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# Operating Contracts for Managing Infrastructure Enterprises under Difficult Conditions

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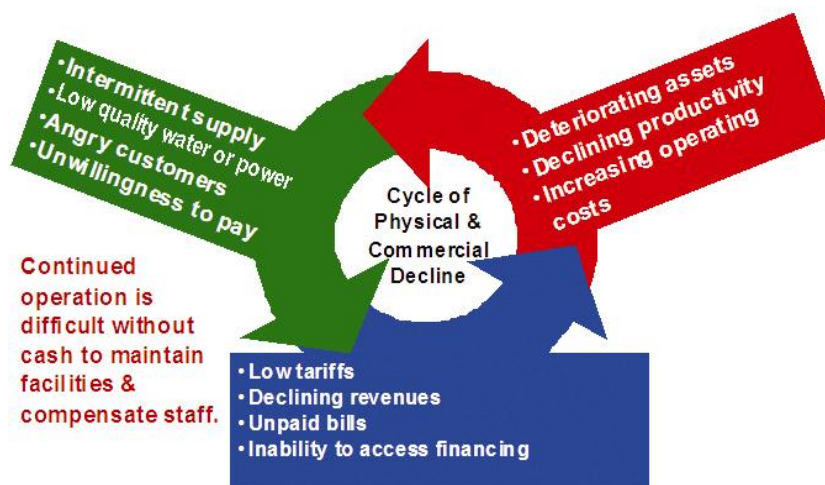
## Introduction

The U.S. Agency for International Development (USAID) is often called to provide basic services such as water, sanitation and electricity in post-conflict, disaster and other “difficult” situations. In some settings, the basic facilities to provide these services already exist, but they require rehabilitation and expansion to meet public demand. In other cases, USAID and other donor agencies will build new facilities to provide services. Either way, providing services on a sustained basis requires an effective service delivery operator.

During a conflict or natural disaster, the capacity of public sector water, sanitation and electricity departments and utility corporations often declines dramatically. The basic capacity to run an infrastructure business is often damaged by conflict, corruption, and social disorder. When the capacity of the public sector service providers declines, there are several predictable consequences for public services. These include:

- Deteriorating quality and regularity of service;
- Declining revenue collection;
- Cash deficiencies that lead to reduced maintenance, poor employee morale, and declining collection effort;
- Deteriorating physical facilities; and
- Unhappy customers.

Over time, it is common for the “customer facing” end of the business to break down almost completely. Collection rates commonly fall below 33%, which is so low that the business is cannot operate at current levels for long. This often leads to a vicious spiral of decline in a utility, as depicted in the graphic below:



Basic infrastructure services are an important factor in rebuilding public order and establishing the credibility of governance. In some ways, the public views the provision of good water, sanitation and electricity supply as a key indicator of whether the country is moving toward recovery. When services gradually improve, the public notices the improvements, and this will indicate that progress in stabilization is occurring. When services get worse, this is often viewed as a symptom that order is declining, and new governance arrangements are failing.

In many cases, rebuilding infrastructure and turning it over to local public authorities will not ensure improved services. In situations with rampant corruption, weak technical and commercial capacity, and poor management, newly rehabilitated facilities are not properly operated and managed, and will continue a downward spiral until major changes in the utility are made. If there is deep rooted weakness in corporate governance and management, reversing this decline through “capacity building” generally will not succeed. This is because the problems facing the utility run deeper than just weak capacity of the staff.

One solution that has been successfully used in difficult situations is incentive-based operating contracts. The term “incentive-based operating contracts” refers to a type of contract for operating infrastructure facilities, with several important features.

First, the contract is intended to put an operator in place which will run the infrastructure service business, including production of water or electricity, transmission, and distribution services, and commercial functions of the business.

Second, the type of contract does not need to follow a single template, such as a management contract, a lease, or a concession. There are many successful examples of contracts that combine features of management contracts and leases. These contracts could also be called “hybrid operating contracts” because they often combine features of different types of contracts.

Third, the term “incentive-based” refers to the fact that the operator’s compensation is to some extent directly linked to their performance. If an operator performs poorly, they receive only a base fee that might actually not even cover all of their incurred costs. If they perform extremely well, they can earn a performance-linked bonus that can be quite substantial.

In recent years, contract designs have evolved substantially in this area. Contracts let in the past several years often contain innovative features such as “base and performance fees,” “progressive performance targets,” “profit sharing formulas,” and other terms that make them fair to all parties.

A wide range of operating contracts has been used in a variety of difficult environments, including post-conflict situations. Some of these are standard management contracts, while others are incentive-based contracts. Examples include the following contracts examined in this report:

<b>Location</b>	<b>Name</b>	<b>Sector</b>
Cambodia	BOT,BOO private water companies	Water
Cote d'Ivoire	SODECI	Water
Georgia	United Energy Distribution Company	Electricity
India – Bhiwandi	Torrent Power Franchise	Electricity
India – North Delhi	North Delhi Power Limited	Electricity
Kosovo	Korporata Energjetik e Kosoves (KEK)	Electricity
Mali	Energie du Mali	Electricity & Water
Senegal	SDC contract with SONES	Water
Sudan	Yei Electric Cooperative	Electricity
Tajikistan	Pamir Energy	Electricity
Uganda	National Water & Sewerage Corporation's Internally Delegated Management Contracts	Water

Operating contracts have generally performed very well under difficult conditions, with dramatic improvements in service levels, cost recovery, and customer satisfaction. There is clearly potential to apply these effectively in post-conflict situations to provide sustainable, improved basic public services.

## **Objective**

The objective of this review is to support continuing improvement in the methods and approaches that are available to USAID and other U.S. Government agencies in providing water, sanitation, electricity and other basic services during post-conflict, disaster and other difficult situations.

This report is intended to help formulate USAID's operational policies for water, sanitation and electricity services in difficult situations. In addition, the report will help USAID staff identify the types of operating contracts and incentive features that are most appropriate for different post-conflict situations. Finally, the report CD includes electronic copies of publicly available documents that have more details on operating contracts.

The report analyzes a set of operating contracts for water, sanitation and electricity services that were used in countries that are either in a post conflict situation or are considered difficult operating environments. This is intended to be a working document, a collection of information about operating contracts that can be expanded and elaborated upon as more information becomes available.

The report examines the following questions:

- What were the key characteristics that made operation of the service difficult prior to the operating contract?
- What were the starting levels of service and cost recovery?

- What were the levels of service and cost recovery after several years of implementation?
- What responsibilities were given to the operator?
- What was the method of tendering the contract and the basis for award?
- What incentives did the operator have to improve performance?
- How well did the incentives work?
- How did operators cope with violence and civil disruption in their service areas?
- What other support did the contractor have to ensure the effectiveness of the contract? This includes, for example, capital investment funds, police and judicial support, exemption from civil service employment rules, and so forth.
- What was done to sustain services at the end of the contract?

## Conclusions about Operating Contracts in Difficult Situations

Based on this review of operating contracts and on the literature on such contracts, we draw the following general conclusions.

### **1. Operating contracts can be very effective in improving sector performance and “turning around” deeply troubled electricity and water utilities.**

Operating contracts—when well-designed—can work very well in terms of delivering improvements and good levels of overall sector performance. Operating contracts often lead to reduced technical and commercial losses, increased billing and collections rates, and introduction of efficient and accountable management. This has been the case in the contracts reviewed in Cambodia, Cote d’Ivoire, George, India, Senegal, Sudan, Tajikistan Uganda, and to a limited extent, Kosovo. These cases include post-conflict situations, disaster relief efforts, extremely poor local economies and settings with weak and corrupt governments.

Overall, the contracts—with the exceptions of Mali and Kosovo—have successfully improved the performance in the sector.<sup>1</sup> The table below summarizes, where data are available, the improvements in performance before and after incentive based operating contracts were introduced.

Experience with contract arrangements, such as those in Kosovo and Mali, shows that contracts do not always significantly improve performance. In the Kosovo case, limited progress in improving performance of KEK, the national utility, is due to a combination of factors that seem to be largely external to the contract. These include: major shortfalls in generation output by Kosovo’s generation plants; unwillingness of mayors to enforce

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<sup>1</sup> Nothing definitive about performance outcomes can be said about the Bhiwandi electricity distribution contract yet because it was let only in December 2006.

bill collection efforts and regulations; blocks on KEK collecting from Serb enclaves; lack of funds for rehabilitation; and difficulties in dealing with corruption among bill collectors and disconnection staff.

In the Mali case, failure is due to a combination of a weak contract design, particularly tariff setting terms, tariff reductions by the Government without corresponding compensation, inability of the contractor to raise financing (largely due to the ongoing disputes and tariff reductions), and persistent disputes between the parties.

<i>Case</i>	<i>Impact of Incentive Based Operating Contract</i>	
	<i>Before Implementation</i>	<i>After Implementation</i>
Cambodia	Most of the public water utilities in Cambodia's provincial towns were shut down during the Khmer Rouge regime and were reopened in the 1980s with seriously depleted facilities.	Over 1997 - 1999, water utilities in three provincial towns began to use of private operators under concession contracts. In 20 other provincial towns in Cambodia, public utilities continued to be responsible for the provision of water. Under private operators, daily availability and quality of piped water is better, and service interruptions are less frequent. Customers of privately operated utilities are more satisfied than those of public utilities.
Cote d'Ivoire	<ul style="list-style-type: none"> <li>▪ Community water services not very successful.</li> <li>▪ About 20% of village wells are out of service</li> <li>▪ 40 % of village water committees are not functioning.</li> <li>▪ Villagers have great difficulties financing investment costs</li> <li>▪ Installations are poorly maintained.</li> </ul>	<ul style="list-style-type: none"> <li>▪ SODECI successful in providing water to some rural villages that previously had no formal service</li> <li>▪ Rural systems are subsidized by Abidjan customers</li> <li>▪ Recently SODECI's performance has declined due to government failure to approve investment decisions and civil war since 2004. However, the contract continues to operate.</li> </ul>
Georgia	<ul style="list-style-type: none"> <li>▪ Poor financial and technical performance</li> <li>▪ Collections as low as 11%</li> <li>▪ Poor customer service; little concept of consumer protection</li> <li>▪ Corruption at all levels (few internal controls or accountability)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collections have increased to above 85%</li> <li>▪ 24-hour supply of electricity restored for the first time in a decade</li> <li>▪ Staffing levels reduced by 30%; turnover has 70%, with many corrupt employees dismissed</li> <li>▪ Full payments are being made for bulk electricity supply, taxes and salaries now</li> <li>▪ The company generates sufficient free cash to maintain facilities and pay part of their capital investment requirements</li> </ul>
India – Bhiwandi	No data available	<ul style="list-style-type: none"> <li>▪ It is too early in the reform process to quantify results.</li> </ul>
India – North Delhi	<ul style="list-style-type: none"> <li>▪ Insolvent utility</li> <li>▪ 48.1% technical and commercial losses, high theft rate of power</li> <li>▪ Routine power shortages</li> <li>▪ Deteriorated physical equipment</li> <li>▪ Public dissatisfaction, demonstrations, riots</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical and commercial losses reduced to 44.8% by 2004</li> <li>▪ Financial support from the government and the reduction of losses contributed significant toward financial self-sufficiency</li> <li>▪ Consumer care programs established</li> </ul>
Kosovo	<ul style="list-style-type: none"> <li>▪ Widespread power shortages</li> <li>▪ Technical and commercial losses of 52-56%</li> <li>▪ Less than half of energy billed</li> <li>▪ Collection rate of 68% of those billed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Some reductions in power outages</li> <li>▪ Total losses in first half of 2006 are reduced to 45%</li> <li>▪ New meters have been installed at every feeder</li> <li>▪ Employee training and severance targets are being met</li> <li>▪ Performance problems are most strongly influenced by lack of willingness of mayors to allow enforcement of collection, persistent generation shortfalls (about 50% of expected</li> </ul>

		generation), unpredictability of bulk energy supply, customer ownership of household meters, prohibition on collection from Serb enclaves, which constitute 15% of load, and lack of funds for rehabilitation, and continuing performance problems with collection and disconnection staff <sup>2</sup>
Mali	<ul style="list-style-type: none"> <li>▪ While 62% of the population has access to drinking water, 20% have no modern water facilities</li> <li>▪ Cholera from contaminated water was epidemic in 2004; between August and December 2003 1,149 cholera cases were reported, resulting in 78 deaths.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Performance relative to ambitious targets was initially very good, but became less so as disputes arose, tariffs were reduced and contractor performance declined.</li> </ul>
Senegal	<ul style="list-style-type: none"> <li>▪ Financial difficulty of the utility and inability to raise needed investment funds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Leakage cut from 31% to 22%</li> <li>▪ Improved collections from government</li> </ul>
Sudan	<ul style="list-style-type: none"> <li>▪ Electricity system destroyed by 25 years of conflict</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public lighting system completed</li> <li>▪ Construction of expanded distribution and generation system begun</li> </ul>
Tajikistan	<ul style="list-style-type: none"> <li>▪ Collapse of the Soviet Union and a civil war in 1992 led to the loss of power plants, transmission lines and distribution facilities</li> <li>▪ 43% of homes without power</li> <li>▪ Revenues were insufficient to pay staff and energy bills; no funds for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Over \$30 million invested in system rehabilitation</li> <li>▪ Available capacity increased from 28 MW to 42 MW</li> <li>▪ 15,000 meters installed</li> <li>▪ Collections increased to 91%</li> </ul>
Uganda	<ul style="list-style-type: none"> <li>▪ 24 years of repressive rule (1962-1986) accompanied by massive inter-ethnic violence resulted in loss of much of the country's water infrastructure as the services deteriorated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Total Connections increased from 50,826 to 152,138</li> <li>▪ Billed Connections increased from 31,284 to 132,444</li> <li>▪ Metered Connections from 37,217 to 149,963</li> <li>▪ New connections per year from 3,317 to about 28,521</li> <li>▪ Staff per 1,000 connections reduced from 36 to 7 by 2006</li> <li>▪ Staff costs reduced from 45% to 42% of operating costs</li> <li>▪ Unaccounted for water reduced from 51% in 1998 to 29.7% in 2006; Kampala from 55% to 35.7%; other areas from 43% to 15.2%</li> <li>▪ Collection Efficiency increased from 60% in 1998 to 90% in 2006</li> <li>▪ Annual turnover increased from US\$ 21 billion to US\$ 58 billion in 2006</li> <li>▪ Operating profit before depreciation increased from US\$ 1.9 billion to US\$ 16 billion in 2006</li> </ul>

However, overall, there were dramatic improvements in cost recovery, customer service, and overall management of the water, sanitation and electricity systems that were covered by operating contracts in our sample. The conclusions presented below discuss aspects of the contracts, their design and implementation that led to performance improvement.

## 2. No standard contract design will fit every situation.

Successful models include advisory contracts (Sudan), management contracts (Georgia and Sudan), divestiture with regulation (North Delhi), incentive-based management contracts with former employees (Uganda) and lease and concession contracts (Pamir, Cote d'Ivoire, Senegal).

<sup>2</sup> Source: USEA August 2006 Performance Review



There was a lot of variation in the types of contracts used. In general, contract designers tailored the contracts to each specific situation. The majority of contracts reviewed used some form of “strong” incentive to force the operator to rapidly improve performance. Incentives linked to realistic performance targets generally lead to better contract performance. In most cases, operators were not expected to invest significant amounts of their own capital in fixed assets. This reflects the fact that when governance is poor, violence is a persistent risk, and the starting condition of the utility is bad, operators will not generally risk their own capital. There are exceptions to this, including Pamir, Bhiwandi, and Delhi.

It is important to note that there are good examples of contracts that are implemented by local firms, rather than international companies. This demonstrates that it is feasible to develop contracts with local firms. This has the obvious advantage of developing local expertise and generating more local employment. Examples of local firms implementing operating contracts include Bhiwandi, Cambodia, Delhi, and Uganda. Outside of our set of cases are many additional examples that demonstrate the capacity of local firms to implement operating contracts, including domestic water companies in China, Malaysia and Thailand, and electricity generation and distribution in numerous countries.

There is also a wide variation in the length of the contracts. When the situation is really difficult and turnaround is a major challenge, short contracts are common. For example, Georgia started out with an initial two year contract, and Uganda used one year contracts with a two year extension option. For longer term contracts, the norm nowadays is generally 7 to 10 years for lease contracts. These longer periods are suitable when operators are expected to invest their own capital in some aspects of the business. This reflects the fact that it takes many years to recover operator investments in fixed assets, such as meters, customer connections, valves and pumps.

### **3. Publicly-owned corporations can respond positively to incentives, particularly if rewards are provided to their managers and employees for improved performance.**

Public ownership and operation can also work well when strong incentive mechanisms are established, such as in the Uganda water contracts. The Bangladesh electricity distribution profit unit contracts is another interesting case where strong performance incentives were used successfully to improve performance in a public utility corporation.<sup>3</sup> Private participation is not always necessary, but experience shows that private involvement enhances the probability of success.

### **4. Mistakes are costly and should be avoided in contract design.**

This seems obvious, but the practical lesson here is that great care should be put into contract design. A lot of the problems in Mali occurred because of mistakes and inaccuracies in the design of the tariff formulas, even though a great number of parties

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<sup>3</sup> The Bangladesh example is not reviewed in this report.

(including the Government, bidders and donors) had the opportunity to review the contract documents. This called into question the validity of the contract and gave ground to the regulator for exercising discretion, since the validity of the contract as the main legal instrument binding the parties was called into question.

To be successful, operating contracts must deal with critical design issues, including:

- **Accumulated losses before the contract and during transition periods, and effective designs for subsidies:** Experience shows that to make transactions attractive to private investors or operators, losses in the transitional period have typically been covered by the government, by donors, or by loans at concessional rates.
- **Operator autonomy and operational control:** Operators should be given as much operational control as possible. In Georgia, Pamir, Delhi, Senegal and Cote d'Ivoire, the operators had extensive control of the utility and its staff.
- **In early phases, competitive bidding may be impossible:** Negotiation of contracts is an acceptable alternative. Experience in Delhi, Georgia, Uganda and Tajikistan shows that competition in awarding operating contracts, while preferable, may not occur because there are too few bidders, the risks are too high, and the uncertainty about the market, physical assets, costs and revenues is enormous. In these situations, negotiations with private firms or with existing employees have resulted in successful incentive-based operating contracts. It is noted that there was competition for award of contracts in the Bhiwandi, Cote d'Ivoire and Senegal cases.<sup>4</sup>
- **Incentives should be linked directly to performance, and large enough to drive behavior:** There are several different types of incentives that work. These include:
  - a. Progressive annual performance targets, such as new customer connections, collection efficiency, and operating income (Uganda)
  - b. Multi-year or end of contract performance targets, such as coverage, continuity of service, quality of service (pressure and pathogens for water; voltage, unscheduled outages, etc. for electricity) (Cote d'Ivoire, Senegal)
  - c. Operating margin, which in electricity usually means that the retail and bulk energy prices are fixed (with adjustment clauses for unexpected events, inflation and regulatory decisions), and the operator seeks to maximize their earnings by reducing losses and costs, and increasing sales given this fixed margin (Pamir, Georgia)
  - d. Fixed per unit delivered, billed and collected: This is the basis for most affermage water contracts. The operator wins with the lowest fixed per unit (cubic meter) operator charge. For example, the fee that wins the contract might be US \$0.40 per m<sup>3</sup>. In this case, the operator will try to deliver, bill and

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<sup>4</sup> One method that seems to work is to negotiate the first round of "shorter duration" contracts, and then at the end of the short contracts, to compete longer lease contracts. Short here refers to a period from 1 to 3 years. This has been done by a number of cities in Poland and Czech Republic for water and sanitation, and was also the method used for water and sanitation in Uganda.

collect as much water as possible if they are earning profit on the US \$0.40 charge. This incentivizes the operator to reduce theft and technical losses, to cut costs, such as electricity, and to maximize the performance of billing and collection (Cote d'Ivoire, Senegal)

- **Ensure transparency and clean transactions through clear performance targets and reporting, and well balanced risks and rewards.**

## **5. Risk allocation should be clear and fair.**

The risks of operating infrastructure business in reconstruction environments are high. For example, after years of poor management, violence, and civil disorder, a utility will frequently have incomplete records of customers and physical assets, metering will be limited or nil, and it is virtually impossible to know the exact progression of service improvements, billing and collection efficiency that is possible.

The operator in Mali could not have known that the Government would unilaterally reduce tariffs in the first few years. In Senegal and Cote d'Ivoire, the operators had no way of predicting what proportion of Government agencies would pay their bills. This turned out to be a huge problem. In Kosovo, ESBI could not have anticipated that many mayors would not allow enforcement of collection actions, or that generation would drop to 50% of planned levels.

There are many ways that contract designers achieve a fair and workable risk allocation. They are too complicated to discuss in detail here. But in every case, except the simplest of management contracts, an analysis of project risks, and assignment of these risks should be part of the contract design process.

## **6. The operator should have full control over the business, assets and staff.**

In Georgia, even though the incentives built into the contract were minimal, the full authority granted to the operator, added to the competence and innovation of the contractor's staff, resulted in a successful contract. In Delhi, the operator had full control over the technical and business aspects of electricity distribution, but had severe restrictions on firing and penalizing staff, and mild regulatory restrictions on capital investment plans. In Uganda, the local operators had full control over physical assets, commercial functions and staff, but no control over investment budgets. In general, the more control the operator has over commercial functions, physical assets, investment and staff, the better are the results.

## **7. Reliable data is critical to shifting risk to the private operator.**

It is important to have reliable technical and commercial data to define the private operator's objectives in an achievable, yet challenging manner. Good baseline data about losses, access, and collections are key inputs to the incentive scheme for effective

performance contracting. Lack of reliable data is a challenge common to many situations.

But keep in mind that there are examples of designs that cope with poor starting data. These include:

- (a) simple management contracts that specify few performance targets (Georgia);
- (b) short contracts that have targets set only for the next one to three years and are only for easily measured results, such as number of customers registered, number of customers billed, percentage of billed funds collected, number of new connections, and average hours of service per day (Uganda);
- (c) bidding or negotiation based on highest bulk energy price, cash realization per unit of water or electricity, or share of operating income above a target (Pamir, Bhiwandi, Cote d'Ivoire, Senegal). Targets such as cash realized, bulk energy input to a network, and operating income are the easiest, most practical targets that can be used to determine operator incentives.

**8. The low capital investment (“low capex”) approach can work in some situations, and may be better than designs that involve huge new capital investment at the start of a contract.**

It is often believed that private operating contracts must be accompanied by large budgets for rehabilitation and expansion of capital facilities. Several cases show that this is not necessarily true, and that “low capex” approaches are sometimes more effective.

Operators taking over a water, sanitation or electricity service after years of neglect and poor performance inherit a badly deteriorated physical and commercial infrastructure, accompanied by poor customer records and damaged customer relationships. In addition, poorly run utilities also are often plagued by systematic corruption by employees.

In the Georgia, Uganda and Armenia<sup>5</sup> cases, capital investment funds were very small relative to engineering estimates of the total amounts needed to rehabilitate physical facilities. In all three cases, governments and donors made a deliberate decision to concentrate on institutional, management and personnel reforms, emergency rehabilitation and rebuilding relationships with customers before undertaking large capital investments.

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<sup>5</sup> The Yerevan Armenia water management contract involved a 6 year management contract for water and sewerage services. The capital investment funds provided by a World Bank loan were barely sufficient to perform emergency facilities rehabilitation, metering and limited network reconfiguration. The total investment needed was estimated to be perhaps 20 times the amount available. However, it was also reported by the Managing Director of the management contractor that the endemic corruption in procurement for capital works made it very difficult to use capital funds effectively in the early years of the contract.

In the Georgia case, the contractor stated that given the endemic corruption found among staff of the utility, a large capital budget could not be spent effectively until major human resource improvements were completed, and corrupt staff were identified and dismissed. Similarly, in the Uganda case, there simply were not sufficient funds for capital investments in most of the towns covered by private contracts. Contractors were incentivized to do the best they could with existing facilities and small budgets for emergency rehabilitation.

One good approach is to identify an “emergency” capital investment package that will be implemented during the first year of the contract, but to focus this package on the investments that are critical for stabilization of the operational performance of the system. This package will generally be a small fraction of the total investment estimated to be needed to connect all customers and rehabilitate the entire water or electricity network.

Finally, it is important to note that the norm now is for capital investment funds to be controlled by the contractor, not the government. In situations with poor governance and instability, corruption is a common feature of capital development programs run by a government utility. It is possible to address this by turning capital works over to the contractor. Generally, donor agencies will be involved in selecting investment priorities, or in approving contractor plans for capital development. Typically, a contractor is required to produce both multi-year and annual capital investment plans using available government or donor funds.

### **9. Practical dispute resolution mechanisms and good financial models can forestall contract failure.**

In Senegal, good working relationships between the stakeholders (including the private operator, SDE, the asset-holding company, SONES, and the Government represented through the Ministry) permitted adapting contractual arrangements based on the emergence of new information (such as on network losses) or problems identified in the original arrangements and contained conciliation mechanisms. The contractual arrangements provided a good framework for dealing with issues as they emerged.

It is very common, particularly in French affermage<sup>6</sup> contracts, for a financial model of the utility to be constructed by an independent consultant and maintained by a government agency with some support from an independent consultant. This model is then used to help resolve disputes, to reset tariffs, and to support capital planning. It is also a good practice for a donor agency to support the appointment of independent contract negotiation advisors when there are disputes over tariffs, performance and targets.

#### **10. If the starting condition of the utility is bad, start with short contracts.**

Chances of success are improved with a gradual approach to operating contracts, introducing management contracts with specific objectives first rather than rushing into long-term leases and concessions. Start with contracts that emphasize:

- Enumeration of customers
- Regularization of illegal customers
- Creation of an inventory of physical assets, and assessment of the condition of these assets
- Setting up a new commercial and financial system, with emphasis on new billing and collection systems
- Introducing new personnel systems that identify employees, create effective supervisory relationships, and weed out corrupt staff
- Introducing bulk and customer metering
- Establishing reliable supply schedules and gradual increases in hours of supply
- Completion of an emergency rehabilitation program

#### **11. Tariff increases should be gradual and should match improvements in services.**

A number of water and power reform programs have encountered serious problems due to rapid tariff increases. In our cases, only Mali showed this problem;<sup>7</sup> the rest involved small and gradual tariff increases that matched improvements in services.

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<sup>6</sup> An affermage contract is a form of concession put into widespread use initially in France. Affermage contracts involve the award of a concession (by competitive tender or by negotiation) to a private enterprise to run a system for a period of years. It differs from the management contract insofar as the concessionaire receives all the revenue and costs of the operation, and usually involves a greater degree of freedom for the managers to determine the commercial strategy. One key condition of most affermages is that the public sector remains responsible to finance most fixed capital investments. It is common for the public sector to raise capital for fixed investments, while the operator or their subcontractors actually carries out capital works using public funds. This reduces the exposure of the private operator to capital investment risks, and gives the public sector substantial control over capital investment decisions.

<sup>7</sup> Other well known example where high initial tariff increases contributed to failures of operating contracts were the La Paz/El Alto and Buenos Aires water concessions.

Various mechanisms can be used to maintain tariff stability when using private operating contracts. Examples include:

- In Delhi, the Government allocated a specific amount of funds to maintain rate stability during a 5 year transition period. If those funds are used up, then rates are supposed to rise to make up for any shortfall.
- In Senegal and Cote d'Ivoire, the contracts allowed for a multi-part tariff comprised of the operator's fee (per cubic meter) and a charge to cover outstanding loans, costs of the water holding companies, and other sector costs. In both cases, the operator charge and other sector costs charge are combined, this equals the allowed retail tariff. When this is deemed by government to be too high, the governments have sometimes cut the portion charged for other sector costs. This reduces the consumer tariff. The amount of the reduction then needs to be paid out of another governmental source, such as general revenues.
- In Pamir, tariff stability was maintained by a combination of a subsidy paid to the operator out of loan proceeds, and a reduced charge for hydro electricity. The idea behind the reduced charge for electricity is that this reduction will be decreased each year of the contract until bulk electricity is supplied at its full economic cost.
- In Bhiwandi, tariff stability is maintained by the Maharashtra State Electricity Board paying for the loss associated with selling electricity to the operator at a fixed rate below the full cost of bulk energy.<sup>8</sup>

## **12. There is wide variation in the cost of developing and tendering operating contracts.**

The Georgia electricity management contract appears to have been cheap to develop, because the contract used a standard USAID cost plus fixed fee contracting mechanism and did not have any exotic performance incentive fees. The Uganda water contracts were also low cost to develop because (1) local operators were contracted, (2) the contracts were short and had simple and easy to measure targets, (3) operators did not have to invest their own capital in physical assets, (4) most private operators were

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<sup>8</sup> It should be noted that the economics of tariffs are rather complicated during the "transitional" period from extremely poor to good performance. During the early years, tariffs that would recover full economic costs would be extremely high because Aggregate Technical and Commercial (AT&C) losses are high. For example, when operators first take over, it is common to see less than 60% of enumerated customers being billed, 10% to 20% of power or water going to customers who have unregistered or illegal connections, and a collection efficiency rate of less than 75%. These extremely poor performance levels can be brought to acceptable levels over a period of 2 to 6 years in most cases. Because AT&C losses are generally included in the calculation of a standard tariff, the actual tariff needed for cost recovery will start high and will decline quickly over these transitional years. The point here is that financial losses of the utility will usually be high for several years and will drop to a level where only capital investment support is needed if the contract is successful. In some situations, an effective contract will move eventually to full economic cost recovery, which includes capital costs, but this generally takes 4 to 6 years.

actually former public water utility employees who had resigned to take on these contracts, and (5) NWSC used their own staff to design and tender the contracts.

We do not know the costs of developing other contracts in our sample. As a benchmark, the unsuccessful Lagos water and sewerage concession contract that was developed by the IFC and World Bank expended something in the range of \$3 to \$4 million to get to the point of a contract design.<sup>9</sup>

In general, longer term concession contracts cost more to design and tender than management contracts. In addition, when there are operator investment obligations, operators typically require much more accurate baseline data, which will add to the cost of a contracting action. As a rule of thumb, the following estimates for the costs of developing an operating contract might be useful:

Type of Contract and Type of Contract Development Advisor	Example	Approx. Cost
Management contract without complicated incentive fees	Georgia	\$150,000
Management contract with strong incentives – international designer	Various	\$1,000,000
Management contract with strong incentives – host country designer	Uganda	\$75,000
Lease contract – international designer	Senegal	\$2 to \$4 million
Lease contract – host country designer	Bhiwandi	\$300,000

We note that not all countries have firms or consultants that are experienced in the design of successful operating contracts. Firms or organizations that have shown their ability to design and successfully tender operating contracts in developing countries include SBI Caps and CRISIL in India, the National Water & Sewerage Corporation in Uganda, the Power Cell in the Ministry of Energy in Bangladesh, and the Board of Investment in Sri Lanka.

#### **14. An effective regulatory framework can enhance success of contracts with private operators, but in many cases well designed regulation by contract is sufficient.**

Overall, regulatory agencies can help ensure that incentive mechanisms work well. They can act as a focal point for the sector, gathering, analyzing and publishing comparative data on sector providers. They can improve the overall transparency of the system and help consumers become more informed about the value of the service they are receiving. Regulators can also play a role in sector development by providing sustained incentives for performance improvement and better service.

Existence of a regulatory body does not equate to an effective regulatory system. Autonomy and effectiveness in regulatory bodies usually takes 5 to 10 years to build. Bad regulatory orders by regulators can undermine even the best designed operating contracts. In the cases examined, very few countries had effective regulators with jurisdiction over the operating contracts. In Africa, only Mali had a regulator; Senegal and Uganda relied on regulation by contract. In India, both the Delhi Capital Region and Maharashtra State

<sup>9</sup> This is one of the authors' personal estimate based on the \$2.5 million transaction advisory contract budget plus a guess as to the cost of additional staff time that went into the design.



had regulators in place at the time of the contract. In Delhi, the DERC had their powers largely suspended for a 5 year transition period to enable the transitional tariff rules to be applied. In Maharashtra, MSEB's powers were not limited at all by the terms of the contract. To cope with this, the contract includes terms that allow adjustment of the contract pricing to accommodate changes in tariffs ordered by the regulator. Tajikistan does not have an independent electricity regulator with jurisdiction over the Pamir contract.

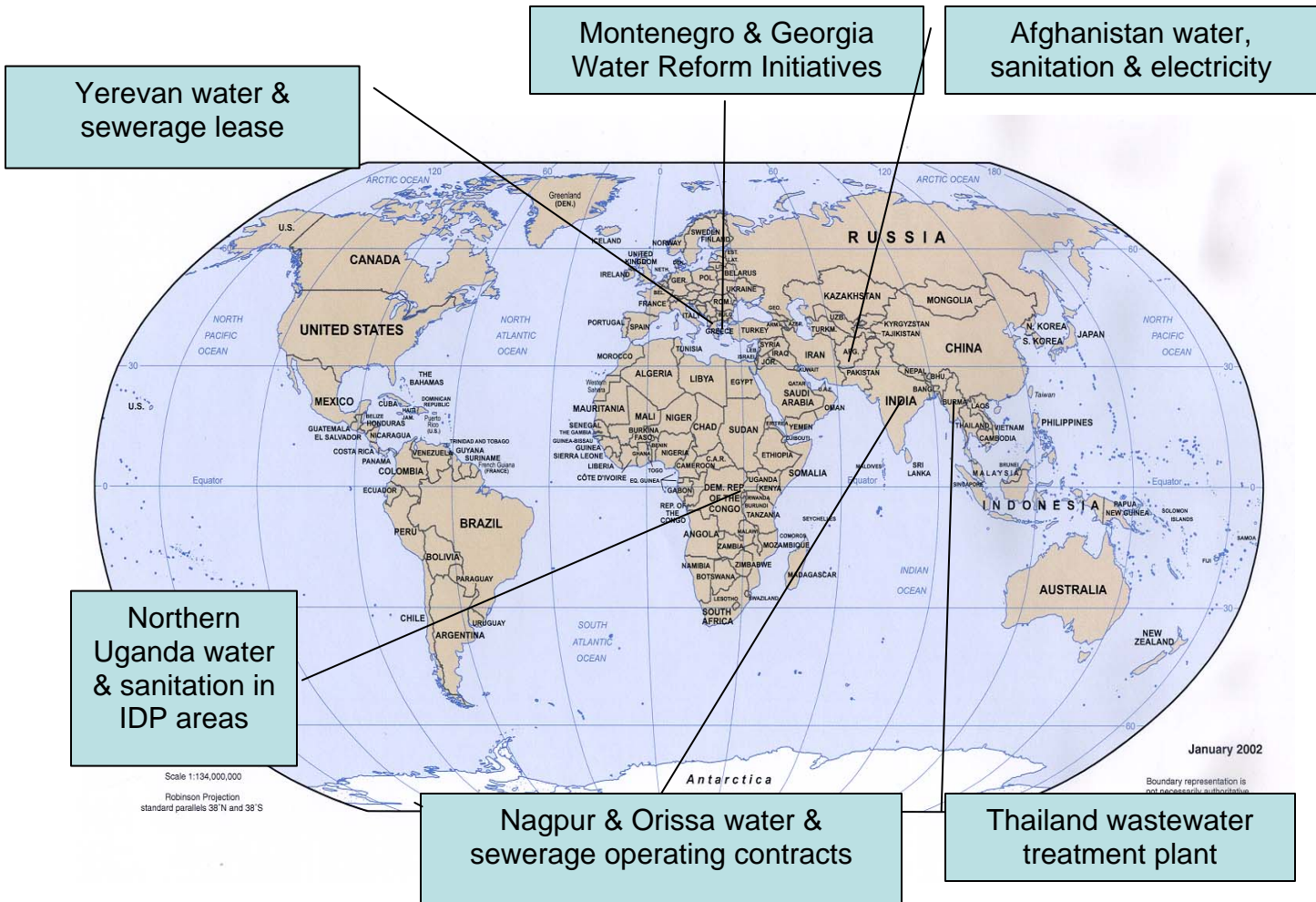
In Mali, the water and electricity regulator, the CREE, is able to operate independently. There was an inherent conflict between the perception of the Government and the CREE that the regulator should set tariffs based on its interpretation of the broad tariff-setting principles contained in the law and the perception of the contractor that the tariff provisions contained in the private contract are binding. In Senegal, analytical reviews of the operating contracts have concluded that the contracts were designed well and as a result succeeded even in the absence of a regulatory body.

In many countries, donor agencies will pay the costs of calculating regulatory adjustments to tariffs and operator compensation when this is necessary. As noted above it is also common practice for some government agency, with donor assistance, to build and maintain a sector financial model that is used specifically for the purposes of tariff setting, contract adjustments and capital investment planning. However, it is important to note that many lower income countries that are using operating contracts are managing their own regulatory, tariff setting and contract adjustment activities. Examples of this include China, India, Malaysia, Senegal and Uganda. This would not be possible in virtually all post-conflict situations; donor support of tariff setting, contract adjustment and capital planning is an essential part of a successful operating contract in these difficult situations.

### **Moving Forward with Incentive Based Operating Contracts**

- In difficult environments, USAID and other U.S. Government agencies are advised to pay increased attention to commercial operations when supporting utility services, such as water, sanitation, and electricity. When the commercial side of a utility fails, it is likely that the entire utility will begin a downward spiral due to corruption, lack of maintenance, and poor staff morale. This report shows that operating contracts are a good tool to keep the commercial side of the business intact.
- Where USAID has a substantial role in rebuilding a utility (e.g., Afghanistan, Iraq, Jordan, Liberia, Sudan, Uganda, West Bank/Gaza), Missions should consider incorporating performance-based provisions within medium term (2 to 5 year) operating contracts.
- USAID staff have case studies, sample contracts and incentive formulae, etc., that can assist agencies to design appropriate contracting activities to support these efforts.

USAID is currently working with possible applications of incentive based operating contracts in a number of countries, as summarized below:



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## Cambodia: Private Water Companies

**1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:** Cambodia's public water utilities have not reached many people in the market area reviewed in this study. Most public water utilities in Cambodia's provincial towns were closed during the Khmer Rouge regime and reopened in the 1980s with seriously deteriorated facilities. Some have since been rehabilitated with support from donor agencies.

Cambodia is experimenting with introduction of the private sector in the management and operation of water supply organizations. Over 1997 - 1999, water utilities in three provincial towns—Banteay Meanchey, Kampong Speau, and Takeo—initiated use of private operators. In the other 20 provincial towns in Cambodia, public utilities continued to be primarily responsible for provision of water. In each privately operated town, the percentage of households served by a water utility is low. The coverage of private water utilities varies from 2 to 20 percent of all households, whereas the coverage of public utilities ranges from 5 to 9 percent.

<i>Selected characteristics of three private water utilities in Cambodia</i>			
	<i>Banteay Meanchey</i>	<i>Kampong Speau</i>	<i>Takeo</i>
Population of town	98,848	41,478	39,186
Year established in current form	1998	1997	1997
<b>Staffing:</b>			
Number of permanent staff	20	6	15
Number of temporary staff	6	8	N/A
Monthly salary of staff (Riels)	285,000	494,000	N/A
Monthly salary of operation and maintenance worker (Riels)	200,000	304,000	N/A
<b>Production Capacity:</b>			
Current production capacity (m <sup>3</sup> /day)	3000	1500	1300
Current production m <sup>3</sup> /day	1200	560*	120
Capacity utilized (%)	40	37.33	9.23
<b>Coverage:</b>			
Total number of direct connections from utility:	1500	1700	450
• Residential	1423	1510	N/A
• Business	50	180	N/A
• Government	25	10	13
Percentage of households covered	7.74	19.93	6.21
<b>Subcontractors:</b>			
Number of sub-contractors to utility	0	0	0
Number of connections served by sub-contractors	0	0	0
<b>Connection fees and tariffs:</b>			
Connection fee (Riels)	350,000	76,000	228,000
Water tariff (Riels/m <sup>3</sup> )	1300	1500	N/A

Source: Garn et. al., 2002.

**2. The reform process:** The Ministry of Industry, Mines and Energy (MIME) granted private companies a three-year renewable license to supply water to residential consumers in the area. The renewal of these licenses depends on the company's compliance with water quality and tariff stipulations. In addition, each of these private companies entered into a contract in which the assets of the water utility are transferred to the company for 23 – 40 years, after which all assets revert to the public sector.

**Tendering:** The privatization process in all three towns was ad hoc and non-transparent (De Raet and Subbarao 1999). Private companies were not solicited through open and competitive bidding. In each town, the process was triggered by unsolicited bids. In the three towns, individuals who submitted these bids were granted the license without competition.

There is currently no economic regulatory framework governing the operations of these private companies and existing regulation is deficient (De Raet and Subbarao 1999). For example, it is not clear how water tariffs will be revised and contractual disputes will be settled. The licenses and contracts for the companies are not clear on important issues that affect both customer service and operator incentives. The government is aware of this and is trying to rectify the situation. Nevertheless, in each of these provincial towns, private companies have made investments--sometimes substantial--to rehabilitate and expand water supply networks in their market areas.

### **3. Key characteristics of the sales/operating contract.**

All private utilities charge a fixed connection fee to customers. These one time fees range from 76,000 Riels to 350,000 Riels (at the time of data collection 1 USD = 3900 Riels). These fees are higher than those charged by public utilities. While households surveyed paid on average 219,684 Riels to private utilities for a connection, the average cost of connection from a public utility was 186,926 Riels.

In addition, the utilities charge customers a uniform tariff per cubic meter of water consumed, ranging from 1300 to 1500 Riels/m<sup>3</sup>. All the utilities have metered all connections and bill customers on monthly based on meter readings.

**Performance targets:** No specific performance targets have been set; see the incentive discussion below.

**Incentive scheme:** While precise information on the incentive scheme employed in these three towns is limited, Garn et al. 2002 indicate that the incentives present in the three towns is simply the operators' profit. The companies provide services that people want and for which they are willing to pay. The companies control costs to increase net income. The willingness of the companies to assume future commercial risks depends on credible assurances that the government will not, in the future, make arbitrary decisions about pricing and additional responsibilities beyond those initially agreed between the operator and the government.

**Subsidies:** No subsidies are provided to low income customers.

**Equity payment:** No information available

#### **4. Analysis of the status and effectiveness of the operating contract:**

Using data from a range of surveys and technical assessments, Garn et al., 2002 compared consumer satisfaction and technical performance of Cambodian private and public utilities. The results show that households served by private utilities are significantly more satisfied with the piped water than customers of public utilities. The daily availability and quality of piped water is better and service interruptions are less frequent. This is not an accident. Private utilities have hired more educated staff and pay higher salaries; they maintain their facilities better; and implement better quality control programs.

The private operators clearly have stronger incentives than public utilities to keep customers satisfied. However, this improved service is not cheap and, consequently, it does not reach all the available households. Households served by private utilities pay significantly more for piped water services, and some lower-income households that are not served by private utilities because of the high connection fees, not the regular monthly payments. Overall, while this recent effort to introduce private involvement in the water sector in Cambodia is encouraging, problems of access remain.

#### **5. References:**

De Raet, Pierre and Duvvuri Subbarao. 1999. "Cambodia: Urban Water Supply Policy and Institutional Framework." The World Bank

Garn, Mike; Jonathan Isham and Satu Kähkönen (2002) "Should We Bet On Private or Public Water Utilities In Cambodia? Evidence on Incentives and Performance from Seven Provincial Towns"; Middlebury College Econ. Discussion Paper No. 02-19

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## Cote d'Ivoire -- SODECI

### 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform.

Until 1956, water services in the Ivory Coast were administered directly by municipalities. In that year the publicly owned electricity company signed fixed fee management contracts for water services with five of the largest municipalities. In 1959, an international tender was held for the provision of water services in the capital city of Abidjan. This tender was won by the French company SAUR. SAUR created a subsidiary Ivorian company, Société de Distribution d'Eau de la Côte d'Ivoire (SODECI). By 1973, SODECI held 8 service contracts outside of Abidjan, but it only served 4,000 customers in secondary towns outside the capitol.

### 2. The reform process:

In 1973, the government initiated a centralization of water services through its National Water Supply Program (NWSP). Two key principles of NWSP were *cross-subsidization* - large consumers and those users with cheaper production costs should subsidize poorer users and those located in areas with higher production costs - and *sector financial autonomy*— the sector should be financially autonomous and have no impact on government budgets.

This reform process also included re-structuring of the private involvement in the sector, and SODECI became the only large-scale private sector operator in Cote d'Ivoire. In 1974 the Central Government signed an affermage contract<sup>10</sup> with SODECI for the towns outside Abidjan. In 1978, SODECI's shares began trading on Abidjan's stock exchange. During this period, a free water connection policy was introduced, which posed a challenge to the company to service increasing number of poor consumers.

In 1987, following a macro-economic crisis, the government and SODECI examined the possibility of entering into a full concession agreement, but rejected it as it appeared unlikely that sector revenues could cover debt service requirements and because SODECI felt that a concession would impose too many risks. The main outcome of this reform led to termination of previous contracts and replacement with a 20-year "concession" contract for provision of water services in Abidjan and 209 production facilities. The contract is in fact similar to an affermage contract, although SODECI has more control

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<sup>10</sup> An affermage contract is effectively a lease contract in which the private operator is given full commercial and technical control over the utility for a specified period of time. The operator is not, however, required to pay for major capital rehabilitation and expansion investments. These are the responsibility of the government. Routine capital facilities maintenance is the responsibility of the operator during the affermage period. Typically, the operator is allowed to retain a fixed fee per cubic meter of water or kilowatt hour of electricity that is delivered to customers, billed and collected. This provides a powerful incentive for the operator to deliver, bill and collect as many units as possible, while minimizing operating expenses and losses.

over investments than many affermage contracts. The new contract was approved on 17 December 1987.

The impacts of the reform were as follows:

- a) SODECI was given a prominent role in programming and executing investments through increased control over the Water Development Fund even though the Water Directorate retained ultimate control over those funds;
- b) The sector's financing arrangements were restructured and the financing strategy shifted from heavy reliance on borrowing to 100% self financing;
- c) SODECI's remuneration was cut by 20%, followed by reductions in customer tariffs;
- d) SODECI's responsibilities for maintaining rural water points were terminated and transferred to rural communities, while government kept investment responsibilities.

SODECI now operates under two separate contracts: a "concession" contract for water services across the national territory, and since 1999, an affermage contract for sewerage services in Abidjan. Despite its name, SODECI's concession contract is closer in its design to an affermage contract, given that SODECI does not have investment obligations that it would need to finance out of its funds. It is different from a standard affermage contracts given the high level of SODECI's involvement in the planning and execution of investments in the urban sector.

### 3. Key characteristics of the sales/operating contract.

Responsibility	SODECI's responsibilities
General Responsibilities	<ul style="list-style-type: none"> <li>▪ The concessionaire has exclusivity over (Article 2):               <ul style="list-style-type: none"> <li>▪ Exploitation of underground aquifers;</li> <li>▪ Production and distribution of water for domestic, industrial uses (but excluding 'hydraulic villages');</li> <li>▪ Operating and managing the network;</li> <li>▪ Carrying out works on the network (repairs, renewals and extensions according to conditions specified in the Contract);</li> <li>▪ To supply all information required to the state.</li> </ul> </li> </ul>
Installations	<ul style="list-style-type: none"> <li>▪ Install all connections (Article 29) and meters (Article 30), at the cost of the consumer excluding social connections.</li> </ul>
Reparations and Maintenance	<ul style="list-style-type: none"> <li>▪ Maintenance and reparation of all the goods necessary for exploiting the service (Article 2), including connections and water meters (Article 27)</li> </ul>
Investments	<ul style="list-style-type: none"> <li>▪ Prepare 5-year investment program for Government's approval</li> <li>▪ Manage three development funds (one for renewal of equipment, one for social connections and the third for extension works) which are financed from a portion of the consumer tariff</li> <li>▪ Execute the investment program, once approved by government.</li> <li>▪ Procurement of works and equipment is to be done under public procurement rules, except for contracts with a value of less than 80 million CFA which may be directly carried out by SODECI, in accordance with unit prices fixed in the concession contract.</li> </ul>
Demand	<ul style="list-style-type: none"> <li>▪ Establish a model of demand to use for planning investments.</li> </ul>



Assessment	
Supply to customers	<ul style="list-style-type: none"> <li>▪ Supply water to any owners or occupants of a titled property and taking up a connection for at least 6 months. Supply water in the same conditions for all customers (building within 60 meters of the main network, and assure pressure of 1 bar. (Article 12)</li> <li>▪ A connection can be terminated for non payment (Article 13)</li> </ul>
Regional Organization	<ul style="list-style-type: none"> <li>▪ For the secondary centers in the perimeter, the Concessionaire must maintain a sufficient number of employees so that no centre is more than 20 kilometers away from the location of its employees (Article 15)</li> </ul>
Conservation of Water	<ul style="list-style-type: none"> <li>▪ Exploit water so that it guarantees the conservation of the water heritage (Article 17)</li> </ul>
Drinking Water Quality	<ul style="list-style-type: none"> <li>▪ Comply with existing quality standards according to national standards (Article 19).</li> <li>▪ Verify the water quality as often as necessary</li> <li>▪ Responsible for any damage caused by poor water quality</li> <li>▪ In case of problem, Concessionaire must propose new works to be carried out by the Conceding Authority at its expense</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>▪ Ensure a pressure of 1 bar minimum above ground (Article 19)</li> </ul>
Reports	<ul style="list-style-type: none"> <li>▪ Submit a proposal of a quarterly program of work to the Conceding authority, including; (1) renewal work; (2) reinforcements or extensions; (3) establishment of social connections.</li> <li>▪ Submit annual accounts and a 5-year accounts report.</li> </ul>
Remuneration	<ul style="list-style-type: none"> <li>▪ SODECI keeps a portion (the Prix Maximal de Base – PMB –Article 43) of the consumer tariffs, which also include surtaxes. • PMB is updated with inflation according to an indexation formula, but no specific efficiency incentive</li> <li>▪ PMB can be renegotiated every 5 years, even though the modification of those tariffs is at Government’s discretion (Article 45)</li> </ul>
Financing	<ul style="list-style-type: none"> <li>▪ Financing from the FDE covers (1) renewals; (2) reinforcement and extension work; (3) social connections; and (4) control of the service, and quality of water (Article 26.2)</li> </ul>
Sanctions	<ul style="list-style-type: none"> <li>▪ Sanctions are applied if there is (1) non justified interruption or partial interruption of supply; (2) failure to reach water quality levels; (3) insufficient pressure levels; and (4) failure to provide accounts. Amounts payable are calculated on the basis of volumetric units multiplied by the Prix Maximal de Base.</li> </ul>
Source: World Bank (2002)	

Small scale community water services in the Ivory Coast have not been very successful. About 20 percent of village wells are out of service, and 40 percent of village water committees are not functioning. Villagers often have great difficulties in financing their required contribution to investment costs, and installations are poorly maintained. Since any village with more than 3,000 inhabitants is eligible to be included in SODECI’s service area and since there is a track record of new centers being added to SODECI’s service area, many villages prefer to wait for incorporation rather than invest in their own facilities. Abidjan’s customers heavily subsidize SODECI’s services to rural consumers, which is an incentive for rural consumers to shift to SODECI’s service area.

None of the centers served outside Abidjan would be profitable on its own, and all these centers are financed through surpluses from Abidjan. In 2001 Abidjan accounted for 48% of connections, 65% of sales revenue, and only 52% of production costs. Water production costs are lower in Abidjan largely because it sits on a large aquifer and abstracted groundwater requires less treatment, while most of the secondary centers use plentiful, though not clean, surface waters, which are expensive to treat.

**4. Analysis of the status and effectiveness of the operating contract:**

While SODECI has responsibility for drafting a five-year investment plan, the company estimates that the Water Ministry, which is responsible for strategic investment decisions in the sector, approves only 50% of its proposed investments. In recent years and in the context of social tensions resulting from a coup in 1999, system performance has declined from previously high levels: losses now stand at an average of 23% as opposed to a 15% contractual target; and one third of production centers, particularly those in the interior, no longer meet WHO quality standards. The Government has not applied sanctions to SODECI for failing to meet contractual targets as they acknowledge that failure to invest is as much its responsibility as that of the private operator. Total turnover and profitability have also recently declined.

**5. References:**

World Bank (2002) "Emerging Lessons in Private Provision of Infrastructure Services in Rural Areas: Water Services in Cote d'Ivoire and Senegal, World Bank/PPIAF, April 2002.

World Bank, 2002a, Cote d'Ivoire How Cross Subsidies Help the Poor

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# Georgia – United Energy Distribution Company

## 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform.

There are four distribution companies in Georgia: Telasi, serving the capital Tbilisi, the Ajara Distribution Company, operating in the autonomous republic of Ajara, the Kakheti Distribution Company, and the United Energy Distribution Company (UEDC), serving the remaining regions.

UEDC is Georgia's single largest electricity utility. It serves about 780,000 customers, covering 70% of the Georgia land mass and, as of this writing, is state-owned. It was established in 2002 following a consolidation of 59 municipal utilities. Its early management and operations were for all practical purposes dysfunctional. It could not meet basic payroll, pay for maintenance or procure electricity supply. It often could not provide electricity to customers and what was provided was unpredictable and unscheduled. Collection efficiency was as low as 11%. Theft of electricity was widespread. The company was corrupted at every level from low-level cash collectors to top management; even UEDC's Supervisory Board was involved.

A major problem with UEDC has been its lack of adequate metering of supplied electricity and the collection of payments. The absence of individual meters in many places and the inability to individually disconnect a customer led to an inefficient consumption of electricity. Customers often use electricity, which is more expensive than other energy sources, for heating purposes (for heating water and flats, cooking, etc). Problems in UEDC and elsewhere in the distribution sector created serious difficulties in financing the operation of the broader electricity sector. Given a chronic shortage of funds, maintenance and capital replacement for all facilities suffered.

## 2. The reform process

In 1998, Georgia began to privatize its energy distribution system and hoped to privatize its energy generation system by 2000, an objective that remains unrealized. By 2002, the Government of Georgia had set a goal to increase private participation in the electricity sector. Management contracts had been awarded for the transmission, dispatch and wholesale market operations, but privatization efforts in distribution had failed. The IFC concluded that the Government of Georgia should use a five-year private management contract approach for distribution. Because it would take time to develop and tender, following government and donor discussion, USAID agreed to finance an 18-month interim management contract for UEDC. PA Consulting was retained in May 2003 to manage the utility. The initial 18-month interim role was extended for another two years and was set to expire November 8, 2006. Before expiration, the contract was further extended to fit the privatization schedule. The Government of Georgia announced in early 2006 the privatization of UEDC and as of this writing has signed an agreement with the private Czech firm Energo-Pro a.s.

### **3. Key characteristics of the sales/operating contract**

The contractor's work on the management component was funded and paid for by USAID using a time and materials type of contract. The incentive the contractor faced was reputational risk and possibility of contract termination if good results were not achieved. The Contract simply required the contractor to carry out its responsibilities "with generally accepted professional techniques and practices." But somewhat unusually for a management contract, the contractor was given full executive control over the company – rights to hire, fire and control all aspects of the company's operations. Even the Supervisory Board's governance role was "constrained."

Moreover, to allow independent and efficient management, the Contract specified the following:

"there are no mandatory provisions of the Georgian legislation except in case of national emergency, which require the Company or which give right to state to request Company to provide power to any person or entity unless the payment terms are acceptable to the Company, or which restrict the Company from suspending the power supply or disconnecting the provision of electricity to not – paying entities"

The Contract specifies explicitly that the government instruct the company "to disconnect customers, including state agencies, state owned or controlled entities and politically sensitive institutions, if they do not pay their relevant invoices." Furthermore, if any institution "speaking in the name of State, requests the Company not to disconnect any particular customer, such request shall be in writing, the Company can, at its option, offset the unpaid amount against the taxes or other amounts payable to state or local budgets."

The contract also requires the government to "eliminate any interference from local/regional bodies (governors...etc.) and agree not to exercise any kind of influence/put pressure on the Contractor, the Company and/or their personnel."

Appendix A to the Contract describes the scope of services required. In brief, the "Contractor will assist in the improvement of daily operations, implement a financial management and accounting system, improve the current billing and collection systems and procedures, and prepare the Company for a long-term management contract and future privatization."

### **4. Analysis of the status and effectiveness of the operating contract**

According to PA Consulting, the contract achieved the following results:

<b>Challenge</b>	<b>What PA did</b>	<b>Results</b>
<ul style="list-style-type: none"> <li>▪ Corruption at all levels (few internal controls or accountability)</li> <li>▪ Collections as low as 11%</li> <li>▪ Poor financial and technical performance</li> <li>▪ Poor customer service; little consumer protection</li> </ul>	<ul style="list-style-type: none"> <li>▪ Massive staffing changes, dismissals for failure to meet targets</li> <li>▪ IT systems (billing, accounting) to buttress internal controls</li> <li>▪ End-user, communal and wholesale metering</li> <li>▪ Consumer protection and customer service advancements</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collections up (~90%) based on supplied electricity</li> <li>▪ 24-hour supply of electricity restored for first time in a decade</li> <li>▪ Staffing levels reduced by 30%; turnover ~ 70%</li> <li>▪ Improved payments for electricity supply, taxes &amp; salaries paid in full</li> <li>▪ Annual investment in the company is now more than total investment over the previous 10 years</li> </ul>

In mid-June of 2006, the company received a bid of \$85 million from a Czech firm – Energo-Pro a.s. – exceeding government expectations. As of May 2007, the contractor is focusing efforts on closing with Energo-Pro so that the USAID funded management team can transition authority and ownership to Energo-Pro a.s. in mid-2007.

For this project, the contractor won the 2006 Management Consulting Association Award for best international project of the year and for best consulting team performance.

## **5. General recommendations as to replicability of the contracting experience**

Lessons learned in this case appear to include the following:

- Critical to the success of the work were the terms of the management contract that granted full executive authority to the contractor. Advisor roles or “shadow management” positions would not have been effective.
- The role played by the U.S. Government, through USAID, was critical in obtaining this full authority, including the authority to hire, fire and make any executive decision required to turn around the company.
- It was important for the contractor to understand local dynamics and decision-making processes. Whether it was the Imam for the ethnic Azeris, the bishop for the ethnic Armenians or other religious and community leaders, the contractor spent considerable effort identifying leaders who could support its work and help tailor its activities to better meet local conditions.
- The contractor quickly replaced the incumbent management. It argued that there was no way to build a cohesive team from the corrupted management and staff that existed prior to the contract management takeover.
- The contractor focused on management first. If the management of the UEDC had focused on investment before having adequate control of the company, it was the opinion of the contractor that the funds would have been wasted. The contractor also focused on management skills rather than on technical skills, arguing that lack of management skill was more of a problem than lack of technical skill.

Whether this management contract experience can be replicated elsewhere depends to a great extent on whether the drivers embedded in the above lessons learned—authority to hire and fire, to disconnect, to remain free from political interference—can be replicated. Often there is no U.S. Government presence to press for such requirement and there is insufficient willingness on the part of the host government to give up control.

## **6. References**

*Management Contract for the JSC United Distribution Company between State of Georgia and USC United Distribution Company and PA Government Services, Inc.* May 2003. Available in USAID project files.

*Agreement Between State of Georgia, represented by the Government of Georgia and JSC United Electricity Distribution Company of Georgia and PA Government Services Inc. on Extension and Modification of the Management Contract for the JSC United Distribution Company From May 8, 2003.* November 6, 2004. Available in USAID project files.

PA Consulting, 2006, *Utility Theft and Efforts at Prevention: The United Energy Distribution Company's Experience.* USAID Contract Number 114-C-00-03-00063-00

White, Dean, 2006, *An Update on the USAID Sponsored Management of the Georgian State Owned United Energy Distribution Company (UEDC),* PA Consulting.

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## India, Bhiwandi: The Torrent Group Franchise

### 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:

The Torrent Group of India now has a 10 year contract to distribute electricity in Bhiwandi, a rural industrial area north of Mumbai. The Bhiwandi circle's estimated annual revenues are INR 500 crore<sup>11</sup> (US \$106 million) and 600 MW of power is distributed in this circle. The Torrent Group, an Indian conglomerate, operates the privately owned Ahmadabad Electric Company in Gujarat.

Large-scale theft has led to a very high level of transmission and distribution losses, which at the time the contract was let were about 45%. This loss-making circle has over INR 800 crore<sup>12</sup> pending as collection arrears to the state electricity utility. Torrent Power has taken over the challenge of cutting transmission and distribution losses from 45% to 14% over a 10-year period. It has also agreed to increase collection efficiency from the current 62% to 98%.

### 2. The reform process:

**Tendering:** CRISIL, a credit rating, risk assessment and infrastructure advisory firm in India, majority owned by Standard & Poor's, advised the Maharashtra Government on design of the Bhiwandi operating contract and prepared the tender documents.

### 3. Key characteristics of the sales/operating contract.

This report does not have the actual document for the distribution operating contract, but it has two useful documents:

- "Principles of Distribution Franchisee Agreement" containing the broad principles of the distribution franchise agreement, undated, and
- Draft Concept Note on the Distribution Franchisee (DF) in Bhiwandi, April 2005

Key elements of these documents include the following:

- **Length of contract:** 10 year term, extendable
- **Power supply:** Maharashtra State Electricity Distribution Corporation, Ltd., MSEDCL, shall supply the power at Input Points as per its aggregated power supply and load shedding schedule planned periodically, based on directives issued by Maharashtra Electricity Regulatory Commission (MERC) on load shedding and availability of EHV transmission capacity at Input Points. To meet demand in Franchisee Area not satisfied from the quantity supplied by MSEDCL, DF may procure the power from other sources.

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<sup>11</sup> A crore is Rs. 10,000,000.

- **Asset ownership:** MSEDCL is the sole owner of existing Distribution Assets. MSEDCL gives DF “Right to Use” these assets. DF uses and maintains these assets at its own cost to keep them in good working condition as per Prudent Utility Practice.
- **Capital investment:** MSEDCL provides a Minimum Investment Plan for five years, which reduces T&D loss and improves quality of supply in the Franchisee Area. DF has the right to carry out capital expenditure in the Franchisee Area to improve quality of supply and reduce losses. The cost of all such capital investment is borne by DF. On completion of the contract, assets will be transferred to MSEDCL at the depreciated value, computed as per depreciation rates used by MSEDCL. DF shall be responsible for incurring capital expenditure to provide new connections in the Franchisee Area.
- **Arrears:** MSEDCL shall transfer the right to collect existing arrears to DF
- **Employees:** The existing public employees in the Bhiwandi Circle are given an option to join the DF on deputation. The cost of employees on deputation will be borne by DF. At the end of the period of deputation or the Franchisee Agreement whichever is earlier, employees on deputation will return to MSEDCL. DF may hire employees, but these have no reemployment rights with MSEDCL.
- **Technical and commercial responsibilities** of DF are defined
- **Responsibilities of MSEDCL** are defined
- **Net annual amount** to be remitted by DF to MSEDCL is equal to energy input by MSEDCL minus energy input from other sources times agreed upon bulk energy charge.
- **Wheeling:** 7% wheeling charge to MSEDCL for power purchased elsewhere.
- **Indemnification:** MSEDCL not responsible for any acts by DF.
- **Standards of Performance:** DF is responsible for complying with Maharashtra Electricity Regulatory Commission’s Standards
- **Innovation:** The DF may consider the use of innovative operating systems and technical solutions for loss reduction, theft prevention, credit control, etc.
- **Subsidy:** MSEDCL will provide credit against bulk purchase charges to DF for subsidy claims for power supply to subsidized consumer categories in Franchisee Area.

#### 4. Analysis of the status and effectiveness of the operating contract:

The Torrent contract was effective January 15, 2007, so it is too soon to judge results. There has been public opposition to the contract reported in the Indian press (see Background Documents).

#### 5. General recommendations as to replicability of the contracting experience:

This model is being examined by USAID for application in Afghanistan.



## 6. References: Principles of Distribution Franchisee Agreement

India CRISIL Electricity Model

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# India - North Delhi Power, Ltd.

## 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:

Before reforms that were implemented in July 2002, Delhi's power sector, including distribution, was managed by a public utility owned by the Delhi government. By any measure, the performance of the sector was deplorable. Almost half (48.1%) of power generated was lost through technical and commercial losses. Power was being stolen at record levels. The financial situation of the utility was "extremely precarious." While demand was growing, no new capacity was being added. Power cuts were routine and there was much public dissatisfaction with the electric utility.<sup>13</sup>

The following summarizes the state of the utility before privatization:

- **Insolvency of the utility.** The utility's revenues could not cover costs. Losses were met through loans from the Delhi government. Receivables had mounted to USD \$400 million. Over the five years prior to privatization, the utility's operating deficit amounted to Rs. 2328.81 crore (USD \$488 million). Accumulated liabilities of the public utility in March of 2001 amounted to Rs. 23,137<sup>14</sup> crores (USD \$4.8 billion). The utility was a financial drain on the Delhi government.

- **Poor equipment:** Physical equipment had deteriorated and was breaking down—cable joint, capacitor and transformer failures were common—from lack of maintenance and replacement. The Delhi government estimated that Rs.1,021 crores (USD \$214 million) was needed for capital investment to bring equipment up to standards. The utility made virtually no use of modern information technology.

### Pre-privatization profile of the North Delhi Zones:

Area: 550 km<sup>2</sup>  
 Population: 4.5 million  
 Number of consumers: 742,895 (estimated actual 1,000,000)  
 Employees: 5,400 at time of take over  
 Units billed (in millions & %): 2518 (31%)  
 Revenue billed (RS. Cr.): 965  
 Revenue collected (Rs. Cr. & %): 856 (89%)  
 Load growth 7 – 10% per year.

Source: Information Memorandum, pages 19-28. Data is for mid-2001 *see Prayas p11*

<sup>13</sup> GNCTD Press Handout on DVB Privatization

<sup>14</sup> Sagar (2004) According to Mr. Sagar the approximate split of liabilities was 60% power purchase dues and 40% loans plus a small (<5%) pension liability.

- **Public dissatisfaction:** Regular power cuts caused many customers to purchase expensive back-up generators. Customer service was poor and utility employees were viewed as inefficient and corrupt. Electricity service had become a political liability. Power shortages were common, and politicians noted the “demonstrations, riots, headlines; the constant ‘monitoring’ of harassed engineers; tense, repetitive meetings, press releases, press conferences, wide publicized ministerial site visits, frantic excuse-making at all levels.” For the New Delhi government that took office in December 1998, electoral defeat was a possible penalty for failure to improve the power situation.<sup>15</sup>

## 2. The reform process:

Over the period from 1998 to 2002, the Government of the National Capital Territory of Delhi (GNCTD) planned and implemented a program of reform of the city’s power sector. Salient features of those reforms included the following.

The public utility, DBV, was unbundled into separate generation and transmission companies and three distribution companies. Delhi’s six distribution circles<sup>16</sup> would be divided among the distribution companies (discoms), which would be joint ventures between the government and the private sector - so-called public private partnerships. All liabilities of DVB, the existing public utility, were transferred to a newly formed holding company (HOLDCO), which would also own the government’s share of the joint venture companies. In 1999, the Delhi Electricity Regulatory Commission (DERC) was formed to regulate the sector.

In November 2001, GNCTD issued a Transfer Scheme that defined the transfer of assets, liabilities, proceedings and personnel of DVB to successor entities. The terms of the Transfer Scheme were as follows:

- All assets and liabilities of DVB were acquired by the state government.
- All DVB’s liabilities were transferred to HOLDCO and all of HOLDCO’s equity was issued to the state government. (More about this below under ‘Subsidies’.)
- All DVB assets were assigned a value equal to serviceable liabilities and were transferred to successor entities. (more about this below under ‘Price of equity’)

**Tendering:** The government decided that loss reduction would be the basis for determination of tariffs and for computation of incentives for better performance. Accordingly, in its November 2001 policy directions,<sup>17</sup> the state government chose to solicit bids for the three new distribution companies. The government decided not to tender the companies for the highest payment for equity, as is commonly done in divestiture transactions. Instead, the government decided to award the distribution companies to the bidders who offered the highest percentage of Aggregate Technical and

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<sup>15</sup> *Ibid.*

<sup>16</sup> In India, distribution zones are called circles.

<sup>17</sup> GNCTD (2001); SBI Capital Markets Ltd., is the investment bank subsidiary of the State Bank of India.

Commercial Loss (AT&C) reduction over a five year transition period. The AT&C concept, which was devised by the state’s transaction advisors, SBI Capital Markets, is explained below.

The distribution privatization process began with a February 2001 Request for Qualifications. Six bidders were qualified. In response to a November 2001 Request for Proposals (RFP), only two bidders—Tata Power and BSES— submitted proposals by the due date in April 2002. Neither bidder met the loss reduction minimum offer levels stated in the RFP. This reflected the bidders’ view that reducing losses would be more difficult and slower than stated in the RFP. Negotiations with the bidders led to agreement on terms of sale in June 2002, and both private companies took over the distribution companies in July 2002. Hence, the privatization transaction took about a year and a half from start to closure.

### 3. Key characteristics of the sales/operating contract.

North Delhi Power Limited’s (NDPL’s) contract to operate its electric utility is actually not an operating contract but an asset sale privatization. Assets of the government-owned DVB were sold to private bidders, with the winning bid being selected using the AT&C loss reduction criterion. The government retains the right to regulate tariffs and to withdraw NDPL’s operating license if the company fails to meet performance targets set in their license and their purchase agreement.

**Performance targets based on loss reduction:** The bidding criteria for the distribution companies was based on a concept called “Aggregate Technical and Commercial Losses” (AT&C). The state determined that tariffs approved for NDPL would be based on the allowed levels of AT&C loss<sup>18</sup> during the five year transition period. The actual AT&C formula includes technical, commercial and collection losses. The AT&C number measures the difference between kilowatt hours supplied to the distribution company and units of energy for which payment is billed and collected from customers.

$$AT\&C = 1 - \left[ \frac{\text{Energy Units Billed to NDPL Customers}}{\text{Energy Units Purchased From Bulk Suppliers}} \times \frac{\text{Collection in Rupees}}{\text{Billing in Rupees}} \right]$$

The first term represents technical and commercial efficiency. The second term represents collection efficiency. Energy units are kilowatt-hours (kWhs); collections and billings are in Rupees.<sup>19</sup>

Before privatization, AT&C losses for the year 2000-01 in what would become NDPL’s service territory were as follows:

<sup>18</sup> GNCTD (2002)

<sup>19</sup> Sagar (2003) The Delhi reforms were the first in India to adopt the principle of AT&C loss as the measure of overall efficiency. According to Sagar, India’s Ministry of Power has now adopted AT&C losses as a measure of commercial efficiency in all its distribution reform programs generally.

a.	Units Input at 66/33 KV (MU)	4424
b.	Units Billed (MU)	2518
c.	T&D Losses (%) $[c=(a-b)/a]$	43.1
d.	Amount Billed (Rs. Crores)	965
e.	Amount Realized (Rs. crores)	856
f.	Collection Efficiency (%) $f=e/d]$	88.7
g.	Units Realized (MU) $[g=bx f]$	2234
h.	AT&C Loss (%) $[h=1-((b/a)x(e/d))]$	49.5

Source: Government of the National Capital Territory of Delhi (GNCTD) (2001)

This indicates that for every kilowatt hour of electricity that entered the Delhi distribution system before the privatization occurred, 49.5% of the energy was lost due to technical, commercial and theft problems.

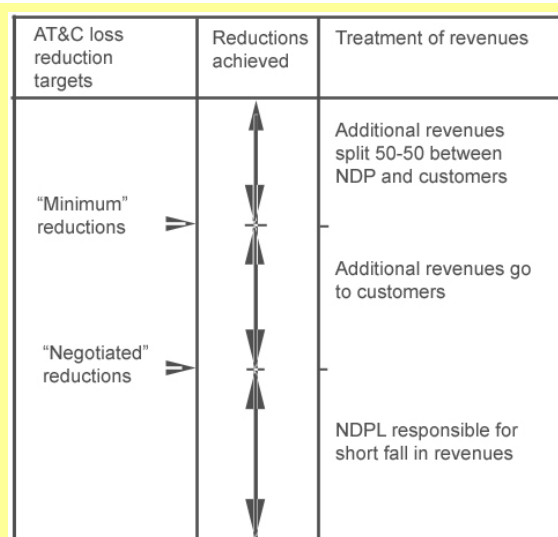
As a result of negotiations, Tata Power agreed to the following targets for the North and West zones, which formed one of the distribution companies that was sold. The targets specified in the RFP are included for comparison.

	5 Year Transition Period				
	2002-03	2003-04	2004-05	2005-06	2006-07
RFP specified minimum reduction (%)	1.50	5.00	4.50	4.25	4.00
Winning bid target (%)	0.50	1.25	2.00	4.50	5.25
Negotiated (accepted) target (%)	0.50	2.25	4.50	5.50	4.25
Negotiated AT&C levels (%)	47.60	45.35	40.85	35.35	31.10

Source: GNCTD (2002a)

**Incentive scheme:** The state ruled that revenues from over-achieving or under-achieving these targets would be treated as follows and is illustrated in the box at right:

- If actual AT&C loss reductions are better than the “minimum” target, NDPL can retain 50% of the additional revenue resulting from better performance. The remaining 50% is passed to customers through reduced tariffs.
- If actual AT&C loss reductions fail to meet the negotiated targets, NDPL is responsible for the entire revenue shortfall.
- If AT&C losses are worse than the minimum AT&C reduction levels, but better than the negotiated levels, then the entire additional revenue will be used to lower tariffs.



Regulatory agencies in the electricity sector commonly will allow a “gross-up” factor in setting tariffs. This factor determines the number of units of power purchases that the regulator will allow in calculating the cost of power, which in turn determines the

allowed revenues for purposes of setting tariffs. It allows NDPL to charge its customers a mark-up for losses such as thermal losses in transmitting power. In well-run utilities with losses around 10%, the gross-up factor would be  $1 + 0.1 = 1.1$ . In Delhi, as in many developing country power utilities, there are high losses due to theft and ineffective billing and collection, so the gross-up factor is high. The calculation for the gross-up factor for NDPL is as follows:

$$\text{Allowed Units of Bulk Power Purchases} = \frac{1}{1 - AT \& C}$$

North Delhi example: If AT&C = 0.495, the gross-up factor would be  $\frac{1}{1 - 0.495} = 1.98$

Efficient utility example: If AT&C = 0.10, the gross-up factor would be  $\frac{1}{1 - 0.1} = 1.11$

### **Subsidies:**

1. Start-up subsidy to mitigate tariff shock: To avoid a tariff shock, the government granted a loan of a maximum Rs 3,450 crores (USD \$720 million) to the Transmission Company (TRANSCO). The subsidy is used to create a discount on the price that the discoms pay for power purchased from Transco.<sup>20</sup> No specific amount was targeted for each discom. The loan must be repaid to HOLDCO by GENCO, TRANSCO and the three distribution companies within 13 years. For the first four years the discoms had a moratorium on repayment and waiver of interest. If necessary, that could be extended for a fifth year.

All three discoms receive 16% guaranteed return on issued and paid up capital and free reserves until 2007. The precondition for this is that they achieve their AT&C loss reduction target and that their investments are approved by the regulatory commission. The bulk supply tariff (BST) that NDPL pays to Transco depends on NDPL's projected revenues, its allowable (by DERC) costs, and profits according to the following formula:

$$\text{BST} = \text{NDPL's (Projected Revenue - Allowable Costs - Profits) / Units purchased from Transco.}$$

The BST thus depends on the paying capacity of the discom rather than the cost of the power purchased. Government support covers the deficit for the first five years. The government subsidy is thus:

$$\text{Government subsidy} = \text{TRANSCO Costs} - \text{sum of BST} \times \text{Units purchased payments from all three discoms.}$$

<sup>20</sup> Agarwal et.al. (2003) p 14

2. Lifeline rates: The National Electricity Policy mandated by the Electricity Act of 2003 states the objective by 2012 of providing 1 kilowatt-hour per household per day as a “merit good” for domestic use as “lifeline” consumption for households below the poverty line.

3. Companies were shielded from pre-existing long-term liabilities of the public utility. In order to increase the probability of achieving financial viability of the successor discoms, liabilities and past losses of DVB were not passed on to NDPL or other successor companies. These liabilities remained with HOLDCO. All successor companies started with a clean opening balance sheet.

**Equity payment:** As mentioned in 2 above, all DVB assets were assigned a value equal to “serviceable liabilities.” A difficulty arose in calculating the value of the assets in the NDPL distribution zone. The accounts of DVB were not audited and no fixed assets registers existed. Therefore it was decided to use the business valuation method. According to this, the value of assets is reflected in *future tariffs*. By this method, the value of the assets is determined by the future revenue that those assets can provide. The value of the DVB was thus determined to be Rs 3,160 crores (close to the book value of the unaudited accounts, i.e., Rs 3,024 crores). Ultimately, all of the distribution assets were sold for Rs 2,360 crores to the new owners.

On the condition that the loss reduction targets are met, the Delhi government adopted the strategy of foregoing a maximum return on the sale and establishing a low par value for equity so that the discoms would have a better chance of becoming financially viable.<sup>21</sup>

#### **Other terms:**

- Public private partnership: 51% private ownership, 49% public by GNCTD.
- Company structured as 60% debt and 40% equity on a book value basis
- No formal agreement on an investment plan for the five years.<sup>22</sup>
- Description of specific risks in the contract, including contractor support from public investment funds, police and judicial support, and labor agreements.

#### **4. Analysis of the status and effectiveness of the operating contract:**

This section discusses how the contract is turning out. Has NDPL performed well, was service stabilized or improved and has the condition of the system improved, stabilized, or deteriorated?

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<sup>21</sup> In fact, “There was no bidding for equity; instead bidding was for loss reduction. In this sense, the payment of equity was like a payment for an admission ticket which, in turn, gave an investor the right to bid for loss reductions.” Agarwal et al(2003) p 9

<sup>22</sup> Agarwal et.al. (2003) p12

**Reduction of AT&C losses:** The table below shows AT&C losses in NDPL's distribution zone. As part of its efforts to drive down AT&C losses, NDPL is undertaking energy measurement at grid stations and all sub-stations receiving energy from these stations. It is also undertaking energy measurement at each Distribution Transformer and LT Feeder.<sup>23</sup> By the end of FY 05-06 it was reported that NDPL had reduced its AT&C losses to about 28%, beating its target by seven percentage points.

**Financial recovery:** In the reform process, the New Delhi government took over nearly all past liabilities, provided transition support over a 5 year period and contributed to the employee pension fund. This financial support and the significant reduction in AT&C losses have contributed to the considerable progress made by NDPL in achieving financial self-sufficiency.

2002-03 (9 month period)		2003-04	
AT&C losses (Target)	Actual losses	AT&C losses (Target)	Actual losses
47.6%	49.12%	45.35%	44.86%

*Source: Order on annual revenue requirement for FY 2003-04 & 2004-05 and determination of bulk, retail and generation supply tariffs, DERC*

**Tariff reform/cost recovery:** The following table compares the average tariff levels pre- and post-privatization for the three Delhi discoms:

Consumer category	Average tariff 1999-2000	Average tariff 2000-2001	Average tariff 2003-2004
	(Rs./kWhr)		
Domestic	1.49	1.49	2.88
Commercial	4.03	4.15	6.19
Street lighting	-	-	4.04
Agriculture	0.50	0.50	1.34
Industry	4.03	4.24	5.25

*Source: Planning Commission, 2002*

## 5. References:

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<sup>23</sup> Modi (2005) Appendix 1.

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## Kosovo – Korporata Energjetik e Kosoves (KEK)

### 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decisions to reform.

Major challenges facing Kosovo's electricity sector were: "(i) poor performance of the power utility KEK, in part due to its weak management capacity; poor maintenance of generation plants and the network due to lack of resources; inefficient operation of generation plants, high level of system losses, and poor bill collection; (ii) need to integrate with the regional energy market (called Energy Community of South East Europe - ECSEE) to optimize its own generation capacity, reduce shortages affecting Kosovo, and exploit its lignite resources for attracting investments in export-oriented power plants; (iii) rationalize excessive use of electricity for space heating during winter to reduce demand for electricity, and revise tariff structure to improve targeting of subsidy for the poor; and (iv) finance its investments to rehabilitate generation plants, rehabilitate and augment the network." (World Bank, 2004)

*Poor performance:* KEK's combined technical and commercial losses were estimated to be 52-56% of supplied energy. The technical losses result from poor system design, lack of maintenance and lack of capital investment. Technical losses were estimated to be 18-22%. Commercial losses resulted from illegal connections and ineffective metering, billing and collection practices. Commercial losses were estimated to be 35%. These numbers were of great concern. A commercially run utility typically has line losses of less than 5% and commercial losses under 1%. Of the 44-48% of energy that was billed in KEK, only 68% was paid. As a result, of total energy supplied, only 32% was paid. Good utility practice would allow for less than 1% of revenue billed to remain uncollected. This was KEK's most serious problem and was the cause of KEK's poor financial condition. Any improvement in the collection rate would lower the dependency on external funds needed from the KCB and donor community. (USAID 2006)

### 2. The reform process

In 2003, KEK's stakeholders and international donor agencies endorsed the proposal for a turnaround management team to manage KEK. In June 2004, the Chairman of the KTA Board, DSRSG Nikolaus Lambsdorff, KEK, and the Irish company ESBI signed a 24 month contract for the management of KEK, with the mandate to turn around performance. This contract was funded with €7.5m from the Kosovo Consolidated Budget. The contract was sponsored by the UN Mission in Kosovo (UNMIK). KEK is currently held under UNMIK's custodianship through the Kosovo Trust Agency.

KEK was operated under a Turnaround Management (TAM) contract by the Electricity Supply Board of Ireland (ESBI). The TAM contained performance indicators and milestones designed to improve the technical and financial performance of the utility and to develop local management capacity in sufficient strength to assume management and operation of the utility. USAID (2006). The Government of Kosovo intended to turn management of the utility over to local control at the end of the ESBI contract.

**Tendering:** ESBI was selected following a competitive and transparent international tender. ESB International won the contract, beating competition from US, UK and German consortia. As management contractor, ESBI was supported by its subcontractors TSI/ESKOM of South Africa and Vattenfall Europe. There was unanimous agreement in the bid evaluation committee regarding the choice of ESBI as management contractor.

At the end of 2005, the view of UNMIK and key donors in the energy sector was that an extension of the ESBI turnaround management contract was desirable to provide continuity of management. In the beginning of 2006, an extension was signed between KTA and ESBI. The payment of €2.8m was offered by the donors USAID, Kreditanstalt fuer Wiederaufbau (KfW-Germany), and the European Agency for Reconstruction.

### **3. Description of key characteristics of the sales/operating contract.**

**Incentive formula:** ESBI had a base fee and a success fee to implement the contract. The base fee was a fixed, lump-sum fee paid annually to cover basic operating costs. The success fee was based on increases in revenue collection on a cash basis and decreased operating expenditures. Additional targets were set for total losses, percentage of energy invoiced, and percentage of revenue collected.<sup>24</sup>

### **4. Analysis of the status and effectiveness of the contract.**

The KEK contract has not solved the poor commercial and financial performance of the utility. However, the contract has had significant successes. For example, for the first half of 2006, total invoiced energy was 72.2% of energy supplied, and revenue collected was 84% of energy invoiced. Due to generation constraints, energy supplied was only 2,178,900 GWh compared to a target of 4,743,000 GWh. Therefore, we can see improvement compared with the starting levels.<sup>25</sup>

Facing continuing difficulties with revenue collection due to non payment and theft, in September 2005, a performance evaluation of ESBI was carried out by a working group made up of the Ministry of Energy and Mining (MEM) and KTA. Following the evaluation, MEM agreed to a six-month extension of the contract until December 2006 if funded by donors. USAID, German and the European Agency for Reconstruction agencies agreed to fund the extension with the expectation that (1) TAM would continue the implementation of a strategy for improving revenue collection that is crucial for the financial turn around of KEK, and that twinning of ESBI with local managers would continue to ensure a more sustainable management capacity in KEK. Failure to achieve these targets could result in the termination of ESBI's management contract. Finally, in a new composition of the KEK Board of Directors, ESBI was reduced to a non voting member.

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<sup>24</sup> Source of information about contract payments is interviews with contractor staff.

<sup>25</sup> USEA December 2006 Project Review.

In March 2006, the UNMIK administration reported that the majority of the ESBI management team would be leaving KEK and be replaced by local managers. ESBI's contract continued until the end of 2006, and in December the remaining ESBI management team was replaced by local managers. The difficult energy situation in the winter of 2005-06, continuing coal problems and flooding in Kosovo B generation unit accelerated the departure of the ESBI team.

The Kosovo electricity management contract indicates that operating contracts do not always quickly resolve the operational and financial problems facing deeply troubled utilities.

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Graves, J. Stanley; Roger Kovack and Robert Manning, 2006 Qualitative Assessment of Preparations for Transition to Local Management Within Korporata Energjetike e Kosoves (KEK), U.S. Energy Association for U.S. Agency for International Development.

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## Mali – Energie du Mali

### 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:

Mali is a poor country with 70% of the population below the poverty line. Around 90% of its energy requirements are met from fuel wood and charcoal. Nearly two-thirds (61%) of its electricity comes from hydropower. The Malian government is encouraging investment in hydrocarbon exploration, as the country borders proven reserves in Algeria.

Water services in 16 of Mali's major urban centers are provided by Energie du Mali, EDM; outside of EDM's service area are 49 urban centers where municipalities provide water. In rural areas, water points are developed by user associations. EDM's mandate is to ensure the supply, quality and safety of electricity and drinking water throughout the area covered by the utility's concession. It currently supplies electricity to 154,000 customers in 35 urban centers and water to 91,700 customers in 16 urban centers. EDM has an interconnected network supplying 13 localities and 20 isolated centers. In 2004, EDM delivered 720,800 MWh of electricity over 3,900 kilometers of transmission lines and 61,900,000 cubic meters of water via 2,660 kilometers of pipe.

Prior to the reforms described below, EDM suffered from years of under-investment and inefficient management, and was in a critical financial position.

### 2. The reform process:

During the period 1988-96, the government implemented a reform program for the public enterprise sector, including the privatization of 16 enterprises, partial privatization of 12, and liquidation of 20; others were restructured. Among the 20 enterprises left, eight were privatized, including the largest - the electricity and water company (EDM), and the textile company (Industry Textile du Mali, or ITEMA). In 2000, the Government of Mali signed two 20-year concession contracts with the national water and electricity operator, EDM, and simultaneously sold 60% of its capital to a consortium led by Saur International, a subsidiary of the French Bouygues group. The objective of the contract was to expand access to those services (within the existing service perimeter for water and with an expansion to additional urban centers for electricity) and to improve EDM's technical and financial performance.

A previous attempt at introducing private sector participation through a management contract let in 1995 was terminated prematurely by agreement of both parties. The management contractor, SHEC (a consortium led by Saur International), was unable to achieve its performance improvement targets due to a combination of factors.

Under the 2000 concession contract, EDM was in charge of operations and all investments in its service area. The DNH (*Direction Nationale de l'Hydraulique*) within the Ministry of Mines, Energy and Water had contract monitoring responsibilities and the

Commission for Regulation of Electricity and Water (CREE), established in March 2000 through the sector reform law carried out economic regulation (including tariff setting).

This privatization of EDM was initially a success, but conflicts between the parties emerged almost immediately following contract signing and led to a vicious circle of mutual accusations and uncooperative behavior. Most problems were initially related to the electricity sector and were due to poor contract design, especially with respect to tariff formulas. Early in the contract, the authorities started to criticize insufficient performance by the concessionaire. The concessionaire was unable to raise long-term finance to fund its investment obligations and a series of tariff cuts (at first, with financial compensation to the concessionaire and then without) compromised its ability to do so. As a result, the concessionaire slowed down investments considerably, leading to accusations of unsatisfactory performance.

In October 2005, after long negotiations organized by the World Bank, the French concessionaire Saur and the Government of Mali agreed to end the 20-year concession. Saur sold two-thirds of its holdings in EDM to the Republic of Mali, raising its share to 66%, and the remaining third to Industrial Promotion Service (IPS) the West Africa affiliate of the Agha Khan Fund for Economic Development (AKFED), raising its share to 34%. The agreement between the government and EDM shifted from a concession, which imposed investment requirements on Saur, to an affermage, which leaves investment responsibility with the government.

### **3. Key characteristics of the sales/operating contract.**

Limited information on the specifics of the concession contract has been available to include in this database.

### **4. Analysis of the status and effectiveness of the operating contract:**

The EDM concession contract of 2000 has been termed a “resounding failure.” The evidence of this is found primarily in the Government decision of 2005 to terminate the concession and replace it with a Government controlled affermage contract.

Balance and Tremolet (2005) provide a detailed analysis of the experience with the EDM concession and the following are some of their key findings:

- **Mistakes:** A lot of the problems in Mali occurred because of mistakes and inaccuracies in the design of the tariff formulas (for electricity in particular), even though parties including the Government, bidders and donors had been given the opportunity to review the contract documents. This opened the way for questioning the validity of the contract and gave ground to the regulator for exercising a considerable degree of discretion, since the validity of the contract as the main legal instrument binding the parties was called into question.
- **Shifting too much commercial risk onto the operator:** In Mali, it was probably too risky to shift all commercial risks to the private operator when the

Government was not paying its bills and had not committed to paying them in the short-term (through compensation for example).

- **Transaction costs:** It is expensive to design and tender an operating contract. It will commonly cost between \$100,000 and \$3 million to reach the stage of executed contract. The cost will depend on the complexity of the contract terms and the amount of risk that will be put on the operator's account. If there is little risk, then a relatively simple contract, such as the Georgia electricity contract, can be used. If the investor will have full commercial control and full investment responsibilities, it will be much more expensive to develop the contract. However, it is important to keep in mind that in most situations, the losses of the utility are far larger than the costs of designing and managing an operating contract.
- **Autonomous regulatory agencies** with considerable discretion are sometimes perceived negatively by private operators, as increasing regulatory risk rather than reducing it. In Mali, the water and electricity sector regulator, the CREE, was set up with almost all the attributes of an independent regulator, including a considerable degree of discretion with respect to key decisions such as tariff setting. However, such a model of independent regulator sits uncomfortably with the contractual tradition reflected in the concession contract, which is based on French tradition with no independent regulator. There was therefore an inherent conflict between the perception (by the Government and the CREE) that the regulator should set tariffs based on its interpretation of the broad tariff-setting principles contained in the law as opposed to the operator's perception that the tariff setting provisions contained in the private contract should take precedence.
- **Social tariffs:** An issue with social tariffs is that they can provide a disincentive for private operators to extend into poor areas if the costs of supplying the service are not adequately covered by tariff revenues. Whether private operators are exposed to this risk or not depends upon the structure of the contract. This would typically be the case in concession contracts, such as in Mali, although in that case, the concessionaire did have coverage targets that compensated this disincentive (even though, tariff levels proved too low to be sustainable following regulatory interventions). Whereas a private operator under a concession contract may have a disincentive to serve customers consuming within a 'lifeline' block, an affermage contract would maintain its incentives. This is because many affermage contracts provide operators a fixed fee per cubic meter or kilowatt hour delivered to customers.
- **Coverage targets can be a powerful incentive for private operators.** In Mali, one of the primary objectives of the concession contract was to improve coverage and there are key targets covering increasing connections (42% in 5 years and 233% in total) and increasing the volume of water sold to domestic customers. This mechanism proved effective during the first few years of the contract. The Mali and Pamir contracts were the only contracts included in our study where the private operator had the obligation to invest in the network and new connections. With the difficulties encountered by concession contracts worldwide, it is likely that schemes where expansion is subsidized, such as Output Based Aid schemes,

are going to be more effective for expanding coverage under private sector management.

- **In some situations, exclusivity clauses should be limited in order not to displace small-scale operators.**  
One critical issue is whether operators should have exclusivity over service provision in their service area. This is something that the private operators often prefer in order to preserve the value of their long-term investments but the risk is that the private operators would then be tempted to expel existing small-scale suppliers who provide very useful services to the poor, at least in an interim period until coverage can be increased. This problem can be avoided by introducing limits to the exclusivity clause. In Mali, the concession contract grants exclusivity to EDM over its service area, but EDM is also required to sell water in bulk to private standpipe operators or to authorize and regularize water resale by domestic users thereby imposing limits on the degree of exclusivity.
- **Donors have often advocated private sector participation as a critical component of overall reforms. This may be the wrong approach in some cases.** Sometimes donors have pushed for strong forms of private sector participation,<sup>26</sup> as in Mali, as a last resort to improve the sector's performance. Retrospectively it appears that the necessary conditions for private participation were not in place at the time. Donor conditionality has proven short-sighted in certain cases, especially when donors have pushed for high-powered forms of private participation when the overall conditions were bad. Conditionality may be better focused on introducing mechanisms for improving and monitoring performance throughout the sector rather than on a particular form of private participation for the main utility in the country. This could help in improving the sustainability of the reforms, and avoid linking an entire sector-wide support program to the success of a particular transaction.
- **Donors have not always provided ongoing support after the PSP contract was let.** Donor emphasis on high-powered private participation arrangements has not always been followed by donor support down the line. In Mali, donor support, which had been substantial before and during the preparation of the reforms, stopped after privatization on the basis that they could not finance a private sector operator (donor support to the sector as a whole, including to the Ministry on water resource management issues continued nevertheless).
- **Donors can play a significant role to support the reform process overall and in particular, service extension in towns that fall outside the perimeter of the main operator.** There is sometimes a tendency for donors to focus on the largest projects, mostly relating to national companies or companies serving the capital city and ignoring the situation in other urban centers which may contain the majority of the urban population. For example, in Mali, it is important to note that

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<sup>26</sup> "Strong forms of private participation" refers to contracts where the operator is exposed to the major commercial and capital expense risks of the situation. Commercial risks include billing and collection risks, while capex risk refers to the operators obligation to make capital investments and then recover these investments plus a reasonable return. Management contracts and leases usually have little or no capital investment responsibility placed on the operator.

EDM only provides services to about 10% of the Malian population (with a 60% coverage rate in towns that contain about 15% of the total population). The concession preparation process followed by ongoing conflict between the private operator and the Malian Government regarding the terms of the contract and EDM's obligations mobilized a considerable amount of time and resources by comparison with the overall impact of EDM's contribution. The dispute is a big drain on the resources of the Ministry, donors, EDM and the regulator.

## **5. References**

Balance, Tony and Sophie Tremolet, 2005, "Private Sector Participation in Urban Water Supply in Sub-Sahara Africa", KfW Bankengruppe, Corporate Communication.

Eberhard, Anton, 2006 "A re-assessment of independent regulation of infrastructure in developing countries: improving performance through hybrid and transitional models", Annual World Bank Conference on Development Economics 29-30 May 2006, Tokyo

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## Senegal – SDC Contract with SONES

### **1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:**

Although a private operator was in place at Senegal's Independence in 1960, water services were nationalized in 1971 and transferred to a national company in charge of the main urban centers, SONEES. As the company was facing financial difficulties and heavy investments were required to address Dakar's long-term supply problems, sector reform became necessary. In 1996, private sector participation was introduced via a 10-year affermage contract signed between the Government and Sénégalaise des Eaux (SDE), the private operator. At the same time, an asset-holding company, Société Nationale des Eaux du Sénégal (SONES) was set up to own the assets and carry out investments in the urban water sector. SONES signed a concession contract with the State. At the time of signing the contract, SONES/SDE's service area included 56 urban centers and 100 villages located by the transport mains. These centers are generally larger than the towns covered in Cote d'Ivoire, with a threshold for inclusion of a town in the contract zone of approximately 10,000 inhabitants rather than 3,000 inhabitants that are the common threshold in Cote d'Ivoire.

### **2. Key characteristics of the sales/operating contract.**

Funds for investment are channeled through SONES, the asset-holding company, which has received abundant funding from international donors for new projects in recent years. SONES is also in charge of monitoring SDE's contract, which is an "enhanced" affermage contract in the sense that SDE is responsible for maintenance and some well-specified investments in renewals (17 km of network, 6000 connections and 14000 meters every year). This added to a set of contractual performance indicators with clearly defined targets and corresponding financial incentives and sanctions means that SDE's incentives have more clearly been focused on improving performance within the existing service area, rather than on expanding services beyond it.

In the contract, the private operator receives a fixed payment for each cubic meter of water sold, irrespective of the tariff at which each cubic meter was sold. At the margin, such arrangements have strong pro-poor properties as the private operator would receive the same remuneration for water sold at the social tariff and for water sold at an industrial (much higher) tariff, although the costs of serving them may differ. These properties benefit customers in peri-urban areas and secondary centers, where the highest proportions of social tariff customers are found. However, in the longer term, such pro-poor properties are undermined by the fact that the fixed remuneration per cubic meter is calculated on the basis of an average tariff. Overall, if the number of social tariff customers increases as a proportion of the total customer base, the average tariff will go down and so will the private operator's remuneration. Such contractual arrangements also run the risk of undermining the long-term sustainability of the sector as a whole. Under

those arrangements, the difference between total revenues and the overall remuneration of the private operator goes back to the asset-holder for future investments. If a rising proportion of social tariff customers leads to decrease in those revenues, less funds will be available for investment in the future.

### Performance targets:

Performance Indicator	Targets according to the Performance Contract	SDE's interpretation
Unaccounted for water within water treatment plants (Article 16)	95% treatment of all water that enters water treatment plants should leave them (except in exceptional circumstances).	<ul style="list-style-type: none"> <li>▪ Output volume / Input volume</li> </ul>
Leakage Reduction (Article 17)	Bring down water losses to 15% over a five-year period. 'Number of leaks' is specified as an indicator of performance.	<ul style="list-style-type: none"> <li>▪ The % of water lost as a proportion of the water produced</li> <li>▪ Number of leaks /year</li> <li>▪ Number of leaks/ year for 100 connections</li> <li>▪ Index of water lost (m3/km/day)</li> </ul>
Water Quality (Article 18)	SDE must check the water quality as often as necessary to conform with WHO recommendations. The physio-chemical and bacteriological quality should conform to WHO standards, for at least 96% of the samples, unless deviations from the standards are agreed by SONES in writing. ( <i>Affermage Contract, Article 36</i> )	<ul style="list-style-type: none"> <li>▪ Bacteriological Standards               <ol style="list-style-type: none"> <li>1) Number of samples taken per year</li> <li>2) The % of samples that conform to WHO standards</li> </ol> </li> <li>▪ Physio-chemical standards               <ol style="list-style-type: none"> <li>1) Number of samples taken per year</li> <li>2) The % of samples that conform to WHO standards.</li> </ol> </li> </ul>
Service Quality (Article 19)	Delays for intervention in the case of pipe bursts or leaks in connections: <i>Standard sized pipes:</i> SDE must intervene within 1 hour, and repair within 12 hours. <i>Larger sized pipes:</i> SDE must intervene within 2 hours and repair within 18 hours, or 24hrs for BONNA pipes. Delays for connecting customers to the network: There must be a connection within 15 days after a demand is made. Authorization must be obtained from the administrative authorities, at the expense of the customer.	<ul style="list-style-type: none"> <li>▪ The % of interventions within 1 or 2 hours.</li> <li>▪ The % repairs within 12, 18 or 24 hours.</li> </ul>
Maintenance of operation material (Article 20)	SDE must maintain and repair infrastructure and materials used in operations, including water meters. SDE must submit a maintenance plan to SONES to be undertaken for the following year.	<i>No indicators specified in contract or SDE's interpretation.</i>
Annual Report (Article 21)	SDE must prepare an annual report, containing specified information.	<i>No indicators specified in contract or SDE's interpretation.</i>
Demand Assessments (Article 22)	SDE must undertake demand assessments for each urban centre. SONES will take account of this when preparing the urban water sector plan.	<i>No indicators specified in contract or SDE's interpretation.</i>
Renewal of operation	SDE must renew at least 14,000 metres per	<ul style="list-style-type: none"> <li>▪ Number of water meters renewed</li> </ul>

materials, including meters (Article 23)	year and, in priority, those of public bodies and administration. If the number of meters installed per year falls short this target, SDE must carry out the additional works the following year or SONES can charge SDE for the cost of works carried out by another company.	
Network renewal (Article 24.1)	SDE must renew the network including at least 17km of pipes of 100mm diameter, (or an equivalent area.) As with the meters, SDE must carry out network extension the following year if it falls short one year, or SONES can charge the cost of this to SDE. SDE must also provide SONES with an annual plan of network extension.	<ul style="list-style-type: none"> <li>▪ Cumulative km of network renewed.</li> </ul>
Renewal of connections (Article 24.2)	SDE must renew at least 6,000 connections each year. The same rule applies as with metre and network renewal when a target is not reached.	<ul style="list-style-type: none"> <li>▪ The number of connections renewed</li> </ul>
Programme of Investments (Article 27)	SDE must prepare and present SONES with a suggested programme of investments to be integrated into SONES programme of investments.	<i>No indicators specified in contract or SDE's interpretation.</i>
Billing and bill collection of drinking water (Article 29)	SDE must recover payment of at least 95% of bills for the first year, 96% for the second year, and 97% from the third year onwards. SDE must limit the percentage of estimated bills to 2% of bills produced every year.	<ul style="list-style-type: none"> <li>▪ The % of bills paid</li> <li>▪ The % of non-estimated bills</li> </ul>
Monthly payment to SONES (Article 30)	SDE must pay SONES's fee on a monthly basis.	<i>No indicators specified in contract or SDE's interpretation although in Annex B of the contract there is a table summarising reporting requirements.</i>
Customer relations (Article 32.1)	SDE must establish and run a centre for receiving customer complaints, and recording the details. SDE must react to all complaints in 24 hours. The reduction of complaints is an indicator of performance and of improvement in customer service.	<ul style="list-style-type: none"> <li>▪ The % of complaints responded to within 24 hours</li> <li>▪ The number of complaints/year</li> </ul>
Source: World Bank (2002)		

**Incentive scheme:** SDE collects all tariffs, and pays back one portion its revenues to SONES in order to finance its activities, as shown below.

<i>Allocation of tariff proceeds between SONES/SDE (Source: World Bank (2002))</i>	
Payment to SONES	Payment to SDE
<ul style="list-style-type: none"> <li>▪ Debt service for investments and rehabilitation;</li> <li>▪ A contribution to the costs of new investments; and</li> <li>▪ SONES's administrative costs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operating and maintenance costs for production and distribution facilities;</li> <li>▪ General expenditure and profits of the operation;</li> <li>▪ The cost of the investments and renewals specified in the affermage and performance contracts; and</li> <li>▪ The cost of assisting SONES to tender and supervise construction works.</li> </ul>

The payment to SONES and SDE follow remuneration formulas detailed in the affermage contract (Annex 3 II), and described below.

**SONES's payment** depends on the volume of water produced, as SONES's costs are related to the capacity of the system, and not to its efficient operation. Its annual payment is calculated by multiplying the volume produced ( $V_p$ ) by the figure resulting from subtracting the operator price ( $P_e$ ) from the average tariff ( $T_m$ ) for that year. (The average tariff is a weighted average tariff taking into account the different volumes produced for ordinary customers at one tariff level, and market gardeners charged by different tariff levels.) This is multiplied by the two performance indexes, one which sets targets for the rate of leakage recovery ( $n'f$ ), and the other to bill recovery ( $n'r$ ) (see the box below).

$$\text{Payment to SONES} = (T_m - P_e) \times (V_p) \times (n'f \times n'r)$$

Where:

$P_e$  = Operator price (FCFA/m<sup>3</sup>)

$n'f$  = Target rate of leakage recovery for this year (e.g. 0.85 in year 2000)

$n'r$  = Target rate of bill recovery for this year (e.g. 0.97 in year 2000)

The payment to SONES therefore increases with the volumes produced, and increasing rates of performance targets (as shown in the performance targets table).

The **payment to SDE** is based on a previously agreed operator price, which was the parameter on which the contract was awarded. This price is adjusted annually for inflation. The operator's remuneration formula also takes into account achievement of two of the performance targets, providing incentives for the operator to limit water losses and to optimize collections. The operator is rewarded for achieving specific targets, and penalized for failing to meet them.

The payment to SDE follows the formula below:

$$\text{Payment to SDE} = (T_m \times V_p \times n'f \times n'r) - [(T_m - P_e) (V_p \times n'f \times n'r)]$$

The first part of the formula shows the estimated amount collected by SDE relating the average tariff with the volume produced, and the actual rates achieved for leakage reduction ( $n'f$ ) and bill recovery ( $n'r$ ). The second part of the formula is the formula for the payment to SONES detailed above. This formula can be rearranged to directly see the incentives for reaching the targets:

$$\text{Payment to SDE} = P_e (V_p \times n'f \times n'r) + T_m [(V_p \times n'f \times n'r) - (V_p \times n'f \times n'r)]$$

The second part of this formula shows that SDE can benefit if it achieves higher rates for both targets, or will be penalized if it falls below the targets (as the difference will be negative and bring the overall payment down). SDE's remuneration is therefore the same payment for each cubic meter, irrespective of the tariff at which it was sold. This means

that there is no disincentive to serving poorer customers who would pay the low social tariff. However, the overall payment is dependent on the average tariff so serving a higher proportion of social tariff customers can be financially detrimental for SDE.

<b>Performance targets linked to financial incentives in the payment to SDE</b>		
<b>Reduction of leaks (n,f)</b>		
SDE must increase the ratio "Volume of water billed/volume of water produced" to 85% by year 2000, 5 years after signing the performance contract. The starting point in 1994 is quoted in the contract at 73%, but it also specifies that a study should be carried out to assess the 'real' starting point with a view to amending the final target if the two points were significantly different. Since 1994 it has been found that the starting point was below 70%. Targets were renegotiated tacitly between the two parties in 1998, leading to a new starting point and allowing two additional years to SDE to reach the 85% target.		
Year	Initial Target	Revised Target
1994 (starting point)	73%	68.5%
1996	74%	69.5%
1997	77%	72.6%
1998	80%	75.6%
1999	83%	78.6%
2000	85%	81.6%
2001	85%	83.6%
2002	85%	85%
<b>Recovery of bills (n'r)</b> : There are also targets to increase the recovery of bills (% of bills paid as a proportion of the bills sent out) as shown below:		
	Year	Target (% bills)
	1	95
	2	96
	3	97
The rate of recovery at 97% must then be maintained after year 3.		

**Sanctions:** Additional to the financial incentives related to performance targets, there are additional sanctions specified in *Article 85* of the affermage contract that must be paid by SDE in the event of:

- Unjustified interruptions of the water distribution;
- Reduction in the water pressure;
- Failure to produce reports or documents required in the contract; and
- Insufficient production of water from the treatment plant.

**Evaluation of Risks:** In the current organization of the sector, SONES has responsibility for investment risks and financial risks associated with servicing debt. Both SONES and SDE face risks related to collection, but SONES may be more seriously affected by any macroeconomic shocks due to its responsibilities in financing investments. SDE takes on operational costs, and shares with the SONES the risk of nonpayment of bills, which has been a historical problem in the public sector.

**Subsidies:** In Senegal, determining who benefits from cross-subsidization is difficult because of poor cost accounting. Although Dakar and its region accounted for 57% of connections and 72% of sales revenues in 2001, water costs are likely to be substantially higher in this region than elsewhere because its water source is 150 kilometers away. No new municipal centers have been added to the service area since privatization. A qualitative review suggests that some secondary towns and rural areas might be cross

subsidizing urban centers and would be better off with a local, autonomous supply system rather than being served by the national operator. Unless managers in new towns know how much subsidy they receive, they might be reluctant to be incorporated into a service area for fear that they will pay more than they need to.

### **3. Analysis of the status and effectiveness of the operating contract:**

This approach has yielded good results: leakage was cut from 31% to 22% (although the 15% contractual target is difficult to reach) and bill collection improved dramatically to 97%. A significant result in Senegal is to have convinced government institutions to pay their bills, whereas in Cote d'Ivoire, low payment rates by government institutions is a major problem. In both countries there is a high rate of disconnection for non-payment (about 10% of connections in Senegal and 20% in some areas of Cote d'Ivoire). Finally, although the measure of performance is based on average figures across the service area, it appears that SDE's performance is similar in all centers regardless of size and location.

### **4. General recommendations as to replicability of the contracting experience:**

Results in Côte d'Ivoire and Senegal suggest that a private national utility can provide water services to small population centers through cross-subsidization. But the present arrangements in these countries have shown limited potential for improving service provision or ensuring its sustainability in rural areas. Transferring risk to the private sector strengthens private companies' incentives to expand access and improve sustainability by relieving the pressure on government funds. With support by a strong, committed government, introducing competition from small, local operators with targeted subsidies could promote transparency and foster the expansion of services in rural areas.

### **5. References:**

World Bank, 2002, *Emerging Lessons in Private Provision of Infrastructure Services in Rural Areas: Water Services in Cote d'Ivoire and Senegal*. World Bank/PPIAF, April 2002

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## Sudan – Yei Electric Cooperative

### **1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:**

Yei is a town in Southern Sudan 50 miles north of the border with Uganda, with an estimated population in excess of 120,000, including 20,000 internally displaced persons. Twenty-five years of conflict destroyed most of the electricity system except for one or two poles in the town, and an old, damaged power generation station.

### **2. The reform process:**

USAID is financing the rebuilding of the electric infrastructure in Yei through a cooperative agreement with NRECA International. While rebuilding the physical infrastructure is a tremendous challenge - all inputs must be imported – the project aims to form a local electric cooperative that will own and manage the rebuilt utility.

The electrification commission named by the Yei River County Council decided to form a consumer-owned and operated utility. The driver behind this decision was the desire of the community to take responsibility for its infrastructure, and not to depend on the nascent GOSS rural electrification program to oversee provision of public services in Yei. This will be the first user-owned utility in Sudan.

### **3. Key characteristics of the sales/operating contract.**

Electric cooperatives are not commonly thought of as management or operating contracts, but in effect they share many characteristics of a management contract. Granted a franchise by the Yei River County Council, the cooperative operates as a separate profit and loss center and is expected to function on a cost of service basis.

Utility staff is composed entirely of Yei inhabitants, newly trained for their responsibilities. Administrators perform all management functions. Meter readers, billing clerks, and collection clerks manage commercial functions. Linemen connect new consumers and operate and repair the distribution system. Power plant operators manage power generation. NRECA is overseeing operations and utility management for the first eighteen months of operation while personnel are trained and assume responsibilities.

NRECA is using standard performance benchmarks that are employed when advising other rural utilities to set expectations for operating performance. Monitored variables include billing and collection efficiency, technical losses, non-technical losses, administrative costs as a percentage of total cost of service, among others.

Under NRECA's contract, NRECA works in an advisory capacity with the newly established cooperative, rather than as an O&M contractor. NRECA advises the cooperative's staff, management and board on critical functions and systems. This model obviously requires that there are competent – and honest – individuals in positions of

control, including the board and management. NRECA also supervises basic management and operational tasks.

**4. Analysis of the status and effectiveness of the operating contract:**

Construction of the public lighting system in central Yei was completed in September 2005. Construction of an expanded distribution and generation system was begun in September 2006 to energize 700 consumers. Yei residents have expressed hope that the electrification project will increase security and livelihood opportunities. The system will be expanded as resources permit and as demand grows.

**5. General recommendations as to replicability of the contracting experience:**

No documents about Sudanese case are included in this database. In general, however, rural electric cooperatives assisted by NRECA have been successful in the Philippines, Bangladesh, Latin America and other countries. The model, if developed with a competent and business oriented local staff, can be successful.

**6. References:**

USAID, “Repowering Southern Sudan”

Personal communications by Jas Singh with Dan Waddle, NRECA. September 28, 2006

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## Tajikistan – Pamir Energy

### 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform.

With the collapse of the former Soviet Union, conditions in the mountainous eastern Pamir region of Tajikistan deteriorated dramatically. Electricity infrastructure quickly fell into a serious state of disrepair and power plants and many distribution lines were destroyed during a civil war in 1992. The sharp economic decline (GDP contracted by 60%) and neglect by the national electrical utility left 43% of homes in the region without power during the harsh winters, where temperatures reach -30° C. Schools, health centers and small businesses were forced to close in cold winter months stifling development.

At that time Tajikistan's estimated per capita income was around US\$160/year and 60-80% of people lived below the poverty line, relying on subsistence agriculture. With many people forced to use wood for cooking and heating, 70% of the region's sparse forest cover was lost. Smoke inhalation from indoor wood fires led to a sharp increase in respiratory disorders.

The biggest constraint in Pamir's power system was generation. The bulk of the electricity was from hydroelectric power. The system was in desperate need of rehabilitation and repairs and the energy demand increased about 15-fold in winter for heating, when hydro capacity was low due to freezing. Transmission and distribution systems were also in poor condition. Although technical losses were not known, later estimates indicated they were high, as total losses were well over 40%. Many households did not have meters and those that did often bypassed them, a practice that has increased in line with increases in consumer energy availability. Even if they paid, retail rates were around 0.4¢/kWh, less than 1/10<sup>th</sup> of the production cost. Under these conditions, attracting private investment into the energy sector with traditional approaches would have been difficult.

### 2. The reform process

The reform process was initially conceived of as using an independent power producer (IPP) to rehabilitate existing hydro systems and add new capacity. However, it was recognized that private investment would be difficult to attract, given on-the-ground conditions and that the national utility, Barki Tajik, was not a creditworthy off-taker for commercial private sector lending purposes. In addition, such an arrangement would not address billing and collections, where meter tampering and theft were commonplace.

Realizing that an innovative public-private partnership with donor assistance would be needed to rehabilitate and manage the electricity infrastructure in eastern Tajikistan, a concession agreement covering generation, transmission and distribution was conceived. In 2002, the Aga Khan Fund for Economic Development (AKFED) and IFC established a private company, PamirEnergy, with equity of 70% (\$8.2 million) and 30% (\$3.5 million) respectively. A 25-year concession contract was awarded to PamirEnergy that

included operation of the electrical utility assets in the Pamir region, rehabilitation of transmission infrastructure and hydro generation capacity and regulation of the level of Lake Yashilkul to ensure adequate water flows in winter. PamirEnergy also assumed responsibility for the utility's 28,000 existing customers and 595 employees.

Stakeholder Consultations. Even moderate environmental and social impacts in this region can have significant repercussions for people's livelihoods, so the PamirEnergy project team carefully designed mitigation measures to ensure that negative impacts would be minimized. During project design, 17 public hearings were held in the Pamir region, engaging a wide range of the population including townspeople, villagers, school teachers and hospital workers.

### **3. Key characteristics of the sales/operating contract.**

Subsidies. As part of the project, the World Bank provided a \$10m IDA credit to the Government of Tajikistan at a rate of 0.75 percent. This was on-lent to PamirEnergy at 6 percent, allowing PamirEnergy to partially finance its capital investments at less than commercial terms and to pass these savings to customers. This 5.25 percent lending margin, plus a \$5m grant by the Swiss government, was used to finance a tariff subsidy to ensure that a 'lifeline' monthly supply of electricity is delivered at a very low rate even to the poorest of households. Also built into the tariff structure is an "Early Years Subsidy" – a long initial grace period that allows tariffs to climb slowly from current levels – thus further reducing risk and keeping tariffs affordable. The subsidy fund is currently scheduled to phase out by 2010, but it is anticipated that these arrangements shall be extended for an additional 5 years.

Payment Structure. PamirEnergy receives payment based on the retail rates, as well as payments from the subsidy fund described above. Reducing losses allows PamirEnergy to sell more electricity and thus capture increased customer revenues and subsidy fees. Increased collections also allows PamirEnergy to increase revenues without increased investments other than meters.

### **4. Analysis of the status and effectiveness of the operating contract.**

The results have been positive as determined by the major stakeholders. Over the past four years, PamirEnergy invested \$28m in rehabilitating the system and improved both the business and service performance of the utility. One of the most important physical accomplishments of the project to date was development of the water regulatory system at Lake Yashilkul, which greatly enhances capacity during the critical winter months. Other important achievements include: available capacity has increased from 28 MW before the contract to 42 MW today; 15,000 digital and analog meters have been installed in most urban areas, with some rural areas still relying on group metering; collections have risen to 91%, a remarkable achievement in just about 4 years; and ongoing rehabilitation of system substations and lines. Technical losses initially increased as the new and rehabilitated generation capacity came on-line, so second phase financing is expected to help address these increased losses. PamirEnergy is now considering a second phase investment of \$10-15m, where an increased focus will be on reducing

technical losses in the network, as well as continue to rehabilitate and add new generation capacity and install an additional 12,000 customer meters. The Concession Agreement allows for an increase in tariffs where new investment is required and agreed.

## **5. General recommendations as to replicability of the contracting experience**

AKFED believes this is a good model given the difficult operating environment, albeit with a number of lessons learned that can be used to improve the model for future replication elsewhere. There were many unknowns at the time the contract was designed to set detailed performance targets tied to specific incentives and in defining a fixed cost/tariff pass through arrangement. For example, it was not possible to estimate total investment requirements, technical losses, staffing, operating costs, various types of losses, and so forth. A key improvement that could be made (for future replication) would be to factor the cost/revenue uncertainties into the tariff mechanism. The extent of these uncertainties made participation by AKFED, IFC and the World Bank a critical aspect in helping the project move forward. It was also clear that the total investment needed was severely restricted in order to maintain tariffs at a low and affordable level.

## **6. References**

AKFED website

([www.partnershipwalk.org/usa/content/featured\\_sections/project\\_briefs/pamirpowerplant.html](http://www.partnershipwalk.org/usa/content/featured_sections/project_briefs/pamirpowerplant.html))

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# Uganda, National Water & Sewerage Corporation's Mbale Service Area

## 1. Summary of key characteristics of the distribution enterprise, pre-reform, that led to the decision to reform:

It is important to note that the Ugandan national water sector reform had several components, all of which contributed to the success that has been achieved. At the national level, the Government of Uganda's Ministry of Water signed multi-year performance contract with the newly incorporated NWSC. Then NWSC subsequently let a number of different types of contracts and agreements to improve the performance of individual towns and sections of Kampala. These included Area Management Contracts, Service and Revenue Enhancement agreements, and finally, Internally Delegated Area Management Contracts, IDAMCs. The latter – IDAMCs – is the focus of our case study here because these represent the most successful approach that is now being replicated throughout Uganda. IDAMCs are operating contracts with private operators for a large a single service area, such as a town or a zone in Kampala, in the country. This case will examine one of the early IDAMCs that was let for Mbale Service Area.

As of the end of 2006, NWSC has let approximately 57 private IDAMCs for individual towns and zones in Uganda. These contracts obligate the operators to provide gradually improving water and sanitation services, and allow the operators to earn significant bonuses if they exceed targets set in the contracts. The contracts were first let in 2001, and have since gone through several “generations” of contracting. Each of the early contracts was for one year; NWSC has recently extended the duration of contracts and included limited investment obligations by the private operators. Private operators are generally former NWSC employees who have resigned in order to be eligible to undertake one of these innovative (and potentially lucrative) contracts.

Mbale District is located in Eastern Uganda, 256 kilometers (154 miles) from the capital, Kampala City. NWSC's Mbale Service Area covers much of Mbale and Tororo district to the south and Pallis district to the east. The service area is comprised of 24,571 households, with an average of 7 persons per household. While total coverage of water services is high (80%), sewerage coverage is limited to the central business district, industrial area and a small area of old settlement. Rural supply coverage was very low.

## 2. The reform process:

In 1998 the World Bank pointed to management as a critical problem for NWSC:

“Over the last 10 years, the GOU in partnership with the World Bank and Other Donors have made significant investments (over US \$ 100 million) in the Urban Water and Sewerage sector. These investments have contributed immensely in rehabilitating the existing infrastructure under the NWSC management. Unfortunately, these investments have not been matched with the necessary efficient commercial and financial management capacity that can ensure the delivery of sustainable services in the medium to long-term”.

Uganda's reform of its water sector began in 1998 with its "100 days" program to turn around the sector's declining performance. This was followed by a Service and Revenue Enhancement Program (SEREP) that had a strong customer focus. Subsequently the proposal was made for NWSC to let a set of operating contracts, with clear and simple performance targets and strong incentives to achieve these targets.

The Government of Uganda's (GOU) intentions with the first national performance contract (2000-2003)<sup>27</sup> was to improve the utility for an eventual handover to the private sector. The contract would also create a track record for eventual private sector participation. The NWSC's intention for the contract was to create a mechanism for government to pay its water bills, to reduce interference from government and to develop a framework for providing subsidies for the poor. The GOU was represented by the Permanent Secretaries of the Ministry of Water, Lands and Environment and the Ministry of Finance Planning and Economic Development. NWSC was represented by the NWSC Board Chairman and the Managing Director

### **3. Key characteristics of the national performance contract.**

Under the national performance contract, the GOU granted full commercial authority to NWSC. This included capital expenditure, commercial borrowing, staffing and tariffs. It granted NWSC a debt free for three years (2000-2003). It agreed to pay for non-viable investments imposed upon the NWSC by the GOU. The GOU also agreed to pay all utility bills from government agencies.

NWSC's obligations included identifying a 3 year network expansion plan and using internally generated earnings for investments, carrying out an update of the assets register in all towns, developing "bottom up" ways of improving staff productivity under the internal performance enhancement programs, restructuring to improve management effectiveness, and preparing an information technology plan for the sector .

The Government/NWSC contract was first operationalized through Area Performance Contracts (APCs) between NWSC headquarters and subsidiary areas. The contracts were for one year, renewable up to three years. The incentive mechanism in the contract capped bonuses at 25% of basic salary. The contracts defined the obligations of each party.

**Performance targets:** According to the incentive scheme in the contract, the NWSC staff was entitled to a performance incentive element of 25% of their annual basic salary. The NWSC Board decided appropriate bonus rates annually according to achievement of performance targets in the contract. Problems with the APCs included:

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<sup>27</sup> The contract was between NWSC and the government, represented by the Ministry of Water, Lands and Environment and the Ministry of Finance Planning and Economic Development.

- SMART targets were not challenging enough
- Incentives were capped with low and demotivating ceiling
- Investments were not linked to performance improvements
- There was less worker involvement and buy-in than needed.

To remedy the lack of challenge of the SMART targets, a “Stretch Out Program” was introduced to:

- Provide more effective performance targets
- Increase participation through worker involvement
- Increase work speed, simplicity and self-confidence
- Lift the capping of incentives
- Link investments to performance improvement
- Reduce bureaucracy

The Stretch Out Program emphasized a team approach and had inadequate emphasis on individual responsibility. Accordingly a second Government//NWSC Performance Contract was signed for the period 2003-2006. Key features included:

- Higher performance targets
- Higher expectations for commercialization programs including private sector involvement in the NWSC
- Re-focus on Management and Operations, Sustainability and Tariff reform, with emphasis on provision of services to the urban poor.
- A better performance review process
- More specific investment mandates defined

This second national performance contract differed from the first in the following ways:

- Indicators changed from absolute numbers to ratios, such as receivable ratio, collection period, and current ratio.
- Performance standards were more stringent
- Incorporated an MOU with government for payment of bills.
- Included investments funded from internally generated resources.
- Incorporated a network expansion fund, new connection fund, and maintenance fund.

Corrective measures were applied to the APCs:

- More autonomy to operating teams
- Better incentive mechanism considering more parent performance indicators
- Strengthened monitoring through “checkers” system
- Better definition of roles and obligations
- Better and more challenging performance targets
- Introduction of well structured management fee structure made up of Base Fee + Performance Fee + Incentive Fee

*Figure 1: Regulation by performance contracts - current Ugandan urban water framework*



**Incentives:** Using lessons learned from previous contracting approaches, NWSC is currently implementing a set of Internally Delegated Area Management Contracts (IDAMCs) as part of its 2003-06 corporate plan. These contracts differ from the earlier Area Performance Contracts by assigning more operating risk to service providers.

The key feature distinguishing IDAMCs from a conventional management contract with a private service provider is that the IDAMC is a litigation-free partnership. The NWSC board is the final arbitrator in disputes. In addition, most firms that have negotiated these contracts are former employees of the national utility who have severed their employment in order to operate under the new incentive framework.

The Internally Delegated Area Management Contracts (IDAMCs) have a well defined incentive mechanism that relates to cash operating margin (COM), unaccounted-for water

(UFW), working ratio (WR), days receivable ratio (DRR) and connection efficiency (CE) as follows:

Management Fee under IDAMC = Base (Fixed) Fee + Performance Fee + Incentive Fee; where:

- Base Fee = All uncontrollable costs + 75% (key partners' pay + controllable costs).
- Performance Fee = 25% (key partners' pay + controllable costs) times (number of achieved weighted targets divided by total number of weighted targets)
- Incentive Fee = X% times COM ( $m UFW_a + n WR_a + p DRR_a + q CE_a$ ); where X% the agreed percentage of the improvement in COM to be retained by the operator as bonus, m, n, p, q are weighting factors and subscript "a" denotes incremental achievement.

Thus, the performance fee gives appropriate weight to each target—in a pass/fail framework. The incentive fee also rewards movements toward key targets. A penalty system under IDAMCs involves withholding payment of the controllable costs if key targets are not met as shown in the management fee formula.



15	Percentage of samples passing bacteriological water quality tests	%	100		
16	Percentage of samples passing physico-chemical water quality tests	%	100		

**CATEGORY E: FINANCIAL INDICATORS**

No.	Indicator	Unit	Minimum Monthly Performance	Average Monthly Target (Year 1)	Average Monthly Target (Year 2)
17	Billing - Total	Ushs '000	140,000	148,370	154,571
18	Collections - Total	Ushs '000	140,000	163,207	170,028
19	Cash Operating margin*	Ushs '000	67,770	80,877	87,788
20	Arrears – Total ** Baseline – 788,488	Ushs '000	788,488	818,44	432,858

\* Cash Operating Margin – is shall be defined as :

Revenue receipts – Operating expenses

Where, for this purpose;

Revenue receipts shall be inclusive of VAT, and

Operating expenses shall exclude re-sanding and de-sludging costs as well as medical expenses of special nature chargeable to the Area but paid by Head Office.

\*\* Indicators with this sign are cumulative. The figures shown are those to be achieved at the end of year. The monthly targets will be taken as the linear interpolation between the baseline and the end of year targets.

#### 4. Analysis of the status and effectiveness of the operating contract:

Achievements of the reform over 1998-2006 include:

- Total Connections increased from 50,826 to 152,138
- Billed Connections from 31,284 to 132,444
- Metered Connections from 37,217 to 149,963
- New connections per year from 3,317 to about 28,521 p.a.
- Staff per 1,000 connections reduced from 36 to 7 in 2006
- Staff costs as a % of Operating costs reduced from 45% to 42%
- Unaccounted for water reduced from 51% in 1998 to 29.7% in 2006
- Collection Efficiency increased from 60% in 1998 to 90% in 2006
- Annual turnover increased from USh21 bn to USh58 bn in 2006 (1USD =1781.5 Uganda Shillings, USh)

- Operating. profit before depreciation increased from USh1.9 bn to USh16 bn in 2006

The reform program is a success. It has produced confidence in the government, a motivated workforce in the sector, and demonstrated improvement in services.

Remaining to be done is to eliminate cases of fraudulent activity due to the abrupt increase in managerial autonomy, and reduce temptation to manipulate information to earn incentives.

#### **5. General recommendations as to replicability of the contracting experience:**

- Performance contracts work if well managed and continuously re-engineered
- Former employees respond well to better performance incentives and targets
- The “low capex” approach can work if performance improves due to incentives

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DFID brochure on Uganda water

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