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Electricity Utility Management Contracts in Africa:
Lessons and Experience from the TANESCO-NETGroup Solutions Management Contract in Tanzania, 2002-2006

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1. Introduction

Management contracts are gaining attention as an element of reform and private sector participation (PSP) in Africa. A policy instrument that brings in outside consultants to oversee all, or part, of utility operations, management contracts aim to generate improvements in utility financial or technical performance. They are generally simpler and of shorter duration than other forms of PSP such as leases, concessions and divestitures. However management contracts are not straightforward. They commonly involve donors, governments, utilities, private consultants and consumers who often have different expectations of what constitutes effective outcomes. They are utility-focused instruments that can be influenced by wider sector conditions, such as overall sector reforms, including introduction of independent power producers (IPPs). As a result, management contracts are highly dependent on how governance and performance incentives are structured. They also generate important questions about what happens after the management contract has ended. There have been relatively few independent reviews of electricity sector management contract experiences in Africa (e.g. Davies 2004; Castalia 2005). Yet, attention to the origins, implementation, and outcomes of existing experiences provide an opportunity to gain valuable lessons about possibilities and limitations of current approaches to PSP in Africa.

Figure 1. Electricity Management and Lease Contracts in Africa

Figure includes current, completed, and cancelled contracts in Africa (see Appendix B)
Source: Compiled by author based on data from World Bank PPI database (2006)

Tanzania is one of a handful of African countries that has undertaken a management contract in its power sector (see Figure 1). Tanzania's management contract was originally conceived as a step toward eventual privatization of the national electric utility. However, reflecting wider trends in power sector reforms in Africa, Tanzania's management contract shifted mid-contract away from being a privatization step, and the contract became an instrument using the technical and managerial capacity of international consultants to drive commercialization and technical objectives, while maintaining formal public ownership.

Tanzania's management contract brought about significant changes in utility operations and generated a near doubling of utility revenues in only two years, making it one of the most high profile management contracts on the continent. However, it also failed to catalyze meaningful improvements in technical performance despite optimism on the part of the consultants, government, and sponsors at the start of the contract's second phase.

Wider sector conditions - including drought, increasing generation costs (linked to IPPs), and delays in government-donor led debt-restructuring - created a difficult context for improving technical performance. The shifting policy context around reforms also created uncertainties and diverging expectations within the already complex governance structure of the management contract. In addition, the contract's scope failed to place sufficient emphasis on customer service, and instead it was treated as derivative of other objectives.

The end result is that electricity consumers face tariff increases with few tangible improvements in return. Needed investments in maintenance and infrastructure have not sufficiently materialized. Tanzania's reforms have brought new IPP generation, increased revenues, and created new institutions to support a reform environment. However, they are yet to yield the desired extent of improvements in basic infrastructure, customer service, and access on the ground that was originally hoped after more than a decade of reforms.

This paper aims to provide greater clarity on the key factors that have shaped these outcomes and, in the process, glean lessons about what management contracts can and cannot do in Africa and how their design and application may be improved. The paper is organized in three main parts. The first sections situate the contract's origins within the context of power sector reform in Tanzania and document the key elements of the contract, its performance metrics, governance structure, and remuneration provisions. The paper then reviews the performance of the management contractors, as measured against the contract's formal metrics. The management contract is also assessed within a wider context of sector goals and conditions in Tanzania. The paper concludes by synthesizing the key outcomes of the contract, and considers broader lessons for PSP and reform in Africa.

This study of Tanzania's management contract is based on: over 30 discussions and interviews with stakeholders connected to the management contract in Tanzania, South Africa and Washington DC, conducted 2005-06; analysis of utility and contract performance data spanning 2002-06; and a review of policy documents and archival materials related to reforms and the contract. Wider interpretations are also informed by interviews, surveys, and focus group discussion with urban residents of Dar es Salaam, customers at TANESCO's regional offices, and employees of TANESCO's corporate and regional offices, carried out by the principal author in 2004-5 as a part of wider dissertation research.

2. Overview: TANESCO-NETGroup Solutions Management Contract

2.1 Contract Overview

In 2002, the Government of Tanzania entered into a two year management contract for the national utility, Tanzania Electricity Supply Company Limited (TANESCO), with NETGroup Solutions (Pty) Ltd. of South Africa. The contract was extended for an additional two and a half years in 2004. In total the contract spanned 56 months from May 2002 to December 2006, including an initial phase of 27 months (May 2002 to July 2004) and extension of 29 months (August 2004 to December 2006).

Beginning in May 2002, NETGroup managers took over the top four TANESCO executive positions and oversaw day-to-day strategy and operations of the utility.

NETGroup also contributed specific consulting projects with personnel from the parent company in South Africa. The Government of Tanzania provided oversight to the management contract, and the utility remained state-owned. NETGroup management was later expanded to five positions during the contract's extension.

The scope of work was designed around specific performance incentives. Initially, the contract aimed to achieve rapid financial turn-around to prepare TANESCO for full privatiation at the end of the two years. Phase I was based on no investment being provided by the government, and the contract's incentives were focused on increasing revenues. Power loss reductions and quality of service standards were also goals, though revenue incentives made up >99% of success fees ultimately awarded.

During the extension, the contract's scope was extended to include technical turn-around. The aim was to direct the revenue gains achieved in Phase I into new, utility-financed investments to improve technical performance. System reliability and electrification targets were added as incentives. The expansion of the contract's mandate was part of a shifting policy context. As eventual privatization became less likely, the contract was increasingly looked to as an independent instrument to pursue financial and technical goals that were necessary to improve sector performance.

Table 1. Terms of Tanzania's Electricity Management Contract

Contract Period	Dates	Term	Contract Objective	Performance Elements	Total Award
Initial Contract, Phase I	May 2002 – July 2004	27 months	Financial Turn-Around	- Revenue & costs - Power Losses - Quality of Supply	US$ 10.7 million
Extension, Phase 2	Aug 2004 – Dec 2006	29 months	Technical Turn-Around	- Utility profits - System Reliability - Electrification	US$ 7-8 million
TOTAL Contract	May 2002 – Dec 2006	56 months			US 18-19 million

The contract was financed from utility revenues and via a grant from the Swedish International Development Cooperation Agency (Sida) that was administered through a World Bank Trust Fund. The contract included fixed fees plus success fees related to performance incentive metrics, and the total contract payments are estimated between US$18 to 19 million. The management contract came to an end in December 2006. TANESCO has reverted to full public management in 2007, with the top management replaced by TANESCO managers, except for the Managing Director who was recruited from outside TANESCO, although from within Tanzania.

2.2 Electricity Reforms Status

Tanzania's management contract is a part of a wider electricity sector reform program that began in the early 1990s. In 1992, the structural adjustment program was expanded into utility reforms, including the electricity sector (Wangwe, Semboja and Tibandebage 1998). The first National Energy Policy framework was written in 1992, and it emphasized plans to involve the private sector in development of the energy sector. In the same year, with a severe drought and supply shortages, the Government lifted the state utility's monopoly on generation, with the goal of attracting new private generation.

These changes in policy in the early 1990s launched Tanzania's electricity reforms and paved the way for a greater emphasis on commercialization, private sector involvement, and restructuring of the electricity sector. Reforms were catalyzed by economic crisis conditions and macro-economic stabilization initiatives in the 1980s and 90s and driven by deteriorating electricity services and sector finances[1].

Reforms were also reinforced by shifting donor policies that made electricity sector lending conditional on reforms. The World Bank made electricity sector reforms a condition for lending in 1993 (World Bank 1993). Sida, Tanzania's largest bilateral energy donor, shifted from its historical role in hydroelectric development toward support for reforms by 1996-98. Norway and Finland pulled back from energy lending, reflecting a view that the private sector would increasingly take care of energy investment needs.

The most immediate results of power sector reforms were negotiations for two private power projects (IPPs) that began in the mid-1990s: Independent Tanzania Power Limited (IPTL), a 100 MW diesel fired plant, and Songas, a 190 MW natural gas plant that was part of a larger natural gas-to electricity project. The development of both projects was lengthy and involved contentious delays[2]. IPTL began selling power in 2002. Songas came online in July 2004 with 115 MW and expanded to 190 MW in January 2005. Notably, both IPPs came online after the management contract began. Uncertainties over generation costs and supply conditions have been difficult exogenous factors that affected the performance of the management contract. IPPs now provide a large component of generation, >50% in 2005 and 60% in 2006, and constitute the largest expense for TANESCO, reaching 70-95% of utility revenues in 2005-2006 (discussed in Section 5, see also Gratwick, Ghanadan and Eberhard 2006).

TANESCO commercialization efforts began in earnest in the early 1990s. To support Tanzania's reform commitments, the World Bank launched the Power VI project (1993-1998), which emphasized utility commercialization as a foremost sector goal. The project increased tariffs, installed pre-payment meters, and increased use of IT systems (although the later initiative was never fully implemented). Yet despite these changes, utility revenue

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[1] During the earlier two decades, TANESCO performed adequately, and according to Collier, "TANESCO had maintained a generally strong financial position." in the 1960s and 70s (Collier 1984, 154; Katyega 2004). But during the 1980s and early 1990s, electricity sector services deteriorated as sector finances were starved by multiple factors: i) the government was unable to finance or subsidize the sector under the fiscal crises of the 1980s, ii) donors' priorities shifted toward reform lending and donor finance for supply and technical investments dropped off, iii) low tariffs (resulting from abrupt currency devaluations in 1986 with structural adjustment) and poor collections and payments (linked to eroded public finances) dramatically eroded utility revenues, and iv) drought conditions in the early 1980s and again in the early 90s created supply shortages. The sector underwent a period of general de-capitalization and decline. This was the backdrop to the extensive commercialization efforts of the 1990s, and continued under the management contract in the early 2000s.

[2] IPTL's power purchase agreement was negotiated directly between the government and Malaysian and Tanzanian investors in 1995 (i.e. not competitively bid). Construction was completed in 1998. However, IPTL was taken to international arbitration over a dispute over construction charges. The 2001 ruling reduced capacity charges by 20%, however IPTL remains one of the most costly projects of its kind compared to similar projects in developing countries. IPTL began selling power to the utility in 2002. Songas was developed as part of a much wider donor-supported project to develop Tanzania's off-shore Songo-Songo gas reserves, build a pipeline, and produce natural-gas and power. The tender for Songas began in 1993 and continued over the next decade, involving more than 20 different contracts and multiple changes in shareholders. The project was put on hold during the IPTL arbitration period, delaying construction with a resultant mushrooming of interest charges to over US$100 million. Songas only began selling power to TANESCO in 2004. Development of Songas was supported in part by the World Bank Songo-Songo gas to electricity project. (For a detailed assessment of Tanzania's IPPs see Gratwick, Ghanadan and Eberhard 2006)

continued to be insufficient to cover operations, particularly as collections remained poor[3] (Katyega 2004). The Government of Tanzania thus began to explore other options to improve TANESCO's financial performance – including a private management contract.

Tanzania's Reforms also involved plans for restructuring and privatization. These were first elaborated in a World Bank Letter of Intent in 1997[4]. The original approach for private sector participation was to be via a 70% trade sale of shares (i.e. privatization). TANESCO's formal ownership and privatization mandate were placed under the state-run President's Parastatal Reform Commission (PSRC). Restructuring plans were further detailed in a 1999 Presidential Cabinet decision, including: vertically unbundling TANESCO into two generation companies, a transmission company, and two distribution companies.

A number of new institutions have been created in the context of reforms. In 2005, legislation was passed to form a Rural Energy Agency and Rural Energy Fund (REA/REF), which separates non-commercial rural electrification from the direct purview of the utility. The REA/REF was not yet functional, as of end-2006, but it will be the principal agency involved in the future in coordinating rural energy initiatives. The Energy and Water Utilities Regulatory Authority (EWURA) was established in late 2006, five years after initial legislation for its formation. As the majority of reforms occurred prior to EWURA's formation, de facto oversight during reforms has been via the PSRC and the MEM.

To date, little progress on unbundling and privatization has materialized, and privatization plans have been formally revised. In 2005, TANESCO was taken off the list of companies specified for privatization. The MEM is now pursuing a more-flexible approach for TANESCO's restructuring, called internal ring-fencing, which separates utility operations horizontally into business areas, while maintaining state-ownership. Private sector participation in electricity remains an ongoing policy objective, although how this will figure into operations post-management contract and under public ownership is uncertain.

Tanzania's reform outcomes reflect wider trends in Africa, where the most concrete changes have been in introducing IPPs, commercialization of service provision, and creation of new institutions, such as regulators, to support a reform environment. Plans for privatization and unbundling are shifting to more flexible concepts of private sector participation and public-private partnerships, which mesh with continued public sector ownership and the private sector taking on less risk. Table 2 summarizes the status of Tanzania's electricity reforms.

Table 2. Elements of Tanzania's Electricity Reforms (ca. 2006)

Reform Elements	Status	Policy Elements	Year
Corporatize	*Implemented*	1931 Electricity Ordinance forms private companies: DARESCO & TANESCO; 1964 government purchases private shares, merge into TANESCO	1964 public utility established
Commercialize	*Extensive*	Extensive commercialization initiated in 1990s under	1992 initiated

[3] TANESCO faced difficulties enforcing payments for services and arrears, particularly from public institutions. In 1991, public institutions' arrears amounted to a 20% loss in annual revenue (Mwandosya and Luhanga 1993). TANESCO made efforts to enforce public payments under pressure from the World Bank and via a 1993 agreement with the Ministry of Finance. However the Ministry was unable to honor it, and the agreement proved unsuccessful (Wangwe, Semboja and Tibandebage 1998). Outstanding debt deteriorated from 203 days in 1990 to 413 days in 1999 (Katyega 2004).

[4] Tanzania's commitment was outlined in a Letter of Sector Development Policy to the World Bank in advance of the Songo-Songo gas-to-electricity loan. Such letters are common requirements for World Bank loans.

Operations & Service Provision		World Bank Power VI Project to address earlier crisis; accelerated under management contract.	2002 – 2006 (Mgmt. Contract)
	Legislation only, not operational (as of 2006)	Legislation to form Rural Energy Agency and Fund (REA/REF): will separate non-commercial electrification from direct utility mandate, commercial (mainly peri-urban) expansion remains under utility.	2005 Legislation
Revise Electricity Law	*General policy framework, Law not amended*	National Energy Policy frameworks in 1992 and 2003 include reform intentions; Electricity Act not yet amended.	1992 framework 2003 framework
Establish Regulator	*Operational as of mid-2006*	Energy and Water Regulatory Authority (EWURA) appointed, operational as of mid-2006	2001 Legislation 2006 Operational
Introduce Private Generation (IPPs)	*Implemented*	Monopoly in generation lifted 1992; Two larger IPPs: Independent Power Tanzania Ltd (IPTL, 100 MW diesel), Songas (180 MW natural gas)	1992 Legislation 2002 IPTL online 2004 Songas online
Restructure & Unbundle Utility	*Modified plan*	Plans for unbundling of national utility into separate generation, transmission, and distribution companies revised to ring-fencing of separate business areas (internal restructuring) while remaining state-owned.	Modified plan underway
Privatization (Private Sector Participation)	*In flux & highly uncertain*	Privatizations plans for utilities announced 1997; Management contract toward privatization 2002; TANESCO despecified 2005; Increasing emphasis on private sector participation rather than full privatization.	1997 specified 2005 de-specified
Sources: Compiled by Author (See MEM 1992; World Bank 1992; ESMAP 1999; Marandu 1999; PSRC 1999; Karekezi and Kimani 2002; Marandu 2002; MEM 2003a; MEM 2003b; Davies 2004; Katyega 2004; ECON Analysis 2005,PSRC, 2002 #686; Gratwick, Ghanadan and Eberhard 2006)			

2.3 Management Contract Origins

The management contract developed from desires to improve TANESCO's financial and technical performance beyond the incremental efforts of the 1990s. In 2000, a group from the MEM and Government of Tanzania took note of Eskom's activities in Uganda, and after visiting Uganda and South Africa, returned with a memorandum of understanding (MOU) for Eskom to manage TANESCO.

The Government was, however, unable to procure World Bank financing for the agreement without a competitive tender, and the MOU with Eskom did not develop. Out of these discussions, a wider donor-supported effort evolved. In October 2001, the Government of Tanzania issued an international request for proposals (RFP) for a two year management contract for TANESCO. Eleven companies responded to the RFP and three ultimately submit bids, including: Eskom of South Africa, Electricity Supply Board (ESB) of Ireland, and NETGroup Solutions, Ltd. of South Africa.

In January 2002, NETGroup Solutions was selected as the winning proposal[5]. It differed from the RFP in that it proposed a smaller resident staff of four managers supported by

[5] NETGroup is a South Africa-based engineering consulting company involved in power sector activities in South and Southern Africa. TANESCO was their first full utility management contract. At initiation, it

separate technical consulting projects that would be sourced from NETGroup's head office. The proposal was agreed to relatively quickly. KPMG of Cape Town conducted a handover audit of TANESCO, collecting year 2000 information to serve as the performance baseline for the management contract.

The contract, however, was controversial with the public. The media criticized what was seen as lack of transparency in the process and workers protested what was seen as a step toward eventual privatization, demanding a labor agreement prior to the commencement of the management contract (e.g. BBC News 2002; East African 2002; The African 2002a; The African 2002b)[6]. The start of the contract was delayed. After five months, NETGroup managers entered the utility premises in May 2002 under police escort. Upon assuming management, their activities focused on gaining the support of workers, improving revenue collection and utility information, and enforcing collections from sensitive public offices.

A labor agreement was developed by TANESCO and accepted by the union later that year. The government supported plans for voluntary retrenchments, which were carried out amicably in 2003. In total, retrenchments involved more than 1,280 workers (21% of the work force) and were financed from TANESCO revenues, totaling US$22 million (Davies, 2004). The consultant managers continued to cultivate good relations with the union; the Managing Director made worker relations a priority[7].

As the initial contract was ending in mid-2004, parties were anxious to translate the revenue increases gained during the contract into improvements in technical performance. A three-month interim contract was granted, which extended the incentives of Phase I from May to July 2004. Negotiations between the government and NETGroup to extend the contract began only in August 2004[8]. They ensued for five months and the formal contract extension began in December 2004 eight months after the formal end of Phase I[9].

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represented about 30% of company revenue. Key factors for the award included NETGroup's experience in Africa, its comprehensive proposal, and competitiveness of the Rand at the time of the RFP.

[6] Protests culminated in workers barricading entrances to the TANESCO buildings, threatening sabotage, and aiming to prevent entry of the new contractors. At the height of protests in late April/May 2002, Tanzania's President Benjamin Mkapa gave successive speeches appealing to the public for calm. He asserted Tanzanians had borne poor services and poor management for too long, and that the management contract was in the best interest of the nation. He used evidence from the KPMG utility audit to highlight financial irregularities and make the case that greater efficiency brought by consultant management would improve services and benefit the people (Mkapa 2002). On May 17, 2002, NETGroup management entered TANESCO offices under protection of Tanzania's Field Force Unit armed riot police. The handover occurred tensely, but peacefully.

[7] With retrenchments, staff numbers decreased from 6,540 to 4,787 employees between 2002 and 2005. The Masters Workers Council supported the extension of the contract in 2004, showing a dramatic turn-around in union relations over the first two years. In their resolution to support the extension, the union paid special tribute to the Managing Director, Mr. Rudy Huysen, for "his style of managing the Company". Huysen was the NETGroup Managing Director from May 2002 until he resigned in November 2005. A second labor agreement was issued at the start of the extension in 2004/05, giving 20% salary increases to TANESCO workers (the first increases in nine years). Contractors had intended 40% raises in wages, however the dramatic down-turn in the utility's cash position in early-2005 stymied these plans.

[8] The governments negotiating team was comprised of senior representatives form the PSRC, the TANESCO Board of Directors, and the MEM. During negotiation of the contract's extension, the negotiating team also benefited from the support of the Sida-financed monitoring consultant and an activity to develop negotiating positions using data-driven models. Here, oversight and involvement of numerous institutions played an important role in reducing information asymmetries and improved the negotiation power of the government.

[9] During negotiations, NETGroup continued their work without a formal contract, which was only later extended retroactively. Some parties fault the Government of Tanzania for not being more proactive in initiating negotiations for the extension earlier, particularly as negotiations did not begin until more than three

In April 2006, the Government of Tanzania gave notice to NETGroup that it would not extend the contract after its completion in December 2006 (six months notice per contract requirements). No further explanation was given. Media announcements emphasized contractor under-performance as the prime reason for ending the contract (e.g. Daily News 2006; East African 2006). However, consultant performance was only one among many factors that influenced contract outcomes. A wider framework is needed to examine the contract's driving forces and outcomes in a broader context. The contract closed in December 2006 and Tanzanian managers assumed full-management of TANESCO in 2007.

2.4 Framework for Examining Contract Performance

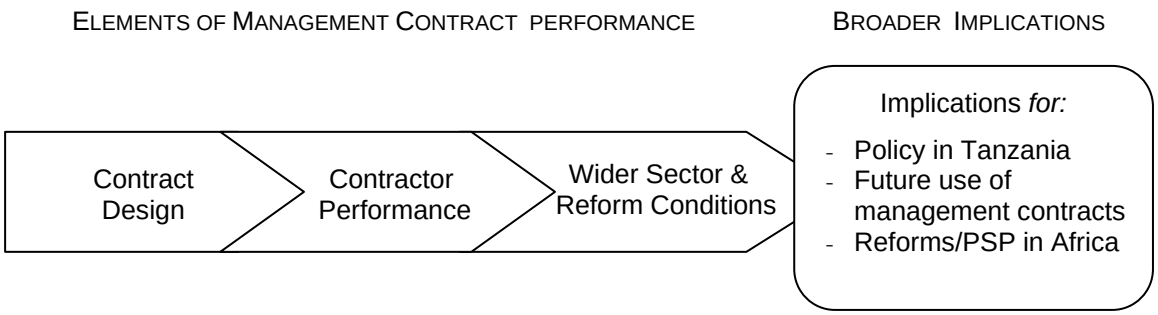
The management contract touches on many areas of utility operations, wider electricity sector issues and socio-political dimensions of electricity. For example:

- First, on assuming management of TANESCO, NETGroup needed to gain the support of the utility workers who had extensively protested and opposed the contract, in order to effectively carryout their operations.
- Second, NETGroup faced sensitive tasks of dealing with non-payment for electricity, particularly from public institutions, and reorganizing tariff structures to undo historical subsidies, with the net effect of making residential and light commercial customer tariffs more cost reflective, but also more costly to these customers.
- Third, the contractors faced the challenge of translating revenue performance into tangible improvements in technical quality and customer service that would directly benefit customers.
- Fourth, TANESCO faced factors outside of the contractor's direct-control that affected its performance, notably high generation costs and insufficient supply that became acute during the contract extension period.

The performance outcomes of the management contract depend on a number of factors, including contract design, the performance of the contractor and wider sector conditions (often outside the control of the contractor). The following sections provide insights into the relationship between these elements in shaping contract outcomes.

Figure 2. Framework for Management Contract Performance

months after the initial contract ended. The negotiation for a contract extension was more lengthy and complex, as both parties had better information and negotiated from more informed positions.



Section 3 outlines elements of the contract, including its design, governance, performance targets and remuneration structure. Section 4 assesses contract performance outcomes in relation to the contract's performance incentives. Section 5 discusses key conditions and issues that have shaped the wider context of contract performance. The analysis concludes with a synthesis of key outcomes and discussion of lessons learned for reforms and private sector participation in Africa.

3. Contract Elements and Institutional Arrangements

3.1 Objectives of the Management Contract

The stated goals for the TANESCO management contract were wide-ranging and demanding. The contract stated that the consultant was expected to continue to improve the technical, financial and commercial performance of TANESCO, increase the number of new connections, improve customer relations, and actively participate in pre-privatization restructuring activities and the ring-fencing of TANESCO's business units. The consultant was also expected to increase investment by mobilizing internal and external funds to improve network reliability, electrification rates and electricity trade in the region (PSRC 2002; PSRC 2004). Increased levels of commercialization were intended to be the driving force of improving utility finances, investments and services. However, despite expansive overall goals and objectives for the contract, a smaller set of terms were translated into the formal performance incentives and remuneration of the contract (discussed in Section 4).

3.2 Payments & Remuneration

Contract remuneration was comprised of fixed retainer fees and performance-based variable fees. The contract also specified internally-sourced technical consulting projects called Relief Projects in Phase I and Turn-Around Activities (TAAs) in the contract extension that were to be carried out by NETGroup technical consultants. Contract terms were first negotiated in 2001 and then renegotiated during the contract's extension in 2004. For simplicity, fees are referred to as fixed fees, success fees, and TAAs in the text below[10].

NETGroup is estimated to have received a total of US$ 18-19 million for its management services over 56 months (including Phase I and the extension). Payments in Phase I totaled US$ 10.7 million. Total payments in the extension period are estimated by the authors to be between US$ 7-8 million[11]. The breakdown of remuneration is about

[10] The contract used a range of terminology for these fees. Fixed fees are also called retainer fees. Success fees are also called performance bonuses. Turn-Around Activities were referred to as Relief Projects in Phase I.
[11] The success fees for the extension were not finalized, as of this report's completion in March 2007.

US$ 8.5 million in fixed retainer fees, US$8-9 million in success fees, and US$1.4 million in Relief Projects (TAAs would have added US$ 3.8 million to Phase 2, but were never implemented).

Table 3. NETGroup Solutions Remuneration

Contract Element	Amount	Notes
Total Fixed Retainer	US$ 8.527 million	
Total Success Fees	US$8.5-9.5 million	
Additional Consulting Projects	US$ 1.4 million	TAAs in Phase 2 never implemented
GRAND TOTAL	US$ 18-20 million	

Source: Compiled by principal author from interviews, PSRC (2004) and Davies (2004)

3.3 Contract Financing

The contract was financed from utility revenues and by donors. Sida funds, administered through the World Bank Trust Fund, financed all fixed retainer fees. TANESCO revenues paid success fees. The relief projects were indirectly financed by Sida through a grant to TANESCO, which freed TANESCO funds for the projects in Phase I. TANESCO revenues were intended to pay for TAAs in the extension, but funds were never disbursed by the Board, due to a downturn in the utility's finances (explained in detail in Section 5). In total, Sida contributed approximately US$10 million (US$ 4.3 million in Phase I, US$ 5.5 million in the extension). TANESCO revenues contributed US$ 8-9 million (US$ 6.4 million in Phase I and estimated US$1.5 – 2.5 million in the extension). In total, Sida provided about 55% and TANESCO revenues 45% of total contract financing.

Table 4. MSSC Contract Payments

Phase 1, Management Contract May 2002 – July 2004, 27 months	Amount	Source of Funds
Fixed Retainer	US$2.980 million	Sida
Success Fee	US $6.4 million	TANESCO revenue
Relief Projects	US$1.39 million	Sida
Phase 1, Total	US$ 10.7 million	
Phase 2, Contract Extension August 2004 – Dec, 2006, 29 months	Amount	
Fixed Retainer	US$ 5.547 million	Sida
Bonus (success) Fee	US$1.5-2.5 million	TANESCO revenue
Turn Around Projects	0 (Never disbursed; US$ 3.8 million planned)	TANESCO revenue
Extension, Total	US$ 7-8 million	
Entire Management Contract May 2002 – Dec 2006, 56 months	GRAND TOTAL US$ 18-19 million	

Source: Compiled by principal author from interviews, PSRC (2004) and Davies (2004)

3.4 Oversight and Governance Structure

Multiple bodies have been involved in oversight and governance of the contract. The Board of Directors of TANESCO functioned as a traditional corporate board, overseeing strategic plans, including the work of the management contractors. The Board was also responsible for overseeing and approving Relief Projects and TAAs (although TAAs were never implemented). The Board also contracted a third party Monitoring Consultant to

review contract activities, whose services were paid with financing to TANESCO by Sida. The Consultant also assisted the government's negotiating team during the extension[12].

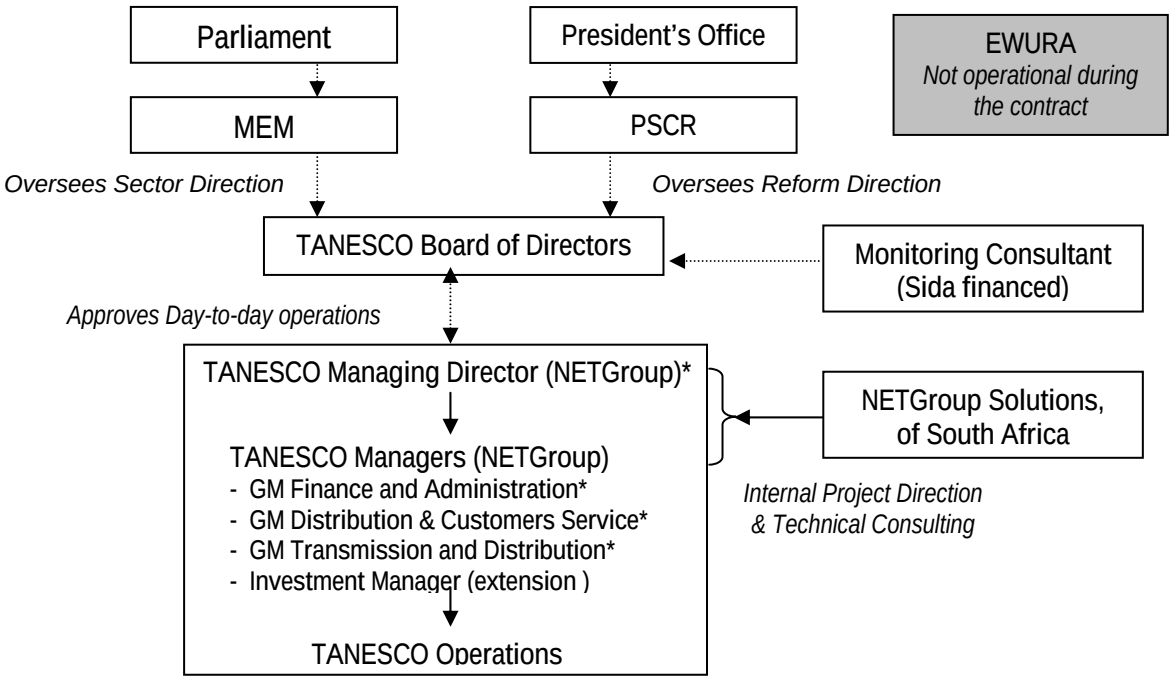
During most of the contract, the PSRC was the formal owner, or shareholder, of TANESCO which was originally scheduled for privatization[13]. The PSRC's main role was to oversee restructuring and privatization of state-owned enterprises, and was directly accountable to the President's Office. The PSRC secretariat also acted as technical advisors to the government on the contract. In October 2005, TANESCO was formally taken off the list of companies specified for privatization, and TANESCO's shareholder/reporting Ministry reverted back to the Ministry of Energy and Minerals.

A parallel structure of governance during the contract period included the Ministry of Energy and Minerals (MEM), which was involved in overseeing specific aspects of utility policy and issues requiring parliamentary approval. The MEM appoints the TANESCO Board. In some cases, NETGroup appealed directly to the Permanent Secretary of the MEM, however this was done informally and was not part of the formal reporting hierarchy.

The World Bank acted as the lead donor to the contract. The contract was regulated a grant agreement between the Government of Tanzania and the World Bank, and a World Bank trust fund administered financing for the contract (originally from Sida). Via these mechanisms, approval from the Bank was required at each stage of the contract, including approval of the terms of reference, extension agreement, and contract changes.

A formal regulatory body (EWURA) only became operational in mid-2006 and was not involved in oversight of the management contract. Figure 3 illustrates the institutional and organizational structure of the management contract within Tanzania.

Figure 3. Governance Structure for the Management Contract



[12] The monitoring consultant prepared the terms of reference for the extension and carried out an extensive modeling exercise to estimate potential outcomes for government negotiating positions.

[13] TANESCO was formally under the purview of the PSRC from 1997 until it was de-specification in 2005.

Note: The four NETGroup management positions from Phase I are noted with an (*)
Source: Compiled by principal author

3.5 NETGroup Presence in Tanzania

Unlike typical consultancy arrangements, NETGroup managers held executive powers over the utility's operations[14]. During Phase I, NETGroup consultants assumed the top four executive positions, including: the Managing Director (MD) and three primary sub-directorships of Finance and Administration, Distribution and Customer Service, Transmission and Generation[15].

The extension expanded personnel to include five management positions. Transmission and Generation were split into two. Transmission was retained by NETGroup, and Generation was filled by a TANESCO manager. An investment expert was specified as the fifth position; however this position was not classified as a top position by the Board, and the investment expert reported to Finance and Administration without line responsibilities.

NETGroup managers were fully integrated into TANESCO corporate offices in Dar es Salaam. The contract also included professional time and budgets for NETGroup technical specialists and project administrators, based in the parent office in South Africa, who traveled to Tanzania on short-term trips and assignments, as needed. Person-months totaled 135 for Phase I and 196 for the extension. The breakdown of NETGroup staffing is presented in Table 5.

Table 5. NETGroup Solutions Contract Personnel[16]

	Contracted Personnel Months	
	Phase I (27 mo.) May 2002 – July 04	Extension (29 mo.) Aug 2004 – Dec 06
Resident Managers		
Managing Director	27	29
Finance & Administration	27	29
Distribution & Customer Service	27	29
Transmission (and Generation)*	27	29
Investment Expert	n/a	23
Specialists & Technical Experts		
Technical Assistance	17	27
IT	1	12
Project Management		
Project Director	9	9
Project Manager	0	9
GRAND TOTAL, person-months	135	196

Source: Compiled by principal author based on interviews and (PSRC 2004)
* Only Transmission was retained by NETGroup in the extension

[14] Management contracts differ from support consultancy arrangements where services are offered to utilities without assuming formal management positions, such as Eskom in Malawi (see Appendix A). Such arrangements are becoming increasingly common, as governments are wary of handing full management over to outside consultants. However, these arrangements are not formally management contracts, and are not included in the World Bank's database of Private Sector Participation in Infrastructure (PPI database).
[15] TANESCO's former top directors were removed from office, initially by forced leave starting in May 2002; other senior staff were integrated into operations under NETGroup management.
[16] Table 5 is based on formal personnel months included in the management contract, though the consultants reported devoting extensive additional home office support above-and-beyond what is formally reported here.

Notably, NETGroup onsite managers were themselves consultants to the parent company. Only one of the original four was a prior NETGroup employee, and they were remunerated through internal NETGroup sub-contracts. This personnel (and governance) structure created complex relations between the contractor and oversight bodies, but also within contractor operations. NETGroup's head-office relied on onsite managers for their direct presence in Tanzania and for day-to-day interactions with oversight bodies.

Only the onsite MD was allowed to functionally interact with the Board over issues such as TAAs, and this created tensions[17]. As differences in opinion emerged between the onsite MD and head-office at different points during the management contract, these relations proved to be a point of tension. The original NETGroup MD resigned in 2005, and a NETGroup representative assumed the MD position in 2006. The shift in high level personnel during the second half of the extension added to difficulties in maintaining shared expectations between parties within the complex governance of the contract.

The contract made provision for an exit strategy towards the end of the contract extension period (see NETGroup 2006). The first position transferred to Tanzanian management was generation in 2004. Remaining transfers occurred in 2006: TANESCO appointed a new MD from outside the utility and three new general managers from TANESCO staff. The utility became entirely Tanzanian run January 2007.

Notably, the contract's ending occurred during a period when loadshedding became extensive and the utility faced difficult conditions for operations and cash flow (see Section 5). This led many Tanzanians to see the transfer as indicative of poor performance by the contractor. However, many factors contributed to the difficult operating conditions of 2006, and the conditions underlying the Government's decision not to renew the contract also included: shifts away from privatization as the goal of reforms on the national agenda, shifting donor agendas toward more flexible approaches to private sector participation and commercialization, and a new Government with a national election in 2005. The ending of the contract was a very different policy context – both in a national context and within shifting expectations of reforms internationally - from when it began.

Many agree it is important for management contracts to have a fixed end-point. The contract was fully completed and it fulfilled its set terms (it was not canceled, terminated, or abrogated). NETGroup hoped to extend consultant-based relations with TANESCO; however no arrangement for additional consultancy was made. The handover occurred relatively smoothly, and NETGroup implemented a formal demobilization plan developed as a part of their consultant activities (see NETGroup 2006). The contract's foresight in including exit strategy implementation as an explicit element of contract activities helped to avoid a more ad hoc transition, which would have made conditions more difficult.

4. Key Performance Indicators (KPI) and Success Fees

While the objectives of the management contract were extensive and ambitious, only specific elements were operationalized into the performance-based success fees. Performance was related to five areas: revenue-related financial performance[18] (Phase I and

[17] The MD was not the only authorized representative, however, the Board was reluctant to interact with other representatives of NETGroup's management, and as a result, the MD became the pivotal position between NETGroup and the Board (due largely to the Board's selective engagement with NETGroup).

[18] Revenue-related performance was termed "Operating Efficiency" in phase one and "Financial Incentive" in the extension, which also included operating costs in phase one, and was based on profits in the extension.

extension), power losses (Phase I), customer care (Phase I), reliability (extension), and electrification (extension). The design and performance in each area is detailed below.

4.2 KPI and Success Fee Formulas

Phase I (May 2002-July 2004)

In Phase I, the contract focused on financial turn-around. The success fee was principally based on revenue collection (termed financial operating efficiency), but also included smaller performance incentives for reducing power losses and maintaining minimum standards of customer care. Success fees were payable quarterly[19] and calculated according to: i) the monthly improvement in revenue collection versus operating costs, ii) the monthly percentage improvements in power loss reduction, and iii) minimum quarterly standards for quality of supply and service, according to the formulas in Table 6. Phase I success fee targets were originally designed to cover 24 months between May 2002-April 2004, however, they were extended to include the three month interim between when the first contract formally ended and negotiations for the extension began in August 2004.

Table 6. Phase I Success Fee Formulas (May 2002 to July 2004)

Financial Operating Efficiency (Revenue versus Costs)[20] $\text{Success Fee}_{m,\text{Efficiency}} = (\%\text{Costs/Revenue}_{m,\text{Previous year}} - \%\text{Costs/Revenue}_{m,\text{Current year}}) \times \text{US\$ } 10{,}000$ Operating Efficiency Success Fee calculated at a rate of US$ 10,000 per percent decrease in the monthly ratio of Operating Costs to Revenue Collected compared with the value from the equivalent month in the previous year[21].
Power Losses $\text{Success Fee}_{m,\text{Power Loss}} = (\%\text{Losses}_{m,\text{Previous year}} - \%\text{Losses}_{m,\text{Current year}}) \times \text{US\$ } 3{,}000$ Power Loss Success Fee is calculated at a rate of US$ 3,000 per percent decrease in total monthly losses (technical and non-technical) compared with total losses from the equivalent month in the previous year[22].
Quality of Supply and Service[23] $\text{Benchmark}_{\text{Quality of Supply and Service}} = -(\%\text{Target}_{Q} - \%\text{Attained}_{Q}) \times (\text{Success Fee})$ Quality of Supply and Service benchmark is calculated as a potential reduction in the Operating Efficiency Success Fee for each percentage point performance falls below the benchmark in each quarter; no bonus is earned if the benchmark is met. Targets increase from 70% to 100% over Phase 1and are a composite of eleven elements[24].

However, in practical terms, revenue was the most direct component. The contractor achieved some small cost reductions via procurement procedures, however overall net operating costs used for calculations have remained virtually unchanged (Davies, 2004). Also, operating costs for the success fees calculations were adjusted to minimize risks to the contractor of IPP costs or poor hydrology, further reducing its variations.

[19] Bonus payments were tied to approval of quarterly reports on financial and performance targets, submitted by the consultants to the Board at the end of March, June, Sept, and Dec.

[20] Total operating costs were defined as the sum of generation, transmission, distribution, and administration expenses as set out in TANESCO audited accounts.

[21] Example (revenue incentive): if the cost to revenue ratio in a specific month were 25% (base year) and 22% (same month, first year), then the success fee for that month would amount to (25 - 22) x 10,000 = US$ 30,000.

[22] Example (power losses incentive): If losses for a specific month were 50% (base year), and were subsequently reduced to 40% (same month, first year), then the success fee would amount to (50 - 40) x 3,000 = US$ 30,000.

[23] Quality of Supply and Service benchmark is based on standards NRS 047 (1999) part 1and 2 and NRS 048 (1999) part 1 to 5 inclusive. Elements include: quotation to customers, providing supply, frequency of meter

Note: Equations in terms of month (m), Source: adapted from (Davies, 2004)

Contract Extension, August 2004-December 2006

During the contract extension, performance incentives were revised to include technical performance improvement targets. Electrification and reliability incentives were added, but the previous measures of power losses and quality of supply and service were dropped. Customer service was originally intended to become an incentive during the extension, but it dropped out during the negotiation process. The success fees during the contract extension (formally referred to as "performance bonuses") were calculated according to: i) quarterly profits above target profit values, ii) improvements in service interruptions and outages above target values, and iii) increases in quarterly rates of electrification above specified targets, according to the formulas in Table 7. Incentives were finalized in December 2004. Financial bonuses were retroactively applied for Aug-Dec 2004. System reliability and electrification targets began in January 2005.

Table 7. Contract Extension Success Fee Formulas (August 2004-Dec 2006)

Financial Bonus (Profits)
$$\text{Financial Bonus} = (\text{Actual Profit}_{Q} - \text{Target Profit}_{Q}) * 4.0\%$$
Financial Bonus is calculated at a rate of 4% of operating profits above target quarterly profits of US$ 6 million, US$ 7million, and US$ 8 million in each quarter of 2004, 2005, and 2006, respectively.
System Reliability
$$\text{System Reliability Bonus}_{Q,n} = (\text{CAIDI}_{Q,n-1} - \text{CAIDI}_{Q,n}) * \text{US\$1,000}$$
$$\text{Where, CAIDI} = \frac{\sum (\text{interruption, min}) * (\#\text{ customers affected})}{(\text{total number of customers affected})}$$
CAIDI is the Customer Average Interruption Duration Index. The System Reliability Bonus (or penalty) is calculated at rate of US$ 1,000 per minute of improvement (or deterioration) in quarterly CAIDI index compared with the measurement of the CAIDI index from the previous quarter.
Electrification
$$\text{Electrification Bonus}_{Q} = (\text{Actual Connections}_{Q} - \text{Target Connections}_{Q}) * \text{US\$ 30}$$
Electrification Bonus (or penalty) is calculated at rate of US$ 30 for each new connection above (or below) a target connections for the given quarter. Electrification targets only begin in 2005-2006; there are no targets for 2004.

Note: Equations in terms of quarters (Q), Source: adapted from (PSRC 2004)

Total success fees were the sum of components; the minimum success fee was zero (i.e. no negative payments). Reliability and electrification targets attracted bonuses or penalties, depending on whether targets were met or there was deterioration in performance. It is important to note that "profits" for the purposes of the contract included a formulaic correction for numerous factors deemed outside the contractor's control[25]. These are not

reading, penalties for non-payment, account queries, reconnection of prepayment meters, notices of planned interruptions, customer complaints, customer inquiries, customer requests, and non-compliance with NRS 048-2.

[24] Example (Quality of Supply and Service benchmark): If performance attained is 76% against a target of 80% for the given quarter, then the total success fee will be reduced by 4% in that quarter.

[25] Operating profits are defined as total operating revenues collected (net of value-added tax), less operating expenses, before interest depreciation and amortization. Expenses include provisions excluding bad debts, slow moving and obsolete inventory, financial charges, capacity charges for IPPs, exchange rate losses on loans,

true profits from the perspective of the utility balance sheet or evaluation by potential lenders. Actual profits would be lower.

One might assume that the consultants had the upper-hand in the negotiations of the contract's extension due to information gained in Phase I. However, built-in reporting requirements and the oversight and support of multiple institutions (including the PSRC, Board, MEM, and Monitoring Consultant) reduced information asymmetries and created a better balance of information in negotiations between the consultants and the government.

In addition, many of the contracts most extensive risks were linked to changing conditions and factors outside of either party's immediate control at the time of negotiations (and these would not have been reduced by information available at the time). Reliability improvements and electrification targets were highly dependent on broader utility finances, which are dependent on wider sector conditions. Higher than expected IPP costs, a shifting generation mix, and onset of drought all dramatically shifted sector finances and operating conditions during the extension (discussed in Section 5). Both teams developed modelling estimates of future performance, but these models required extensive assumptions (and many assumptions proved inaccurate on both sides). As a result, negotiation of the extension – and its goals of technical turn-around - faced extensive uncertainties. Many of these wider sector factors came to dominate contract performance in the extension (discussed further in Section 5).

4.3 Relief Projects and Turn-Around Activities

The contract also specified technical consulting projects to be carried out in addition to management activities. Phase I projects were called relief projects; five were completed. In the extension, they were called turn-around activities (TAAs). Six of eight were accepted by the Board, however, due to deterioration of utility revenue surpluses during the extension, funds for TAAs were never disbursed and the projects never got off the ground. The failure to implement TAAs contributed to under-performance in these areas (discussed in Section 4.4)

Table 8. Technical Relief Projects and Turn-Around Activities

Relief Projects, Phase I		Status
1	Financial Modeling and Tariff Analysis (Project 1.1)	Completed
2	Network Performance Improvement (Project 1.2)	
3	Utility Information Systems Improvement (Project 1.3)	
4	Revenue Management and Meter Audits (Project 1.4)	
5	Distribution System Rehabilitation (Project 2)	
Technical Turn-Around Activities, Extension		**Status**
1	Electricity loss reductions	6 TAAs approved by Board, But funds never disbursed & Projects were never implemented
2	Distribution reliability improvement	
3	Accelerated electrification	
4	Transmission reliability	
5	Training and capacity building	
6	Quality of Supply	
7	Generation scheduling and optimization	2 TAAs not approved by Board
8	Information technology	

Source: Compiled by author from interviews and (Davies 2004; NETGroup 2005)

capital expenditure, exceptional items such as retrenchment costs, and bonus and other payments to consultants. This minimizes the risk of IPPs, hydrology, and other factors to the consultant success fees.

In addition to problems disbursing TAA funds, the consulting projects generated disagreement over the appropriateness of directly including the Relief Projects and TAAs in the contract. They also raised questions about the extent of utility discretion in relation to technical consulting projects specified in the contract. Sida, the World Bank, and the original resident NETGroup MD came to see the TAAs as projects to be implemented at the utility's discretion, given the availability of utility funds. In contrast, the NETGroup's head-office saw TAAs as essential parts of their technical mandate to catalyze improvements above and beyond daily operations and fundamental to their interest in the contract.

During negotiation of Phase I, directly including relief projects in the contract would have conflicted with World Bank rules for procurement, which require consulting projects to be independently bid through a competitive tender. Stakeholders - including the government, private contractors, and donor representatives - were all eager to see the contract move forward. They were concerned that carrying out an additional RFP would hinder the management contract, especially with the contract having a short and ambitious timeframe. The Projects were ultimately financed indirectly by Sida (with funds provided to the TANESCO budget via an existing grant) which freed TANESCO funds for the projects. Thus the projects were formally procured by TANESCO.

During negotiations for the contract's extensions two years later, the government, private contractors, and Sida were again eager for the contract to move forward, this time to translate revenue gains from Phase I into technical improvements. Yet, as parties faced protracted and time-constrained negotiations (see Section 2.3), the TAAs again proved to be a sticking point. Sida and the World Bank were only willing to support the TAAs through TANESCO and if the TAAs were openly tendered. However, the consultants saw the TAAs as central elements of their mandate and interests in the contract. These differences led to divergent views on the TAAs. Under the final formulation, Sida funds covered the fixed retainer. The TAAs were specified in the contract, but their implementation was contingent on approvals by the Board and payment from available utility funds.

However, operating and financial conditions became more difficult in the extension, and revenue surpluses expected to fund TAAs eroded within months of negotiating the extension. As a result, TAAs created tensions, as the NETGroup head-office sought to move forward with TAAs, while alternatively, the NETGroup resident MD advocated that not all were necessary or appropriate to immediate utility needs. The Board ultimately chose not to disburse funds for the accepted projects. The disagreements demonstrated differences in expectations around TAAs and the practical monitoring and implementation difficulties within internally-sourced projects. The NETGroup resident MD was expected to oversee TAAs as a subset of management powers, yet he was also a contractor and employee of NETGroup. This created a potential conflict of interest. In addition, the major downturn in TANESCO finances during the extension eroded utility surpluses, and funds for the TAAs were never disbursed by the Board and TAAs were never implemented.

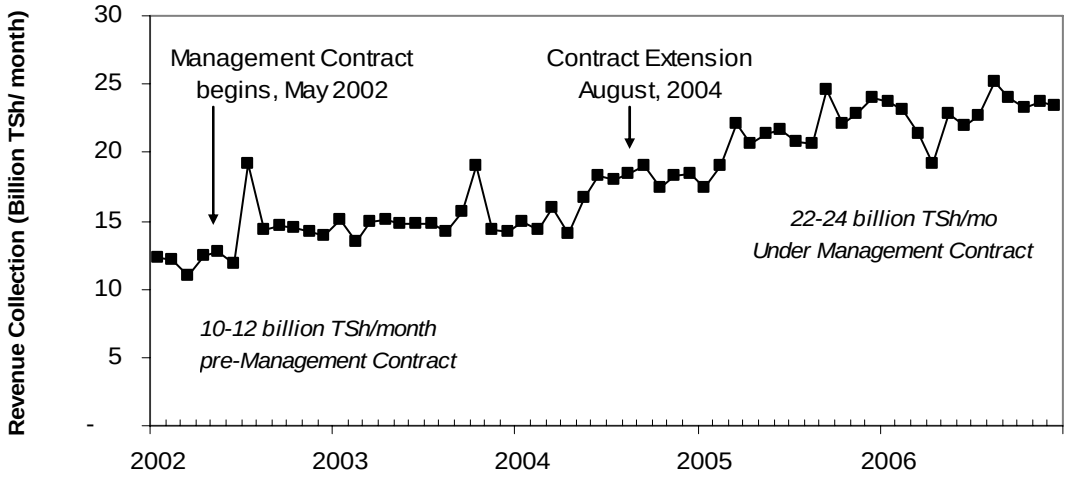
4.4 KPI Performance Outcomes

4.4.1 Revenue Performance

During phase I of the contract, TANESCO's revenues increased from US$ 10-12 million per month in 2001 to US$ 16 million per month by mid-2004. Revenues increased further to US$ 22 to 24 million per month in 2005-06. In total, revenue-related success fees

totaled US$8-10 million, equivalent to approximately about 4% of net increases in revenues achieved during the management contract. More than 99% of the success fees ultimately awarded were for revenue performance. Success fees were paid from utility revenues. Figure 4 shows revenue performance between 2002 and 2006 (in Tanzania Shillings, TSh).

Figure 4. TANESCO Revenue from Electricity Sales[26], 2002-2006



Source: Compiled by principal based on unpublished TANESCO data, 2002-06

Increases in revenues resulted from multiple factors, including: growing electricity sales, increasing tariffs, and improving collections levels. Table 9 shows a breakdown of contributing elements. Overall, electricity sales made the largest contribution with sales growing 37% between 2001and 2006, primarily in response to increasing numbers of electricity customers. Tariff increases also increased revenues. The average selling price of electricity grew 28% between 2001 and 2006 (in TSh terms). Visible step-increases from tariff increases are seen in mid-2002, mid-2004, and early-2005. Collections rates dramatically increased during the first year of the management contract from 69% in 2001 to 95% in 2002. After 2002, collections rates dropped off slightly (but remaining at higher levels overall). Other factors - namely sales growth and tariff increases - drove the revenue gains after 2002. Arrears payments by the government are seen as revenue spikes in Figure 4. Notably, overall revenues were lower in US dollars than TSh due to declining exchanges rates.

Table 9. Elements of Revenue Performance[27]

Revenue Collections	2001	2002	2003	2004	2005	2006	% Change 2001-2006
Revenue Collections (Billion TSh/mo)	9.6	14.4	15.0	17.0	21.4	22.9	+140%

[26] TANESCO revenue collections data are inclusive of 20% value-added tax (VAT). They also include additional revenue from government, private consumers and collections of arrears.

[27] Values in Table 9 are based on averages over 12 months for each year, except 2002 (May-Dec).

Revenue Collections (million US$/mo)	11.3	14.9	14.5	15.6	19.1	18.3	+62%
Demand Growth							
Electricity Sales (GWh/mo)	169	189	196	209	225	232	+37%
Number of Customers	450,950	482,820	526,610	550,840	585,750	619,850	+37%
Ave Sales / Customer (KWh/cust/mo)	375	391	372	379	393	380	+1.3%
Tariffs (includes VAT)							
Average Selling Price (TSh/kWh)	82	80	83	93	102	105	+28%
Improved Collections							
Collections Rates	69%	95%	92%	88%	94%	94%	+36%
Billing (Billion TSh/mo)	13.9	15.2	16.3	19.4	22.8	24.4	+76%

Source: Compiled by principal author based on unpublished TANESCO data, 2002-06, and Katyega, 2004
Note: Average selling price and reported revenue include 20% VAT

Components of Revenue Efforts

Many of the utility's efforts to increase revenues also had far-reaching effects on electricity service provision and utility-customer relations. One key area was enforcement of electricity payments from public institutions, the largest contributors to arrears. Upon assuming private management, TANESCO began carrying out high profile service cut-offs of public institutions, including the national police, post-office, even the entire Island of Zanzibar. Cutoffs were controversial, but the contractors gained support form the highest levels of government, including the President's Office. The policies remained intact, and the government worked with TANESCO to negotiate lump-sum back payments for public arrears (Figure 4 revenue spikes). Outside management facilitated the utility being able to carry out sensitive collections that had been difficult for the government to do on its own[28].

TANESCO also improved collections from other customers. For large industrial customers, TANESCO negotiated payback schedules for arrears without disconnections. For residential and light commercial customers, collections efforts involved expanded prepayment meters and large-scale cutoff campaigns for standard meter customers. Prepayment services expanded to 15% of the customer base (>80,000 mainland, an additional >13,000 in Zanzibar as of 2005) with projects underway to expand prepayment to other regional towns. In Tanzania, prepayment meters are largely a middle class technology available to mid- to higher revenue customers. As a result, prepayment does not carry the stigma of being for the poorest customers, as in other parts of Africa like South Africa[29].

For residential and commercial customers with conventional meters, TANESCO initiated service cutoffs to enforce collections. The scale of disconnections has been large, averaging 15-20,000 customers per month, about 2-3% of the utility customer base. In total, the number of disconnections carried out during the contract exceeded the number of total

[28] Enforcing collections from politically sensitive public institutions was viewed by many as a turning point in TANESCO's operations, signaling that the contractors (and the government) were serious about enforcing collections - all users would have to pay or be disconnected. No customer, public or private, would be exempt.
[29] Prepayment is largely a middle class technology due to initial targeting of the installations in mid-1990s and the larger upfront contributions that are required for prepayment meters under the current request based system. Prepayment meters (40,000 in total) were first installed in Tanzania in higher revenue neighborhoods of Dar es Salaam via a mandatory operation in 1995-97 as a part of the World Bank Power VI project. Prepayment was expanded, on a request basis where customers pay basic installation fees under the management contract. Until recently, prepayment was limited to Dar es Salaam by the lack of computer networks. However, with recent implementation of a computer wide-area network between the corporate and regional offices, prepayment is being extended to other regional towns. These programs are likely to include a combination of request- based and mandatory installations, continuing to focus on high revenue customers.

utility customers[30]. In 2005, TANESCO also began to pursue legal proceeding to enforce collections from residential and light commercial customers with large arrears. An extensive enforcement and disconnection campaign in September 2005 led to TANESCO's largest revenue collections in the utility's history, which collected 24.7 billion TSh in that month. It is important to note that conventional meters and service cutoffs are the most common metering technologies and enforcement techniques for low income electricity customers.

Tariff revisions have had significant implications for changes in service. While the average tariff increased 28% overall, the greatest changes have been to the structure of tariffs and the distribution of charges between customers. During the management contract, the residential and light commercial tariff increased +39%, while the industrial high voltage tariff decreased -22 to -28% (in TSh terms). In dollar terms, the average tariff increased from 7.0 USc to 7.6 USc/kWh, while the industrial high voltage tariff decreased from 7.6 to 5.2 USc/kWh, and the residential and light commercial tariff increased from 6.9 to 8.2 USc/kWh (calculations based on unpublished TANESCO data, 2002-05). See Appendix H.

Tariff changes undo the historical cross-subsidy from industry to residential and light commercial customers, in line with efforts to make the industrial tariff regionally competitive, comparable to rates with neighboring in Kenya and Uganda. Tariff changes also scale-back the lifeline subsidy from the first 100 kWh to the first 50 kWh per month and target the lifeline subsidy only to those consumers using less than 275 kWh/month. The aim is to limit the subsidy to only those who need it most (the effectiveness of targeting has not been directly assessed, however, and problems with current targeting are discussed in Section 5.2)[31]. These changes show commercialization efforts to be not only about absolute revenues, but also about shifting distributions of charges within energy pricing[32].

The net effect of tariff restructuring is that cross-subsidies have been undone and lifeline tariffs reduced over a short period, and residential and commercial customers have experienced large increases in electricity bills during the period of the management contract. Residential electricity customers using more than 50 kWh per month have seen their electricity bills nearly triple – increasing by nearly 200% - between 2000 and 2005

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[30] The total number of disconnections carried out between May 2002 and June 2005 were 713,720 versus a total number of customers of 569,770 (calculations by principal author based on unpublished TANESCO data, 2002-2005). Some customers may have multiple disconnections and this does not mean that all customers have been disconnected, however it does give an indication of the large magnitude of disconnections overall.

[31] Since 1990, the lifeline tariff has been dramatically scaled-back. In 1990, the lifeline tariff was for the first 1,000 kWh consumed per month. However, currency devaluations, made the effective lifeline even higher in the late 1980s and early 90s. The government was reluctant to raise tariffs at rates needed to compensate for the large currency devaluation mandated with structural adjustment, especially as the population faced deep losses to purchasing power and wages. As a result, up to 2,500 kWh/month was effectively provided at rates below the long-run marginal cost of power, which was estimated to be 8.9 USc/KWh at the time (Hosier and Kipondya 1993; London Economics 1993). The lifeline was scaled back to 500 kWh in 1995, 100 kWh in 2002, and 50 kWh/month in 2004. In 2004, the lifeline was also reduced form a universal to a targeted subsidy. In 2006, the lifeline stood at 50 kWh/month, available to customers using < 275 kWh/month.

[32] Average tariffs were increased throughout the early 1990s, and reached levels above 9 USc/kWh as early as 1995 under the commercialization efforts of the World Bank Power VI project (see Appendix G). Yet, recent reforms have emphasized the structure of tariffs (i.e. away from cross-subsidies and large lifelines). This reflects a wider international trend toward greater use of marginal cost based pricing principles, and away from overall rate-of-return approaches - a shift actively supported by the World Bank since the 1970s and accelerated under power sector reforms in the 1990s. This shift has meant closer monitoring of the internal structure of tariffs, in contrast to rate-of-return approaches (and earlier electricity loans) that emphasized average tariffs and overall returns as benchmarks of commercialization (Turvey and Anderson 1977; Munasinghe and Warford 1982; Collier 1984).

(calculations by principal author based on TANESCO tariff schedules and customer numbers 2000-2005) [33]. This rate is more than seven times the consumer price index for the same period. Customers will face additional increases in the future to address financial shortfalls resulting from the utility facing high capital costs and growing reliance on more costly IPPs (discussed in Section 5); industrial customers will likely also face increases.

The utility also implemented activities to support collections efforts. Contractors put in place protocols for data collection, monitoring, and reporting to integrate collections and revenue targets more directly into operations. Information and publicity campaigns to encourage regular payments were developed to support wider revenue goals.

4.4.2 Power Losses

The management contract did not generate sustained reductions in power losses. Losses initially decreased from 28% in 2001 to 21% in 2002 but increased again in 2003-2005 to 26%. In 2006, losses were reduced to 22%, but still above levels of the first year of the contract. Overall loss reductions did not reach levels achieved during the ESMAP Power Loss Reduction Project in 1992 to 1997 (12-15%) or utility operations prior to structural adjustment in late 1970s and early 1980s (15-16%), as shown in Figure 5. Overall, contractors earned a small penalty for power losses in phase I. Losses were not included in the extension, and as a result, contractors were not penalized for increasing losses after 2002.

As a breakdown, transmission losses increased from 3.5 to 4.8% between 2002 and 2006. Technical distribution losses increased from 10% to 14%. Poor performance in technical losses reflects increases in energy sales with no real improvement in the electrical systems (losses increase with the square root of the increased unit sales). As no new networks were added to the system to assist in the reduction of losses, technical losses increased. These losses reflected insufficient investment in transmission and distribution[34].

Non-technical distribution losses (or commercial losses) are not well quantified or directly measured. Averages ranged between 8-9% in 2002 to mid-2005, and potentially decreased in 2006, however more exact interpretations cannot be made with existing data.[35] Much of the utility's non-technical distribution losses result from poor customer management, non-payment or billing issues, or theft. Illegal connections also play a role, though their extent has been poorly quantified or understood. These issues have gained only modest attention and little improvement during the contract (discussed in Section 5.2). Nevertheless, the contractors were able to improve collections from customers as noted in the improved financial performance of the utility..

Figure 5. Historical Power Losses, 1975-2006

[33] Electricity bills of residential customers using >50 kWh/month increased by 190% between 2000 and 2005, resulting in near tripling of their bills. By comparison, the consumer price index rose only 25% in the same period. About 50% of residential and light commercial electricity customers fall into the category of consuming >50kWh/month and would have experienced these dramatic increases (See Appendix I for details).
[34] Such projects were identified and included in the TAAs, but these were never executed due to lack of funds (see Section 4.3). Additional financing mechanisms for investments in maintenance, upgrades, and expansion of were not specified in the contract outside of utility surpluses, which did not materialize (see Section 5.1).
[35] Non-technical losses data are not measured directly. They are calculated as the difference between total losses (generation minus sales) and technical losses (a technical function of sales). However, time periods for measuring generation and sales are not the same, and as a result figures are not accurate (some values are reported as negative in 2006). Thus data are presented only to give a general view of reported differences.

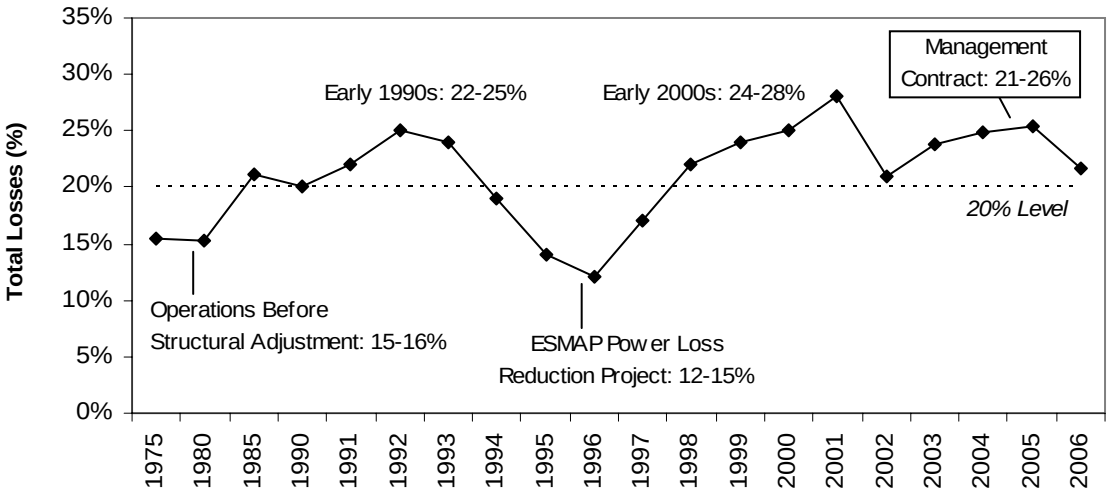


Figure 6. TANESCO Monthly Power Losses, 2002- 2006

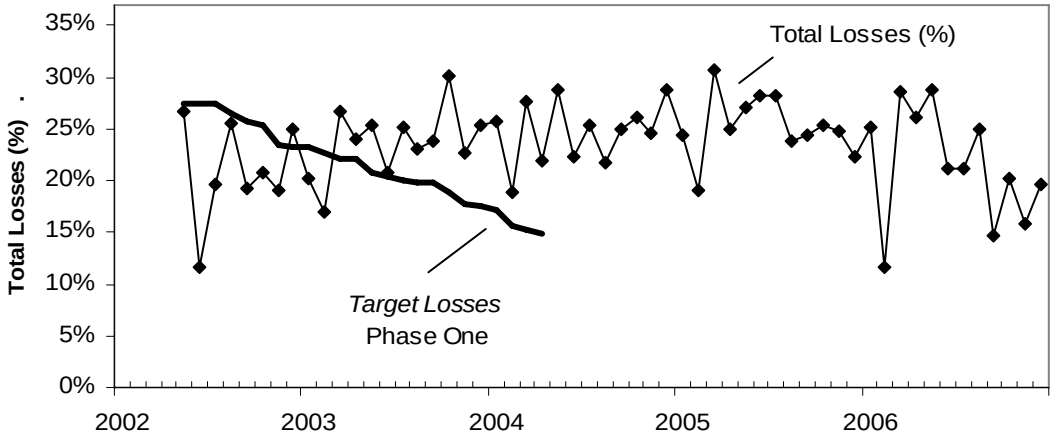
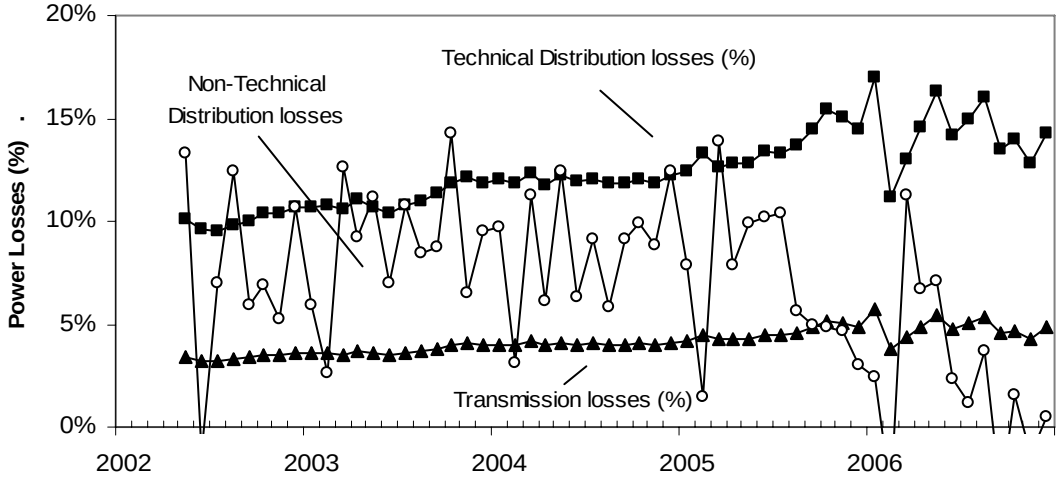


Figure 7. Breakdown of Power Losses, 2002-2006



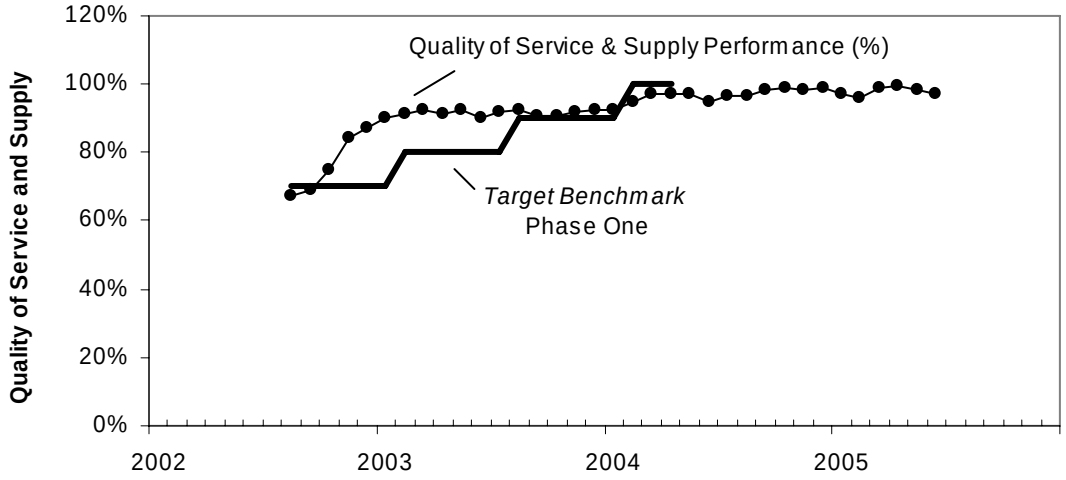
Source: Compiled by principal author based on unpublished TANESCO data, 2002-2006, and Katyega, 2004
Note: Total losses include technical and non-technical losses

4.4.3 Quality of Supply and Service

During phase I, TANESCO met the performance benchmark for quality of supply and service, except for a very small penalty in the third quarter of phase I. Performance reached 98% attainment, and the quality of service and supply benchmark was not included in the extension[36]. Development of a more direct customer service performance incentive was intended for the extension, but was dropped during the negotiations.

It is important to note that many customer service issues have remained unmeasured and unresolved. A customer service incentive was originally intended for the extension, but fell-out during protracted negotiations for the extension of the contract.

Figure 8. TANESCO Quality of Supply and Service Benchmark, 2002-2005



Source: Compiled by principal author based on unpublished TANESCO data, 2002-2005

4.4.4 Reliability

Overall, system reliability has not improved during the management contract. Between 2002 and 2005, forced distribution outages averaged 1,500 events and 2,500 hours per month. Planned distribution outages averaged 92 events for a total of 450 hours per month. Full transmission grid failures averaged 1 per month lasting on average 2 hours in total. Partial grid failures averaged 17 events for a total of 30 hours on different parts of the grid. In 206, TANESCO was forced to implement extensive loadshedding as demand outstripped supply under drought conditions and eroded hydro reserves (discussed in Section 5). 2006 values of planned distribution outages reached more than 3,500 hours per month (Figure 9). (Loadshedding also corresponded to low forced distribution outages in 2006 in Figure 10).

In designing the contract's extension, the government, donors, and contractors assumed that reliability investments would be made from revenue gains achieved during Phase I. Yet, little attention was given to who would be responsible should utility revenues prove insufficient on their own. Loadshedding and the use of Songas and IPTL as base load contributed to the deterioration in grid performance. Revenue gains were consumed by

[36] Elements comprising the Quality of Supply and Service benchmark are described in detail in footnote 23.

increased generation costs, and the utility was left without mechanisms to carryout needed maintenance to prevent deterioration of technical performance. Overall reliability incentives during the contract extension generated small penalties.

Figure 9. Forced Distribution Outages, Number and Duration, 2002-2006

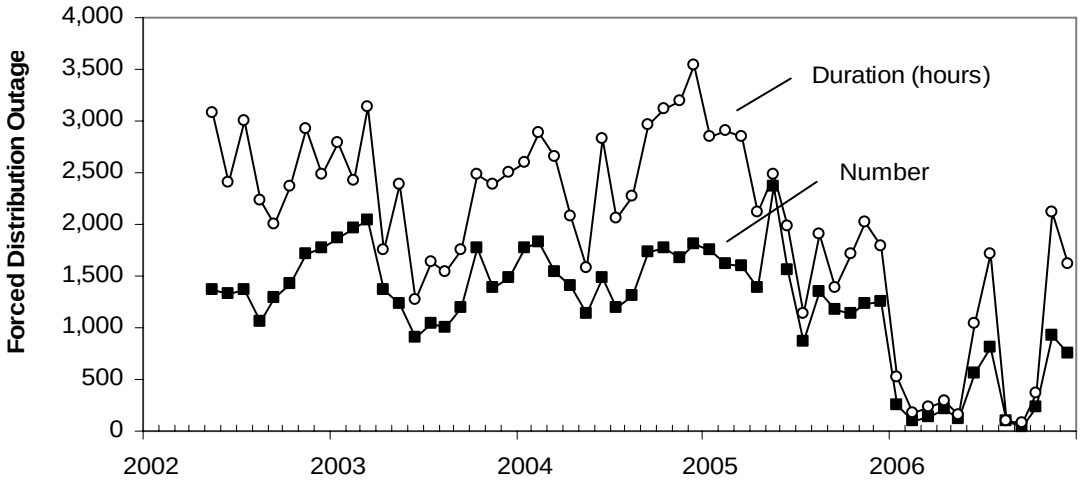


Figure 10. Planned Distribution Outages, Number and Duration, 2002-2006

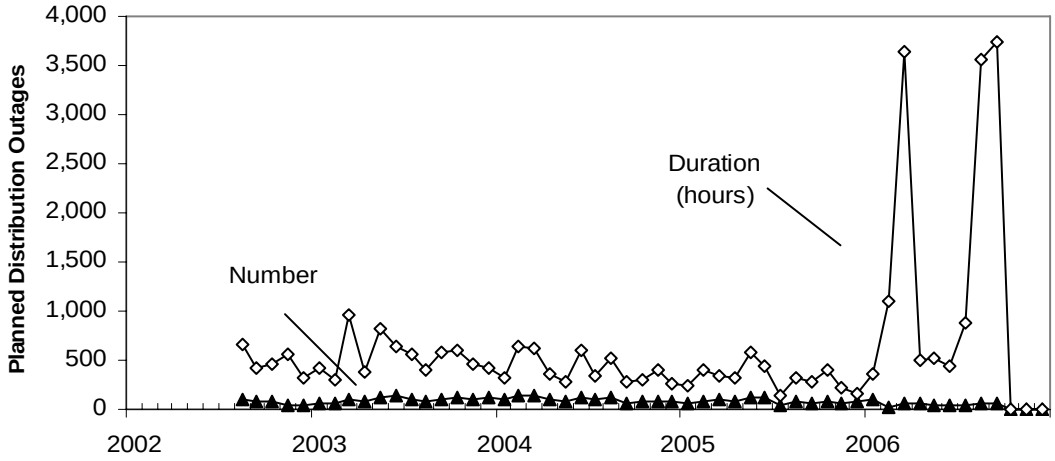
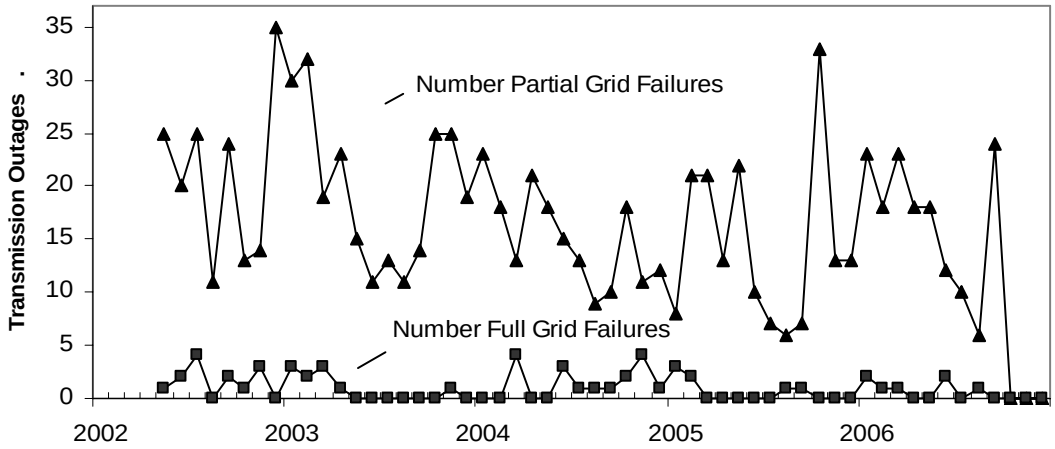


Figure 11. Transmission Outages, Full and Partial Grid Failures, 2002-2006



Source: Compiled by principal author based on unpublished TANESCO data, 2002-06

4.4.5 Electrification

The rate of new connections has not increased substantially, and the contract extension's targets were not met. Targets aimed to ratchet up new connections from 2,900 to 6,875 per month between 2005 and 2006. These targets would have added 114,000 new customers and increased total customers by 7.5% in 2005 and 12% in 2006. Instead, electrification rates remained steady at about 2,500 per month. In total only 58,000 new customers were added in 2005 and 2006 combined (equivalent to +6% growth per year), falling short of targets by nearly half. Electrification during the contract does not improve historic electrification rates, and the contractor earned penalties for failing to meet targets.

Like reliability, poor electrification performance in part reflects wider sector conditions that hindered the utility from generating surpluses for new investments. Yet, the utility also has extensive backlogs in new commercial connections (i.e. connections to customers paying connections fees and waiting for service lines). These backlogs are not entirely explained by exogenous financial constraints, and point to problems in customer administration and allocation of resources to new connections (these issues are discussed in later sections).

Figure 12. Numbers of New Connections and Electrification Targets, 2002-2006

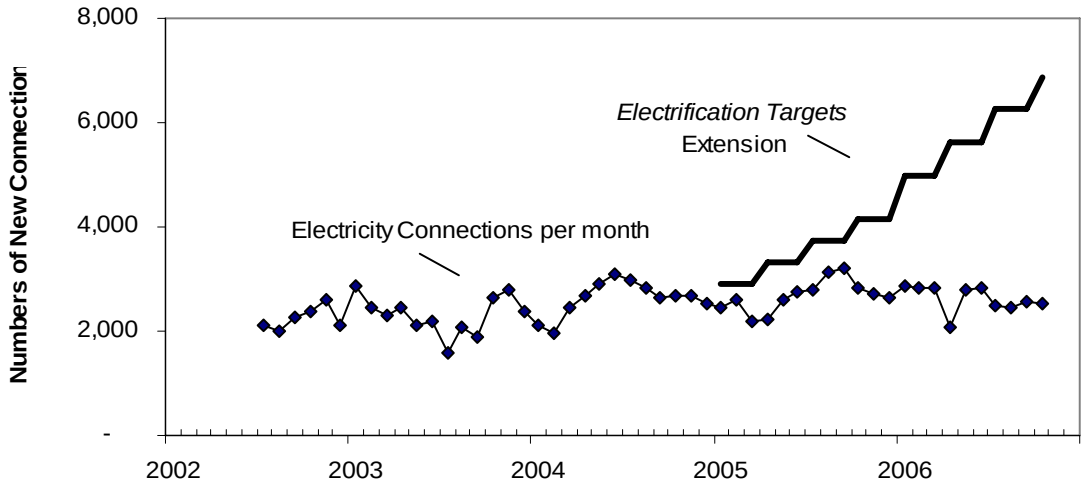
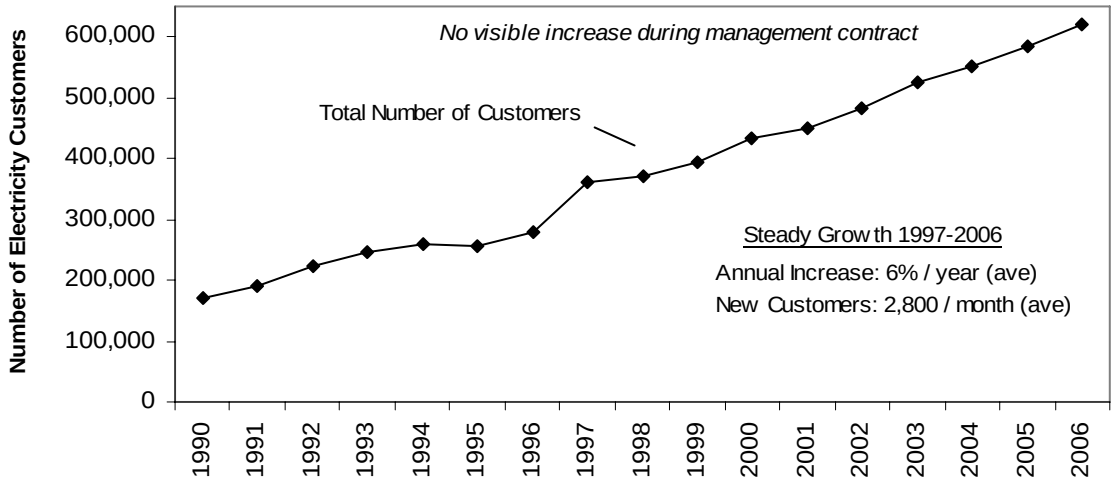


Figure 13. Historical Growth in New Connections, 1990-2006



Source: Compiled by principal author based on unpublished TANESCO data, 2002-2006 and Katyega, 2004

4.5 Breakdown of Success Fees

Revenue-related performance generated more than 99% of the success fees ultimately awarded. NETGroup paid small penalties for power losses in phase I (US$21,000). They gained a small bonus for reliability in the extension contract (US$ 50,000). The contractors have also paid larger penalties for not meeting electrification targets (US$ 1.6 million). NETGroup sought to renegotiate the reliability and electrification penalties from the extension period, as many of the contributing factors were outside of the contract's control (discussed in Section 5). However, at the time of finalizing this report, NETGroup and the Board were under negotiations for the final success fees, thus reported values are estimates.

Success fees also reflect the sensitivity of performance measures embedded in the contact. A strong emphasis was placed on increasing revenues, and the revenue formula generated returns for the contractor of about 4% on net revenue gains. In contrast, the power loss incentive had low sensitivities, generating only a small penalty, despite increases in losses in phase I (continuing into the extension). Power system reliability was also designed with low performance sensitivities. Starting conditions were poor, and reliability improvements were costly in comparison to the rate of remuneration. The contractors faced little incentive for improvements and no penalty maintaining the status quo[37]. In addition, erosion of the utility's revenue surpluses during the extension meant that investment was not readily available for improving network reliability (discussed in Section 5.1).

Electrification had a strong incentive of $30 per connection, and the contractors were eager to carryout the electrification mandate. However, increasing new connections was hindered by wider sector conditions that impacted negatively on the utility's financial position during the contract extension and by poor administrative management of existing new connections.

Table 10. Breakdown of Actual Success Fees

Phase 1, May 2002-May 2004	Actual Success Fee				Incentive Level
Financial (revenue-related)	US$ 6.4 million (~ 100%)				High
Power Loss	US$ 21,000				Very low
Quality of Supply/Service	Small penalty				Very low
TOTAL	US$ 6.4 million				
	Success Fee Estimates (as of)				
Extension, Aug 2004-Dec 2006	Dec 2004[38]	Aug 2005	Dec 2005	Feb 2007	Incentive Level
Financial (revenue-related)	US$ 4.5 million	$ 6.0 million	$ 3.5 million	$2.2 million	High
Reliability	US$ 1.3 million	0 to sm. Penalty	$ 60,000	$50,000	Very low
Electrification	US$ 1.2 million	Penalty	$ -525,000	$-1.6 million	High
TOTAL	US$ 7.0 million	$ 6.0 million	$ 3.0 million	$ 1.5-2.5 million	

Source: Compiled by principal author based on interviews and (Davies, 2004)
Note: Success fees for the extension are estimates, as values were not finalized at the writing of this report

[37] The incentive had a penalty/bonus of $1,000 per minute of improvement/deterioration. However, a hard-earned 5% improvement in the CAIDI measure of 100 minutes, translates into only $5,000.

[38] At the time of negotiating the extension in Dec 2004, the contractor estimated US$7.0 million in success fees (composed of 64% profits-revenues, 19% reliability, 17% electrification). By Aug 2005, they revised their estimate downward to US$6.0 million (100% from profits-revenues, small reliability penalty, and larger electrification penalty likely to be renegotiated.) Dec 2005 estimates were revised downward to US$3-4 million. At the time of finalizing this report in March of 2007, the contractors estimated a total of US$ 1.5-2.5 million, though the final fees were under negotiation and dispute, and remained uncertain..

5. Understanding the Wider Performance Context

Overall, the performance outcomes have been mixed. The management contract exceeded its goals in increasing utility revenues, nearly doubling monthly collections between 2002 and 2006. Revenue performance exceeded expectations for the end of the initial contract, and TANESCO was referred to in an internal World Bank memo as "the best utility in Africa in terms of revenue collections after Eskom" (unpublished email, 2004).

The contractors also succeeded in gaining support of TANESCO workers and were able to work closely and intensively within the utility throughout the contract. They gained government support at key moments, such as cutoffs and implementing tariff policies. They implemented numerous management practices oriented toward closer monitoring of financial and technical performance. These were major accomplishments given the extent of opposition at the onset of the contract and numerous efforts required within TANESCO.

However, despite reaching desired outcomes in these areas, overall improvements in the utility's financial situation and technical performance proved elusive, and the desired utility turn-around was not achieved. Non-revenue KPIs targets were not met. Power losses were only maintained at starting levels. Reliability did not improve, and the levels of outages and grid failures are poor by international standards. Levels of new electricity connections have remained flat, despite ambitious targets and earlier optimistic projections.

To understand these contract outcomes, it is necessary to go beyond the KPI statistics to understanding the wider contract features and wider sector conditions that have shaped performance. The section below details, first, the high generation costs and shortages of hydro capacity that have prevented TANESCO's doubling of revenues from translating into financial autonomy or improved investment and technical performance, as expected. It shows the origins and implications of generation and IPP related challenges that became acute in 2005/06. Notably, TANESCO has resorted to extensive loadshedding from 2006, revenue surpluses are now going to IPP payments, and TANESCO's ability to finance investments for reliability or electrification has eroded – making the utility more dependent on infusions of outside finance than before.

Second, the section below highlights the fact that customer service has been largely omitted from the scope of the contract, creating a context where customers (particularly residential and small commercial customers) face poor customer management by the utility and numerous barriers to improved services. Combined with failings to translate revenue gains into technical improvements, customers face an environment where, for the time being, commercialization means paying more for services without tangible improvements in customer service.

5.1 Barriers to Re-investments in Networks and Improved Service: Growing Generation Costs & Supply Shortages

Parties were optimistic at the onset of the contract's extension that the utility would be able to make investments to improve reliability and expand electrification. With large revenue gains and a good cash reserve in December 2004, conditions seemed promising. However, within the first months of the extension, a number of conditions, exogenous to the contract, combined to put TANESCO in a poor position to finance investments from equity or commercial loans.

Growing Generation Costs with Onset of IPPs

TANESCO's generation costs increased significantly over the course of the management contract. Both IPTL and Songas came online, IPTL in January 2002 (just prior to Phase I) and Songas in July 2004 (just prior to the contract extension). These projects brought with them new charges. TANESCO paid large fixed monthly capacity payments to cover capital costs of construction for both projects, which averaged US$ 3.2 million per month for IPTL and US$ 4.4 million per month for Songas during the 2002-2006 period[39]. The utility also came to rely heavily on electricity generated by the IPPs, resulting in additional large variable energy use charges (essentially fuel charges).

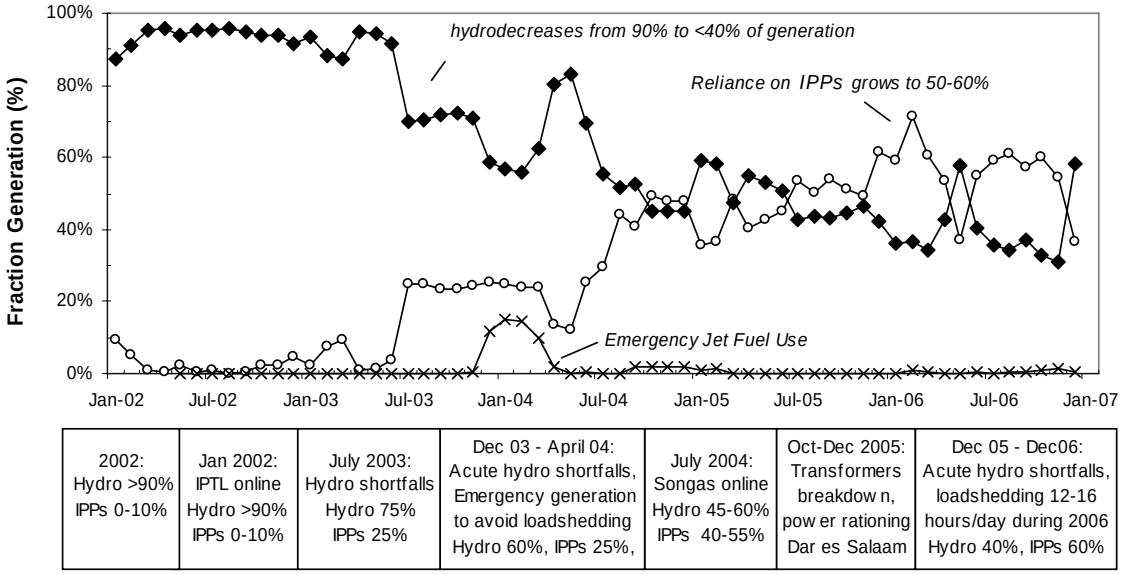
The contribution of IPPs to total electricity production more than doubled during the contract extension period – from a maximum of 30% of generation during phase I to more than 50% of generation during most of 2004 and 2005 and reaching nearly 60% of generation in 2006. A series of below-average rainfall years eroded Tanzania's hydro capacity and caused TANESCO to become more reliant on IPP-derived thermal generation than anticipated (reflected in the shifting generation mix,

[39] Capacity payments are monthly averages since projects came online (including a VAT of 20%). IPTL covers Jan 02-Dec 06; Songas covers July 04-Dec 06. Since mid-2005, TANESCO has not been making full Songas capacity payments, which would amount to US$ 5.8 million per month. This is part of a debt restructuring agreement, where TANESCO is not paying the subordinated debt portion of the capacity charge (see later section on commercial on-lending policy). For details see (Gratwick, Ghanadan and Eberhard 2006).

Figure 14). In 2005, IPP charges to TANESCO averaged US $13.0 million per month, 68% of utility revenues. By 2006, they reached US$ 17.5 million per month, more than 95% of total utility revenues.

With such high generation costs, TANESCO's revenues were insufficient to cover generation plus general network operating and maintenance costs throughout the extension period. As a result, TANESCO found itself without revenue surpluses to finance investments to improve reliability or expand electrification, as former surpluses were redirected to growing IPP charges. With the erosion of the utility's revenue surpluses, funds were also never disbursed for TAAs, and the contractors were prevented from carrying out the project activities that were intended to make technical improvements. The utility has gotten by with government infusions, reduced IPP payments, and external support.

Figure 14. Composition of Electricity Generation, 2002-2006



2002: Hydro >90% IPPs 0-10%	Jan 2002: IPTL online Hydro >90% IPPs 0-10%	July 2003: Hydro shortfalls Hydro 75% IPPs 25%	Dec 03 - April 04: Acute hydro shortfalls, Emergency generation to avoid loadshedding Hydro 60%, IPPs 25%,	July 2004: Songas online Hydro 45-60% IPPs 40-55%	Oct-Dec 2005: Transformers breakdown, power rationing Dar es Salaam	Dec 05 - Dec06: Acute hydro shortfalls, loadshedding 12-16 hours/day during 2006 Hydro 40%, IPPs 60%

Source: prepared by authors based on unpublished TANESCO data, 2002-06

Poor Hydrology, Supply Shortages, and Load-Shedding

By 2006, hydrological conditions deteriorated further and IPPs were unable to fill the growing supply gap created by acute hydro shortages. In February 2006, TANESCO began load shedding for the first time since the management contract began. Rains in April-May 2006 were inadequate and loadshedding was extensive throughout much of 2006, often reaching twelve to sixteen hours per day. These conditions eroded revenues and services further and created large costs and burdens to consumers.

TANESCO has sought additional generating sources to address the short term supply gap. In the short term, commencing in October 2006, the Government planned to lease 100 MW in emergency power plants from Richmond Corp of the USA. However, as of December 2006, these plants were not yet operational and their procurement has been mired in controversy reminiscent of IPTL. The proposed five year generation plan aims to add additional gas and coal generation to reach a mix of 70:30 thermal to hydro generation[40]. Tanzania's hydro capacity is unlikely to recover even in a single year of good rains, as the dams have been run low. Base load IPP use is likely to continue and TANESCO faces an uphill battle to balance its generation costs and its financial objectives.

The contractor was protected from the risk of increasing generation costs in its revenue-related success fees[41]. However, they were not protected against failure to achieve reliability and electrification targets. The contractor received penalties in these areas, despite the fact that many of the contributing factors were outside their control.

[40] Plans have included a 100 MW permanent plant owned by TANESCO (expected operational May 2007), 50 MW Kiwira Coal plant (January 2007), and 45 MW Tegeta plant (February 2007).

[41] The contractor success fees are based on a modified definition of "costs" that removes IPP charges if hydro generation falls 10% or more below 2,750 GWh/year. Alternatively, it corrects upward if hydro generation falls 10% above 2,750 (based on the equivalent cost of Songas-derived electricity). As a result, the contractor can earn positive revenue related success fees, even when the utility is unable to cover operating costs.

Table 11. TANESCO Revenues and IPP Costs (million USD/month)[42]

	2002	2003	2004	2005	2006
TANESCO revenues (million USD/month)	$14.9	$14.5	$15.6	$19.1	$18.3
IPP charges (million USD/month)	$3.2	$6.3	$10.5	$13.0	$17.5
- IPTL charges	$3.2	$6.3	$8.2	$7.6	$9.3
- Songas charges	n/a	n/a	$5.6	$5.4	$8.2
IPP Charges vs. TANESCO revenues (%)	21%	43%	67%	68%	96%

Source: calculated by authors based on unpublished TANESCO data, 2002-06
Note: TANESCO revenues increased in TSh terms in 2006, but decreased in USD due to exchange rates

Under-estimating IPP Costs

The tariff revisions put in place during the management contract were designed to put TANESCO in a position of full cost-recovery. However, cost-of-supply calculations that informed tariff revisions during the management contract relied on expectations that proved inaccurate.[43] These were compiled in a 2003 NETGroup tariff study, which in hindsight did not account for the full extent of TANESCO's ultimate reliance on IPP generation or the full extent capital costs that IPPs would ultimately require.

In the case of IPTL, a study by Gratwick, Ghanadan and Eberhard (2006) found IPTL to be the most costly power project of its kind benchmarked against sixteen similar diesel IPP projects in developing countries (see Appendix C). IPTL's high capital costs have no apparent technical basis and remain the highest of its type despite 20% reductions in construction charges following international arbitration in 2001. The Government of Tanzania has contributed US$ 1.5 million per month of these capacity charges (about 50%) since IPTL came online in 2002 via an informal agreement. Increases in the costs of diesel fuel used by IPTL, and passed on to TANESCO, have also been costly. Conversion of IPTL to natural gas has been delayed, even though this would reduce its energy charges by at least 25%.

Songas energy charges are based on a special pre-negotiated rate for natural gas between TANESCO and Songas that is lower than international market prices (and much less than the energy costs of IPTL)[44]. However, Songas construction costs were also substantial. They included amortization of the entire natural gas infrastructure, including the pipeline, etc. They also included a 22% return on equity to investors compounded annually during construction or AFUDC agreement (Allowance for Funds Used During Construction)[45].

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[42] Average IPP monthly charges include fixed capacity payments, variable energy charges, and 20% VAT normalized to the quantity of electricity sold. Values for 2005 are for the period through to Sept 2005. The average cost of electricity from IPTL was 13 USc/kWh and Songas 4.9 USc/kWh (excluding VAT) in 2005.

[43] The 2003 tariff study was carried out by NETGroup using a cost reflective approach to tariff design (NETGroup 2003). It was reviewed by NETGroup resident mangers and presented to the Board of Directors. The Board of Directors and the MEM reviewed the study and submitted the tariff proposals to Parliament for approval. The recommendations were approved and have been the basis for tariff revisions since 2004.

[44] The gas price for Songas turbines I-V (150 MW) is set at US$0.55/million British Thermal Units. Additional gas for Songas turbine VI is set to 75% of the liquid fuel equivalent.

[45] According to project sponsors and investors, Songas' 22% return on equity was comparable to other projects of similar risk profiles in the region at the time, and reflected risks of TANESCO having no experience in paying IPP charges and being in a poor financial condition. It may also be argued, however, that much of risks were already mitigated by facilities built into the project. In the case of Songas, the government maintained an offshore escrow facility, where it made payments equivalent to 100% of the private equity contributions to mitigate against risks of nationalization prior to completion of the project. The government also maintained a liquidity facility funded at levels equivalent to four months of Songas capacity charges to cover against TANESCO non-payments of capacity charges (see Gratwick, Ghanadan, and Eberhard, 2006).

When the project was delayed for three years during the IPTL dispute, interest continued to accumulate at a rate of 22% per annum. The AFUDC ballooned to over US$100 million, and Songas' associated capacity charges for Songas would have been US$ 6.2 million per month (more than 30% of TANESCO revenues at the time). TANESCO's tariff study anticipated Songas capacity charges could be reduced to US$ 2.7 million per month by implementing a number of policies (including buying down the interest on the AFUDC)[46]. However, not all the policies were fully carried out, and Songas capacity charges were US$ 4.2 million in 2005. As a result, the tariffs put in place did not cover costs.

The contractor did show that if the reduced capacity charges were not realized (from actions outside their direct control), then the government had to either maintain or increase financial support, or adjust tariffs accordingly to cover cost. However, neither occurred and tariffs were set below levels necessary to recover full Songas capacity charges. In addition, the tariff did not account for drought conditions, which mushroomed generation costs, as the utility offset lower cost hydro-power (that was no longer available) with thermal IPP generation. During these difficulties, the government opted to provide drought relief, which was in the form of financial support from the World Bank and the Government, instead of adjusting tariffs or adding a fuel levy on the tariffs. However, as the fiscal gap deepened, revenue from sales became increasingly inadequate to cover costs and further tariff increases became imminent. By 2005, tariffs needed to be raised by an additional 20-25% to generate sufficient revenues to cover costs[47]. By 2006, needed adjustments were higher, as the gap included costs of emergency generation and revenue losses from loadshedding.

Delays in Debt Restructuring

TANESCO's ability to finance new investments during the extension was also hindered by delays in restructuring TANESCO's debts to the government of Tanzania, and this responsibility falls primarily to the government and donors. World Bank policy for development assistance specifies that the Government of Tanzania receives IDA support at 0.75% with a six year grace period on interest, which is then on-lent to TANESCO and other electricity sector players (such as Songas) at higher rates of 7.1%.

Concessionary interest rates were not passed on to TANESCO, and were based on World Bank electricity sector lending policy that aimed to commercialize electricity sectors[48]. However, commercial on-lending in Tanzania preceded TANESCO actually being financial autonomous or earning commercial returns. TANESCO was unable to service interest repayments and large debts built up on the utility's balance sheet. These debts largely pre-dated the management contract, and built up over more than a decade.

The extension to the management contract was negotiated with the assumption the large debts that had built up on TANESCO's balance sheet would be restructured and moved off the utility's balance sheet within a few months of the start of the extension. The Ministry of Finance confirmed that the restructuring of TANESCO's debts would be finalized "very soon" as early as January 2004. However, restructuring was delayed with extended

[46] The policies proposed for reducing Songas capacity payments in the tariff study included: buying down of the interest on Songas construction costs (reducing capacity charges TSh 1.6 billion/month), extending the grace period on the Songas IDA loan (reducing TSh 1.72 billion/month), and obtaining a tax exemption on fuel for generation (saving TSh 0.2 billion/month) (NETGroup 2003).

[47] As a reference, the IPP average charge was 9.4 USc/kWh and comprised 50% of total generation in 2005.

[48] Notably, the on-lending rate is still below commercial bank loan rates, which would be in the mid-teens.

negotiations between the Ministry of Finance, Ministry of Energy and Minerals, TANESCO, and the World Bank, and the debt restructuring was not effective until 2006[49].

In the meantime, these debts prevented TANESCO from being considered creditworthy and able to access offshore commercial bank loans. These delays meant TANESCO was informally not paying pay the subordinated debt portion of the Songas capacity charge from May 2005 (the part associated with 7.1% interest on-lending to Songas that was passed through in Songas capacity charges to TANESCO). In addition, funds that were intended to be made available to the utility via the World Bank Songo-Songo gas-to-electricity project (for reliability investments) and Energizing Rural Transformation (ERT) project (for electrification) were severely delayed and not available during much of the extension period.

All of these factors – increasing generation costs, poor hydrological conditions, infrastructure run-downs, and delays in debt restructuring and donor financing – impacted negatively on TANESCO's financial performance and hindered its ability to invest in network reliability or electrification. Improvements that were possible without investment were done, but lacking investments from debt, equity, or other grants/subsidies, major improvements were not possible. These factors – configured by a multiple dimensions outside of the immediate management contract and control of the private contractors - drove the disappointing investment results during in the extension period.

5.2 The Customer Service Perspective

While growing generation costs, poor hydro conditions and supply shortages have impacted negatively on technical quality, and customers also face burdens resulting from poor customer service - the managerial and administrative aspects of service provision. Yet, these customer service issues have received little attention within the formal scope of the management contract.

Customer Service Not Included in the Management Contract

Customer service standards were not included in the contract targets or remuneration incentives[50]. Rather, customer service has been treated only as a derivative of revenue (i.e. billing and collections), or alternatively, as a subset of technical performance (i.e. reliability or electrification). However, these areas do not, on their own, guarantee quality service provision. Direct attention to managerial and administrative aspects of customer service is an important part of utility operations and performance in these areas make up the front lines of customer experiences.

The contractors monitored and measured many aspects of customer service as a part of internal efforts to improve revenue and benchmark financial performance. They improved the customer database, developed and revised procedures for documenting service requests,

[49] It must be noted that even with the restructured balance sheet, TANESCO would not have had sufficient surpluses from operations to service new debt, given the tariff regime which did not sufficiently cover increased generation costs (refer to the Financial Recovery Plan).

[50] Phase I included a quality of service and supply benchmark, and NRS 047 and 048 were implemented to improve customer services. However, it did not cover many dimensions of customer service and numerous problems remained outstanding and unreported even though NETGroup ostensibly met the benchmark. In the contract extension , stakeholders – including NETGroup, Sida, and MEM - intended that a more direct customer service incentive would be included. As the negotiations for the extension were intensive and time-consuming (extending over five months), stakeholders cited "difficulty in developing a metric", "lack of time", and "practical trade-offs of negotiation" as the reasons why customer service was ultimately not included in the incentives of the contract's extension.

and launched a number of efforts to minimize losses due to theft and/or poor administration. However, without an explicit incentive in the scope of the contract, the contract lacked a wider structure to directly monitor and report on customer service issues or customer concerns. As a result, customer service has been under-emphasized.

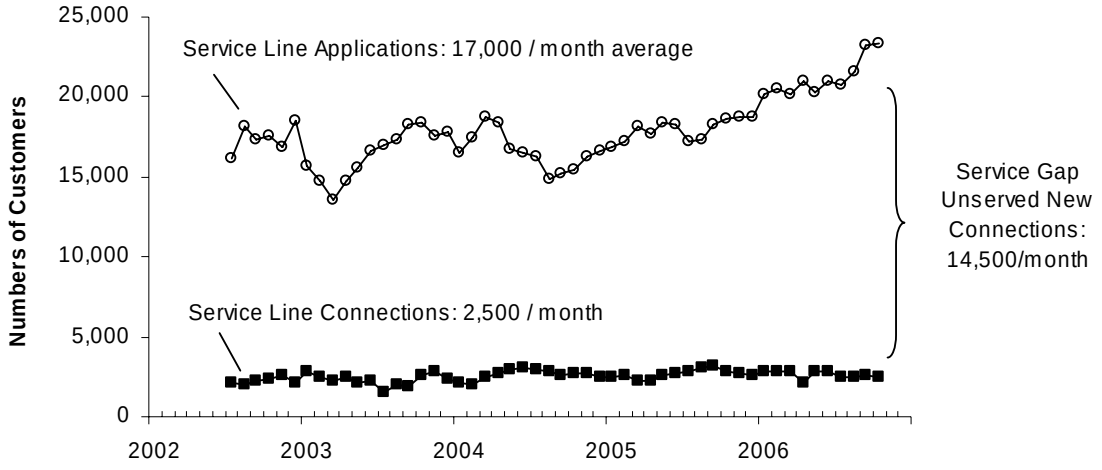
Poor Customer Management Creates Losses and Customer Burdens

Poor customer service has contributed to non-technical distribution losses, which averaged 8-9% throughout much of the management contract. Records remain poorly maintained, billing errors common, and procedures poorly enforced. Implementation of new billing software has not been successful and needs a lot of further work. Service applications have been redesigned, but irregularities remain. These issues contribute to losses, and they also create extensive barriers and burdens to customers. These burdens, combined with the growing costs of power, create a difficult context for many consumers, particularly many small and low income customers who have few alternatives and resources for negotiating customer service barriers. Often losses are called electricity "theft", however this is misleading, as poor customer management is a major contributor. Key examples are explained below.

Backlogs in New Service Line Connections

Regional offices have not met demand for new service lines from commercial customers. During the contract, service line applications average 17,000 per month, but the utility connected only about 2,500 (unpublished TANESCO data 2002-06). Thus there have been backlogs averaging 14,500 customers per month, who have paid for service line connections but are not served. TANESCO's internal goal to reduce service line waits to less than three months has not been achieved. Instead, customers must wait on average six months for connection even after providing all necessary materials and payments. Backlogs increased even further in 2006 as the utility faced extensively curtailed services and loadshedding. Notably, this service gap is not fully explained by exogenous financial constraints, and points to poor customer administration as well as problems in allocating internal resources to new connections. The ability to meet new service line requests should be a minimum measure of performance if the utility is serious about expanding services. Currently, it is falling short.

Figure 15. Unserved Gap in New Connections

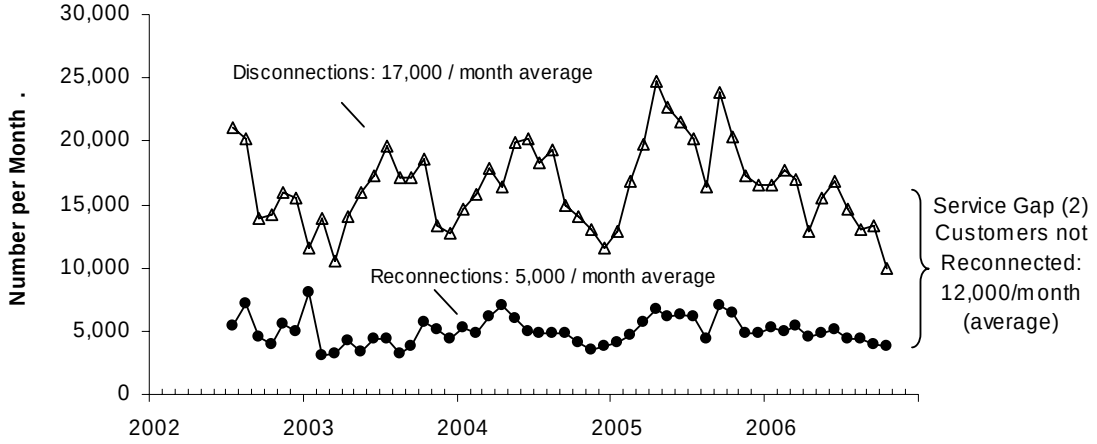


Source: Calculated by principal author from unpublished TANESCO data, 2002-2006

Poor Management of Service Disconnections/Reconnections

The utility also has a poor management record in reconnecting customers after enforced cutoffs for non-payment. According to utility data, disconnections during the contract averaged 17,000 per month, but reconnections averaged only 5,000 per month. This yields a gap of more than 12,000 customers each month who are disconnected by the utility but are unaccounted for within formal utility records. Thus the outcome of more than 80% of disconnections is currently not known. Whether the gap represents permanent disconnections, illegal reconnections, or formal reconnections not logged in utility data – all are problematic and indicate serious issues in customer management. Service disconnections carry with them responsibilities for effective follow-up, to ensure legitimate avenues are available for bringing customers back into the system of service provision. The current failure to make reconnections (or understand what happens in their absence) is shortsighted and hinders customer welfare and the utility's revenue and service provision goals.

Figure 16. Loss of Customers from Service Disconnections



Source: Calculated by principal author from unpublished TANESCO data, 2005

Irregularities in Service Provision at Regional Offices

There are extensive informal dealings around some areas of service provision in regional offices. A key area is in the provision of new service line connections. Some employees (not all) take side-payments from customers in return for faster, less hassled services[51]. Third party informal agents called "vishoka" facilitate these interactions by working in close proximity to regional offices and offering customers quicker services for a bribe.[52] Customers realize such dealings are not sanctioned methods of service provision and would prefer to follow formal procedures (especially as it is more costly to customers). However, given that formal procedures are slow and burdensome, and informal dealings widespread,

[51] Information in this section is based on research conducted by the principal author at two regional offices in Dar es Salaam in 2005, including: surveys of 250 customers, interviews with more than 20 "vishoka" operating in proximity of these offices, and interviews with managers and employees at these regional offices.

[52] On any given day, numerous vishoka can be found just outside of regional offices taking payment from customers and promising to deliver faster services for a fee. Many (but not all) vishoka are part-time or former TANESCO technicians, who rely on informal "expediting" when formal employment is not available. The link to internal TANESCO employment procedures of using short-term, temporary technicians and outsourcing of operations shows how some vishoka are able to build close relations with some TANESCO staff and activities.

many customers feel they have little alternative to following these procedures. Interviews with vishoka and customers revealed that customers make payments of US$ 50 to $100, on top of utility fees, in order to expedite new service line connections from the typical 3-6 months to closer to 2-3 weeks[53]. The presence of informal activities around some areas of service provision is well-known to regional managers and onsite consultant managers, who have been concerned about these problems in a general sense. However, attention has focused on short-term revenue goals. Without customer service incentives in the contract, there has been little outside driver to resolve these issues, and numerous other areas demanding management attention[54]. These informal dealings thrive within a context of materials shortages, inefficient procedures and poor customer service. For many customers, the large time savings and reduced hassles are simply worth the additional charges and risks, particularly when the alternative is long waits and poor customer service.

Impacts on Low Income Electricity Customers

Another concern is the impact of new supply and service conditions on low income customers who face higher tariffs, disconnections, as well as poor customer service, poor customer management, little attention to reconnections, and hassles at regional offices. Little attention has been given to the impact of power sector reform on the poor.

An important issue needing greater attention is that many low income electricity users are unable to access lifeline subsidies. Most electricity customers are urban residents and many low income customers share meters. It is common in urban areas for multiple low income households to share a single dwelling. Each household may rent one or two rooms. At most, households sharing meters receive a single lifeline of 50 kWh of subsidized power each month. More commonly, they receive no lifeline benefits at all, as combined consumption exceeds the eligible ceiling.

Scaling back lifelines and increasing residential tariffs have made lifeline tariffs less accessible. For those sharing meters, the monetary loss of ineffective targeting can be large[55]. These conditions contribute to the large numbers of service disconnections in low income areas[56]. The principal author estimates that nearly half of low income residential electricity customers are currently unable to access lifeline subsidies[57] (see Appendix J).

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[53] Customers and vishoka indicated in interviews that informally negotiated services involved full payment of formal fees, filling out of formal records and use of formal utility materials and staff to make connections. The key difference was that customers paid an additional premium (bribe) to be given priority. Some vishoka reported that they do not see what they are doing as criminal as they are working with TANESCO employees, TANESCO receives its full revenue payments, and they themselves are sometimes employed by TANESCO.

[54] If the depiction is accurate, these informal dealings may not reduce TANESCO's overall revenues, however they do reflect major burdens to customers and a lack of accountability within some areas of utility operations.

[55] Illustrating these conditions, a survey of 102 electrified households was carried out in Manzese in July 2005 (comprising a representative sample of one of Dar es Salaam's most populous and established low income wards). More than 63% of electrified homes had been disconnected in the last year; 16% were currently disconnected. Of those reporting disconnections, 90% involved households who shared meters. When asked about length of disconnections, more than 67% had been disconnected more than a month, 40% more than two months, and 25% more than six months. Nearly all households relied on daily income sources 87%. The numbers of households sharing one meter ranged from 2 to 12 with a median of 4.5. Very few households had prepayment meters, 97% were conventional meters. In interviews, households reported having difficulties organizing shared payments: dividing bills according to use, collecting and enforcing payment, etc. These difficulties contributed to collective failures to pay bills even when individual households are striving to pay.

[56] Using the median of 4.5 households sharing one meter in Manzese, the loss of benefits associated with not being able to access lifeline subsidies would amount to US$10.20-11.70 per month (11,500-13,100 TSh per month). (Assuming 4 households, losing 150-200 units of subsidized consumption per month based on 2005

These dynamics, in combination with poor customer management, raise concerns about the effectiveness of service disconnections of low income customers. Disconnections are most effective when the issue is an unwillingness to pay, with enforcement as a threat to change behavior (as in case of public institutions). For low income households, many conditions may contribute to their inability to pay – social conditions poorly matched to targeting mechanisms, poor customer service and management and the requirement of paying regular monthly bills when income might not be as predictable. (Prepayment meters are largely not available to low income households). However, none is necessarily resolved by service disconnections, as the key constraints are more complex than an absolute unwillingness to pay.

Expansion of prepayment to include low income customers would assist these customers making smaller, more "budget-friendly" payments. Improving the management of service reconnections after cutoffs is an essential element of responsible service provision. In addition, targeted subsidies and collections procedures could be reassessed and better managed for low-income customers. Greater attention could be given to balancing between financial and development objectives in an environment of hard commercialization. Currently, not enough attention is being given to service conditions on-the-ground.

6. Lessons Learned for PSP and Power Sector Reform in Africa

The ability of policy makers to design, negotiate and oversee effective contracts that restore utilities to financial viability, improve technical performance and result in expanded and reliable services for customers, depends on governments having accurate information and learning from the success, mistakes, and limitations of previous experiences. Tanzania's management contract experience yields a number of key insights and lessons which are summarized below.

1. **Successful management contract outcomes are dependent, in part, on the broader power sector reform and planning environment.** Management contracts focus on improving the financial and technical performance of utilities and in providing reliable, cost-effective and expanding services to existing and new customers. However, carefully these contracts are designed and managed, the utilities performance is affected also by a number of broader power sector policy, reform and planning issues. For example, generation planning and the introduction of IPPs can have a profound impact on the availability and cost of electricity supply. Electrification funds and agencies might complement (or hinder) the utility's electrification efforts. It is thus clear, that governments need to achieve effective integration, coherence and consistency between the design, negotiation and oversight of utility management contracts and wider power sector reform and electricity policy. Management contracts can only be as successful as there is effective policy, management, and planning in the sector as a whole.

TANESCO tariff rates, either for low use or general tariff class one). This is a significant sum, particularly given 87% of households in Manzese relied on daily income sources. As a second measure of comparison the national minimum wage was only 60,000 TSh per month in 2004).

[57] Comprehensive data on the extent of meter sharing are not available. However, using data from Tanzania's 2000/01 National Household Budget Survey (TNBS 2002) the principal author estimates that nearly half of low income residential electricity customers are currently unable to access lifeline subsidies (see Appendix J).

2. **Management contracts must balance multiple interests.** Governments look to management contracts to build capacity, catalyze technology transfer and increase revenue and investment in the power sector. Private sector contractors are concerned with clear incentives, minimizing risk and ensuring support so that they can carryout operations, earn sufficient profits, and build a reputation for future work. Donors want management contracts to serve wider reform agendas – bringing commercialization and private sector involvement to the sector and generating examples of successful reforms in Africa. Customers are concerned with services improving, being affordable, and expanding to those yet unconnected. Support from all these stakeholders is essential, and striking a balance between interests means incorporating elements of each into the contract. Otherwise management contracts run the risk of being seen as unreasonably profitable or a technical success by some and a social or political failure by others. Recognizing these different interests up front, can help create realistic expectations and more open discussions about the prospects of management contracts, and ensure all stakeholders have something to gain from the process.

3. **Effective Regulation is needed for Coherent Oversight and Achievement of Objectives.** An electricity regulator can play an important role in the need for effective oversight and monitoring of management contracts within the broader sector reform and planning environment. While the TANESCO management contract occurred without the presence of an independent regulator, the oversight function of the SIDA funded Monitoring Consultant played an important role. This oversight function could be undertaken by a formal regulatory body which could help to balance multiple stakeholder interests in the sector – especially between the imperative of achieving a financial viable and efficient utility, on the one hand, and reliable and affordable electricity services for customers, on the other. It also means encouraging effective power sector planning and promoting efficiency and commercial discipline in IPP projects so that they provide not only much needed power, but also power that is cost effective and supplied via contracts that are competitively priced. Effective regulation can fill a gap in raising the profile of customer and citizen-based concerns within the policy process. Tanzania's newly created EWURA and its Council of consumers will be a particularly important step in this direction. One word of caution however is important. Inexperienced and ill-equipped regulators, rather than improving coherence and oversight, can actually increase regulatory risk and confusion. In capacity constrained situations, some form of outsourcing of regulatory functions to third parties might be considered. It is important that regulatory decisions are predictable, transparent and credible – and that they are consistent with the performance measures and incentives in the management contract.

4. **Information asymmetry can be reduced during the course of a management contract, resulting in more balanced outcomes.** One of the key challenges in management contracts is the inherent principal-agent relationship (between government and the contractor) and associated problems of information asymmetry and moral hazard. At the start of the project, baseline information may be unreliable and neither the government, nor the management contractor, might have sufficient information to set and agree to realistic performance targets or to effectively manage risk. However, as the contract progresses, the management contractor obviously gains more information and is in a better position to maximize profits, sometimes at the expense of customer

benefits or government's development goals. One would also expect that the contractor would be in better position than government regarding access to reliable information and thus in re-negotiating a more favourable contract extension in terms of increased remuneration and reduced risk. What is interesting about the Tanzanian experience is that the management contractor did not achieve significantly higher financial returns or rewards in the contract extension period. In part, this was because of unforeseen exogenous factors. However, it could also be because the government also gained access to much more relevant and reliable information and was able to negotiate a tight contract. The involvement of a wider governance and reporting structure also effectively served as wider oversight and input to the process. The obvious point is thus emphasized, that effective oversight of the contract is essential – particularly in reducing information asymmetry and moral hazard and for managing a more effective principal-agent relationship – ultimately to the benefit of the industry and consumers.

5. **Management contracts may improve conditions for investment, but they do not on their own resolve the question of where finance for new investment will come from and who is responsible.** Many mistakenly see management contracts as a direct instrument for new investments. While management contracts may increase utility revenues and improve utility operations, they do not guarantee investment outcomes. In practice, investment risks and most operational risks remain with the public sector (and in most cases, consumers directly). In Tanzania, the government and donors assumed that investments for reliability and expansion would come from utility revenue gains (no direct investment by the government was part of pre-privatization goals). However, little attention was given to who would be responsible for essential investments if utility revenues gains proved insufficient. As this ultimately was the case, the sector faced systematic under-investment in basic maintenance and infrastructure due in part to over ambitious assumptions about commercialization and a failure to plan for contingencies. This under-investment eroded technical quality. A combination of public and private, concessionary and commercial financing are likely to continue to play important roles in financing electricity investments in Africa, and clear mechanisms for debt-based investment need to be specified within management contracts in addition to revenues.

6. **Cost-effective generation planning and procurement are critical to the success of management contracts.** It is important that IPPs support (rather than compete with) management contracts and their objectives. In Tanzania, the assumption that the utility could increase revenue sufficient to pay for new costly IPP generation, garner surpluses for new investments, and maintain reasonable tariffs proved too demanding for short term conditions. These experiences point to the importance of sound investment planning, adherence to a power sector master plan, negotiation of competitively priced private sector contracts, and effective implementation of projects to ensure the utility procures cost-effective generation (supporting reasonable tariffs, utility surpluses, and ultimately investments). Effective regulatory oversight has an important role to play. In addition, the utility must be allowed to set cost-reflective tariffs (or gain direct government subsidies). Yet, passing costs to consumers should only be secondary - and not a substitute for cost-effective planning and procurement. Reasonably priced, well-functioning generation is the foundation of efficient sector finances and operations.

7. **Contract incentives need to reflect not only financial and technical goals, but also customer service, access, and direct public benefits.** One key lesson that has emerged from power sector reforms in developing countries is that while finance is essential to the effective operation of the sector, explicit attention and mechanisms are needed if concerns of access, affordability, and customer service are to be improved. In Tanzania, the contract emphasized revenue, both in success fees and ultimate performance. It did not realize sufficient gains in customer service, technical performance, or tangible benefits to customers. Some of these outcomes resulted from exogenous factors (such as the burden of high IPP costs), but a component is also attributed to contract design and scope. For example, TANESCO's large backlogs in making new commercial connections (customers paying fees and making service line applications), poor management of service disconnections, and poor customer relations in regional offices are not so readily explained by simply exogenous finances. High quality services must be asserted as the benchmark of successful electricity policy, and the scope of management contracts needs to directly prioritize customer service, access and public benefits. These goals need to be incorporated with clearly defined incentives and monitoring, and should not be treated only as a derivative of other goals.

8. **A number of further design considerations are important, including:**

   i) **Clearly defined performance benchmark and financial incentives:** which are desirable to the government, donors, private sector, and customers – and most importantly, correspond to both financial and development needs of the sector. Performance targets should be easily measurable, incentives should be meaningful and rewards and penalties effective.
   ii) **A fixed contract period and clear end-point:** so policy makers can reassess sector policy based on information garnered from the electricity contract, and so that contractors can prioritize and focus their activities around fixed timelines. At the same time, there should be early and timely planning for the period beyond the contract, either in terms of an extension to the contract, re-bidding the contract, movement to deeper PSP (such as leases, concessions or divestiture) or, alternatively, a return to a state-owned enterprise with local management - but under more effective governance oversight and regulation.
   iii) **Contractors with deep engagement in Africa:** so that they have experience in the institutional context of African power sectors and are motivated not only by financial incentives, but also by reputation and interests in gaining future work in Africa.

9. **Ending management contracts without further private sector participation is not necessarily a failure.** Management contracts are instruments that work within existing public institutions. Improvements made during a management contracts will bring about changes and increase information about utility operations. As such, if management contracts are successful, they improve conditions for future management, be it public or private. While donors may see further private sector participation as the benchmark of success, this is not a necessary or inherent logical outcome of management contracts. Rather private sector participation should be considered when the private sector actually offers something, and private sector participation policy needs to be balanced with considerations for improving public sector management performance. This means that

further private sector involvement is not pre-given, or an end in itself. Rather what is important is achieving sustainable improvements in utility performance and in reliable, affordable and expanding electricity services.

7. Synthesis of Outcomes

This section summarizes key outcomes of Tanzania's management contract experience. They touch on multiple elements of performance, including: contractor efforts, contract design, exogenous factors, and reform policy. These outcomes show the contributions and limitations of Tanzania's management contract in advancing electricity sector goals. They also show the on-the-ground workings and significance of the TANESCO management contract in Tanzania.

- **Contract Exceeded Revenue Goals.** The doubling of utility revenues achieved during the management contract exceeded goals set out in the contract. Contractor efforts were central to this outcome: they increased collections, benchmarked conditions, implemented tariff restructuring, and successfully pursued collections that had been difficult prior to the management contract. Most critically, they were able to catalyze enforcement actions that had not been possible prior to the contract. However, the contract encountered rising IPP costs during the extension that largely negated these revenue gains and constrained investments in improving network reliability. In any case, given the rising costs of generation, which are unlikely to reverse, the utility would have been in a far worse position if it had not increased revenues, and in this respect, the management contract has helped to avert greater crisis.

- **Contractors Gained the Support of Workers.** Many stakeholders cite the improvement of worker relations under NETGroup management as one of the biggest "miracles" of their performance. Conditions went from workers barricading the entrances to the utility in 2002 to the union calling for the contract to be extended in 2004. Consultants were able to oversee a large retrenchment program (totaling 21% of the workforce) peacefully and with the support of workers and the union. This accomplishment is significant, given early resistance and the tense start to the contract. Many cite the management style and human resources focus of the original Managing Director as central to turning around worker support, and he has been singled out by stakeholders (including the union) as a key personality in catalyzing this outcome. The success of the consultants in gaining worker support speaks strongly to the importance of making human resources a priority in management, as performance would have been impossible without such efforts.

- **Contractors Improved Information about the Utility.** The contractors extensively enhanced collection of technical and financial data on the utility, as a part of reporting and performance monitoring. A secondary benefit of the management contract is that it has improved the availability of information about utility operations, which will provide better information for making future decisions, whatever policy choices are made. The contractors also implemented an extensive roll-out of information technology which will continue to benefit the utility in the future including: networking regional offices, improving computer skills of staff and moving the utility toward greater use of technology. In many ways they have been completing the job of earlier IT efforts to implement software platforms under

the World Bank Power VI project which were never adequately completed or integrated. The information and IT benefits are an under-recognized outcome of the management contract.

- **Government Support was Critical to Performance (though not monolithic).** Backing from the Government, particularly the President's Office was critical to NETGroup enforcing sensitive collections from public offices. The Government also supported the financing of workers' severance benefits from TANESCO revenues. The Government also put through the tariff revisions recommended by the 2003 NETGroup tariff study. However, MEM has been criticized for being slow to negotiate the contract extension, as negotiations did not formally begin until three months after the initial contract ended. It has also been critiqued for not sufficiently supporting tariff increases during the final years of the contract (including election years). Relations were also strained between the contractors and TANESCO's Board of Directors, which included the Board being unwilling to engage with NETGroup representatives beyond the MD. Despite these difficulties, all parties (including the consultants) reported that Tanzania's management contract benefited from support from the government and this was essential to carrying out their mandate and revenue performance.

- **Success Fees Fit Stated Objectives (but Scope of Objectives was narrow).** There has been extensive popular debate in Tanzania about whether the contractor's success fees were justified, given the importance of Government support in turning around collections. However, while collections required government support, the private contractors – in part by being outsiders – were able to implement practices that were politically difficult for the publicly-owned utility to implement on its own. Earlier government efforts had been largely unsuccessful in areas such as: retrenchment of workers, enforcing collections from public offices, undoing subsidies, carrying out large scale service disconnections. Thus in terms of how the contract was actually designed, the contractors successfully carried out the job they were hired to do – primarily to increase revenues. In all, the contractor was paid success fees equivalent to about 4% of the revenue gains they were able to realize, and this is a fraction of the revenue they were contracted to collect. The issue, in fact, is less about contractor performance in relation to the contractual obligations, but rather the more central question is around the actual design of the contract and whether customer service was adequately incorporated into performance targets and incentives.

- **Contract's Governance Structure was Cumbersome.** One of the complexities of management contracts is that oversight and management functions commonly occur with the same the institution – that is, within the public utility itself. In the case of TANESCO, NETGroup reported to the Board of Directors, and this created a complex public-private interface for regulation and oversight. Tanzania's oversight structure also involved additional complexity, by including public and donor agencies involved in reforms (including the PSRC, MEM, Sida, and the World Bank). The involvement of multiple players in governance created competing and sometimes conflicting signals around the contract's mandate, as some were more or less supportive of contractor activities and the concept of the management contract itself. In addition, the policy context and goals for the contract changed mid-stream from pre-privatization and revenue to a wider technical performance, which depended on wider sector conditions (and governance relations of other reform elements). As a result, governance was cumbersome and often conflicted, and this made operations less coherent, adding difficulties to an already challenging mandate.

- **Directly Including TAAs in the Contract proved Problematic.** TAAs created disagreements between stakeholders and within the consultant company itself. The two key issues at the center of these debates are: i) first, whether or not TAAs should have been directly incorporated into the contract, and ii) second, whether or not the TAAs were needed or appropriate at any given time. The utility did need flexibility in adapting its technical efforts to rapidly changing conditions, suggesting a practical need for avoiding tying pre-defined technical consulting projects too rigidly to the contract. A better route may have been to separate the consulting services from the management contract and to incorporate them instead into a set of consulting projects, which could be called upon as needed. In the actual contract, the level of utility discretion in taking on TAAs was left somewhat ambiguous, and this created differing expectations between parties during the extension. A more clear separation would have removed potential conflicts of interest within the management contractor, created more flexibility within a rapid changing reform environment, and reduced conflicting expectations.

- **Capacity Building is not Guaranteed.** Management contracts are complex, in part because the parties involved have different objectives. To the government, one particularly important objective was capacity building. Consultants carried out capacity building in the contract to the extent required. However, there are limitations to capacity building that will occur within a top-down, short-term performance-driven management contract such as the one implemented in Tanzania. The contractors professionalized utility operations at the corporate level, including: financial monitoring, benchmarking, and directives to regional offices. However, improved business operations have not extended sufficiently into day-to-day operations within regional offices, the frontlines of customer service. There has been some training and capacity building for senior TANESCO staff and senior corporate employees did cite a more interactive management style. However, the bulk of management and technical work has been carried out by onsite managers in concert with consultants from the parent office in South Africa. More in-depth capacity building is only likely to occur if distinct incentives and objectives are built directly into the contract, particularly given a management contractor's short timeframe and narrow focus on contractual obligations.

- **Exogenous Conditions Dominated Wider Performance.** The financial, technical, and development performance of Tanzania's energy sector is vulnerable to a range of factors such as drought, project delays, crisis-driven planning and non-competitive costs. With the benefit of hindsight, hydro might have been dispatched more conservatively during wet periods to create a buffer for dry periods. However, the drive to improve utility finances, juxtaposed against high IPP costs (particularly IPTL), created strong incentives to use hydropower in the short-term. Hydro reserves were depleted and were unable to recharge during wet periods. Tanzania's electricity sector was also undergoing dramatic changes in two areas of reform at the same time and the management contract was designed prior to the IPPs coming online. Tanzania's IPP projects and the lack of implementation of the power sector master plan created a very uncertain context for the management contract to operate in. Many expectations about generation costs proved wrong, and IPP costs now dominate overall sector finances and wider performance to an extent that was not anticipated by those designing the TANESCO management contract. With erosion of revenue surpluses, constrained access to debt finance, and delays in technical assistance projects, the necessary investments and activities for improving network reliability or

expanding electrification never got off the ground. Exogenous factors, beyond the control of the contractor in the extension period created a nearly impossible context for technical performance improvements.

- **IPPs provided much Needed Power, but Costs are Stressing the Sector.**

Compared to similar projects, IPTL is the most costly plant of its type in the region in terms of construction and operating costs. Its high costs have been attributed to government's inexperience with power sector contract negotiations, deviations from the power system master plan, poor transparency, possible corruption, international arbitration and longstanding delays in conversion of the plant to natural gas. Songas is also costly to the utility, though its assessment depends on a full reading of the project costs, as it includes amortization of the full gas development infrastructure. Songas electricity charges are significantly less than IPTL, but they are also contain large interest payments and a 22% equity return to investors during the delayed construction period while uncertainties around IPTL were being resolved.. The extent to which these additional interest charges could have been avoided by project sponsors, or alternatively simply reflect the failings of IPTL, is debated and subject to interpretation. For a more extensive treatment of both projects see (Gratwick, Ghanadan & Eberhard, 2006). New generation costs are inevitably higher than existing, amortized hydro costs. However, crisis-driven supply planning, project cost over-runs, and premium charges all come at a very high price to the finances of the utility and welfare of customers. These projects point to the serious need for improved policy and planning coherence within government, donor and private sectors operating in Tanzania to ensure competitive, timely and cost-effective power plant procurement and investment.

- **Outcomes have Increased (not Decreased) Demands on Public Budgets.**

TANESCO is not financially self-sufficient, despite doubling its revenues. The utility is expected to need more than US$140 million in outside assistance over the next 12 to 18 months, as of end-2006. The short-fall does not come from insufficient efforts by the utility to implement cost-recovery tariff, rather it results from sector generation costs being more costly than expected. The Government was already offsetting 50% of IPTL capacity charges, to the tune of US$1.5 million per month. Tariffs implemented during the contract also assumed Songas capacity charges would be lower than they turned out to be in practice, and tariffs did not cover IPP costs. These conditions were exacerbated by growing IPP energy charges, as hydro capacity eroded under drought. The end result is TANESCO is unable to make full IPP capacity payments and is reliant on outside government support and informal deferments on debt payments to get by. Increasing generation costs have swamped the utility's financial performance, and for the time being, power sector reforms to date have meant increasing demands on public budgets and higher costs to customers, rather than less.

- **Customer Service was not Sufficiently Emphasized in the Management Contract.**

Customer service was treated in the management contract only as a derivative of other objectives, namely revenue collections and technical performance. Yet, customer service is important in its own right, and numerous customer service issues – including billing errors, backlogs in new connections, irregularities at regional offices, and poor management of service disconnections/reconnections – all create unnecessary service burdens to customers, especially those with fewer resources to negotiate bureaucratic obstacles. Non-technical losses and improving customer service also go hand-in-hand. The contract failed to incorporate customer service in the scope of the contract and, without incentives or

reporting, these issues have not been sufficiently visible in the management contract. The delayed establishment of a formal regulatory body to take on a mandate of balancing customer, government, utility and private sector interests, has not helped. More attention is needed on customer issues to improve the quality of service provision and ensure that policies effectively balance development goals with other financial and technical objectives.

- **Customers are yet to gain the expected benefits of commercialization.** Tangible improvements in technical performance and customer service are yet to materialize. Despite widespread earlier promises of reforms improving efficiency and lowering tariffs, reforms to date have increased electricity tariffs for residential and commercial customers by reducing cross-subsidies, scaling back of lifelines and raising average tariffs. Rates for industrial customers have gone down, but along with other customers, they also face imminent tariff hikes to address growing generation costs. Load-shedding of up to 12 to 16 hours per day was prevalent throughout much of 2006. Tariffs and quality of service are the ultimate benchmarks of sector performance, reflecting its accomplishments as well as problems. Ultimately, customers judge the success and outcomes of the management contract in terms of whether they have received more cost-effective and reliable services. In that respect, the management contract in Tanzania cannot be regarded as an unqualified success.

8. Conclusion

Tanzania's management contract did many things right. It developed explicit objectives tied to sector needs and incorporated them into clear performance metrics and incentives. The contract gained support of key parties, including the government, donor agencies and private sector consultants, making Tanzania's management contract one of the few in Africa to gain an extensive level of cooperation and a shared vision between participants. The contract was thus able to address early hurdles and gain support of workers, establish collections from public institutions and implement a transfer of management. This created a conducive environment for the utility to improve revenues and collections, which it did admirably.

However, Tanzania's management contract also faced almost insurmountable challenges. Management contracts have a complex public-private interface. All contingencies cannot be specified in the contract and governance is as much about the ability of the public-private interface to successfully negotiate day-to-day challenges, as it is about formal regulation. In Tanzania, the contract's complex governance structure and the shifting reform environment clouded governance and constrained operations thus creating impediments for the achievement of more successful performance outcomes.

Factors exogenous to the contract also had a large impact. IPPs and poor hydrology resulted in generation costs that were beyond what the utility or customers were able to absorb during a period of already dramatic changes in tariffs, collections. Reliable and affordable generation is fundamental to the viability of the sector, and points to the importance of ensuring coherence between the different elements of power sector reform, effective long-term investment planning, and improving conditions for the government to negotiate competitive private contracts.

The match between contract design and sector needs was also an issue. The contract did well in incentivizing revenue collections. It made efforts at improving technical service and electrification but was hindered by wider constraints. However, the contract omitted customer service standards and incentives. An emphasis on revenue and a focus on ease of

implementation made the other areas higher priority. However, public benefits dimensions of services are unlikely to be addressed without direct targets and incentives, and this area needs greater attention, even if it involves more complex monitoring and implementation.

The resulting outcome is one where IPPs and poor hydrology demand additional tariff increases, overall sector finances are insufficient to invest in technical improvements, and customer service has been largely left out of the scope of reforms. Tanzania's electricity sector will benefit from improved revenues catalyzed by the contract. However, improvements in effective public sector management, competitive relations with the private sector, and clear goals for bringing public benefits into the scope of reforms are all needed for reform policy to be more accountable to development as well as sector's financial goals.

Management contracts are, in principle, easier to implement than other forms of private sector participation in the electricity sector, such as concessions or leases, but they nevertheless incorporate a number of complexities and challenges, which have been highlighted in this report. These instruments depend on effective relations between parties, clear incentives and goals, and a coherent wider vision for the sector. Tanzania's experience offers lessons for electricity management contracts and more effective power sector reforms throughout Africa.

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List of Abbreviations

CAIDI	Customer Average Interruption Duration Index
ESBI	Electricity Supply Board (Ireland)
ESMAP	Energy Sector Management Assistance Program (of the World Bank)
Eskom	South Africa's National Electric Power Company
EWURA	Energy and Water Regulatory Authority
GoT	Government of Tanzania
IPP	Independent Power Producer (private generator)
IPTL	Independent Power Tanzania Limited
KWh	Kilowatt-hour of electricity
MEM	Ministry of Energy and Minerals
MOU	Memorandum of Understanding
PPA	Power Purchase Agreement
PSRC	Parastatal Reform Commission
REA/REF	Rural Energy Agency and Rural Energy Fund
RFP	Request for Proposals
Sida	Swedish International Development Cooperation Agency
TAAs	Turn-Around Activities
TANESCO	Tanzania Electricity Supply Company, Limited
USc	U.S. Cents ($0.01)

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Additional Resources

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TANESCO Management Monitoring Report to Sida, 2004. Technical Issues, MC Field Visit Report, prepared by AF – Process AB, August.
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Appendix A. List of Interviews

Over 30 interviews were conducted by the principal author with more than 20 stakeholders in June-August 2005 in Dar-es-Salaam, Tanzania and in Washington D.C., USA. Interviews were followed by extensive email correspondence to clarify discussion points. Interviewees included present and former directors and managers of the following institutions.

- TANESCO
- NETGroup Solutions (Pty), Ltd.
- Ministry of Energy and Minerals (MEM)
- Parastatal Sector Reform Commission (PSRC)
- Swedish International Development Cooperation Agency (Sida)
- World Bank

This study also benefited from an earlier research study of Tanzania's Independent Power Producer (IPP) experience which included interviews conducted by the Rebecca Ghanadan and Katharine Nawaal Gratwick, which included the following additional stakeholders:

- Songas
- Independent Power Tanzania Limited (IPTL)
- EastCoast Energy
- Tanzania Petroleum Development Corporation (TPDC)
- VIP Engineering Limited

Appendix B. List of Management & Lease Contracts in Africa (current as of January 2007)

Country	Project Name	Sponsor	Start	Type	Segments	Sector	Statu
Management Contracts[1]							
Madagascar	Jiro sy Rano Malagasy (Jirama)	Lahmeyer International	2005	Management Contract	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Operati
Rwanda	Electrogaz	Hamburger Wasserwerke & Lahmeyer International	2003	Management Contract	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Operati
Tanzania	Tanzania Electricity Supply Company (TANESCO)	Net Group Solutions	2002	Management Contract	Generation, Transmission Distribution	Electricity	Conclu 12/2006
Lesotho	Lesotho Electricity Corporation (LEC)	SAD-ELEC Pty	2002	Management Contract	Generation, Transmission Distribution	Electricity	Conclu
Togo	Companie Energie Electrique du Togo	Mazard & Guerard	1997	Management Contract	Generation, Transmission Distribution	Electricity	Conclu
Mali	Electricite et Eau du Mali (Management)	Bouygues, CRC Sogema, Electricite de France, Hydro-Quebec International	1994	Management Contract	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Conclu
São Tomé and Principe	Empresa de Agua e Electricidade	SUEZ	1993	Management Contract	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Conclu
Guinea-Bissau	Electricidade e Aguas de Guinea-Bissau	Electricite de France, SUEZ	1991	Management Contract	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Conclu
Management Contracts & Lease Contracts (Unbundled Utilities)							
Kenya	Kenya Power & Light Co.	Manitoba Hydro International	2006	Management Contract	Transmission, Distribution	Electricity	Operati
Namibia	Reho-Electricity	Icon Investments	2000	Lease Contract	Distribution	Electricity	Operati
Namibia	Northern Electricity	Icon Investments	1996	Lease Contract	Distribution	Electricity	Conclu
Ghana	Electricity Corp. of Ghana	Bouygues & EdF	1994	Management Contract	Distribution	Electricity	Conclu
Cancelled Management Contracts							
The Gambia (CANCELLED)	SOGEA, Management Service Gambia (SAGI)	Biwater & Veolia Environnement	1993	Lease Contract	Generation, Transmission Distribution	Electricity	Cancell
Chad (CANCELLED)	STEE	Veolia Environnement	2000	Management Contract	Distribution	Electricity (primary), Water & Sanitation (second)	Cancell 6/2004
Support Consulting Contracts[2]							
Malawi	Electricity Supply Corporation of Malawi Ltd	Eskom	2001	Support Consulting	Generation Transmission Distribution	Electricity	Conclu
Ghana	Takoradi Power	Electricity Supply Board of Ireland	1997	Support Consulting	Generation	Electricity	Conclu
Gabon	Societe Africaine de Gestion et d'Investissement	Electricite de France, Hydro-Quebec International, SUEZ	1993	Support Consulting	Generation, Transmission Distribution	Electricity (primary), Water & Sanitation (second)	Conclu 1995

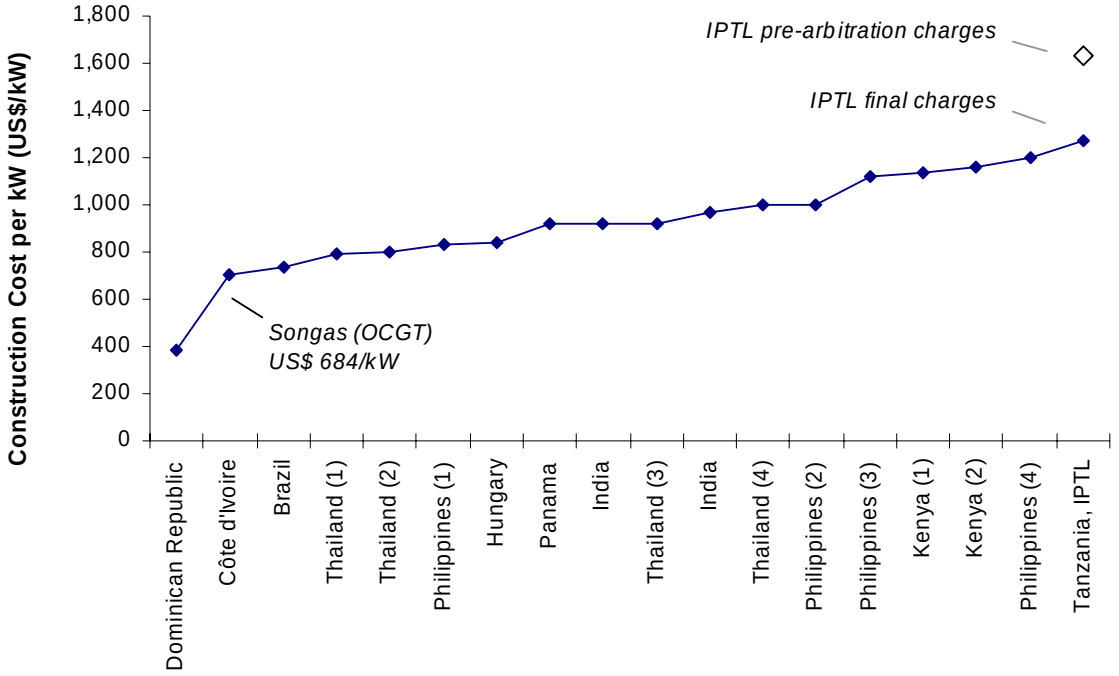
[1] Management contracts involve full transfer of management-operational responsibilities; classification consistent with the World Bank PPI database.

[2] Contracts without full transfer of management responsibilities are classified as a support consulting arrangement rather than management contracts.

Source: compiled by principal author based on the World Bank PPI database (2006) and correspondence

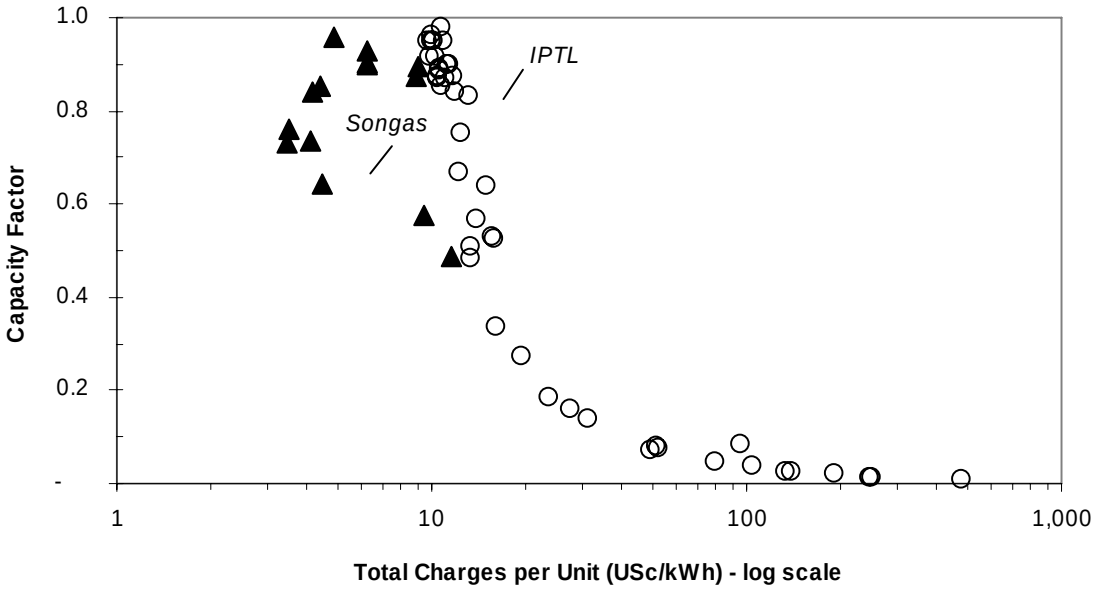
Appendix C. Tanzania Independent Power Producers (IPP) Data

Figure 17. Benchmarking IPTL Construction Costs versus 17 other small diesel IPPs in developing countries (capacity <110 MW).



Source: compiled by principal author using World Bank PPI Database (see Gratwick, Ghanadan and Eberhard 2006)

Figure 18. IPP charges per unit at different levels of plant use, based on monthly data, Jan 2002 - Sept 2005



Note: Total charges per unit include energy and capacity charges normalized to generation, and represent monthly averages. IPTL data points include Jan 2002-Sept 2005; Songas data points include July 2004-Sept 2005. Unit charges are VAT exclusive. Source: compiled by principal author based on unpublished TANESCO data (see Gratwick, Ghanadan and Eberhard 2006)

Appendix D. Revenue Collections and Billings Figures

Figure 19. TANESCO Billings versus Revenue Collections, May 2002-2006

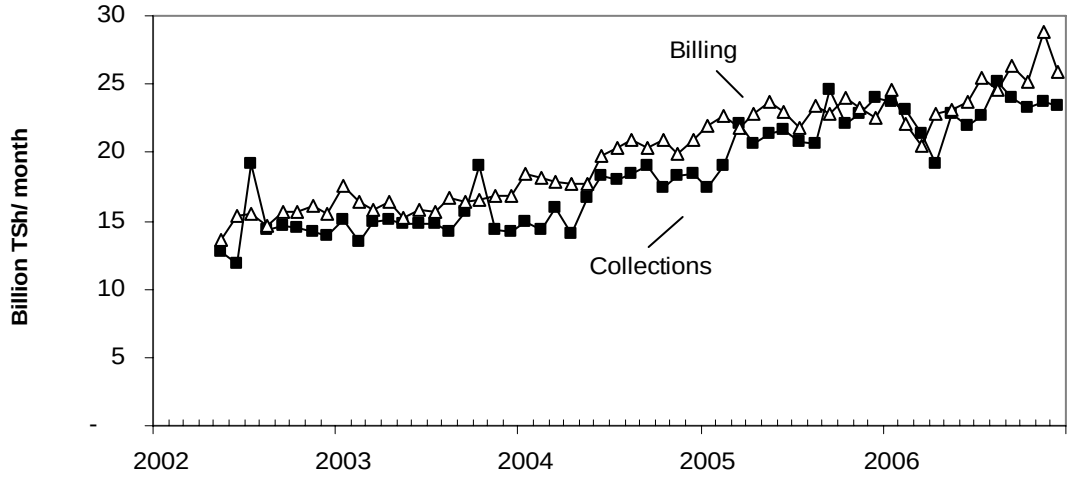
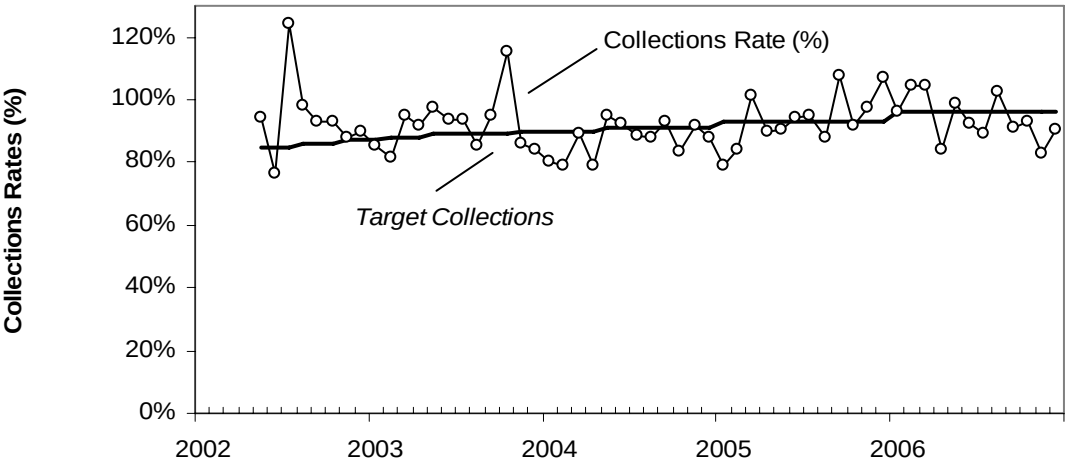


Figure 20. TANESCO Collections Rates (%), May 2002-2006



Source: Compiled by principal author based on unpublished TANESCO data (2002-06)

Appendix E. Electricity Sales, Number of Customers, and Average per Customer

Figure 21. TANESCO Electricity Units Sold, May 2002-2006

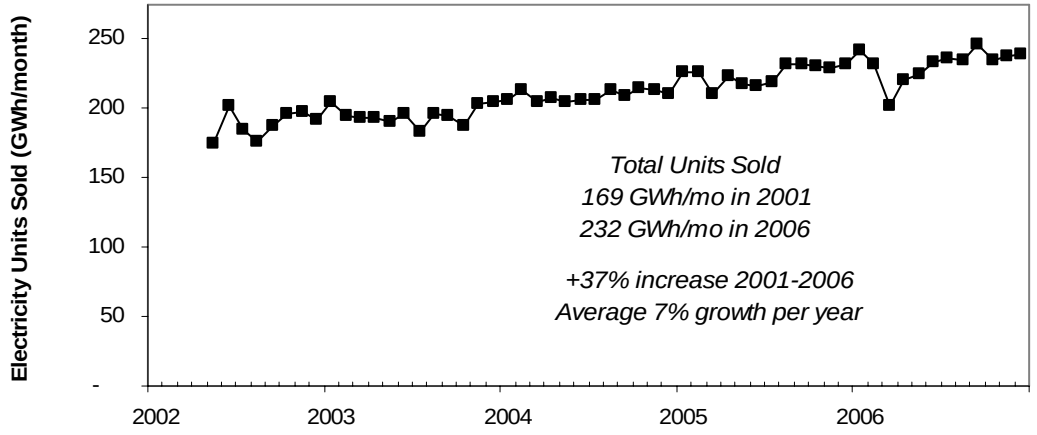


Figure 22. TANESCO Total Number of Customers, May 2002-2006

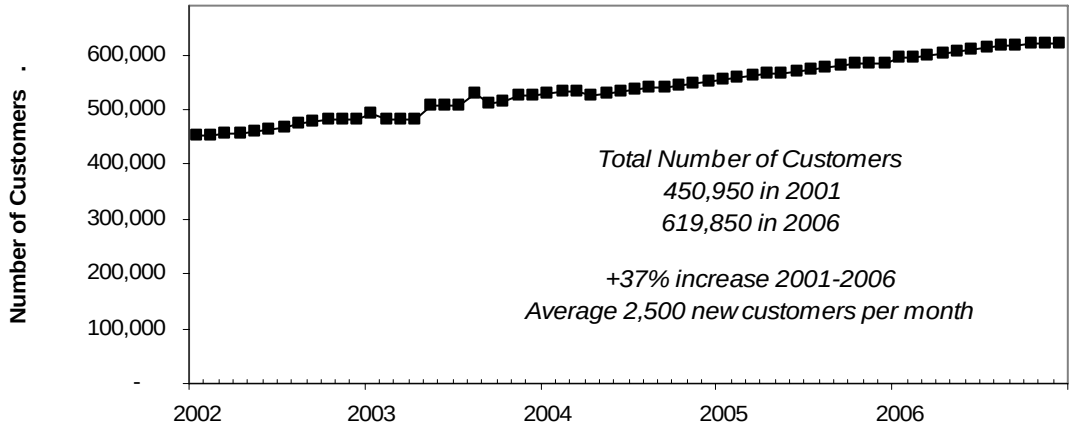
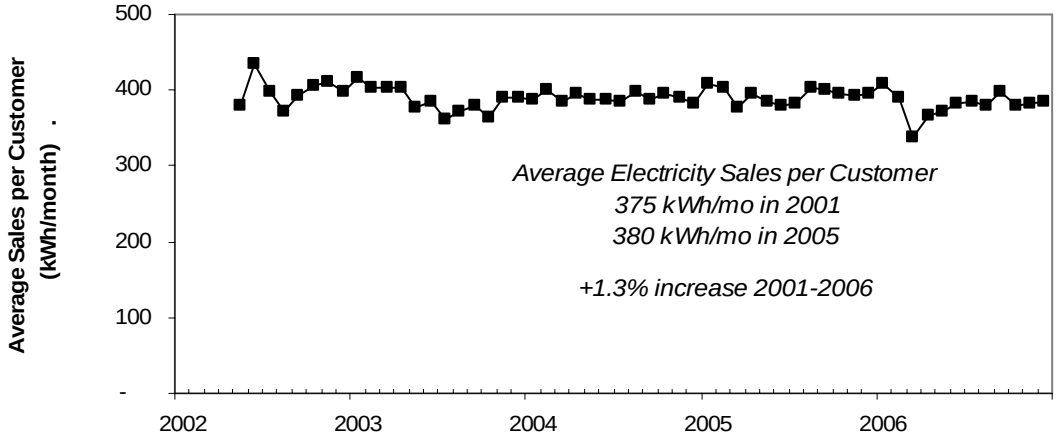


Figure 23. Average Electricity Consumption per Customer, May 2002-2006



Source: Compiled by principal author based on unpublished TANESCO data (2002-06)

Appendix F. Revenue Enforcement Figures

Figure 24. Prepaid Meters Installations, 1995-2004

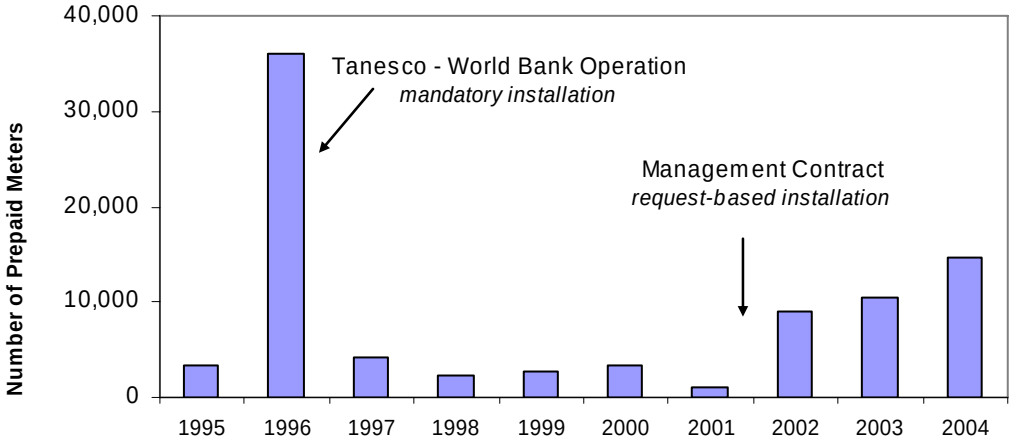


Figure 25. Enforcement of Collections via Service Disconnections, 2002 to 2006

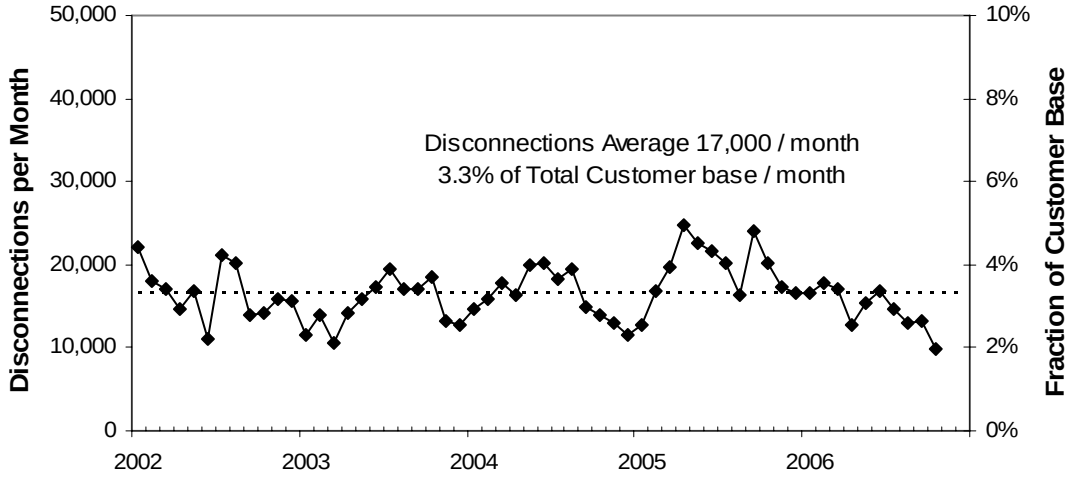
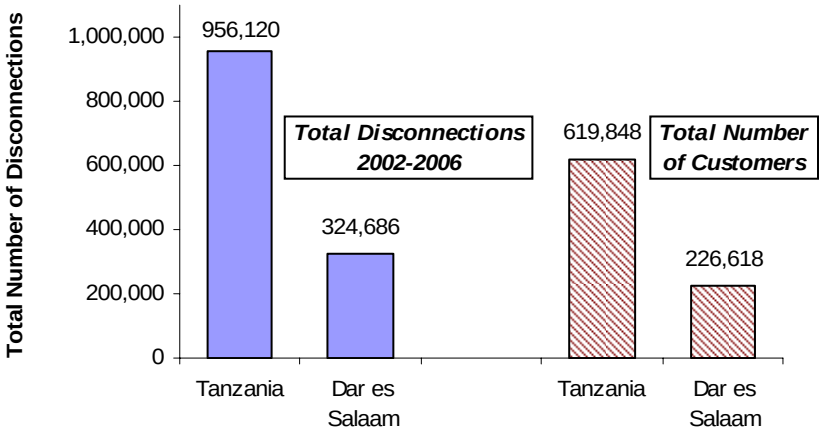


Figure 26. Electricity Disconnections, 2002 to 2006



Source: Compiled by principal author based on unpublished TANESCO data (2002-06)

Appendix G. TANESCO Average Tariff Figures

Figure 27. Average Electricity Tariff (TSh/kWh), 1985-2005

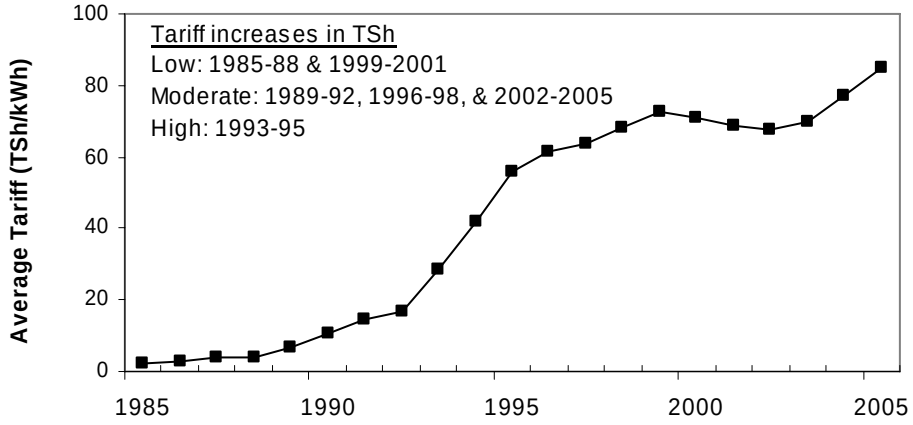


Figure 28. Average Electricity Tariff (USc/KWh), 1985-2005

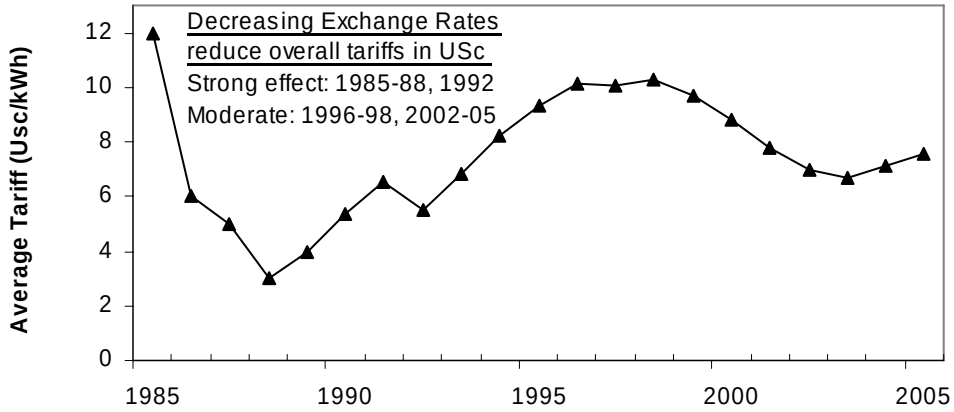


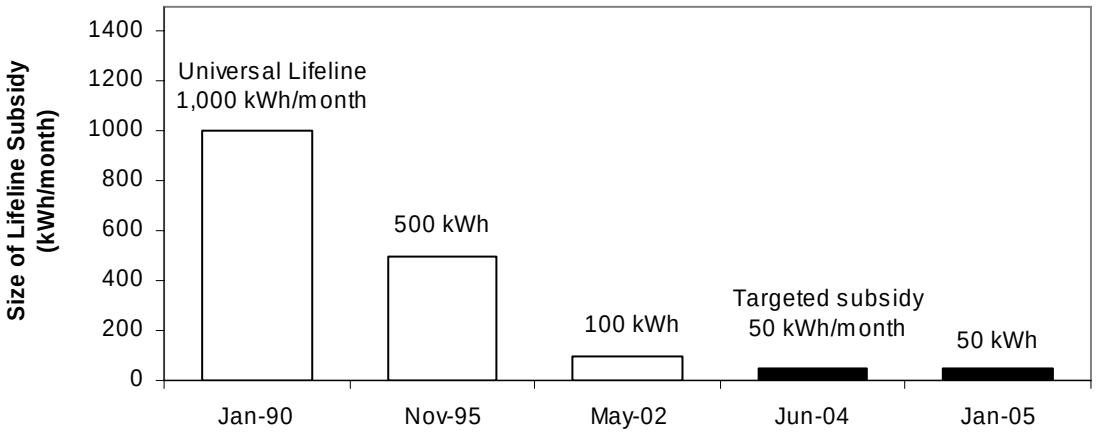
Table 12. Average Electricity Tariffs, 1985-2005

	1985	1990	1995	1997	1999	2000	2001	2002	2003	2004	2005
Average Tariff											
USc/kWh	12.0	5.3	9.4	10.1	9.7	8.8	7.8	7.0	6.7	7.1	7.6
TSh/kWh	1.97	10.4	55.6	63.5	72.6	70.8	68.6	67.6	69.7	77.2	84.8
Exchange Rate (TSh/USD)	11.3	195	595	631	747	800	877	966	1039	1089	1123

Note: Average tariff values exclude the 20% Value-added Tax (VAT), which customers must also pay.
Source: based on (Mwandosya and Luhanga, 1993; Katyega 2004; and unpublished TANESCO data, 2005)

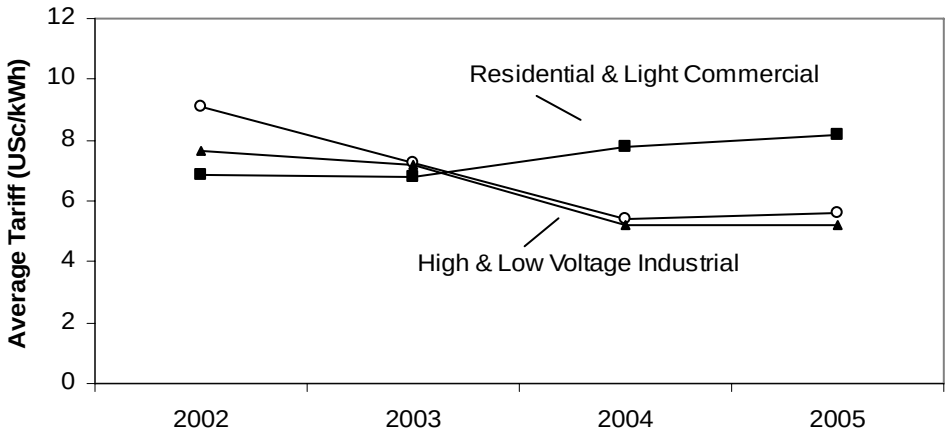
Appendix H. Tariff Restructuring Figures

Figure 29. Scaling Back Lifeline Subsidy Tariffs, 1990 to 2005



Source: calculated by principal author based on unpublished TANESCO data, 2002-2005

Figure 30. Undoing Industrial to Residential Cross-Subsidy, 2002-2005



Source: calculated by principal author based on unpublished TANESCO data, 2002-2005

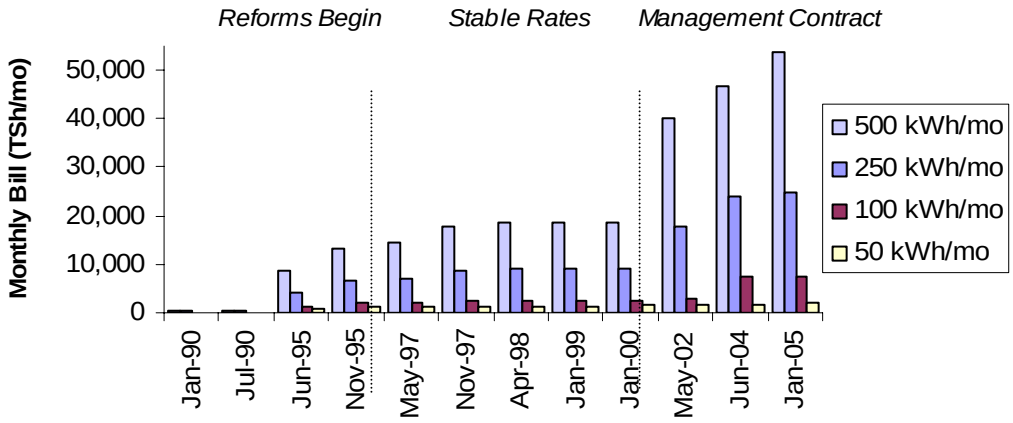
Table 13. Electricity Tariff Rebalancing and Restructuring, 2002-2005

Tariff Class	2002	2003	2004	2005	% Change 2002-2005
Average Tariff (TSh/kWh)	68	70	77	85	+25%
Residential & light commercial (T1)	66	71	85	92	+39%
Low Voltage Industrial (T2)	88	75	59	63	-28%
High Voltage Industrial (T3)	74	75	57	58	-22%
Average Tariff (USc/kWh)	7.0	6.7	7.1	7.6	+8.5%
Residential & light commercial (T1)	6.9	6.8	7.8	8.2	+19%
Low Voltage Industrial (T2)	9.1	7.2	5.4	5.6	-38%
High Voltage Industrial (T3)	7.6	7.2	5.2	5.2	-32%

Source: calculated by principal author based on unpublished TANESCO data, 2002-2005
Note: values exclude 20% VAT, T1 also includes low use tariff customers (those using <50 kWh/month)

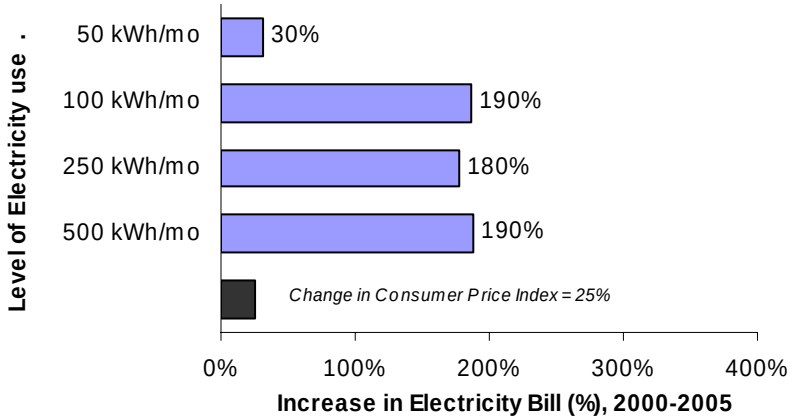
Appendix I. Changes in Tariffs and Residential Electricity Bills

Figure 31. Residential Electricity Bills for Different Levels of Use, 1990-2005



Note: Calculations are based on tariff one customers at different levels of monthly use. Values are in nominal Tanzania Shillings and include energy and service charges (when applicable) and a 20% VAT charge.
Source: calculated by authors based on TANESCO tariff schedules 1990-2005

Figure 32. Rapid Increases to Residential Electricity Bills, 2000 to 2005



Source: Calculations by principal author based on TANESCO tariff schedules (2000-2005) and National Bureau of Statistics values for CPI (2000-2005), Note: values based on bills in TSh

Appendix J. Lifeline Subsidies: Issues of Targeting

Estimate of Subsidy Loss

Ideal data do not exist for determining the fraction of residential customers who are unable to access lifeline subsidies due to meter sharing (particularly prevalent among urban residents). However, data from Tanzania's 2000/01 National Household Budget Survey provide a number of proxies, which make it possible to estimate the extent of low income electricity customers who are unable to access lifelines to ineffective targeting.

Methodology – Proxies for Meter Sharing and Estimates of Affected Population

The National Household Budget Survey covers 22,000 households, including 5,500 electrified households (TNBS 2002). The survey comprises a representative sample on national and regional levels, and includes a number of descriptive characteristics of housing, income, and services. Our calculations examine the following proxies for meter sharing:

a) Electricity customers residing in 1-2 rooms
b) Electricity customers who are renters
c) Electricity customers who are renters, and residing in 1-2 rooms

Our calculations examine the proportion of low income residential electricity customers who meet proxies for meter sharing (in the bottom 30% by income). These are interpreted as an estimate of the proportion of low income electricity customers unable to access lifelines. Results are summarized in Table 14 below and Figures 33a-c on the following page.

Summary of Results

The magnitude of low income residential customers who are likely to be unable to access lifelines is very large. **Our calculations estimate that nearly half (46-64%) of low income electricity customers are currently unable to access lifeline subsidies** due to ineffective targeting to households sharing meters. These conclusions hold even if the definition of low income customers were to be reduced or increased to include anywhere between the bottom 10-60% of customers (the fraction effected remains similar across the bottom six deciles).

Social Implications of Loss of Subsidy Benefits

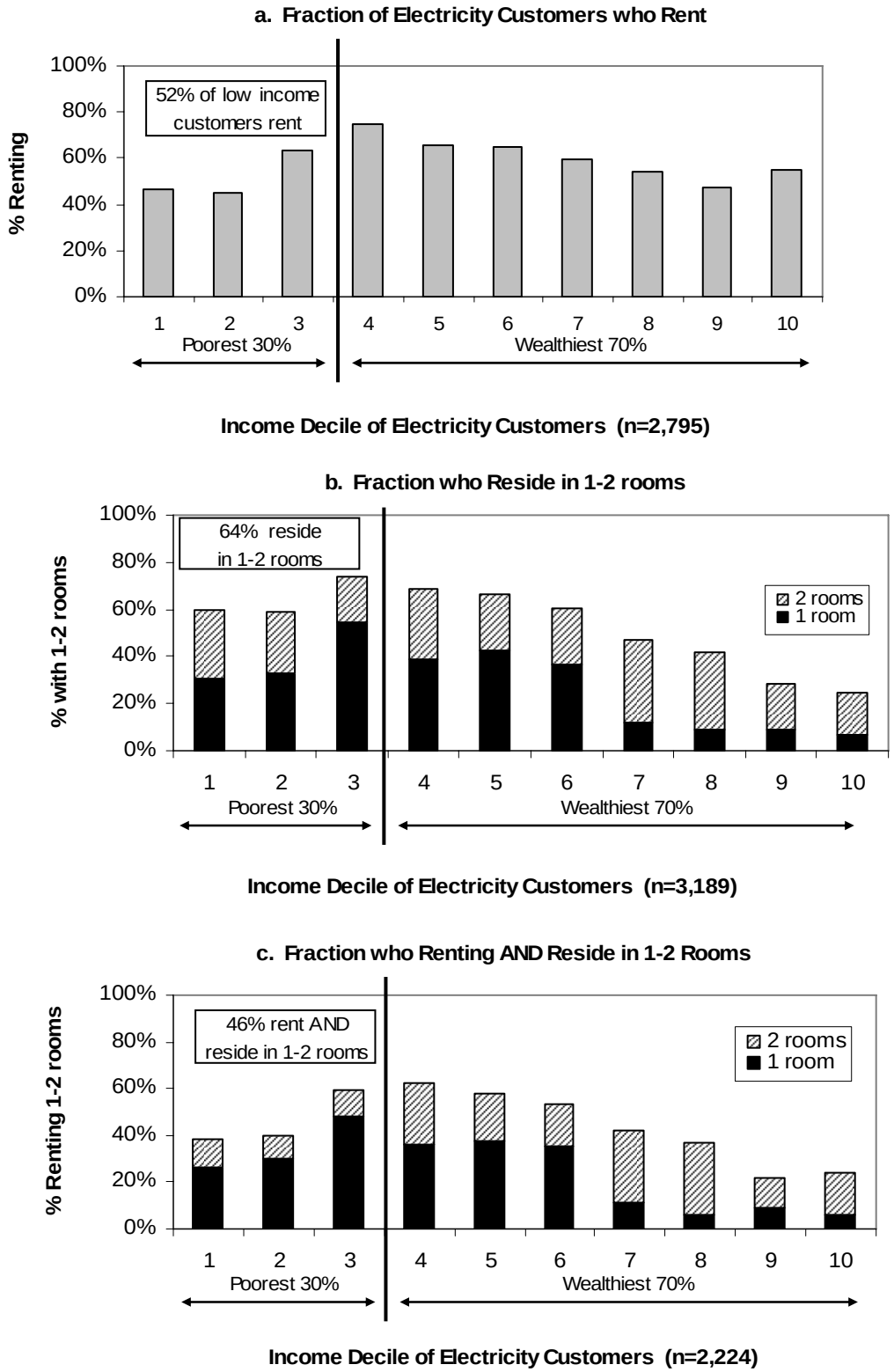
This inability to access lifelines can be a significant loss of benefits to the poorest electricity customers, and compounded with growing tariff rates for residential customers. These conditions can contribute to large numbers of service disconnections among low income customers as well as reduced affordability of basic electricity services.

Table 14. Results: Estimate of Residential Customers unable to access Lifelines

Proxy for Meter Sharing	Fraction of Low Income Electricity Customers Fitting proxy for meter-sharing		n
	Range (within Poorest 30%)	Average (within Poorest 30%)	
Reside in 1-2 rooms	59-74%	64%	2,795
Renting	46-63%	52%	3,189
Renting & residing in 1-2 rooms	39-59%	46%	2,224

Source: calculated by authors using Tanzania National Household Budget Survey Data, 2000/01 (TNBS, 2002)

Figure 33a-c. Proxies for Meter Sharing: used to Estimate Fraction of Low Income Residential Electricity Customers Currently Unable to Access Lifeline Subsidies



Source: compiled using Tanzania National Household Budget Survey Data, 2000/01 (TNBS 2002)