

LACK OF ACCESS TO ENERGY

Background paper prepared for the Enabling Environment Conference by:

The World Bank Group

I. INTRODUCTION

This background paper aims to address issues related to increasing reliable access to power in Afghanistan's urban and rural contexts. It focuses both on necessary public reforms and investments, and on exploring opportunities for leveraging private sector know-how and investments.

The electricity sector in Afghanistan is generally recognised as one of the primary constraints to the development of the country's economy. In the initial period of reconstruction, the efforts of the Government and its international development partners have focused on both the rehabilitation of damaged physical assets and the creation of new ones. The role of the private sector in this period has been limited, for the most part, to supplying goods and consulting services under contract. While the need for public investments in the power sector's physical infrastructure will continue for years to come, it will also be necessary to tap the financial resources and managerial "know-how" of the private sector, so that the power sector becomes an engine of economic growth and not an obstacle to development. As physical assets are completed and become operational, there is growing recognition for the need to reform the sector's institutional and policy framework so that the value of significant investments in the sector, and their long-term sustainability, are maximised and

ensured. This process of policy reform entails, in part, supporting the growth of private initiative in the economy and exploiting opportunities for public-private partnership.

II. ACCESS TO POWER: CURRENT STATISTICS AND TRENDS

In all likelihood, the data on access to electricity in Afghanistan most commonly cited by the Government and others – namely, that **only six percent of the population has access to electricity** – significantly understate the actual level of access of electricity in Afghanistan today. Data from two recent household surveys indicate a much higher access to electricity.

The National Risk and Vulnerability Assessment (NRVA), a large, country-wide survey that was carried out in 2005, showed overall access to electricity at about 25 percent. This result is equivalent to 73 percent of urban respondents and 14 percent of rural respondents reporting access to electricity from any source. In the World Bank-commissioned Kabul Household Energy and Water Survey (KHEWS) carried out in August 2006, 89 percent of respondents reported access to electricity from any generating source. When batteries were included, this figure rose to 93 percent. Table 1 shows comparative data for these two surveys.

Table 1: NRVA and KHEWS Comparative Data
Households Reporting Connection to (i) Public Supply of Power and (ii) From Any Source

	<i>N</i> =	Public access %	From any source*
NRVA national data (incl. <i>kuchi</i>) (2005)	30,020	15.6	24.8
NRVA Rural	22,601	4.3	14.1
NRVA Urban (incl. Kabul)	5,755	64.2	73.0
NRVA Urban (excl. Kabul)	3,480	67.7	72.5
NRVA Kabul	2,275	58.7	73.6
KHEWS Kabul (Aug 2006)	2,000	68.2	88.6

* For NRVA "any source" includes public supply, government generator, personal generator (engine), personal generator (microhydro), community generator (engine), community generator (microhydro) and solar.

For KHEWS "any source" includes Breshna (own house), Breshna (through neighbour's connection), personal generator (own), generator (neighbour's), generator (locally privately owned, not neighbour's) and community generator.

A few factors account for the large discrepancy between the oft-cited low figure of six percent access and the survey results that show considerably higher levels of access. First, the estimate of six percent nation-wide access was probably inaccurate even when it was calculated some years ago – the result of an extrapolation of poor-quality data from registered utility customers on average household size and the overall population that were available after the fall of the Taliban. Second, the years of reconstruction efforts by the Government (or the utility acting on its behalf), have yielded results in urban areas and modestly increased access in rural areas (primarily thanks to the National Solidarity Program). Finally, the private efforts of individuals and domestic entrepreneurs have contributed to the increased access to electricity and other energy services.

The important points to note are that:

- ◆ **Access to electricity has been increasing steadily** in recent years.
- ◆ Improvements in this area will likely **be the result of continued Government action** (policy reform and public investments), along with the private actions of individuals and entrepreneurs.
- ◆ Strong evidence that **Afghans highly value electricity** and demonstrate a "willingness to pay" should send a positive signal to the private sector and to policymakers.

At the same time, it must be stressed that, notwithstanding these higher levels of access to electricity, the electricity sector continues to be a severe constraint to the economic and human development of Afghanistan. The power supplied is generally of **poor quality**, meaning that voltage levels fluctuate (which damages machines and appliances) and power surges and blackouts are common. There are still **extreme supply-side constraints** for existing consumers (power from the public grid is available only a few hours daily in most places), to say nothing of the supply that would be required to fuel economic growth; industrial load is virtually non-existent. **The high cost of private generation** is prohibitive for most of the population, allowing for only very limited generation when the public supply is not available.

The basic challenges in developing the power sector are:

- ◆ For **consumers on the public grid** (primarily urban-based consumers), increasing the quantum and quality of supply of affordable electricity, taking particular care to ensure high quality of supply to the fledgling industry of Afghanistan to "jump start" economic growth.
- ◆ For the majority of **rural consumers** who will not be connected to a public grid in the foreseeable future, increasing their access to reliable supplies of electricity needed for basic services (such as lighting) and developing income-generating opportunities through improved power supply.

III. POLICY RESPONSES

While policy innovation and reform will help to expedite the process of expanding access to power, the **constraints to rapidly increasing access to electricity** lie not so much in the arena of sector policy, but have more to do with the nature of the physical investments that are required, the objectively large scale of the problem, and in broad country issues such as the deteriorating security conditions. Given the fundamental economics of network-supplied services, areas with greater population concentrations and higher disposable incomes – that is, urban areas – will tend to show the most rapid and sustainable growth in response to investments in the sector (although there are other reasons why it will be important to continue to develop infrastructure in rural Afghanistan).

Afghanistan's various options for increasing generation capacity and supply were analysed in the course of the preparation of the *Power Sector Master Plan (2003)*.

The Plan identified the country's least-cost generation expansion options as being:

- ◆ The importation of low-cost electricity from Central Asia, which requires the construction of transmission lines (ongoing).
- ◆ The development of domestic generation capacity using the natural gas at Sheberghan (which has been delayed but has financing from USAID).
- ◆ The rehabilitation and expansion of existing hydropower plants as an important part of the supply story for Kabul and some other locations (taking place).
- ◆ In the medium- to longer-term, construction of new hydropower capacity and development of coal-based generation could conceivably be economic options for Afghanistan, but it would likely be several years before such projects would begin to produce electricity.
- ◆ While the Power Sector Master Plan identified the Baghdara Hydropower Project as worthy of immediate investigation (and a feasibility study is underway), projects of this type require some years of site investigation and new projects should not be considered an immediate investment priority (as they are apparently by some within the Government).

The Government should **renew its focus on implementing the Power Sector Master Plan** to ensure that the economy has an adequate supply of generation at its disposal.

Beyond that, much more attention should be given to **the rehabilitation and expansion of distribution systems** throughout Afghanistan. The present conditions of limited supply mask the problem of limited distribution capacity, but as sources of supply become more secure, local distribution networks will emerge as a constraint to delivering power to the end-consumers. In fact, this has already happened in Mazar-e Sharif and Herat, where adequate supply is available through interconnection to neighbouring countries but the local distribution networks cannot carry the available supply.

The **solution to this problem** will be found partly in continued public investments (with support from donor countries) and partly in unleashing the potential of the domestic (and, potentially, foreign) private sector to generate and distribute power (see Box 1 on Private Power Distribution in Ghazni). The policy actions called for here are not complex, generally falling under the heading of **creating the enabling environment** and “doing no harm”.

While there are no known legal obstacles to the private provision of power, there are potentially practical obstacles such as interference from local officials and the utility, and issues of safety regulation and technical standards.

As the example of OEC in Ghazni suggests, there is potential for small- and medium-scale providers in smaller cities and towns (including in particular those that are not located close to transmission lines) to contribute to efforts to rapidly expand access to and improve the quality of supply of electricity. Government policy should be directed at encouraging this form of private sector activity.

The key investments that are required to ameliorate the power deficit are:

- ◆ The transmission lines from Uzbekistan to Mazar-e-Sharif and Pul-e-Khumri; Pul-e-Khumri to Kabul; Tajikistan to Pul-e-Khumri; and eventually Turkmenistan to Mazar.
- ◆ The rehabilitation and expansion of existing hydroelectric plants.
- ◆ A gas-to-power plant at Sheberghan (subject to satisfactory findings from additional investigations to be conducted).
- ◆ Potentially, other high-voltage transmission lines that could pass through Afghanistan in the broader context of regional energy trade.
- ◆ Distribution.

The concept of “**conditions of confidence**”, or what is often called the “investment climate”, embodies a range of attributes in any economy that go beyond any individual sector. Clearly, in Afghanistan, a primary concern for both foreign and domestic investors would be the fundamental security, both of personnel and physical assets (which are often located in remote, vulnerable areas). Other aspects of investment climate (such as repatriation of profits) also obviously need to be addressed but are not specific to the power sector.¹

Sector-specific attributes in the power sector include **regulation and perceptions of regulatory risk**, such as whether an investor can be confident that the tariff allowed for the sale of electricity will make it possible for the business to cover costs, at a minimum. Given the low level of capacity in the sector and the existence of more pressing priorities, creation of independent regulatory capacity may not be appropriate in Afghanistan for the foreseeable future. Alternatives to consider are “regulation by contract”², which could give greater comfort to investors than the existence of a

Box 1: Private Power Distribution in Ghazni

Omary Electric Company (OEC) is a private power company that started business more than eight years ago when the Taliban were in power. The company runs eight diesel generators with a total capacity of about 1 MW and distributes power throughout the city through its own decentralised low-voltage networks. The generator sets are self-made from truck engines. OEC began using two engines from junk Russian trucks and has now expanded by acquiring junk Mercedes truck engines. OEC serves 8,500 customers with a total staff of 42 employees and offers 24-hour supply with decentralised generators. In contrast, the local division of the national utility, DABM, runs a centralised system serving 1,460 customers with 29 employees and offers only five hours of supply daily. (Thus, the customer to employee ratio of OEC is four times greater than that of the local DABM branch.)

OEC offers the four following tariff groups:

- 24-hour supply
- load dependent
- evening lighting
- flat rate (100 Afs) for one 18 W bulb, 14 hours in winter, 10 hours in summer for shop lighting at night for security
- holy places, such as mosques, are served free of charge

The tariff is tied to the price of diesel. In July 2006, the tariff was 35 Afs/kWh; it is noteworthy that even though this was slightly higher than the tariff offered by the local DABM, OEC was clearly more competitive and was gaining customers thanks to the quality of supply offered.

OEC categorises its customer in three classes:

- customers who must pay within a month or face being cut-off from the power supply
- good customers who may pay with delay
- government offices which often face cash flow problems due to delayed budget disbursements and receive a credit of up to four months

Previously, OEC offered automatic switches which cut off customers in case they drew more load than agreed, and customers paid on the basis of flat rates. Nowadays, all 8,500 customers are metered. New customers pay a non-refundable connection fee of between 1,500 Afs and 3,000 Afs, depending on the connection distance.

Of note is the contention of the local DABM branch in Ghazni that when DABM customers fall far behind in their payments to DABM, they shift to OEC, leading to large outstanding accounts receivable for the utility. It is not possible to confirm or refute this contention, but obviously in encouraging the development of private provision of power, the Government will need to ensure that the financial position of the local utility is not undermined by widespread migration away from utility and refusal to pay bills. Discrete definition of service territories and measures to strengthen collection capacity could help address this potential problem.

fledgling regulatory agency, and light-handed economic regulation that would allow small, self-contained systems (whether rural or urban in location) to be “self-regulating” i.e. to charge what the market would bear (as described in Box 1).

Domestic and foreign investors alike would benefit from a “**one-stop window**” in the Ministry of Energy and Water, or some other appropriately designated agency, that would allow them to handle all required transactions with the Government (licenses, fees) in one location, thereby facilitating the investors’ work with the Government and reducing the potential for corruption.

For large-scale projects involving foreign investors, the Government could help build investor confidence by offering Government guarantees, potentially backstopped by a World Bank Partial Risk Guarantee (PRG) or similar instruments provided by other development agencies. PRGs

cover private lenders against the risk of a government-owned entity failing to perform its obligations with respect to a private project, and can cover a range of risks relating to government performance including:

- ◆ changes in law
- ◆ failure to meet contractual payment obligations
- ◆ obstruction of an arbitration process
- ◆ expropriation and nationalisation
- ◆ foreign currency availability and convertibility
- ◆ non-payment of a termination amount or an arbitration award following a covered default
- ◆ failure to issue licenses, approvals and consents in a timely manner

IV. ADDRESSING THE CHALLENGE OF PROVIDING POWER TO RURAL AFGHANISTAN

The challenge of rural electrification will remain for many years and there are no easy fixes. Past years' achievements in increasing access to electricity in rural Afghanistan (primarily through the National Solidarity Program) have been made possible by heavy subsidisation, which may not be within the possibilities of the budget in years to come. Moreover, the rural electrification that is taking place provides only minimal levels of supply to cover basic demand for lighting, and in some cases, communal hot water heaters. The challenge of advancing to the next level of development – supplying electricity for income-generation – is not merely a matter of increasing the supply of electricity. Larger systems with more complex load structures (residential, industrial, different types of motors, etc.) have different physical properties that require much more sophisticated load management than demanded by a simple 20kW village system which provides only a few hours of lighting daily.

Thus, part of the challenge of developing rural Afghanistan is ensuring that there is **adequate technical capacity to run larger-scale electrical systems** in remote locations (adequate capacity does not exist today even in urban areas).

The rural electrification that is taking place in Afghanistan today is taking place in a **policy vacuum**, without a clear institutional framework within Government for oversight of policy and programmes. There is a *de facto* split of responsibility for rural electrification over different ministries, and coordination between ministries and donor-funded programmes could be improved. As a first step to creating a more robust enabling environment for rural electrification, the Government should articulate a **Rural Electrification Policy** that defines the goals and objectives of such a policy; clarifies the role and expected scope of subsidies in supporting rural electrification programmes; and emphasises the role of the private sector and rural cooperatives in advancing rural electrification. (Of note in this regard is the ongoing effort by ADB to prepare a draft Policy for Renewable Energy Rural Electrification.) The policy should recognise the limitations of the Government's ability to intervene meaningfully in this area in view of the size and remoteness of much of the rural population. The need for small-scale, site-specific solutions means that significant technical and financial resources would be required to bring modern energy services to the bulk of the population in rural Afghanistan, and these resources may not be available to the Government given other claims on the budget.

In order to advance the economic development of rural Afghanistan – which has strategic relevance in the struggle against the opium economy and the Taliban insurgency – the Government should seek to **promote rural electrification with an emphasis on income-generating activities** (e.g. support for village-level light industry). Given the paucity of financial and technical resources, the Government could adopt a policy of concentrating resources on larger villages or small towns, with villages in the vicinity serving as growth points. Such an approach would help avoid the dispersion of resources and increase the likelihood of sustainable development that could be monitored.

For the overwhelming majority of villages, connection to the grid will not be a viable option, and the focus should be on (eventually) identifying the most appropriate supply solution for each particular location (which might be a renewable or non-renewable supply option).

Given the scope of the problem of rural energy and the limitations of Government resources, it is particularly important to prioritise the specific measures that are to be pursued in order to improve rural energy access and to ensure the consistency of these measures with the developmental goals as defined by Governmental policy. From a practical planning perspective, a good starting point would be the development of a differentiated typology of rural areas identifying, among other variables, the proximity to the regional power grid; the suitability of establishing a rural “growth point” in the area; the size and density of population; the structure of the local rural economy; and the availability of hydro, wind, solar and biomass resources.

In order to stimulate small-scale private entrepreneurial activity and/or rural cooperatives (for which numerous positive developing country examples exist, including Bangladesh and Sri Lanka in the region), the Government could announce an explicit policy of “laissez faire” in rural electrification, recognising that most rural communities will remain outside the public grid for years to come and that such systems are most successful when they are self-supporting, whether developed as cooperatives or as private enterprises. Economic regulation need not be required in a small village-based system. USAID is piloting a cooperative approach in the smaller cities of Aybak and Qalat in which the initial support consists of provision of a diesel generator and technical assistance in the areas of distribution, billing and collections. The community is responsible for the operation and maintenance of the system.

Box 2. Rural Electrification Fund and Supporting Technical Assistance in Bangladesh

Introduction

The Bangladesh off-grid electrification fund, supported by the World Bank Rural Electrification and Renewable Energy Development Project (RERED), provides solar home systems to rural households at an unprecedented rate of more than 3,000 households per month. With the assistance of Participating Organisations (POs), which include municipalities, NGOs or the private sector, the programme has resulted in the installation of nearly 90,000 solar home systems to date – a figure much higher than the expected project target of 50,000 by 2008. With additional funding from the World Bank, GTZ and KfW, the target has now been raised to 200,000 units by 2010. The programme has also expanded its scope of funding to other rural energy services such as biogas and community electricity systems.

Fund Configuration

The fund is administered by the Infrastructure Development Company Limited (IDCOL), a non-bank financial institution, and provides both credit and Global Environment Facility (GEF) subsidies to 14 POs for the purchase of photovoltaic (PV) household systems. In addition to its function as a source of finance, the fund also supports the development of energy projects that are appropriate in rural Bangladesh.

Participating Organisations purchase PV panels, batteries and other components from a list of vendors approved by a Technical Standards Committee (TSC). Vendors wishing to participate in the programme must submit documentation, test certificates and guarantees to the TSC. Once approved, vendors may then sell their products directly to POs with their own contractual terms. Vendors are generally eager to cooperate with POs, often times offering delayed payment terms. POs must also work with vendors to arrange regular and expedient after-sales service should any complaints arise.

Fund Activities

The project includes the following types of activities:

- providing loans to POs, who pass these funds on to their customers (up to 80 percent)
- providing the GEF-financed grant (starting at US\$ 90 per system and gradually declining to US\$ 50)
- developing consumer awareness of solar home systems or other rural energy interventions
- providing technical assistance to POs in developing proposals for financing
- selection of POs based on their performance and financial track record
- supervising the activities of POs and coordinating activities between POs, suppliers and customers
- assisting the TSC on programme-eligible equipment specifications

Success Factors

The main reason for the success of the programme has been the ability to mobilise non-governmental organisations (NGOs) and microfinance operators in rural Bangladesh to operate as solar home system intermediaries. The project was built upon the premise that NGOs, with an existing level of confidence among the rural population as well as established lines of credit stemming from strong collection histories, were well suited to function as solar home system delivery intermediaries. The utilities, in contrast, are not organised for social mobilisation, have limited access at the village level, and are not generally interested in off-grid options. With careful planning and adequate support in the initial stages, the project overcame the biggest challenge of ensuring adequate proficiency in selecting solar power systems from equipment suppliers and post-sales servicing among the NGOs, which has been one of the pitfalls of other rural electrification programmes.

Government could also give support to the development of domestic manufacture of energy-related equipment that could be deployed in rural Afghanistan (e.g. turbines for microhydro plants) through provision of microfinance.

Bangladesh's successful rural electrification programme, described in Box 2, is based on an innovative collaboration with existing NGOs and other groups active in rural Bangladesh and has provided for the installation of nearly 90,000 solar home systems. Given its high potential for solar power and nascent microfinance programmes, Afghanistan could benefit from a rural electrification scheme of this sort.

V. LEVERAGING THE PRIVATE SECTOR

The demonstrated high demand for electricity and good growth potential suggest that there are **many opportunities in the power sector for private sector** involvement such as foreign and domestic capital; private equity projects as well as other forms of private sector participation; and large-scale, multi-country projects as well as small-scale projects. At the same time, it should be recognised that the private sector's enthusiasm for the power sector will be tempered by perceptions of country risk (security, political instability, etc.) and sector risk. Government should seek to address these risks through appropriate policies to improve the investment climate, as Afghanistan's future will hinge on the ability of the Government and its

international partners to defeat the ongoing insurgency's threat to the country's security.

Some specific opportunities for private sector participation in the power sector include:

- ◆ supplying the ongoing reconstruction effort
- ◆ owning/operating small stand-alone grids
- ◆ being management contractor for DABM and the North East Power System
- ◆ EPC (“turnkey”) contract/O&M for gas-to-power plant at Sheberghan
- ◆ small-scale manufacturing, e.g. turbines, solar installations, networks

Different policies are required to attract the different types of private sector entities for the different types of projects. Large-scale, multi-country infrastructure projects (such as high-voltage transmission lines from Central Asia to and through Afghanistan) require a sophisticated legal and regulatory framework to give investors the assurances they demand before making investments worth hundreds of millions of dollars. Even relatively straightforward long-term power purchase transactions require complex legal instruments that do not yet exist in Afghanistan but that are being developed with donor assistance. As a general rule, foreign private sector entities will be more sensitive to perceptions of country and other types of risk, and adequate attention to these concerns by the Government will be a prerequisite to meaningful foreign private sector involvement in the power sector. Domestic private sector players, on the other hand, will generally be more capable of absorbing certain kinds of risks.

The Government should more explicitly take advantage of the potential of the domestic private sector in developing the power sector.

VI. INTERNATIONAL EXPERIENCES: LESSONS FOR AFGHANISTAN

Given the concerns about the security situation in the country and the illiquid or “lumpy” nature of large infrastructure investments, it would be most prudent to assume that large-scale foreign equity investment in the power sector is unlikely in the near to medium term. At the same time, experience from other transition and post-conflict countries suggests that there are possibilities for other forms of private sector participation in the provision of electricity, including notably management contracts

to manage and operate segments of the public power sector. From the perspective of the government in any country that has suffered from prolonged conflict, **the private sector represents a vital source of finance and “know-how”** which augments the government's own limited resources.

Management contracts have been successfully leveraged in past instances in reforming poorly performing sectors, particularly in post-conflict countries, where capacity is often limited. Box 3 highlights the Government of Georgia's sector-wide approach with management contracts, which were used to help turn around the power sector. The experience of Georgia demonstrates that financial discipline in the sector cannot be obtained by management contracts at the upstream end of the sector alone; the sector's problems need to be tackled holistically and improving performance of distribution is critical.

The experience of **Cambodia** in rapidly increasing access to electricity in rural areas through private provision of electricity could be relevant to Afghanistan. Like Afghanistan, Cambodia is a poor country with a large rural population that emerged from a long period of devastating conflict which destroyed part of the country's already under-developed physical infrastructure. According to the best-available data, at the beginning of the post-conflict period, access to electricity was among the lowest in the world. By 2002, there were an estimated 600 private providers in rural Cambodia ranging from the largest who served up to 750 customers, with battery recharging reaching another 2,000, to the smallest who had fewer than 20 customers.³ Prices charged by the providers were high, ranging from 25 USc/kWh to 90 USc/kWh, which again underscores the high value accorded to electricity even by rural consumers with extremely limited means.

The capital costs of this expansion of electricity services in rural Cambodia were initially financed through the small-scale entrepreneurs' own funds. This limited source of capital is increasingly becoming a constraint on the continued growth of the rural electrical systems, and microfinancing and output-based aid schemes are being developed to remove this critical bottleneck. Such schemes would clearly be relevant in Afghanistan today.

In the area of licensing, there was recognition of the need not to impose onerous restrictions on rural private providers of electricity. Registration is required but is a formal process that does not involve any inspection of facilities (and is, in the event, not observed by many small-scale providers in rural Cambodia). There is no explicit regulation of tariffs for rural suppliers.

Box 3. Management Contracts: The Power Sector in Georgia

Until recently, much of Georgia outside its capital, Tbilisi, suffered from shortages caused by sector-wide financial and technical mismanagement. To remedy the situation, the Government entered into three management contracts for power transmission, power distribution and a quasi-single wholesale buyer entity. This holistic approach has been critical in the successful development of the Georgian power sector, focusing not only on the upstream end, but also on the management and performance at the distribution level.

Power Distribution

United Energy Distribution Company (UEDC) of Georgia distributes power to the majority of Georgian consumers, except for Tbilisi. The management contractors, PA Government Services (PA), addressed symptoms of utility mismanagement (as manifested by the low consumer collection rate of 15 percent), in the following areas:

- **Company Restructuring:** The UEDC management team reformed the company's human resources, implementing updated salaries, transparent employment policies, hiring procedures, job descriptions and appraisal processes. They also decentralised management, placing management in each of the company's six regional branches to ensure proper adherence to Headquarter directives.
- **Loss Prevention:** PA formed a 30-person team to curb the theft of both electricity and of money through embezzlement. This eventually led to the prosecution of many former UEDC employees.
- **Enabling Political Environment:** The government of Georgia demonstrated commitment through its actions – monetarily through subsidies, politically through public statements of support and legally by encouraging a close relationship between the management team and criminal justice authorities – which, in effect, created a change-fostering environment.

Power Transmission

ESBI, the Irish management contractor selected in December 2002, addressed four primary areas at the national power transmission company, Georgian State Electrosystem (GSE):

- **Company Restructuring:** Stressing the importance of labor relations, management immediately started paying salaries, including accumulated unpaid salaries (on average 11 months) with support from the government. In response to massive overstaffing, figures were gradually decreased from a starting point of 4,000 to 1,192 in October 2006. To retain quality staff, salaries were raised on the basis of responsibilities and performance.
- **Commercial losses:** Reducing loss of electricity due to theft took on heightened priority. Within the first 18 months, overall losses (technical and commercial) were reduced from 16 percent to less than 8 percent.
- **Financial development:** GSE faced a cash flow problem caused by the prohibition of switching off power supplies to non- or low-paying customers (i.e. distribution companies). Because of this, GSE lacked sufficient funds for preventative maintenance costs. This issue was ultimately solved by the distribution companies' success in collecting payments from end-users and through a large increase in end-user tariffs in 2006.
- **Asset Control and Asset Transfers:** GSE faced transmission and dispatch difficulties when dispatch orders were disobeyed while hydropower stations continued to illegally service non-paying power markets. ESBI initially grasped adequate control of the situation by rotating substation management, but eventually decided to transfer the assets over to the UEDC for better end-user management reasons.

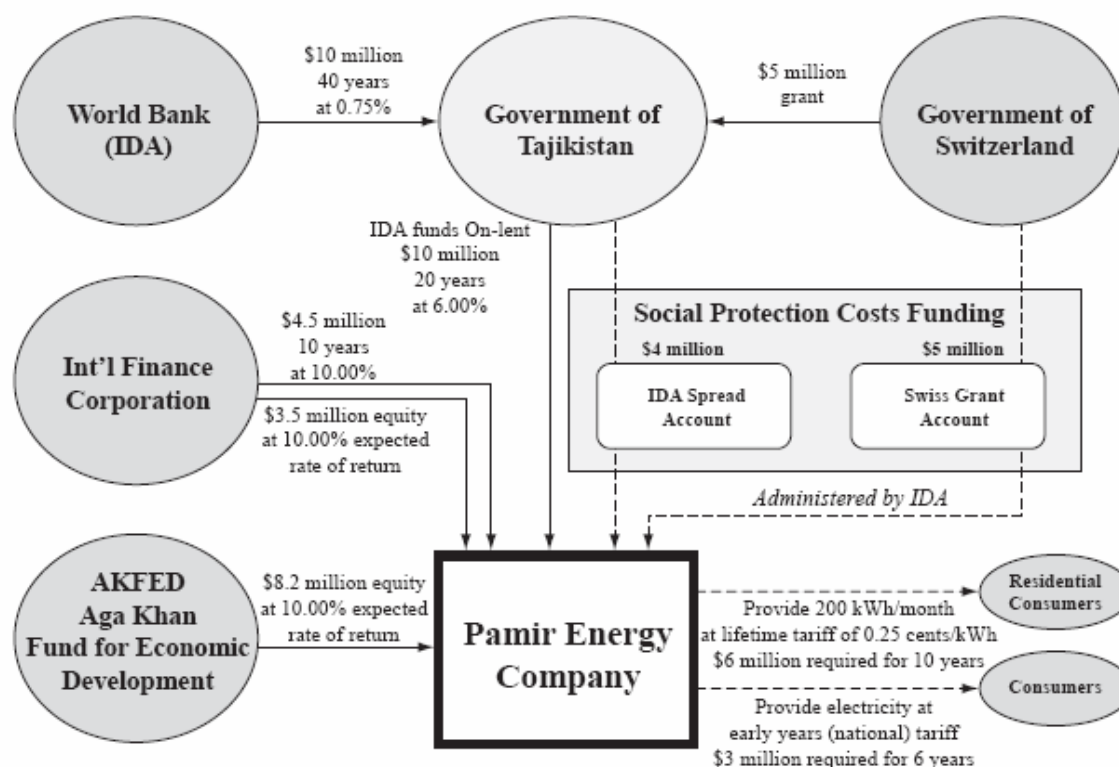
Wholesale Market

GWEM was an association of sector entities that had aspects of a "single buyer" although not all electricity supplies were routed through GWEM. GWEM managed the payments to upstream service providers (transmission, dispatch and domestic power generation) which had been an area of corrupt practices. The Spanish management contractor, Iberdrola, initially succeeded in increasing transparency in the wholesale energy and financial transactions of the GWEM from 2001 to 2006. Though GWEM was replaced by direct contracts in 2006, the management contractor nonetheless played an important role in executing the first steps toward financial discipline.

Box 4 describes the **Pamir Private Power Project**, an innovative, multi-donor project that helped restore reliable and affordable electricity supply to a poor rural region of Tajikistan. Although the region benefited from the Soviet legacy of universal access to power (distinguishing it from most rural parts of the world), in the post-Soviet years household incomes had contracted severely and the

quality of electricity supply had deteriorated sharply.

The project demonstrates an innovative public-private approach in overcoming a number of challenges, including the limited ability of customers to pay for electricity services. The project has pioneered a new way of collaborating between investors, development agencies, bilateral donors, governments and the project sponsor.

Box 4. Pamir Private Power Project in Tajikistan


With the collapse of the former Soviet Union, conditions in the mountainous eastern Pamir region of Tajikistan deteriorated dramatically. Electricity infrastructure quickly fell into an advanced state of disrepair and power plants and many distribution lines were destroyed during the civil war in 1992. The ensuing sharp economic decline (GDP contracted by 60 percent) and neglect by the national electrical utility left 43 percent of homes in the region without power during the harsh winters where temperatures reach -30°C . Schools, health centres and small businesses were forced to close in cold winter months, stifling economic and human development. With many people forced to use wood for cooking and heating, 70 percent of the region's sparse forest cover was lost. Smoke inhalation from indoor wood fires led to a sharp increase in respiratory disorders. At that time, Tajikistan's estimated per capita income was around US\$ 160 per year, and 60-80 percent of people were living below the poverty line and relying on subsistence agriculture. Those that did have access to electricity were used to paying 0.4¢ per kWh, less than 1/10th of the production cost. Under these conditions, attracting private sector investment into the energy sector with traditional approaches would have been difficult.

The PamirEnergy Company, jointly owned by AKFED and IFC, with equity of 70 and 30 percent respectively, was established in 2002. AKFED has invested US\$ 8 million in equity and the IFC has committed US\$ 3.5 million in equity and US\$ 4.5 million as debt. PamirEnergy operates under a 25-year concession contract to operate the electrical utility assets in the Pamir region, improve transmission infrastructure and hydro generation capacity, and regulate the level of Lake Yashilkul to ensure adequate water flows in winter. PamirEnergy also assumed responsibility for the utility's 30,000 existing customers and 595 employees.

A key aspect of the project is the social protection scheme that ensures that tariffs paid by households remain affordable, while the tariffs received by the investors provide a rate of return commensurate with the risks involved in such a project.

The World Bank's International Development Association (IDA) loaned US\$ 10 million to the Government of Tajikistan at a rate of 0.75 percent. These funds are on-lent to PamirEnergy at 6%, allowing PamirEnergy to partially finance its capital investments at less than commercial terms and pass these savings on to customers as lower tariff rates. This 5.25 percent lending margin, plus a US\$ 5 million grant by the Swiss government to the Government of Tajikistan, has been 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 lessons relevant to Afghanistan are:

- ◆ Attracting private investment for the provision of infrastructure services is possible, even in high-risk contexts, provided the involvement of an MFI from an early stage.
- ◆ Innovative combinations of international grant aid with preferential loans can at the same time ensure social protection for customers and acceptable rates of return for the investor.

VII. CONSOLIDATED RECOMMENDATIONS

In summary, this paper makes specific recommendations in five key areas:

1. The Government should renew its focus on **implementing the Power Sector Master Plan** to ensure that the economy has an adequate supply of generation at its disposal.
2. More attention should be given to the **rehabilitation and expansion of distribution systems** throughout Afghanistan.
3. The Government should articulate a **rural electrification strategy** that defines goals and objectives, clarifies the role and expected scope of subsidies in supporting rural electrification programmes, and emphasises the role of the private sector and rural cooperatives in advancing rural electrification. Key components of such a policy could include:
 - a) Promoting rural electrification with an emphasis on income-generation/village-level light industries.
 - b) Designing and implementing capacity building measures in order to ensure that there is adequate technical capacity to run larger-scale electrical systems in remote locations.
 - c) Adopting a policy of concentrating resources on larger villages or small towns with villages in the vicinity serving as growth points.
 - d) Identifying the most appropriate supply solution for each particular location by developing a differentiated typology of rural areas identifying, among other variables, the proximity to the regional power grid; the suitability of establishing a rural “growth point” in the area; size and density of population; the structure of the local rural economy; and the availability of hydro, wind, solar and biomass resources.

4. Government should more explicitly **take advantage of the potential of the domestic private sector** in developing the power sector through:

- a) Encouraging private small- and medium-scale providers in smaller cities and towns.
- b) Introducing a “laissez-faire” policy in rural electrification to stimulate small-scale entrepreneurial activity and rural cooperatives.
- c) Supporting the development of domestic manufacture of energy-related equipment that could be deployed in rural Afghanistan (e.g. turbines for microhydro plants) through provision of microfinance.
- d) Introducing light economic regulation that would allow small, self-contained systems to be self-regulating i.e. to charge what the market will bear.

5. **Improve the foreign investment climate by:**

- a) Considering “regulation by contract” as a possible alternative to the creation of an independent regulatory capacity which might not be feasible in the foreseeable future given the low level of capacity in the sector and the existence of more pressing priorities. This would give greater comfort to investors than the existence of a fledgling regulatory agency.
- b) Simplifying interactions with the Government for domestic and international investors through a “one-stop window” in the Ministry of Energy and Water (or some other appropriately designated agency). This would allow investors to handle all required transactions (licenses, fees, etc.) with the Government in one location, thereby greatly facilitating their work with the Government and reducing the potential for corruption.
- c) Having the Government offer guarantees – potentially backstopped by a World Bank Partial Risk Guarantee (PRG) or similar instruments provided by other development agencies – to boost investor confidence.

¹ See *The Investment Climate in Afghanistan: Exploiting Opportunities in an Uncertain Environment*, World Bank 2005, for a more detailed treatment of this subject.

² See *Regulation by Contract*, World Bank Working Paper No. 14, 2003.

³ See *Private Solutions for Infrastructure in Cambodia*, PPIAF/World Bank, 2002.