulation, integration of various railway lines, etc.** Concessioning has been a necessary condition for investment in railways in Zambia, as well as in many other countries of SSA, but rely on heavily concessional funding. Even with the highly concessional financing which other Sub-Saharan railway system enjoyed the operations appear highly fragile. Despite a reduction in the number of derailments from 400 per year to 200 (the regionally accepted level is 20), the level of maintenance remains poor and rail volumes declined by 7 per cent in one year, with most of this decline reflecting a shift to road transport. Addressing all these issues would require the creation of an independent regulatory framework.

68. **The long term Output Based Road Contracting contracts (OPRC) in the road sector is an innovative concept** developed by the World Bank that could lead to private investment, even though at the moment is financed 100 percent by the Government. The financing structure may change in future for some roads as volumes of traffic increases on such roads. Donors, such as the EU, are already adopting this form of contracting to their funding in road maintenance. One of the key requisite to private participation in the transport sector is the existence of a sufficiently large market to recover the investment and maintenance costs. In the road sector this does not yet exist in Zambia, where current traffic volumes are less than 7 000 vehicles per day. This is less than half of what would be seen as a minimum threshold for successful PPPs in the road sector. The financing responsibility in Zambia is also slowly moving from central government to the newly established National Road Fund Agency that will over time shift the financing responsibility from government to the road user.

2.2. Implications for Public Private Partnerships

69. **Zambia can do better on PPPs.** For budgetary and efficiency reasons, Zambia will benefit from further developing public-private partnership schemes to meet its huge investment needs, and to develop these partnerships there is a need to resolve issues concerning tariff setting and access to the market. Public investment could be more efficient though and private investments even greater and more stable than at present particularly in sectors such as energy and ICT, where the international trends is towards increase private sector participation.

70. **Good reasons to have strong hopes for major improvements in PPP opportunities.** The project pipeline for infrastructure projects provides further opportunities for private sector participation. Apart from the ample scope for private participation in the telecom sector, also the other infrastructure sectors could attract significant private sector involvement. The key obstacles would be to create the regulatory and business environment to attract them, as we will analyze in Section 5.

71. **In the energy sector, additional generation risk will need to added to the system, in light of the expected supply-demand deficit, present an opportunity to attract the private sector,** avoiding the risk that extra generation is added on a rather ad hoc way through expensive quasi-IPP contracts awarded on a non-competitive basis with a large risk premium on investment. This trend occurred in other Sub-Saharan countries, such as Ghana and Madagascar, when the contracts have been concluded when the sector was already facing a severe crisis.

72. **PPI projects in the pipeline can be substantial.** The Itezhi-Tezhi hydro power station of 120MW is planned to be developed under a PPP framework as a joint venture between ZESCO and Tata Africa Holdings. The Kalungwishi power project of 220MW is also being developed by the private sector. Similarly, it is expected that other projects envisaged under the FNDP would also involve significant private participation. The Fifth National Development Plan has identified several projects to be implemented in the period 2006 to 2010, and many of these may be undertaken on a PPP basis (see box 2.3 for additional potential PPP projects in electricity).

73. **In an effort to make Zambia, a hub of economic development in the region, the private sector can be involved on the Build Operate and Transfer Basis in the construction of some selected sections of railways.** For a landlocked country such as Zambia some of the selected routes can allow to shortest routes to the seaports. Upcoming reported forthcoming projects include the completion of Chipata-Mchinji and Chipata-Mpika railway: proposed to connect the eastern to the northern province and thereby provide access to the port of Nacala in Mozambique, Nseluka-Mpulungu proposed to provide access to the Mpulungu port on Lake Tangayika in the northern province; Chingola- Solwezi-Lumwana-Bengwela Railway: proposed to link Copperbelt Province, North Western Province and the Port of Lobito in Angola; Mulobezi-Nambia Railway: involving rehabilitation of the Mulobezi Railway line between Livingstone and Mulobezi and extending the line to connect it to the Namibian System as part of the Walvis Bay-Livingstone-Lusaka-Ndola-Lubumbashi corridor.; and Kafue-Lions Den

Railway: involves linking the Railway System of Zambia Railway line from Kafue in Zambia to Lion's Den in Zimbabwe all the way to the Beira port in Mozambique.

Box 2.3: Potential projects for Public Private Partnerships in electricity

The identified projects include as mentioned above Kafue Gorge Lower Power Station with potential to generate 750 MW; Kariba North Bank Extension with a capacity of 320 MW; Itezhi-Tezhi Hydropower Project with a capacity of 120 MW, including a 200 km transmission line from Itezhi-Tezhi to Choma (Muzuma), which is the nearest interconnection point the national grid; Zambia-Tanzania-Kenya Inter-connector Project, involving construction of transmission line of which 600 km will be on the Zambian side and about 100 km on the Tanzanian side, and in addition 200 km of transmission line shall be built from Arusha in Tanzania to Nairobi in Kenya. Zambia-Democratic Republic of Congo Inter-connector Project, being developed by Copperbelt Energy Corporation and SNEL.

This will enable transfer of 500 MW from DRC to the Southern African market. A 200 km transmission line between Luano and Solwezi was commissioned by ZESCO in 2004 to supply power to Kansanshi Copper Mines. A further 70 km of transmission line shall be constructed to supply power to Lumwana Mine and shall be extended to Kolwezi in DRC; Implementation of Phase 2 of the Zambia-Namibia 220 kV Inter-connector from Victoria Falls to Katima Mulilo; Hwange-Livingstone 330 kV Inter-connector (Zimbabwe-Zambia), meant to decongest the Insukamini-Phokoje-Matimba 400 kV line; Kalungwishi Hydropower Scheme, of 200 MW, to supply to the northern Zambia with the objective of stabilising and increasing the reliability of the National Grid. All major power stations are located in southern and central Zambia. The scheme would also be strategic to the regional power supply system linking DRC and Tanzania; Lunsemfwa Lower Hydropower Scheme, of 55 Mw, to support mining and agriculture in central and Copperbelt provinces.

74. **Transport corridors play a key role in enhancing trade and economic growth and attract PPPs.** The government in its Fifth National Development Plan is focusing on development of seven major international transport corridors, including the Beira Corridor which stretches from Mozambique via Zimbabwe and Zambia to Lubumbashi in Democratic Republic of Congo (DRC); the Nacala Corridor which stretches from Port of Nacala in Mozambique via Malawi to Lusaka in Zambia; the Durban Corridor from Durban in South Africa via Zimbabwe, Botswana and Zambia to DRC border and the Dar-es-Salaam Corridor from Dar-es-Salaam in Tanzania to Harare in Zimbabwe via Lusaka, the Walvis Bay Corridor from Namibia via Katima Mulilo in Zambia to Bujumbura in Burundi, the Mpulungu (Great Lakes) Corridor servicing Lusaka and Malawi via Chipata to Mpulungu and the Great Lakes Region, Mtwara and Lobito: The stretches of roads of regional importance under the jurisdiction of Zambia is Livingstone-Ndola, Lusaka-Chipata, Lusaka-Chirundu, Kapiri Mposhi-Nakonde and Sesheke-Livingstone, while the entire railway network is part of the regional connectivity.

75. **In late 2003 the Zambian authorities authorized ZESCO to begin actively engaging with Chinese power sector players and financiers on hydropower investments,** though to date no one reach financial closure. One of them adding capacity to the existing Kariba Dam water source is an advanced stage of negotiation with funding provided by the Chinese Exim Bank. According to the Zambia Privatization Agency, in mid-2005, the Chinese government expressed interest in participating as an investor if TAZARA were to be open to be run under a concession or joint venture. The two Governments of Zambia and Tanzania have agreed to invite the Government of China to

join in the running of TAZARA either through a concession or joint venture in order to improve its performance. TAZARA system was built by the Chinese in 1975 and is owned jointly by the Tanzanian and Zambian governments. It represents the main route for exporting copper cathodes via the port of Dar es Salaam. In recent years, copper has increasingly been channeled through the ports of Beira and Durban, reducing volumes transported on the TAZARA line. This decline has pressured Zambia and Tanzania to search for a foreign investor, although an outstanding USD10 million debt to the Chinese government could discourage perspective investors.

76. Performance-based contractual agreements are powerful instruments to help define sector development goals and resources. They do so by imposing a time-framework in which monitorable performance targets are to be achieved, allowing for increased managerial autonomy. Performance-based contracting requires the government to play a key role in planning, policy, and regulation. Management, in turn, is empowered to do what it does best: (i) invest capital; (ii) manage the businesses, (iii) manage and create appropriate incentives for staff and management; (iv) deal with customers; and (v) improve the efficiency and quality of service also under the pressure of benchmark competition. These arrangements are intended to promote cost-savings, efficiency, and responsiveness in terms of performance expectations linked to budgets, service, and management. They can play an important role in clarifying the roles of the government and the utility, improve accountability for fulfilling the expected outcomes as defined in the contracts, and provide incentives for operational efficiency and effective investment with financial incentives and penalties; they also link remuneration to the ability to meet the performance targets, and provide incentives to improve performance and efficiency (see also box 2.2).

77. Performance contract system must be coupled with long-term planning. This means that every enterprise has to develop medium- and long-term plans that are consistent with the priorities established by the government through sector ministries. The overriding principle for preparing a performance contracts remains that they are based on simplicity so that their content can be easy to monitor and to evaluate. In the case of ZESCO, for instance, the targets for the three year performance contracts signed in 1996 and 1999 were overly ambitions, and both ZESCO and the government failed to meet most of them. In 1999, for instance, the targets included a 6 percent return on assets, which would have required an average price of 7.5 US cents/kWh, compared with then existing price of 2.1 US cents/kWh, and the proposed one of 3.36 US cents/kWh. Neither the Government nor ZESCO management took the actions needed to reach the targets, and over the next several years there was no measurable improvement in ZESCO's financial performance.

3. Obstacles to PPPs and Policy Solutions

3.1. Lessons from other Regions

78. **The analysis of investor's past experiences and of their attitudes toward future PPPs in other regions reveals four main impediments**, listed below together with a broad range of policy/institutional/financial instruments, the analysis identifies a number of instruments, which are on the critical path to alleviate these impediments (see Noel *et al.*, 2005).

79. **Inadequate cash flow (level, variability) is the first concern among investors in infrastructure PPPs in the region.** Cash flow level and stability may be influenced, directly or indirectly, by a broad range of foreign exchange risk allocation, legal, regulatory, institutional and financial instruments. Two main instruments are on the critical path to meet investors concerns. First, foreign exchange predictability is a necessary, albeit not sufficient, condition for attracting foreign investors in PPP transactions. The impact of the recent Turkish economic crisis of 2000 on local utility PPPs has been dramatic, as was the case in the Argentina crisis. In the case of Turkey, unconstrained guarantees offered by the Government to foreign investors in local infrastructure PPPs resulted in major, ongoing fiscal liabilities that cast a shadow on the future of PPP in the country.

80. **In countries with a history of macroeconomic instability, or where investors' expectations of future macroeconomic stability are low, governments need to address the issue of allocation of foreign exchange risks among government, investors and users as a pre-requisite for sustainable PPP transactions.** Second, even if the foreign exchange risk allocation issue is resolved, the capacity of central and local governments to implement a transition to cost-recovery tariffs is also on the critical path to attract both foreign and domestic investors in local infrastructure PPPs. Although initial tariff increases may tail off due to the cost reductions resulting from the efficiency gains resulting from PPP investments, the transition to cost-recovery tariffs may cause major access and affordability problems for lower-income households in many countries of the region, at least in the short term. Governments need to address these problems up front less they will negatively affect the sustainability of PPP transactions.

81. **Poor quality of the contractual environment, especially contract transparency, enforcement and dispute resolution, is the second major concern of investors in local infrastructure PPPs in the region.** This concern may be addressed by a broad range of policy instruments, starting from improvement in the overall legal and regulatory framework to improvements in contract regulation (model contracts), contract enforcement and dispute resolution and contract regulation frameworks. In parallel with undertaking broad-based judicial reforms that are critical to improve contract enforcement and dispute resolution over medium to long-term, governments need to develop effective systems that will improve contract transparency upstream and provide avenues for contract monitoring and out-of-court dispute resolution without waiting for the full impact of the reforms of the judiciary.

82. **Lack of policy risk mitigation instruments is the third major concern expressed by investors in local infrastructure PPPs in the region.** The most appropriate solution would be the development, implementation and enforcement of a comprehensive and coherent legal and regulatory framework, which would include: contract regulation, contract transparency and minimize contract disputes or contract breakdown. Moreover, the existence of strong framework for contract dispute resolution, both judicial and extra-judicial, would ensure that investor rights are adequately protected in the few cases when a dispute does take place. However, in practice, the implementation of such a comprehensive legal and regulatory reform program focusing on effective court and alternative dispute resolution—such as arbitration—would take time to be fully implemented. In the meantime, governments would need to develop transitional policy risk mitigation instruments to protect investors against sub-sovereign breach of contract risk. These instruments may take the form of third-party policy guarantees, with or without counter-guarantee by the government.

83. **Lack of exit opportunities is the fourth major concern expressed by investors in local infrastructure PPPs in the region.** This impediment is on the critical path to attracting first-round private equity funds in the sector. Given the narrowness and shallowness of capital markets in many countries of the region, there is a need to develop a new class of investment instruments that would create exit opportunities for first-round private equity funds investing in local infrastructure while providing opportunities for portfolio diversification for emerging institutional investors such as pension funds, insurance companies and mutual funds.

3.2. Tariff Challenges

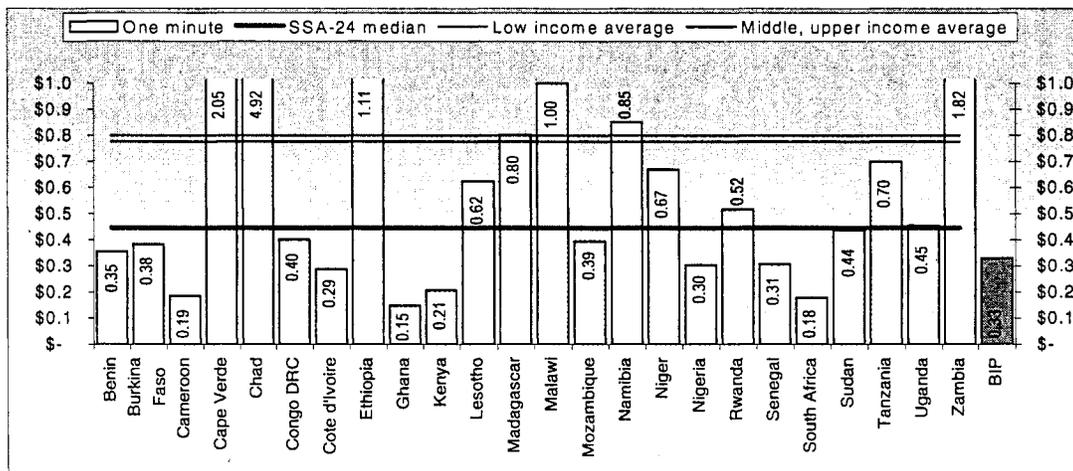
84. **Tariffs for most infrastructure services remain well below the levels required to achieve full cost recovery.** Private sector operators have been hesitant to invest if a government is unable to provide guarantees for future tariff increases or return on capital invested. With such uncertainty, the main contributions of the private sector are likely to be management skills and operational experience rather than finance. An alternative form of PPPs can be a ring-fenced investment project, such as a build-operate-transfer (BOT) contract, backed by a senior claim on the revenues of the utility. Experience shows, however, that the failure to address the central financial and operational problems of the utility can easily undermine the stability of a PPP contract.

85. **Reluctance to transfer responsibility for infrastructure services to the private sector may be reinforced if publicly owned utilities have privileged access to finance for major investment projects.** For instance, several countries in the region have adopted systems of revenue sharing or grants for local government authorities that underpin the deficits or the investments made by municipal companies providing water and other services. Progress of PPPs can be held back or limited to management contracts where national governments continue to offer investment grants or guarantees to municipally owned companies. Certainly, this has been a feature of water and waste-water services.

A. Telecommunications

86. The prices of local fixed-line telecommunications services are kept artificially low – in this sector via cross-subsidies from international calls. International call costs in Zambia are among the highest in the region, not all connections (incoming and outgoing) are successful and calls are often of poor quality (see figure 3.1). This has been frequently cited by investors as contributing to the high cost of doing business in the country. All international calls are currently routed through an international gateway operated by Zamtel. However, this gateway is unable to provide for the required traffic because of a lack of investment in equipment and the fact that Zamtel has no competition which could provide the incentive to do so. The cost of the highest profile of these reforms, such as the gateway liberalization, falls directly on one of the longstanding ‘cash-cows’ of the political class with a strong revenue stream, including substantial payments in hard currency from international telecommunications providers for Zamtel to connect international calls terminating in Zambia. The perspective of a potential transfer from this Zambian entity to wholly foreign-owned companies – such as the mobile operators, might represent a substantial obstacle to reforms, even when it happens at the expenses of Zambian urban and rural households in terms of access to both fixed line and advance services (such as mobile and internet). At the same time, Zamtel is facing serious financial problems caused by a low bill recovery ratio, high payroll expenses, deferred maintenance and past underinvestment.

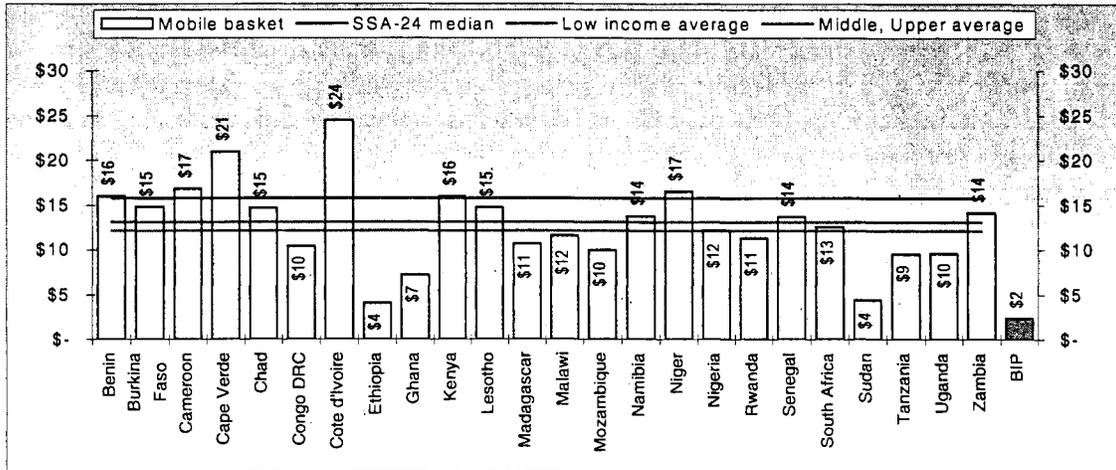
Figure 3.1: Price of one minute peak rate call to USA, US\$, 2006



Note: BIP = Bangladesh, India and Pakistan. Peak rate including taxes.

Source: AICD.

Figure 3.2: Mobile prepaid monthly tariff basket, US\$, 2006

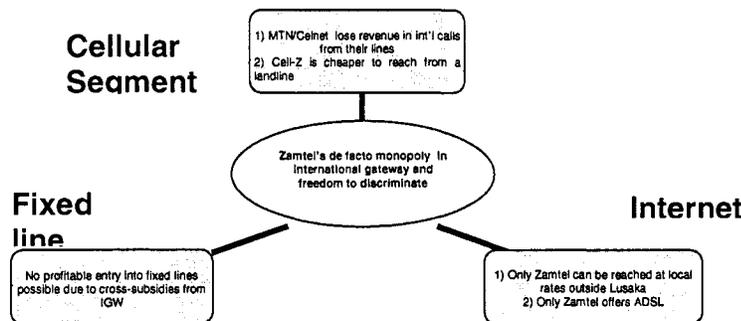


Note: BIP=Bangladesh, India and Pakistan. Based on OECD low user basket methodology. Source: AICD.

87. **The telecommunication regulator is not empowered to establish a level playing field.** Cost effective arrangements for inter-connection were not put in place, so (with a single, dominant mobile network accounting for over 80 percent of all local traffic) the costs of local calls remained high. As we have seen above Celtel has led the way in Zambia's cell phone expansion, and now has more 80 percent of all subscribers, exerting a dominant position.

88. **At close to US\$ 14 of mobile prepaid monthly tariff, Zambia also has among Africa's highest prices, signaling a lack of significant competition even in the mobile segment of the market** (see figure 3.2). Telecommunications reforms aimed at fostering entry and competition thus seem capable of reducing prices of both local and international calls to local consumers. Figure 3.3 reinforces the cross sectoral adverse consequences of Zamtel's monopoly in international gateway on all segments of the telecom market. For instance, Zamtel protects its mobile subsidiary Cell-Z by setting cheaper interconnection rates.

Figure 3.3: Consequences of Zamtel's Monopoly

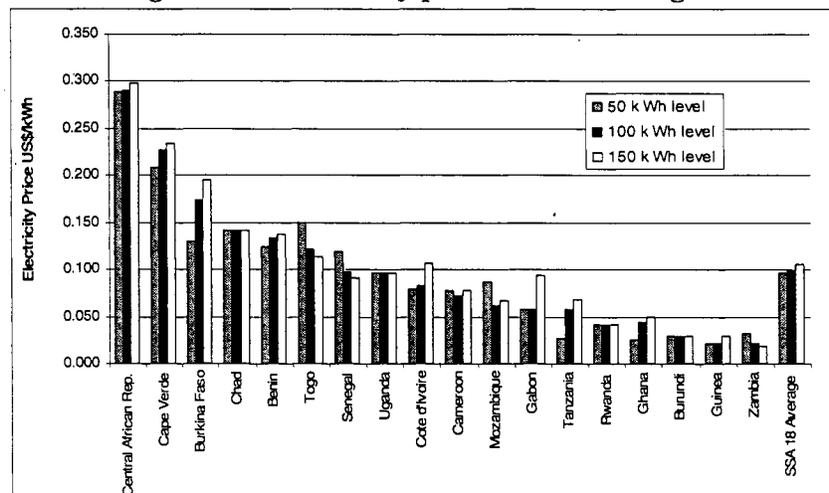


B. Energy

89. **Zambia's Energy Regulatory Board has been slow to approve tariff increases** and its tariff decisions have consistently favored minimal tariff adjustments at the expense of ZESCO's financial viability. The result has been that during the years 2000-2005, when inflation was about 220 percent, electricity prices were adjusted by only 70 percent. No significant move to rebalance tariff has been undertaken, so that it is not surprising to see how Zambia is characterized by one of the lowest electricity prices, as Figure 3.4 shows.

90. **Most noticeably, the Government failed to take the actions required to enable ZESCO to start to become financially viable.** It continually delayed implementing its obligations to settle debts owed to ZESCO. It was unable to get its institutions to pay their electricity bills in a timely manner, and after it had agreed to pay these bills from the central budget, it was slow to allocate funds. On the other hand, ZESCO has not been able to keep up with payments to suppliers and scheduled refurbishing of its generation capacity and this has greatly aggravated the load shedding problem when those suppliers stop deliveries because of non-payments.

Figure 3.4: Electricity prices across the region



Source: AICD database

91. **Substantial tariff increases are required.** According to the cost of service, ZESCO's full cost to serve current and expected new loads ZESCO's current average tariffs of US\$ 2.66 cents per KWh would have to step up by 45 percent to US 3.87 cents per KWh in 2008 and would have to continue increasing by about 6 percent a year thereafter. The average mining tariffs would require an increase of 28 percent to cover full cost to serve the mining loads, increasing from US\$ 2.34 to 3.01cent /KWh. This raises the question of whether the CEC supply contract and the new contracts with retail mining customers can be reopened and renegotiated. If tariffs are not increases, the current mining load could accumulate a deficit of US\$ 926 million over the next 10 years, unless the current pricing structure is rebased. Export prices would also need to be increased by about 15 percent. The analysis concludes that ZESCO's financial viability

depends crucially on increasing tariffs and controlling costs. Both of these actions are needed.

92. **Users are unwilling to access tariff increases, before seeing improvement in the efficiency of the company**, so that improvements in turn will not be possible in the absence of investment and/or increase commercialization of SOEs. Better monitoring to avoid cash injections will not be siphoned off in inefficiency and rents is needed. This could be incorporated in the multi-year incentive price control, as a mechanism to cap growth in staff numbers and cost per employee to improve financial performance.

C. Water

93. **The burden of covering operating costs shortfalls is shared among levels of government and donors, sometimes with more than one contributing stakeholder.** Zambia adopted a system where government and donors have a shared responsibility in covering operating cost shortfalls. However, cost recovery of operational and maintenance (O&M) is very low, as reported in Table 3.1. The actual cost recovery percentage of the three largest CUs, Lusaka, Nkana and Southern WSCs at different level of consumption, is ranging from 13 percent to 22 percent according to the AICD estimates and from 16 percent to 29 percent according to the Global Water Intelligence (GWI)'s estimates. This is low compared to the SSA and LIC peers.

94. **A significant contributor to low operating cost recovery is poor levels of collection efficiency.** The water regulator (NWASCO) reports that, with the exception of one Commercial Utilities (CUs), CUs are able to cover operating costs if they were to reach an acceptable level of collection efficiency (i.e. 85 percent). The key problems come from the fact that government institutions in general still do not pay their water bills although central Government has instructed them to pay.

95. **Tariffs would need to be higher, however, to ensure capital costs are recovered.** As reported in table 3.1, the recovery of capital costs at different level of consumptions is at best 9 percent.

Table 3.1: Cost Recovery of African Utilities

| Utility | Cost Recovery | | | | Cost Recovery | | | | Cost Recovery | | | |
|------------------|------------------------|-------------|--------------------------|--------------------|-------------------------|-------------|--------------------------|--------------------|-------------------------|-------------|--------------------------|--------------------|
| | Effective price at 4m3 | O & M (GWI) | Actual O & M Cost (AICD) | Capital Cost (GWI) | Effective price at 10m3 | O & M (GWI) | Actual O & M Cost (AICD) | Capital Cost (GWI) | Effective price at 40m3 | O & M (GWI) | Actual O & M Cost (AICD) | Capital Cost (GWI) |
| SWSC | 0.30 | N | n | N | 0.30 | n | n | N | 0.34 | N | y | n |
| LWSC | 0.56 | Y | y | N | 0.39 | n | y | N | 0.34 | N | y | n |
| NWSC | 0.25 | N | y | N | 0.26 | n | y | N | 0.29 | N | y | n |
| Cost Recovery(%) | | 23 | 13 | 4 | | 16 | 13 | 4 | | 29 | 22 | 9 |
| SSA | 0.55 | | | | 0.49 | | | | 0.63 | | | |
| MIC | 0.72 | | | | 0.89 | | | | 1.31 | | | |
| LIC | 0.50 | | | | 0.38 | | | | 0.44 | | | |

Source: AICD WSS Survey Database, 2007

96. **NWASCO has issued a new guideline on tariff setting designed to better involve stakeholders, increase the transparency of the process and define better the basis for increasing tariffs.** The analysis of a tariff proposal consist of new mechanism designed to achieve O&M cost recovery for all CUs by 2005 and for full cost recovery to be achieved within four years of achieving O&M cost recovery (i.e. by 2009 at the latest) with the pre-conditions that there is the ability to pay the tariff, O&M costs are within a reasonable limit and performance is acceptable.. Full cost recovery is defined pragmatically as being 150 percent of O&M cost recovery.

97. **The tariff setting process consists of a several appropriate steps.** The first step is initiated by the provision by a water utility of projections of O&M costs for the forthcoming year jointly with current and past O&M costs figures. The second step is for NWASCO to provide the utility with a so-called “Adjusted O&M” cost estimate, which eliminates unacceptable costs as determined by NWASCO. The decision to provide the utility with an annual increment is based on the (adjusted) O&M cost. A further adjustment of +/- 10 percent of “Adjusted O&M” costs dependent upon the previous year’s performance against benchmarks for performance contained on the Minimum Service Level Agreement (MSLA). The method for determining the range of increase/decrease is abased on a score card, which consists of negative adjustments for failure to achieve specific targets such as for metering ratio, unaccounted for water, water quality and average service hours/day as well as a bonus for “programs documenting specific efforts of the CU”. The tariff mechanism is particularly designed to provide incentives to reduce unaccounted for water (UFW), increase collection efficiency and increase metering.

98. **As such, tariffs might well increase to cost recovery levels – dependent upon performance.** This system is prime facie a considerable improvement on the existing process in a number of regards, since it sets out expected increases in tariffs and it provides incentives to improve performance. However, the regulator is silent on how the water utilities are to find the financial resources necessary upfront to undertake the investments needed to the meet some of the agreed benchmarks e.g. increased metering. In the medium term a move to an even more incentive based process still, which could consist of a full medium term outlook for setting tariffs, an annual tariff indexation mechanism (e.g. to adjust for changes in prices e.g. inflation), which does exist in the electricity sector (with the so-called Automatic Tariff Adjustment Formula) and an explicit link in terms of tariff increases to performance indicators which in turn could be linked to CU manager’s remuneration.

99. **For Local Authorities (LAs), the problems are more complex due in large to poor reporting and poor data.** Tariff increments have been tied more to cost recovery of the operational and maintenance costs, as the very low tariffs in the past were not related to the cost. According to NWASCO increasingly tariff increments in the future will be linked to improved performance and efficiency with unjustified costs not being allowed.

4. The Legal and Regulatory Framework Supporting PPPs in Zambia

4.1. Separation between Policy and Regulatory Functions

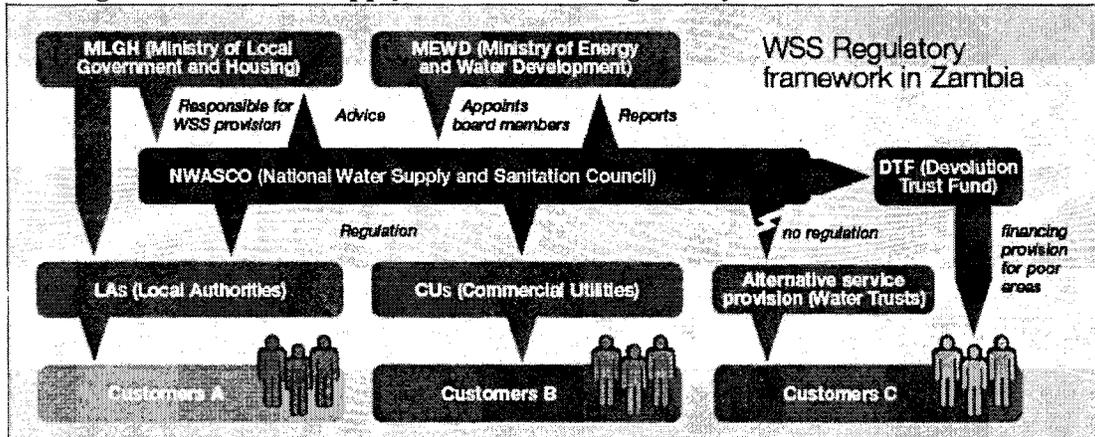
100. **Some degree of separation between policy and regulatory functions has been achieved across all sectors.** The Ministry of Communication and Transport (MCT) is responsible for planning and policy making in the telecom and transport sector. A regulatory agency (NAC) has been created for the telecom sector. There are specific agencies dealing with various transport sub-sectors. With a view to clarifying the management and financing of the core road network, three road agencies, namely, the National Road Development Agency (NRDA), the National Road Fund Agency (NRFA), and the Road Transport and Safety Agency (RTSA), have been created and became operational in 2005. Under the new configuration, NRDA is responsible for planning, procurement, construction, maintenance, supervision and monitoring the whole road network and for centralizing functions, which were previously split up between various line ministries. Similarly, the NRFA coordinates all resources for the road sector, including government and donor funding and user charges. Accordingly, the fuel levy for routine maintenance is now channeled directly to the NRFA, avoiding the slippage and erratic fund flows caused by its previous inclusion in the overall government budget.

101. **The multiplicity of agencies creates coordination problems in the some segment of the water sector (see figure 4.1).** The Government has adopted an institutional framework in 2004 where in the Ministry of Local Government and Housing (MLGH) is entrusted with the overall responsibility of planning, implementation and coordination of the national program, and provide policy guidance, setting standards, criteria for service provision and funding in the sub-segment. The national RWSS Unit is responsible for resource mobilization and coordination with MoFNP and cooperation partners, monitoring and reporting of service provision and liaise with other line ministries to ensure complementary inputs into the national program. At the provincial level, the Provincial Local Government Office shall coordinate implementation and monitoring of district plans. At the district level, the District Councils shall plan for water supply and sanitation through WASHE, oversee implementation, monitor progress and disburse funds to the communities. At the community level, the communities shall be responsible for implementation of RWSS program, collection of user charges and operation and management of facilities. Government is working on a more coordinated approach to rural water supply as stipulated in its national rural water policy.

102. **MLGH co-ordinates activities mandated under the Local Government Act and is responsible for the facilitation of an enabling environment for the effective function of all councils in the country.** The local government is multi-functional in nature as it is the recipient of delegated responsibilities from various sectors. The sector covers issues such as, physical and regional planning, infrastructure development, social services, water and sanitation, fire services, local economic development and poverty reduction. While the Act assigns 63 functions, many of these functions are beyond the current institutional capacity of the local governments. Indeed the Government, in its

FNDP, has recognized that it would not be appropriate to transfer all functions and finance matters to those local authorities that still suffer from severe human resource capacity shortfalls. The Government acknowledges the need for addressing the issue of capacity building prior to, and during the implementation of, a decentralized system.

Figure 4.1: Water Supply & Sanitation Regulatory Framework in Zambia



Source: Amelie D'Souza and Nina Barmerier (2006)

4.2. Regulatory Governance

103. **The regulatory literature emphasizes from an institutional perspective three key regulatory criteria – independence, accountability and transparency.** Regulatory independence or the degree of autonomy concerns the relationship between regulatory agencies and the government. There are several important sub-dimensions of regulatory autonomy, including: i) formal autonomy, if the hiring/firing of the head of the regulatory agency is not determined by the government or the line ministries; ii) financial autonomy—where the regulator has an earmarked and secure source of funding, not dependent on the government budget, iii) decision autonomy—where the regulator decisions are taken not only by the chair but shared through commissioners (or a multi-sectoral agency) and cannot be vetoed by the government or the line ministries. To get a full score (of 1) all criteria must be satisfied. Accountability ensures that regulators enforce rules fairly while protecting the legal rights and economic interests of the state, operators and users.

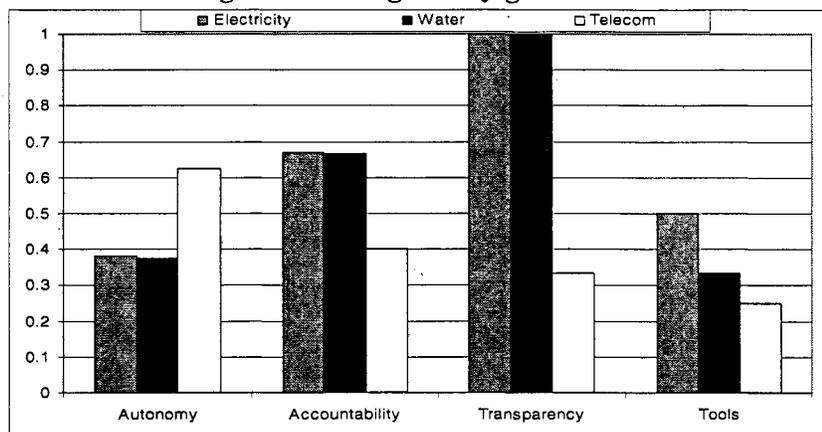
104. **Accountability is facilitated by the right to appeal by operators and consumers.** To reach a full score one requires the right to appeal to an independent body, outside local courts, as an effective means to ensure the independence of the body dealing with appeals against the regulator. Transparency covers several issues. It involves the right of stakeholders to be informed about decisions affecting them, and also relates to the scope for corruption and secretive decision-making. One way of judging the extent of transparency is the frequency with which existing regulatory decisions, rules and policies are published and disseminated to all interested parties effectively. To get a full score here it needs to take place through reports, publicly available on the web-site and through public hearing. Finally, the regulator must adopt suitable pricing tools; adopt

a tariff methodology, use tariff indexation and a mechanism of multi-year periodic review (of at least 3 years).

105. Electricity and water score better than telecom on regulatory governance.

Figure 4.2 reports how the different sectors score in Zambia in terms of regulatory governance. It is interesting to note how both the electricity and water sector score substantially better than the telecom one for all dimensions except autonomy.

Figure 4.2: Regulatory governance



Source: AICD database

106. Additional problems emerge in practice for telecom, including

interconnection. For instance, on a separate occasion, the responsible Minister did not appoint a new board to the regulatory agency (CAZ) for almost one year subsequent to the expiration of the term of office of the previous board – notwithstanding the fact that board approval is required for any regulatory decisions to be binding. Outside the basic institutional criteria that we used, in the telecom sector we should also note how the interconnection regime is poorly defined. Preferential interconnection charges in favor of Zamtel’s mobile subsidiary are allowed and despite a statutory instrument has been issued to address the failure of operators to enter into interconnection agreement, no agreement has been reached to date between Zamtel and Celtel and disputes are likely to arise after the expiration of Celtel and MTN agreement. Moreover, there is no agreement on the methodology to adopt for the calculation of cost-based interconnection. Whereas both Zamtel and CAZ favor a fully allocated cost approach, mobile operators favor forward looking approaches rather than historical ones.

107. The higher ranking in governance for the energy regulator (ERB) can be also explained due to revised legislation,

including the revised ERB Act passed in November 2003 that has enabled it to hire more professional staff, strengthened its organizational structure, and, with the hiring of additional professional staff, enhance its operational capacity. An international regulatory consulting firm has been engaged to assist in strengthening the capacity and capability of ERB staff through training in all aspects of electric utility regulation to enable ERB to be able to fully discharge its functions as the Electricity and Energy Regulatory Acts. As part of the assistance, a cost-

of-service based tariff structure has been developed as well as a framework for introducing the new tariff regime.

108. **The water regulator has significantly improve reporting of information and benchmarking.** Every year NWASCO publishes the “Urban and Peri-urban Water Supply and Sanitation Sector Report” in which the performance of the service providers is assessed and compared on the basis of a number of key indicators. The quality of the underlying data was improved significantly with the establishment of the NWASCO Information System (NIS). NWASCO facilitates competition by benchmarking, thus creating comparative competition in the absence of market competition. The main tool used is NAWASCO’s annual comparative sector report. Transparency in price regulation was enhanced under the new tariff model incorporated in the guidelines in May 2005. It gives less discretionary power to the regulator and makes tariff adjustments more predictable.

109. **The composition of NWASCO’s Board ensures a high degree of stakeholder involvement.** In order to establish a direct link with the consumers, NWASCO set up voluntary consumer groups (Water Watch Groups - WWGs). Currently, there are four active WWGs, acting as mediators between the CUs and the customers; educating consumers on their rights and obligations; and assisting in resolving complaints and providing feedback to NWASCO. Consumer involvement in the tariff setting process is guaranteed through consultative meetings, which the CUs are obliged to hold with consumer representatives before applying for tariff adjustments. The minutes of meeting of these consultations are part of the tariff adjustment proposal submitted to NWASCO. The Water Watch Groups (WWGs) concept has proven to be successful in establishing the regulator’s presence on the ground. NWASCO aims to establish a WWG in each of the service areas and explore how the WWGs can adopt a more explicit pro-poor focus.

5. Key Public Private Partnership Challenges for Zambia

Introduction

110. **The work on PPPs has been undertaken by the National Council for Construction (NCC) that is acting as the coordinating agency for the established Working Group on PPP in Infrastructure.** The Working Group has prepared a **PPP Policy framework (the “Policy”)**, in line with international best practice in many respects, including PPP Unit housed within the Ministry of Finance, choice of “value of money” as the overarching criteria, methodology to select PPPs, and an extensive consultation process. In what follows the key challenges moving forward based on the experience in other countries are highlighted.

5.1. Cross-Sectoral Challenges

111. **Countries engaged in a broad-based PPP programs often feel the need to develop a cross-sectoral pool of expertise in a dedicated PPP unit to supplement capacities in the line agencies that contract for PPPs.** These fulfill different roles depending on the needs of the situation. Regarding the location of a PPP unit, the primary objective is to allow the unit to enjoy high visibility, strong influence and political backing. The optimal location of a unit varies according to the different roles it is expected to perform.

- Whether the unit’s primary role is in project evaluation or in knowledge dissemination, the optimal location of the unit would be as a group within an existing government agency, such as Finance or Planning.
- When the unit’s primary role is to provide transactions support, its location can be either: *i*) a unit relying on long-term consultants (as in South Africa), or *ii*) as an autonomous entity, attached to but not fully part of the government bureaucracy (as in the Philippines), or *iii*) as a government-owned company (as in Canada), or *iv*) as a joint venture owned in part by private shareholders.

112. **An important policy decision is whether the cross-sectoral unit will have the power to impose mandatory requirements on the line departments – and in that case, what kind of requirements.** This is often done by involving the PPP unit in approval of the PPPs. In South Africa, the Treasury relies on the PPP Unit to assess whether the expenditures incurred by PPPs developed by line agencies and provinces can be met within their future budgets. The PPP Unit is involved at three different points: after the feasibility study, before issuing the bidding documents, and before signing the contract. In contrast, in some countries, e.g. Italy, the national cross-sectoral PPP unit plays only an advisory role.

113. **A good procedure rules for PPP approval.** Each government’s process is different, ensures that:

- A PPP proposed by a line agency cannot proceed unless approved by another body
- The approving body has an understanding of the government's fiscal situation and an interest in maintaining prudent fiscal policy
- The approving body has access to all the information needed to make a well informed decision.

114. **Conflicts of interest may arise when a PPP unit is granted authority to perform both roles within a check-and-balance bundle, for example selection-and-approval, or implementation-and-evaluation.** Private-public ventures are especially prone to such conflicts, in which case, the remedy calls for both strong corporate governance and effective limitation of the venture's role in either policy issuance or project approval.

5.2. Relation between National and Sub-National Governments

115. **PPP programs are undertaken in many infrastructure sectors where service responsibilities lie with sub-national governments or agencies.** The role of national agencies relative to sub-national ones usually reflects legal and fiscal relations between these levels of government, deriving from the constitution and existing budgetary practices.

116. **While some advanced countries, such as Canada and Australia, have adopted more decentralized approaches, most countries, especially developing countries, tend to reserve active advisory, oversight, policy development roles for the nation unit.** In the UK, local authorities initiate most PPPs, while accessing advisory support from national level agencies and receiving approved by a central government interdepartmental committee chaired by Treasury. In South Africa, the national PPP unit, besides performing an oversight role, also develops standards and procedures to improve the quality of PPP transactions. Brazil recently passed a legislation to entitle the national level entity to establish procedures for PPP contractions and to identify PPP project priorities.

117. **Since its establishment in 2000, South Africa's Treasury PPP unit has achieved substantial success despite low deal flow.** The primary role of the unit is to scrutinize the quality, affordability, and expected fiscal cost of proposed PPP programs. The country's clear regulatory process has helped the unit perform its anticipated role. A primary concern of national government is that the provinces may use PPPs as a means of off-balance sheet financing to get round budgetary constraints. To address this concern, the national government developed new regulations under existing public financial management legislation to impose central government oversight and approval of PPPs being developed and signed by the provinces (World Bank/PPIAF, 2006). The national PPP unit has also played an important role in developing standards and procedures to improve the quality of PPP transactions. A cautionary note needs to be made regarding the location of the national PPP unit within the Treasury – conflict of interest may occur

while the unit performs dual functions in providing transactions advice for projects and granting approvals.

118. **The structure of local government is a single tier system of local government comprising three types of councils**, namely: City, Municipal and District. However, there is a weak link between the Mayor/Council Chairperson and the Ministry of Local Government and Housing which has led to lack of co-ordination, transparency and accountability on civic matters. The main problems with the current structure are highlighted as below:

- Absence of competition for service delivery leading to inefficiencies;
- Absence of financial and administrative autonomy;
- Absence of commercial principles in service delivery;
- Inadequate access to private finance and utility suppliers; and
- Absence of performance measurement criteria.

119. **The management of PPP liabilities has two parts.** The first is deciding whether to incur the liabilities. This includes deciding whether to implement a project as a PPP and, if so, deciding whether to offer construction subsidies, availability payments, guarantees, or other forms of financial aid. To compare the cost of the options, the government needs to calculate the present values of the estimated payment streams, taking any relevant differences in the degree of systematic risk associated with the payments. Some kinds of systematic risk can be accounted for by varying the discount rate. The second part is managing the liabilities after they have been incurred. This includes monitoring to minimize risks and to avoid paying more than necessary; budgeting for payments; ensuring cash is available when needed; and reporting liabilities internally and to the public.

120. **After PPP liabilities have been incurred, governments need to budget for possible spending, monitor the PPPs and the liabilities and report the liabilities** in some form, internally and externally. Most budgetary systems contain devices to deal with the inevitable uncertainty of spending. Certain other devices may be used specifically for guarantees. Both Brazil and Colombia have set up guarantee funds to help manage government guarantees for PPPs. Each country's approach is, however, quite different. The key advantage of a transparent monitoring reports is that it allows to summarize the government's financial obligations (and rights) in each PPP, estimate that maximum amount the government could have to pay, by year of the contract, and in total, as a result of the government's main financial obligations (including those relating to availability payments, revenue guarantees, and termination payments), state the payments the agency had made in the PPP in the previous period and the reason for those payments, briefly discuss the state of the PPP and mention any problems that were reasonably likely to lead to unplanned government spending and forecast payments in the next period.

121. **Value for Money represent the best practice** One of the approach that has been used is the concept of testing the value for money (and affordability) of implementing PPPs against a "Public Sector Comparator" (PSC). The PSC is a risk-adjusted financial model of the hypothetical public sector project. It estimates the total costs to the

government of achieving the targeted outputs, assuming that the project is handled in the normal way, with reasonably foreseeable efficiency improvements. This approach played a key role in PPP project development in Australia, Canada, the Netherlands, and the UK, the country where it originated in the early 1990s. Officials in some of these countries have recommended wider use of the PSC method in developing countries, to help ensure that PPP projects clearly demonstrate value for money before public partners enter into contracts. South Africa also adopted this approach (see Box 5.1).

122. **Yet the method has come under growing criticism in the past few years** in such countries as Australia and the United Kingdom (see Box 5.2 for more details). The comparison can be made at two points in project development. First, it can be done before bids are received, usually as a way to determine whether to move forward with expensive procurement processes. In this case the PSC is normally compared with a hypothetical PPP project (the PPP reference), a risk-adjusted financial model that estimates the total cost to government of having a private company deliver the targeted outputs. Second, the comparison can be made after the bids are received, as a way to determine theoretically whether any of the bids are acceptable. The original logic for using PSC remains valid and is especially important in developing countries: governments need to think through and document their rationale for using the private sector rather than traditional public sector methods for delivering infrastructure services. The PSC also forces sponsoring agencies to think through how much it now costs to provide similar services, what risks are associated with a project, and how these should best be managed in an eventual PPP project.

Box 5.1: The South African Public Sector Comparator Model

Definition of PSC: A PSC is defined as a costing exercise, with the public sector as assumed supplier, to a prior output specification. The PSC is based on a recent actual public sector project providing that defined output (including any reasonably foreseeable efficiencies the public sector could make) or, where there is no actual recent public sector project, a best estimate. A risk-adjusted PSC takes full account of the risks that would be encountered.

In constructing a risk-adjusted PSC, it is necessary to:

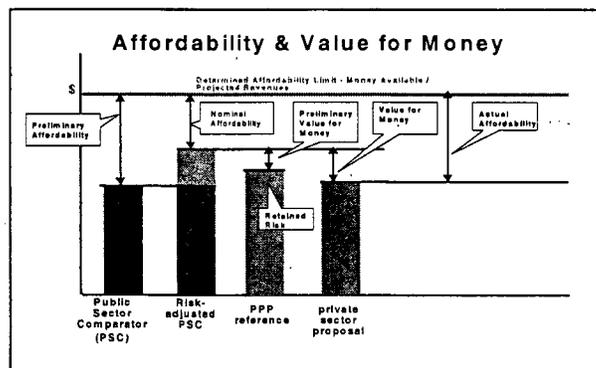
- Determine the total cost of providing a given output specification, called the Base PSC.
- Adjust the base costs to reflect the various risks associated with public sector procurement, leading to the Risk-adjusted PSC.

Definition of PPP reference model: The PPP reference model is what can be called a “shadow” or “virtual” bid. This involves establishing a cost estimate, from first principles, for the output specifications, from a private party’s perspective, to estimate the cost of the private sector delivering the required service. Comparing the PSC and the PPP reference model is how the public sector is able to assess whether service delivery by the government or by a private party yields the best value for money for the Institution. However, to allow for comparability, the PPP reference model must be developed using the same output specifications in the PSC model and be adjusted for all relevant risks in the same manner as the base PSC.

Risks: In the case of the PSC, risk is the potential for additional costs above the Base PSC. Historically, public sector procurement has tended to be deficient in appreciating risk, and as a result, budgets for major procurement projects have often been prone to optimism bias, i.e. a tendency to budget for the best possible (often lowest cost) outcome rather than the most likely. This has led to frequent cost overruns. Optimism bias has also meant inaccurate input prices have been used to assess options. Such biased financial (i.e. price) information early in the budget process can result in real economic costs resulting from an inefficient allocation of resources.

Demonstrating affordability Affordability relates to whether the cost of the project over the whole project life can be accommodated in the budget of the department, given its existing commitments. This is different from value-for-money, which simply means that private provision of a government function/service results in a net benefit to government, defined in terms of cost, price, quality, quantity, or risk transfer, or a combination thereof. A particular PPP contract may thus be unaffordable, even though it provides “value for money”. If a project is unaffordable, it undermines the Government’s ability to deliver other services and should not be pursued, even if there is a possibility that it may meet “value for money” criteria. Value for money is a necessary condition for PPP procurement, but not a sufficient one. Affordability is the driving constraint in all PPP projects. The demonstration of affordability is done by comparing the Risk-adjusted PSC with the Institution’s budget, as a preliminary analysis of the project’s affordability. And then by comparing the risk-adjusted PPP reference model cash flows with the Institution’s budget to assess affordability.

The value-for-money test The value-for-money test is only conducted when private bids are submitted. But it is a requirement for the initial feasibility to get an initial indication of what value for money this project is likely to provide if it were procured through a PPP or PSC. The Risk-adjusted PSC benchmark is used to conduct the value-for-money test, by comparing it to the Risk-adjusted PPP reference model during the Feasibility study stage and then by comparing both models with the actual bids received at procurement stage. “Value for money” will be determined by comparing the PSC to the private sector proposals on a net present value (NPV) basis. The figure below illustrates how comparing the PSC and the PPP reference models will assist the government institution to determine value for money. It must be noted however, that this illustration does not include the “time value of money”, which must be calculated in the financial models and shown as net present value (NPV), using appropriate discount rates. The illustration usefully shows how the Feasibility Study models provide the critical benchmark for evaluating PPP bids when they are received during the procurement phase.



Source: Leigland (2006a) and (2006b)

123. In response to the criticisms summarized in Box 5.2, in 2004 the U.K. Treasury initiated reforms in how the PSC method should be used:

- There should no longer be a bias toward private participation; more open-mindedness toward conventional public procurement is encouraged.
- The systematic tendency for appraisers to be overly optimistic in estimating key parameters for PPP projects should be explicitly countered through empirical evidence of this “optimism bias” from past projects.
- After bids have been received, there should be no comparison with the PSC, and no questions about whether the PPP approach is appropriate. The emphasis will be on getting the most from the deal with the preferred bidder.

Box 5.2: Public Sector Comparator Criticisms in the UK and Australia

Among the key criticisms that developed countries raised against PSC the most relevant ones are summarized below:

- **Inaccuracy.** Even industrial countries have little objective data on which to base cost estimates. Without such data, calculating with any accuracy how much a project will cost to run over 25–30 years is almost impossible. There have also been difficulties in standardizing methods for determining the “normal way” in which the public sector implements a project, and the “reasonably” foreseeable efficiency improvements that public officials might make.
- **Omitted risks.** Some risks, including the one related to contract renegotiation or bailing out by the government, are difficult to estimate, especially in the developing world. Expected project costs are rarely adjusted for such risks.
- **No consensus on discount rate.** The comparison between the PSC and the PPP project is made in terms of present values, so the discount rate used is critical. Since PPP costs to the public partner are spread out over more time, using a higher discount rate will favor the PPP project, and the comparative gains in PSC efficiency must be greater to make the PSC approach attractive. Unfortunately, no clear consensus exists among economists, policymakers, or practitioners about what the rate should be and whether it should be the same for the two projects. Countries that have adopted the PSC approach use a wide range of approaches to determining the discount rate.
- **Manipulation.** Much of the PSC depends on subjective judgment, and small adjustments for risk or in discount rates can have dramatic effects on cost estimates. Because of this, some U.K. experts were unsurprised when a parliamentary committee found several cases involving “manipulation of the underlying calculations and erroneous interpretation of the results”.
- **High costs.** The financial modeling required for PSCs and PPP references can be expensive and time consuming.
- **Second-guessing.** The PPP reference for the pre-bid comparison has been criticized as a futile attempt by government officials and their consultants to estimate what the private sector will do. Australia’s leading state government authority on methodologies for PPP project development, Partnerships Victoria, has recommended not wasting resources on this.
- **Post-bid results too late.** The bidding process establishes the PPP costs with much more accuracy than a PPP reference does. But by the time bids are received, canceling the procurement process on the grounds that the bid price is higher than the PSC costs is almost impossible. In countries like Australia and the United Kingdom this is almost never done except when departments simply do not have the budgetary resources they need to make required payments to the contractor.

Some cautionary notes are needed. The PSC method, particularly as used in some industrial countries, may not be the best way to do all this in developing countries:

- Many African countries lack public funding for infrastructure projects, so developing and using PSCs in any meaningful way is generally not feasible. In these cases a comparison can still be made, and documented, between the net economic benefits of the PPP project and those of the status quo alternative (or perhaps a less costly, remedial project).
- Doing PSC comparisons for one or several representative projects of different types might also make sense. Often this could be an abbreviated PSC that estimates the transaction costs associated with a PPP alternative and determines whether its likely efficiency savings would compensate for those costs. On the basis of these representative PSCs, guidance could be prepared for the routine appraisal of projects of each type.
- In some situations it might be sensible to use the PSC more as a way to achieve consensus among stakeholders about what features a project should have than as an expert judgment for convincing stakeholders that a project is affordable and offers value for money. That is, governments could fully acknowledge the subjectivity of the PSC estimates while using the PSC as a starting point for soliciting inputs on project design.
- Finally, in many cases, PPP appraisal methods have been left largely to consultants. So there has often been little consistency in the methods used across projects, and almost no effort to build up a body of knowledge about which methods produce successful projects and which do not.

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Annex 1: Lessons from Public Private Partnerships in Infrastructure

Introduction.

124. **In order to implement a successful PPP program a number of pre-conditions need to be satisfied.** Such criteria include: (i) ability to appraise investment in the sector; (ii) having in place a legal and regulatory framework that allows for private participation, that defines the role and scope of the regulator as well as the institutional setting in which it operates; (iii) revenue adequacy of pricing/tariffs and predictable payment culture; (iv) structure of rights and obligations to be transferred to the private sector; (v) depth of the domestic capital markets and the ability to source in local currency for clients that earn their income in local currency; (vi) political commitment and an articulation of policy to accomplish in the sector through private participation.

125. **A PPP takes the form of a contract between a private sector entity and the government that calls for the private sponsor to deliver a desired service and assume the associated risks in exchange for the right to earn an adequate return.** The government may be currently providing that service, or it may be a new service that would benefit the country and economy, but is not currently being provided. Risk allocation is at the heart of how PPPs are structured. PPPs allow better risk allocation since PPPs are procured as services, and not assets. And unlike conventional procurement, the focus is outputs not inputs. PPP is a procurement tool that is available to the governments where the private sector is contracted to deliver outputs rather than inputs and services rather than assets. In other words, the public sector passes on the responsibility of service delivery to the private sector. PPP procurement method is only beneficial if it provides *value for money* over conventional procurement (see Grimsey, 2005, Grimsey and Lewis, 2002 and 2005).

126. **One of the key lessons from the economic literature is that PPP of this form can deliver strong benefits, but only if done well:** It has to be based on fair, transparent bidding, designed to select the most efficient operator; tariffs (or possibly secure subsidies) should be set to achieve cost recovery; the contract needs to specify procedures for tariff adjustment, quality standards and access targets; dispute resolution mechanisms need to be established in advance; and regulation needs to be performed by qualified staff, based on technical criteria, independently of operator, public and government pressures (see Berg et al., 2002 and Harris, 2003).

127. **It is generally argued that governments can borrow on more favorable terms than private utilities.** This implies that the overall cost of capital for publicly owned utilities is significantly lower than that for private utilities. A contrary argument is that the lower cost of capital for publicly owned utilities results from the implicit transfer of risk to the taxpayer. Public financing may however also lower the incentive to manage business risks prudently. The implication, therefore, is that the true cost of capital for publicly owned utilities is usually no less than the equivalent cost for private utilities. In terms of public versus private sector provision of infrastructure, on the negative side,

there have been a number of clear failures of private sector provision. Most have been the result of unrealistically high expectations from private investment, public opposition to tariff increases, and poorly designed contracts combined with unanticipated changes in key economic and financial conditions. While the private sector has certainly contributed to such failures, reversals in government policy have also been to blame (see Guasch, 2005). On the positive side, the majority of contracts have led to substantial improvements in operational efficiency and in the quality or coverage of services. Better management of existing assets can also reduce the amount of investment required to sustain or extend services. However, it has been argued that such gains could sometimes come at the expense of social goals, such as universal access to services at affordable prices.

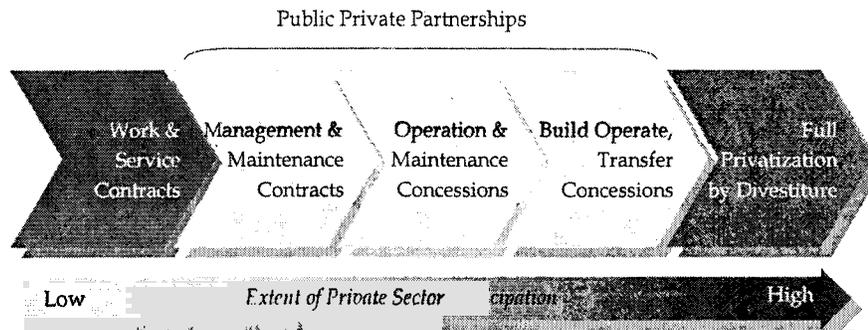
128. **PPPs tend to have a lower net present fiscal cost if concessionaires' private-sector incentives mean they can offer a service of a given quality at lower cost than is possible with public finance.** Also relevant to the comparison are the costs of writing, enforcing, and renegotiating contracts under each option: PPPs are more likely to be cheaper if the service the government wants to get is relatively simple to specify and unlikely to change much over the life of the project. Judging whether a PPP or a publicly financed investment will be cheaper would be difficult if it requires a careful measurement of their costs, and comparison of them with similar publicly finance projects. For, even then, doubts would arise about whether the projects being compared really were similar and whether any differences in costs were caused by differences in the projects unrelated to the choice of financing.

129. **The most noticeable effect of using a PPP rather than public finance is to reduce the government's spending in the short term.** This difference is not, however, representative of the long-term fiscal effect of using a PPP (see Irwin, 2005). After the initial positive effect, the use of a PPP typically has a mainly negative effect on the government's cash flows. In a PPP with user fees, the main negative effect is that the government cannot itself collect the user fees. In PPPs without user fees, the government must pay for the service once it is available.

A. 1. Contractual forms of PPPs

130. **The nature of the partnership between the private and the public sector can range from simple contractual arrangements to supply a specific service, to complex arrangements to design, construct, operate, maintain, finance, and provide an infrastructure service.** Figure A.1 below illustrates the broad spectrum of private sector participation in service delivery. As more equity and control is transferred to the private sector, so is more risk. PPP, in which the private sector can provide significant amounts of finance for the project, provides relief to government budget. With these savings, the government could invest in those projects that are less amenable to PPPs.

Figure A.1: Full Spectrum of Private Sector Participation in Service Delivery



131. **Under concessions and Build Operate and Transfer (BOT) contracts, the operator has an obligation to invest in new capacity or the replacement of existing infrastructure.** The investor is compensated through the tariff charged for the service and/or a payment for the depreciated value of investments at the end of the contract period. With leases, the primary responsibility for financing most investment in infrastructure rests with the (public) owner although the operator may be encouraged to invest in equipment. The overall level of tariffs is not as critical under these contracts as under divestiture because lower tariffs can be offset by lower lease payments for the existing assets. However, concessions or BOT contracts involving substantial investment obligations over 20-30 years and will be viable only if the tariff structure ensures that revenues are sufficient to cover the long-term cost of service.

132. **Concessions and similar arrangements are the primary form of PPP in the provision of water and waste-water services and are quite common in transport.** The majority of new investment in electricity generation has been through BOT contracts, sometimes combined with leases for existing plants. The absence of liberalized wholesale power markets means that investors rely on long-term agreements with (usually) state-controlled or guaranteed purchasers. Under these conditions, it is natural to link the purchase agreement to the license of electricity to operate the power plant. From a regulatory point of view, however, long-term power purchase agreements present the disadvantage that they can impede subsequent liberalization and the introduction of competition.

133. **Management and outsourcing contracts are operating contracts without any investment obligations.** These were relatively rare during the early privatization phase when most attention was focused on the divestiture of assets. However, they have become more common in recent years as countries have found it harder to attract private operators ready to invest in infrastructure services (particularly water and electricity sector) where there is resistance to cost-reflective tariffs. Outsourcing contracts have been

awarded in the railway sector as a result of government reluctance to cede control of the basic network infrastructure.

134. **Under each of these different forms of PPPs, risks and responsibilities are allocated in a different way.** While the exact allocation is subject to the outcome of bidding processes and negotiations, a distribution across the spectrum can be broadly presented as depicted in Table A.1.

Table A.1: Main Options for PPPs and their Allocation of Risks and Responsibilities

| | | Risk & Responsibility Allocation | | | |
|----------|------------------------|----------------------------------|--------------------------|--------------------|-----------------|
| | | Asset Ownership | Operations & Maintenance | Capital Investment | Commercial Risk |
| PPP TYPE | Service Contract | Public | Public & Private | Public | Public |
| | Management Contract | Public | Private | Public | Public |
| | Lease | Public | Private | Public | Shared |
| | Affermage | Public | Private | Public | Shared |
| | Build-Operate-Transfer | Private | Private | Private | Private |
| | Concession | Public | Private | Private | Private |
| | Divestiture | Private | Private | Private | Private |

A.2. Key lessons from PPPs - sectoral overview

A. Telecommunications

135. **The telecommunications sector has had one the most extensive use of PPP across all regions.** The main forms of PPP have involved the sale of strategic stakes in incumbent operators, together with management control. In many cases, governments have retained either a minority shareholding in the incumbent fixed-line operator or some kind of “golden share” designed to prevent (hostile) takeovers.

136. **A major issue in many PPP transactions has been the balance between the promotion of competition and maximizing the revenues from the sale of shares, assets or licenses.** Governments wishing to maximize the price have had an incentive to grant exclusivity rights or periods of restricted competition to the purchaser. These privileges are sometimes justified on the grounds that they make it possible for the government to impose other more onerous conditions on the purchaser, such as investment in installing new lines. However, enforcing conditions on investment has proved difficult despite such privileges. Furthermore, studies have shown that competition has been a crucial factor in improving the performance of telecommunications operators.

B. Energy

137. **The private sector has a significant role in electricity generation and distribution.** Most commonly, these arrangements have taken the form of outright ownership transfer. However, some countries have also used management contracts, either in part or exclusively. Subsidies have been a major factor influencing both the

degree and nature of private sector involvement in the electricity sector. In the early transition period, electricity tariffs were low and many utilities ran large financial deficits that were borne ultimately by the state. In some countries, privatization was seen as a route to better performance. This route, however, has proved more difficult than anticipated since governments have often been reluctant to sanction tariff levels necessary to generate an adequate return on capital. Consequently, the private sector has been more cautious about making a substantial equity commitment to buy distribution companies in perceived riskier countries. Throughout the regions, governments have generally retained control of electricity transmission systems (as a key strategic sector) – either through a vertically integrated power company, or through a separate, state-owned transmission company after unbundling.

138. **Reforming the distribution companies therefore has high priority.** Reform of tariffs and revenue collection has become a pre-condition for the successful sale of distribution companies. If anything, private involvement is far more important in the distribution sector than in generation, for without commercial distribution charging cost-reflective tariffs, the counter-parties to any power contracts will be financially weak and the Public Purchase Agreements (PPAs) will lack the credibility needed to attract private investment into generation.

139. **There is general agreement that sustained improvements will require privatization or at least credible commercialization,** although preparing the companies or boards for privatization requires considerable care, not least in ensuring adequate information (from metering, management budgetary systems, etc) is available to regulators and investors before final privatization, to avoid costly mistakes and painful policy reversals.

140. **Monopoly power and vertical integration continue to pose difficulties in developing countries with substantial PPPs.** Even where the intention has been to introduce some form of competition in generation and distribution, it may be undermined by a lack of bidders or subsequent sales of different assets to the same investor.

C. Water and waste-water services

141. **The water sectors face many similar problems in promoting PPP, but also additional ones, as it is dominated by municipal companies and have a history of charging low tariffs.** Even though many of the municipal companies face similar problems as the larger electricity companies, a first step in the case of Zambia will be to improve their operating procedures and financial management systems such that they can actually absorb (donor) funds to improve access and quality of service, before adopting PPP based arrangements. BOT contracts have been signed with only the most creditworthy municipalities. Elsewhere, concessions or other PPP contracts have been dominated by a “thin equity” model, under which almost all new investment is funded out of accumulated profits and loans provided by international financial institutions or grants.

D. Transport

142. **Countries have introduced PPPs through toll roads.** Many toll road concessions (e.g. in Hungary) did not fulfill all objectives, partly due to under-estimation of the extent of traffic diversion to alternative routes and the high risks allocated to private operators. Some countries (e.g. Hungary) have now replaced its toll-based concessions with contracts based on payments for road availability, therefore transferring traffic risk back to the state. Such a model preserves the PPP character of the transaction as private companies remain responsible for construction, maintenance and related risks. However, they are now paid directly from the state budget or through state controlled road agencies rather than through tolls.

143. **PPPs in railways are also limited.** Reform has so far focused mainly on the commercialization and restructuring of public railways. However, even in countries where this process is well advanced, governments have been hesitant to transfer operations to the private sector. In most developing economies, passenger services make a loss and are subsidized.

144. **For PPPs to be viable under these circumstances, it is necessary to establish explicit arrangements for providing subsidies through Public Service Obligations (PSOs).** Many freight services can, however, be profitable. The sector can be gradually liberalized by allowing licensed transport and leasing companies to supply wagons to freight users and by granting carrier licenses to private companies, allowing them to operate freight services over main lines as well as branch lines.

A.3 The Sub-Saharan experience in PPPs

145. Table A.2 below reports the extent of PPP in Africa's infrastructure sectors. Note that in this context the existence of PPPs simply means that these sectors have been unbundled enough to allow some parts to be operated by the private sector. In many instances, the segments in which the private sector is present might not be essential to the operation of the infrastructure service.

146. **The strongest private sector presence is for telecoms sector with 51 percent.** However, even there --and this is for the fixed line business only-- it may seem to be low in comparison to common wisdom on PPP in the sector. This is because a somewhat surprisingly large share of the operators has actually been corporatized but not privatized. Next in line in terms of the PPP performance are rail and electricity generation--over 40 percent of the cases for these infrastructure business lines. The sectors the least successful in attracting private sector interest are water and electricity distribution for utilities, where fewer than 30 percent of the countries count on PPPs, with the lowest performance for the water sector with only 1 country in 5. Overall, Africa's performance on this front is consistent with that of its peers. It is however well below the performance of lower-middle and upper-middle income.

Table A.2: Extent of PPPs in Africa's infrastructure sectors as of 2004

| shares of sample (% of total sample size for each country grouping given in parenthesis) | Africa | Low income | Lower-middle income | Upper-middle income |
|--|------------|------------|---------------------|---------------------|
| Electricity | | | | |
| Existence of Private Capital in Electricity Generation | 41 (46) | 41 (59) | 48 (42) | 58 (33) |
| Existence of Private Capital in Electricity Distribution | 28 (46) | 29 (62) | 37 (43) | 48 (33) |
| Water and Sanitation | | | | |
| Existence of Private Capital | 20 (44) | 18 (55) | 50 (40) | 47 (32) |
| Telecoms | | | | |
| Existence of Private Capital | 51 (47) | 50 (64) | 62 (50) | 72 (32) |
| Transport – railways | | | | |
| Existence of Private Participation | 48 (31) | 34 (41) | 26 (38) | 60 (20) |

Sources: Estache and Goicoechea (2005) and Jane's World Railways 2003-04.

Notes: * Private participation refers to the existence of any kind of private participation including management and service contracts. Private capital refers to private participation that requires capital investment from private parties, includes only concessions, divestitures, and built-operate-transfer (BOT) contracts.

* Rail data was published in 2004, but there is a lag of about 2 years in the data. Thus, it would be more accurate to say that rail data is a snapshot of 2002.

147. *Which sector made the most of PPPs in Africa?* To keep things in perspective, it may be useful to point out that considered the level of private sector presence that financed no more than 10 percent of Africa's investment needs during the 1990s. Table A.3 provides some insights on the sectoral distribution of the private sector commitments to Africa since the early 1990s. Roughly, 70 percent of those went to the telecoms sector and about 20 percent to the electricity sector. Neither transport nor water and sanitation were very effective at attracting the private sector. Table A.3 also shows that average project sizes confirm the total volume bias in favor of telecoms and electricity.

148. *Which contractual agreements are the most popular for PPP in Africa?* In total, greenfield contracts are the most popular but this is driven by the experience of the two most attractive sectors for investors where greenfield projects tend to dominate all other contract forms. The electricity sector has also seen a fair volume of concession and management contract while for the telecoms sector, the second most common type of PPP arrangements are divestitures or sales—but way behind Greenfield projects. For Water, the preferred instrument is a management contract. For transport, concessions dominate but are followed closely by greenfield contracts.

Table A.3: Nature of Private Participation in Sub-Saharan Africa's Infrastructure (1990-2006)

| | Concessions | Greenfield | Divestiture | Management | Total |
|--------------------------------------|-------------|------------|-------------|------------|--------|
| Electricity | | | | | |
| Total investment (US\$ millions) | 1,682 | 3,377 | 1,104 | 13 | 6,175 |
| Number of projects | 12 | 21 | 5 | 10 | 48 |
| Average project size (US\$ millions) | 140 | 161 | 221 | 1 | 523 |
| Water & Sanitation | | | | | |
| Total investment (US\$ millions) | 197 | 13 | .. | 21 | 230 |
| Number of projects | 2 | 2 | .. | 10 | 14 |
| Average project size (US\$ millions) | 98 | 6 | .. | 2 | 107 |
| Transport | | | | | |
| Total investment (US\$ millions) | 1,709 | 871 | 169 | 0 | 2,749 |
| Number of projects | 18 | 12 | 3 | 11 | 44 |
| Average project size (US\$ millions) | 95 | 73 | 56 | 0 | 224 |
| ICT | | | | | |
| Total investment (US\$ millions) | .. | 11,960 | 9,375 | 388 | 21,724 |
| Number of projects | .. | 95 | 15 | 2 | 112 |
| Average project size (US\$ millions) | .. | 126 | 625 | 194 | 945 |

Notes: * Total investment adds investment in government assets and investment in facilities and is based on commitments.

149. *What about small scale PPPs?* The most basic fact is that only 20 percent of the countries have any significant private sector participation in the form of major contracts with international operators. The four main international actors in Africa are Veolia, Ondeo, Saur and RWE. They are present in the 20 percent of African countries with significant PPPs in water. In most of these countries, they also focus mostly-- and dominate--the urban markets. Most of these PPP contracts are in the form of management contracts, which means that the investment risk is carried by the public sector. In Africa as in other regions, there is indeed a plethora of small scale providers, sometimes financed from foreign capital, sometime domestic firms which are taking over an increasing share of the contracts, often procurement controls for firms nominally operated by the public sector.

150. A similar story could be told for the energy sector in complementing large public and private providers. Indeed, cases of small-scale providers contributing to rural electrification in more than 21 African countries. They play a significant role in rural electrification in Kenya, Mali, Somalia, Mozambique and Ethiopia, and account for as much as 21 percent of rural households with access to solar powered electricity in Kenya (entrepreneurs); 20 percent with generator powered electricity in Somalia (entrepreneurs) and 12 percent with generator powered electricity in Mali (community organizations). This segment of the market supply has its own quality, affordability and sustainability issues which are too seldom addressed as part of the high profile policy debate. This is an issue because in many countries, these suppliers cater to the needs of shares of the population at least as large as those being served by public and private utilities.

Annex 2: Bank's Available Instruments

Local Infrastructure Investment Trust (LIIT) Instrument

The LIIT is an innovative vehicle for mobilizing institutional resources, both globally and regionally, toward infrastructure services improvement, providing exit alternatives for first-round private equity investors through increased marketplace liquidity. An LIIT is an investment fund that invests in long-term equity positions in local utility corporations and raises resources through equity, quasi-equity and debt issues on the domestic and international market.

Political Risk Insurance/Partial Risk Guarantee (PGR) Facility Against (Sub-)sovereign Breach-of-Contract Risk

The PRG facility offers two very important advantages sought by many private sector investors as well as by (sub)sovereign authorities: (i) better financing terms through spread reduction and maturity extension; (ii) incremental public debt at a fraction of capital investment leveraged; and (iii) better discipline of all involved parties. PRGs supported by the World Bank are very seldom called. In total, of the eight PRGs concluded to date, none have been called.

Output-Based Aid (OBA): Output-Based Subsidy Scheme for PPPs

In many developing countries, public sector utilities often fail to recover operating costs. This prevents most utility companies from providing service population at large, due to very limited investment capacity to enhance their systems, hence leaving large areas unconnected. In addition, operating below cost recovery levels worsens the quality and continuation of service of those areas already covered by the network. The low rates of return have often prevented private investors from entering in segments of the infrastructure sector that do not offer enticing investment opportunities.

Attracting private capital requires moving tariff to cost-covering levels (including costs of investment). In many instances this means sharp tariff increases from existing levels, although initial tariff increases can tail-off in subsequent years as costs are squeezed due to the increase in efficiency resulting from the turnaround. Rebalancing tariffs leads to significant increases to prices that end users may not be able to afford, hence creating risks of adverse impact of tariff rebalancing with the lower quintiles of the population potentially connected to the network but not able to pay for services.

To mitigate the risk of adverse impact of swift tariff increase, governments have often relied upon alleviation instruments such as subsidy schemes that allow low-income users to access (municipal) utilities' services. The subsidy scheme must be designed to accomplish two primary objectives. On the one hand the subsidy should create incentives for operators to improve performance, quality and coverage of service. On the other, the subsidy should support the transition towards cost-recovery pricing for those users that cannot afford a rapid change in tariff.

Contract Transparency Assurance and Monitoring (COTAM) System

The establishment of a PPP requires a comprehensive negotiation process due to the mixed nature of the agreement involving both the private and public sector. There are many factors that in some instances can affect and even undermine the viability of PPPs. First, local authorities—especially at the municipal level—may have limited capacity in negotiating contracts and partnerships, hence preventing the public sector from fully reaping the benefits of PPPs. Second, the private sponsors of the PPP may lack a thorough understanding of the local market and its potential and limitations. Third, the negotiation process itself may be distorted due to inadequate information sharing mechanisms among the partners involved, leading to lack of transparency in the final agreement. Finally, contract negotiations may be burdened by complex and poorly understood administrative procedures that may exacerbate the lack of transparency of the proceedings. These rigidities have the potential of distorting the nature of the partnership, hence altering its delicate balance of risk allocation and beneficial impact.

COTAM would be neither a party to nor a signatory of the contract, but would ensure appropriate knowledge sharing between the parties to guarantee that information circulates openly during negotiations. In some instances, it could well be the case that contracts run astray because parties “forget,” or rather more likely deliberately choose to ignore certain key elements during negotiation. The nature, structure and functioning of this independent body would depend on the institutional setting of any given country to ensure that adequate measures are taken to identify the most suitable structure for a COTAM facility in the recipient country.

COTAM would also become a valuable framework within which to negotiate potential upgrades of the agreements or renegotiate a few components of the contract subject to revision depending on certain events or scheduled deadlines. Moreover, COTAM could serve as a forum for informal settlement of potential disputes among the parties, thanks to its familiarity with the issues and its involvement in the many steps of the process, prior to resorting to formal procedures.