



Conference on Scaling Up Poverty Reduction

Shanghai, China

Mat 25-27, 2004

Reducingpoverty@worldbank.org

Case Study on

Tajikistan

Pamir Private Power Project

Region: ECA

Country: Tajikistan

Type: Country case

Authors: Anil Markandya and Raghuv eer Y. Sharma

Contact: The World Bank, Mail Stop H5-503, 1818 H Street NW,
Washington DC 20433.

Tel. 202 473 9266, Fax. 202 614 0696

Table of Contents

1. EXECUTIVE SUMMARY	1
2. PROGRAM DESCRIPTION.....	6
3. IMPLEMENTATION PROCESS.....	9
3.1 Rationale and Objectives.....	9
3.2 Political Context.....	9
3.3 Consistency of Objectives with Ongoing Poverty Reduction Strategies	10
3.4 Institutions Involved and Degree of Commitment	11
3.5 Other Actors Involved	12
3.6 Process of Reaching Agreements.....	12
3.7 Preliminary Results and Comparison with Initial Objectives.....	13
3.8 Adjustments and Changes to Original Plan.....	14
4. IMPACT ANALYSIS	16
4.1 Efficiency in the Use of Resources	16
4.2 Affordability and Impact on the Poor	17
4.3 Impact of the Project on Changes in Policies	17
4.4 Contribution to Poverty Reduction.....	18
5. DRIVING FACTORS	19
5.1 Commitment and Political Economy for Change	19
5.2 Institutional Innovation	19
5.3 Learning and Experimentation.....	20
5.4 External Catalysts.....	20
6. LESSONS LEARNED	21
REFERENCES	22

1. Executive Summary

The Pamir Private Power project is restoring reliable electricity supply to a poor and isolated population in eastern Tajikistan that was substantially cut off from power supplies after the country's independence from the former Soviet Union in 1991. This restoration has been achieved through an innovative combination of private investors and multilateral financial institutions. It has been backed by a donor-funded social protection program to ensure that the electricity remains affordable. At the same time, the government of Tajikistan has undertaken reforms necessary for the new framework to work.

With an estimated per capita income of about \$160, Tajikistan is the poorest country in the former Soviet Union. When it became independent in 1991 it faced the loss of transfers that had amounted to as much as 40 percent of GDP in the late 1980s. A civil war broke out in 1992, paralyzing the adjustment and development process. The warring factions signed peace accords in 1997, and the government, led by President Emomoli Rakhmonov, now has adequate control. Nevertheless, the multi-ethnic population and geographical constraints (both internal and external) pose considerable challenges to political and economic governance.

The Gorno Badakshan Autonomous Oblast (GBAO), where the project is located, is the poorest area in Tajikistan. A two-day drive from the capital, it is cut off during winter from the rest of the country and is underrepresented economically and politically. Regional identities remain strong, helping patronage networks to dominate politics and the economy. GBAO's population is reported to have supported the opposition in the country's civil war, which resulted in virtually no developmental activity in the region. Under the peace accords, the president is committed to ensure as much development activity in GBAO as feasible, and the Pamir Project is a result of such commitment.

Under the former Soviet regime, 60 percent of Tajikistan's energy was provided by diesel generators running on imported diesel fuel. When the country became independent, diesel deliveries ceased—and with them ceased reliable electricity. Citizens now are frequently without power and have resorted to foresting the scarce woodlands in the area for firewood, a practice that poses a severe threat to the environment.

The Pamir Private Power Project contributes to Tajikistan's poverty reduction strategy by providing an efficient and fair provision of basic social services, and indirectly by supporting economic growth in the country. Although it is too early in the project's life to make a full

assessment of its impacts, the ex ante analyses show an efficient use of resources and that it will help to reduce poverty in spite the increase in tariffs that it entails. Most measures of poverty do not take account of the indirect costs of lack of electricity, and hence the restitution of supply is not easy to relate to the national poverty indicators. But a recent World Bank study determined that in urban areas, linking households to electricity was the only key factor that reduced both the infant mortality rate and the under-five mortality rate, and that the effect is large, significant, and independent of incomes.

Pamir has taken over all existing electricity generation, transmission, and distribution facilities in GBAO through a privately owned special purpose company (Pamir Energy) operating under a 25-year concession agreement that sets out the legal, regulatory, technical, operational, environmental, and financial framework for the project, as well as the tariff schedule. The project has expanded the Pamir 1 Hydro Power Plant from 14 MW to 28 MW and built a river-regulating structure at the Yashilkul lake to ensure adequate flow in winter. The project is rehabilitating other assets including hydro plants, substations, transmission, and distribution lines at a total cost of \$26 million.

The financing mix was 45 percent through equity and 55 percent debt provided by the International Finance Corporation (IFC) and International Development Association (IDA). IFC provided \$3.5 million in equity financing; the remainder, \$8.2 million, came from the Aga Khan Fund for Economic Development (AKFED), the principal private sector partner in the venture. Active in GBAO since Tajikistan's independence, the Aga Khan Foundation in 1999 approached IFC to help resolve the catastrophic energy situation. This was followed by an initial study that confirmed that the best source of new generation would be an expanded Pamir hydroelectric plant. Environmental impacts were then reviewed, followed by an analysis of consumers' ability to pay.

The primary agreement to be prepared and negotiated was the concession agreement—the asset that the concession company would own, since ownership of the physical assets would remain with the government. The IFC played a key developmental role in mobilizing trust funds to provide, among other things, the services of an international legal counsel to help draft and negotiate the concession agreement with AKFED and IFC. The government established a high-level working group headed by a deputy prime minister and including senior representatives from all relevant ministries and agencies. IDA played a key brokering role clarifying the investors'

objectives to the government, while at the same time ensuring that Tajikistan's interests were also considered.

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. Although the government agreed to meet the social protection costs, its limited fiscal resources and weaknesses in public sector financial management created a risk that it might not meet these obligations in full or on time. To address this issue, the funds to meet the social protection costs were mobilized at the same time as the funds for capital expenditures. This did not burden the project because a good part of the social protection funds were obtained from donor sources—in part from the spread between the interest-rate at which the IDA lent to the government and the rate at which the government lent to the private investor.

Even in a high-risk context like Tajikistan, private provision of infrastructure services can be effective and efficient. But because exploratory development expenditures so often come to nothing, the private sector requires early involvement of a multilateral financial institution to provide guarantees, instill confidence, and supply technical assistance and analytical services. Combining IDA and IFC funding in a public/private partnership has had a significant impact on capital cost and radically improves the risk profile—the benefits of which can be captured by consumers in the form of lower tariffs and less steep tariff increases in the early years. World Bank participation offers the additional benefit of involving the government more closely in the venture and providing a venue for donors to participate. Finally, a credible social protection element combined with “payments for results” is required to ensure sustainability of a private investment in a very poor and politically volatile region with little experience with private investment in infrastructure.

The project reports show reasonable progress in implementation of the physical, legal, and financial areas. Even at this early stage, the company operating the concession generated more electricity than was projected and more than the national utility had generated over a comparable period. Revenues from electricity sales for the second quarter of 2003 were 38 percent above budget. A key problem remains, however—how to ensure improved collection of bills. The better-than-expected revenues were achieved as a result of four measures: increased public relations, disconnections, payment flexibility, and work through village organizations. Of

these, the most effective was probably the use of disconnections, which can of course cause hardship. Disconnections were not practiced in winter.

For the government of Tajikistan this project represented a challenge, to which it responded positively. This is the first time that a private concession has been granted for the generation, transmission, and distribution of electricity. Arriving at the concession agreement required the government to recognize the need for a less generous credit policy for electricity and, more importantly, to face up to the need to pay its own electricity bills on time. The agreements on social protection made transparent for the first time the amount of subsidy that was being given and to whom it was being given.

Not all has been smooth in the relationship between the company and the government. During this first year of project implementation, government agencies raised concerns about the verification of the social protection cost payment mechanism, the metering and billing arrangements under the project, as well as the level of electricity tariffs applied to certain consumer categories. All these issues have been duly agreed upon in the various project-related agreements, but the practical implementation has brought up the need for some further refinement.

Questions about the project's sustainability cannot be answered with absolute certainty, but the structural elements of the project, as defined in the concession agreement that came into effect in December 2002, are such that it should be sustainable. Equally important are the key stakeholders involved in the project. The private investor, AKFED, has a real commitment to the country and is unlikely to pull out when problems arise. Likewise the World Bank and IFC have a long-term engagement in the country and a track record of providing support in the face of difficulties. Similarly, the government is quite committed to the project. The first real test will come in 10 years, when the social protection fund is supposed to be wound down. It is expected that by that time economic growth will have reduced the need for such a fund and the government will be in a better position fiscally to cope with any remaining costs. If it is not, it would continue to have access to the income from the interest rate on the on-lent IDA loan.

For a project of this kind, the financial rate of return is probably on the low side. It has been found acceptable, however, because the parties financing the project, including the private partner, have social objectives as well as commercial ones. This is important to bear in mind when seeking to replicate such a project: a purely commercially driven private entity may not be

able to provide the partnership needed. The economic rate of return, on the other hand, would be considered reasonable in the present circumstances.

The Pamir Private Power Project has been driven by the need to find innovative ways to provide essential services in countries where public resources are extremely limited and that the private sector is reluctant to enter. Investors have been retreating from emerging markets that attracted private investment in the boom years of the 1990s. In the face of reduced private flows, the World Bank Group has announced its commitment to increase support for infrastructure. One avenue under consideration is public/private partnership. This will require the sort of early collaboration that occurred here. Pilots are already underway in West Africa and an electricity distribution project is being developed in the Kyrgyz Republic along these lines. This approach may offer a vehicle that can attract some new participants and even persuade some others to return to the power (and other infrastructure) sectors of emerging markets.

Some aspects of this project are unique—a development-oriented investor such as AKFED may not be available in every country. Tajikistan is also unique from the poverty and risks perspective. If the public/private partnership approach outlined here can structure a viable infrastructure project with private sector participation in one of the more challenging countries in the world, it should be applicable elsewhere.

Some of the institutional innovations brought in to the structure of this project included: creation of a full-function regional utility, which meant the monolithic national utility was unbundled in a geographic sense (as opposed to the functional sense of separating generation, transmission, and distribution which was the conventional wisdom at the time); creation of a fully funded social protection mechanism, monitored and administered by a credible third party (in this case the World Bank); and participation of IDA in the financing of a project company in which IFC has a 30 percent equity stake.

2. Program Description

This case study is on restoring reliable electricity to eastern Tajikistan. This has been achieved through an innovative combination of private investors and multilateral financial institutions (MFIs), backed by a donor-funded social protection program, to ensure that the electricity remains affordable. At the same time, the government has been centrally involved in facilitating and supporting the reforms necessary for the new framework to work.

With an estimated income per capita of about \$160, Tajikistan is the poorest country in the FSU and fully 60-80 percent of the population has been defined as living in poverty. The highest incidence of poverty is in Gorno Badakshan Autonomous Oblast (GBAO), the area targeted by the project. GBAO, also known as 'the Pamirs', experiences long harsh winters -- temperatures average -5 degrees C and can fall as low as -30 degrees. In Soviet times, 60 percent of its energy was provided by diesel generators run on imported diesel fuel. Electricity, access to which was nearly universal, was used for both cooking and heating. When Tajikistan became independent in 1991, diesel deliveries ceased and with them, a reliable electricity supply. Several years of civil war destroyed almost all of the plants and much other infrastructure. No functioning diesel capacity remains and only about 15 percent of the transmission network is still in service. The national utility, Barki Tajik, was responsible for the power supply, but outages were frequent and lengthy -- 43 percent of living areas have no electricity during the winter, and 10 percent have no electricity at any time during the year despite "enjoying" a connection to the grid. Schools and hospitals are forced to close in winter for lack of heating. People have resorted to cutting down the few trees in the area for firewood. The population of the region is around 250,000, mostly Shia Ismaili Muslims.

The project is designed to: (i) take over and operate all existing electricity generation, transmission, and distribution facilities in GBAO through a fully privately owned special purpose company under a 25-year Concession Agreement; (ii) expand Pamir 1 Hydro Power Plant from 14 MW to 28 MW and construct a river-regulating structure at the upstream Yashilkul lake to ensure adequate flow in winter; and (iii) rehabilitate other assets including other hydro plants, substations, and transmission and distribution lines.

The project had a total cost of \$26 million, of which \$2 million was interest during construction. The financing was as follows: 45 percent through equity and 55 percent through

debt provided by the IFC and IDA. Of the equity financing \$3.5 million was by IFC and \$8.2 million by The Aga Khan Fund for Economic Development (AKFED), the principal private sector partner in the venture. The Aga Khan Foundation has been active in GBAO since Tajikistan's independence. In 1999 AKFED approached IFC to help resolve the catastrophic energy situation. This was followed by an initial study, which confirmed that the best source of new generation would be expansion of the Pamir hydroelectric plant. Environmental impacts were then reviewed, followed by an analysis of consumers' ability to pay electricity tariffs and a review of Barki Tajik's capacity to pay for power generated and to access customer service.

The operations under the project are run by a company specially set up for this purpose (The Pamir Energy Corporation or Pamir Energy), which is 70 percent owned and controlled by AKFED. Pamir Energy operates under a Concession Agreement which contains within it the necessary legal, regulatory, technical, operational, environmental, and financial framework for the project, as well as the tariff schedule, with some flexibility built into the formulae, for the entire (25-year) concession period. Parliamentary approval of the Concession Agreement gave it the status of deemed legislation and reduced the risk of political challenges at a later stage.

A key element of the project is the social protection scheme, which ensures that tariffs paid by households remain affordable, while the tariffs received by the investors provide a rate of return that is commensurate with the risks involved in such a project. The tariff needed for a purely commercial investment with a 50-50 debt-equity structure was estimated at $\text{¢}4.65$ kWh. By obtaining the concessionary financing from IDA which enabled debt at more affordable terms, and the mitigation of risks which reduced the required return on equity requirements, the tariff needed to make the project viable came down to $\text{¢}2.1$ per kWh (averaged over the 25-year concession period). A long grace period also allowed a slower increase in tariffs.

IDA's involvement was also instrumental in establishing an effective social protection scheme under which households (which account for 98 percent of all consumers) pay reduced tariffs consistent with what they can afford. Affordability was judged to be around 15 percent of all expenditures for various sources of energy. On this basis, a household tariff structure was agreed to which set a 'lifeline' rate of $\text{¢}0.25$ per kWh, followed by a higher tariff that increased gradually from $\text{¢}0.4$ to $\text{¢}3.0$ over a 10-year period. This naturally gave rise to social protection costs, which the government agreed to take on. The cost of providing lifeline amounts at lifeline rates (as opposed to tariffs set out in the Concession Agreement), is approximately \$9 – 10m (depending on actual consumption) over the next nine to 10 years.

Although the government agreed to meet the social protection costs, its limited fiscal resources and weaknesses in public sector financial management created a risk that the government might not meet these obligations in full or on time. To address this issue, the necessary funds to meet the social protection costs were mobilized from two sources. First, the revenues arising from the interest rate spread of 5.25 percent on the on-lent IDA credit proceeds were maintained in an Escrow Account to be used towards the social protection costs. This measure would enable the government to meet about \$4m. Second, a grant of \$5m was mobilized from the Swiss government to help the Tajik government meet the remainder of the social protection costs. These Swiss funds would be maintained by the World Bank in a trust fund and disbursed to Pamir Energy to deliver the requisite electricity to residential consumers.

Figure 1 provides the structure of the project as a whole and Figure 2 illustrates how the social protection scheme is structured.

3. Implementation Process

3.1 Rationale and Objectives

The Pamir Private Power Project has been driven by the need to find innovative solutions for providing essential services in countries where public resources are extremely limited and the private sector is reluctant to enter. Investors have begun to retreat from those emerging markets which attracted private investment in the boom years of the 1990s. More challenging environments such as in Africa and the CIS countries never attracted significant volumes and the current scarcity of investors, even in the lower risk markets, highlights the need for new approaches.

At the same time, the social problems caused by a lack of essential services such as electricity are all too obvious. Households suffer in various ways: they are forced to use noncommercial fuels causing environmental health problems and degrading the environment; the health of children and other vulnerable groups suffers significantly; and any potential economic development is stalled.

As stated, the objectives of this project were to rehabilitate the system of electricity supply in one of the poorest regions of Tajikistan by mobilizing investments through a public-private partnership, ensuring that the electricity generated is affordable to the poor while also designing a tariff system that provides a reasonable rate of return to the investors.

3.2 Political Context

Tajikistan is a result of the Soviet Union's division of Central Asia in the 1920s into ethnically based republics. The country gained independence in 1991 as one of the poorest in the former Soviet Union (FSU) and this rural and agricultural society immediately faced the loss of transfers which had amounted to as much as 40 percent of GDP in the late 1980s. A civil war broke out in 1992 and paralyzed the adjustment and development process until 1997. The warring factions signed peace accords in 1997, so now the government, led by President Emomoli Rakhmonov, has adequate overall control. The multi-ethnic population and the geographical constraints (both internal and external), however, pose considerable challenges to political and economic governance.

The Tajik population speaks a Persian dialect and its religion is mainly Sunni Muslim. The industrial territory of Sogd in the north has a significant Uzbek minority. The current

population is 6.4 million, with Dushanbe, the capital, accounting for 525,000. The only other town with more than 100,000 people is Khujand, center of the Sogd region, with a population of 165,000 – the region is much closer to Tashkent, the capital of Uzbekistan. The GBAO comprises mainly Ismaili Muslims, and is thus linguistically and religiously separate from the rest of the country.

Tajikistan's geography also poses a number of constraints. A long border with Afghanistan to the south has left it vulnerable to drug-trafficking and potential infiltration by Islamist militant groups, while offering little opportunity for the export of goods. The border with Uzbekistan has been difficult to cross for years, and in parts remains mined by the Uzbek government. Only to the north, with Kyrgyz Republic, is there a semblance of normal cross-border relations, although even here there are significant obstacles.

Inside the country, too, there are geographical and cultural barriers. The northern Sogd region is geographically cut off from the Tajik heartland by high mountains, and the rough road that links it to Dushanbe is closed for half the year. This region also was essentially left out of the 1997 peace agreement and thus has little access to political power. The remote region of Gorno Badakhshan is a two-day drive from the capital, is cut off during winter from the rest of the country, and is underrepresented economically and politically. The Rasht Valley is in a similar position. Regional identities remain strong, helping patronage networks to dominate politics and the economy

In addition to being separate from the rest of the country in terms of language, culture, and religion, and facing geographical isolation, GBAO's population is reported to have supported the opposition in the country's civil war, which resulted in virtually no developmental activity in the region. As a part of the peace accords, however, the president is committed to ensure as much development activity in GBAO as feasible, and the Pamir Project is a result of such commitment.

3.3 Consistency of Objectives with Ongoing Poverty Reduction Strategies

Tajikistan's first poverty reduction strategy was produced in 2002. It identifies four main elements in its strategy:

- Accelerated, socially fair, and labor-intensive economic growth with emphasis on export;
- Efficient and fair provision of basic social services;

- Targeted support to the poorest groups of the population;
- Efficient governance and improvement in security.

The PRSP also notes that the “availability of adequate infrastructure is an essential element in achieving satisfactory economic growth, which in turn provides the means for reducing poverty” and that the government is committed to “take actions to improve access to, and affordability of basic infrastructure services to the poorest groups.” [Tajikistan PRSP, page 42]. The main actions proposed in the strategy are:

- Increased competition in the supply of infrastructure services through privatization and corporatization;
- Rehabilitation of physical assets that are in a serious state of disrepair;
- Tariff reform, which will include ensuring affordability of services to the poor either within the tariff structure or through separate targeted measures;
- Supply of power to remote areas through the establishment of small dams.

The Pamir Project contributes directly to implementing element (b) and, indirectly, to (a) and (c). The supply of electricity is undoubtedly a basic social service, which was, essentially, not being provided in the GBAO region of Tajikistan. It represents the first attempt to involve the private sector in the supply of power through rehabilitation of an existing hydropower facility. The tariff issues, including affordability, are addressed head on in the project, which, as shown in this study, contributes in several ways to the reduction of poverty, where the latter is interpreted widely to include not only consumption measured in money terms, but also access to basic services such as power.

3.4 Institutions Involved and Degree of Commitment

A high degree of commitment and support from the multilateral financial institutions (MFI) IFC and IDA was provided at an earlier stage than an MFI would engage in a private power project in a less risky environment. This was necessary because without it the private partner would have been reluctant to commit resources on the scale required. The private sector attaches a high discount rate to early stage development expenditures because so much of it comes to nothing. In this project, even a particularly development-oriented sponsor such as AKFED could not invest in project development without the early stage involvement of IFC and

subsequently IDA. IFC was able to play an unusually proactive role in the early stages of project development with generous and repeated Swiss support through trust funds.

The MFIs also played an important role in evaluating the commitments required of the government and in playing the role of broker between the government and the private sector. In this context, IDA played a critical part during the later stages of development, increasing the government's level of comfort by supporting a group of private investors and providing a channel for other 'official' financiers (e.g., the Swiss government) to participate in the project. In such high risk projects, the investor may be persuaded to risk resources on development, together with the MFI(s), particularly after the project is developed to a certain stage. Participation of the MFIs in development can reduce early stage risks and therefore the very high cost of seed capital.

For its part, the government had to show that it was serious and willing to make commitments under the Concession Agreement, as well as in operating the social protection fund and ensuring that it would cease to be delinquent in its payments. To a large extent, all these are matters of credibility, which is only established with experience.

3.5 Other Actors Involved

In addition to the government, AKFED, and the MFIs (IFC and IDA), the Swiss government played a key role. First, it supported the project preparation efforts with considerable amounts of grant funds (approximately \$1 million), thus lowering the capital expenditures that needed to be mobilized. Second, through its Secretariat for Economic Cooperation (SECO), it provided a \$5 million grant to the Government of Tajikistan to help meet the social protection costs.

3.6 Process of Reaching Agreements

The primary agreement to be prepared, discussed, and negotiated was the Concession Agreement (as this would be the "Asset" that the concession company would own since ownership of the physical assets would remain with the government). The Concession Agreement contains within it the necessary policy, regulatory, operational, technical, environmental, financial, and legal framework necessary for the project and concession to function. IFC, as explained earlier, played an unusually proactive developmental role in mobilizing trust funds (mainly from the Swiss government but also on its own account) to provide, among other things,

the services of an international legal counsel to help draft and negotiate the Concession Agreement with AKFED and IFC. The government established a high-level working group headed by a Deputy Prime Minister and including senior representatives from all relevant ministries and agencies, to discuss and negotiate the Concession Agreement. IDA played a key brokering role clarifying the investors' objectives to the government, while at the same time ensuring that Tajikistan's interests were also considered. The second set of Agreements included the Development Credit Agreement between the Government of Tajikistan and IDA (reinforcing key elements of the Concession Agreement and committing the Government to specific ways of complying with the Concession Agreement); and a Project Agreement between Pamir Energy and IDA that, among other things, commits the company to certain performance criteria consistent with the Concession Agreement. In view of the centrality of the Concession Agreement, it was also ratified by Tajikistan's parliament, thus making it a deemed legislation of the country.

3.7 Preliminary Results and Comparison with Initial Objectives

The project supervision reports show reasonable progress in implementation of the physical, legal, and financial areas. Contracts for the work are being awarded, more or less on schedule. Even at this early stage, the company operating the concession generated more electricity than was projected and more than the national utility had generated over a comparable period.

Revenues from electricity sales for the second quarter of 2003 were 38 percent above budget. A metering plan has been prepared and will be implemented in the near future. A key problem remains, however -- how to ensure improved collection of bills. The better-than-expected revenues were achieved as a result of four measures: increased public relations, disconnections, payment flexibility, and work through village organizations. Of these, the most effective was probably the use of disconnections, which can of course cause hardship. It is noteworthy that disconnections were not practiced in winter and other alternatives were offered to customers.

Problems also remain to be solved regarding the relationship between Pamir Energy and the community. Several meetings were held to explain the company's policy, but some distrust remains. Equally, not all has been smooth in the relationship between the company and the government. During this first year of project implementation, government agencies have raised concerns about the verification of the social protection cost payment mechanism, the metering and billing arrangements under the project, as well as the level of electricity tariffs applied to

certain consumer categories. All these issues have been duly agreed upon in the various project-related agreements, but the practical implementation has brought up the need for some further refinement.

On the social protection cost payments, the government has committed to certifying the accuracy invoices but it did not have the capacity to do so. This has been solved by bringing in local government to check the accuracy of the payments. On the billing and metering arrangements, it was generally recognized that not all residential consumers had reliable electricity meters. Hence it was necessary to agree that, in the absence of metering, an alternative space-based billing method would be applied during an 18-month transitional period after the Concession ratification until reliable meters were put in place. There have been some problems in implementing this method, which proved inequitable, but which has been replaced by another, based on capacity to use electricity, which is proving more satisfactory.

Finally there have been some issues concerning the tariff levels to certain categories of consumers. Under the Concession Agreement, an average electricity tariff was agreed upon and a corresponding tariff structure was developed by consumer categories. The project tariffs applied to commercial consumers, however, turned out to be prohibitively high and practically constrained the operations of this type of consumers. Consequently, an agreement was reached to modify the project categories of electricity consumers and re-balance the tariff structure so that the electricity tariffs for commercial consumers were reasonably reduced while the average electricity tariff under the Concession Agreement remained satisfied.

3.8 Adjustments and Changes to Original Plan

Originally the venture was designed as an independent power producer (IPP) project, whereby the private investor would take over only the generation part of the GBAO electricity network, expand it, and sell power to the Barki Tajik, the state-owned national electricity utility. Barki Tajik would continue to be responsible for transmission and distribution of electricity as well as the commercial functions of metering, billing, and collection. It also was designed originally as a purely private venture, with financing from investors, IFC, and perhaps other commercial lenders.

It was soon recognized that the IPP model would have problems from the very beginning, whereby a private venture would have to depend for its revenues on a bankrupt state-owned utility with no credible plan of action in place for improving the situation. At the time,

international experience from Indonesia to India was proving that such a model would not be feasible.

Therefore, the first change made was to the structure of the project -- the private investor would be asked to take over all of the utility functions, from generation through commercial functions. This would reduce sovereign risks considerably, and enable the inclusion of investments in transmission and distribution networks which were also seriously needed.

The second and third changes followed from the first. Expansion of the mandate of the investor required more funding, and given that affordability of the population was quite low, this additional funding had to be at concessional terms as opposed to the commercial terms mobilized thus far. Accordingly, IDA funding was mobilized to the tune of \$10 million (approximately 40 percent of the overall funding).

Lastly, a credible, adequately funded, and transparently administered social protection scheme was put in place by mobilizing \$9 million for the government to meet its social protection costs obligations. This social protection costs funding was in addition to the \$26 million raised for capital expenditures

4. Impact Analysis

4.1 Efficiency in the Use of Resources

The project has been under implementation for just under a year (the Concession Agreement came into force in December 2002). At the appraisal stage, however, a number of estimates were made of the key indicators. The project generates an estimated 10percent return on equity on an IRR basis, with the greatest risks arising from failures to increase tariff levels in accordance with the agreement and failure to collect payments from those who have been supplied with electricity. For the latter, the biggest concern is nonpayment by government organizations. From residential consumers, a better record base is needed, as well as installation of meters to enable implementation of the social protection tariff structure.

The economic analysis was carried out under three “without project” scenarios. The first scenario shows the system deteriorating at five percent per year -- i.e., it would function on a declining basis for another 20 years. The second shows the rate of deterioration at 10 percent and the third places it at 20 percent. Naturally the economic rate of return (ERR) from the project increases with the expected increase in the rate of decline without the project, going up from 15 percent in the slowest declining case to 24 percent in the highest declining case. The economic rates of return are significantly higher than the financial ones because of the higher value attached to the delivery of electricity than the actual payment made. A sensitivity analysis shows that the economic rate of return was particularly dependent on (a) underproduction of electricity (possibly for hydrological reasons) and (b) overestimation of the true willingness to pay for the electricity.

For a project of this kind, the financial rate of return is probably on the low side. It has been found acceptable, however, because the parties financing the project, including the private partner, have some social objectives as well as commercial ones. This is important to bear in mind when seeking to replicate such a project: a purely commercially driven private entity may not be able to provide the partnership needed. The economic rate of return, on the other hand, would be considered reasonable in the present circumstances. Furthermore, it does not take into account a number of environmental and social benefits. (For social benefits see the discussion below on the links to poverty reduction.) The environmental benefits are hard to quantify but are nevertheless real. Currently, because of frequent power outages, many residents in the area rely on firewood as an energy source despite their electricity grid connection. This reliance on firewood results in two significant negative environmental impacts. First, many residents in the area use firewood and/or biomass for cooking instead of their electric stoves. They also resort to

these fuel sources for heating purposes during the harsh winters in the region. As a result, smoke is always inside the houses which lack proper ventilation and residents face adverse health effects such as respiratory infections, pulmonary diseases, and lung cancer. By increasing the availability of electricity to consumers along with greater public awareness, the project will enable consumers to increase their use of electric stoves and heaters and reduce the negative health effects of indoor air pollution. The second environmental impact will result from the reduced need for firewood. It has been estimated by the government that nearly 70percent of the tree cover in the area has been destroyed because of excessive reliance on firewood. Thus, deforestation can be arrested, helping to alleviate such dangers as mountain mudslides and other calamities.

4.2 Affordability and Impact on the Poor

The affordability analysis shows that with the proposed tariffs, 67 percent of households can comfortably afford the tariffs; the remaining households will be spending a significant proportion of their incomes on electricity and from some of the surveys the amount could be as high as 20 percent. There are, however, problems with the basis for the assessment: reported household incomes at the bottom end are so low as not to be credible given the lifestyles observed. More data are needed as part of the monitoring and subsequent project assessment before a final judgment can be made.

4.3 Impact of the Project on Changes in Policies

For the Government of Tajikistan this project represented a challenge, to which it responded positively. This was the first time that the monopoly of Barki Tajik was broken, and a private concession allowed for the generation, transmission, and distribution of electricity for a region in the country. The process of arriving at the Concession Agreement required the government to recognize the need for a less generous credit policy for electricity and, more importantly, to face up to the need to pay its own electricity bills on time. The agreements on social protection made transparent for the first time the amount of subsidy that was being given and to whom it was being given. In the operations of Barki Tajik, the targeting of the subsidy among households is poor (most users pay very little and consumption is not assessed on a proper metered basis for most of them). With the new concession, a more targeted approach has been adopted and is slowly being extended to the operations of the state utility. Indeed, it is encouraging that, as a result of the successful implementation of the project, the government has shown greater interest in wider reforms in the energy sector as a whole.

4.4 Contribution to Poverty Reduction

Unfortunately most measures of poverty do not take account of the indirect costs of lack of electricity, and hence the restitution of supply is not easy to relate to the national poverty indicators. The last comprehensive study of poverty in Tajikistan was carried out by the World Bank in 2000 and is based on data for 1998. The measures of poverty per person per day range from TJR 7,577 (equal to PPP \$1.075) to TJR 32,083 (based on the minimum consumption basket costing and equal to PPP \$4.3). There are indications that poverty has declined in the last four to five years but in the absence of any more recent data, these figures have been taken. To assess the benefits of the reforms, account is taken of the increase in household benefit from the nonrationed supply of electricity. Of course, there is also a price increase to be taken into account, so it is not always the case that households will indeed be better off. But the analysis shows that with the kind of tariff increases likely, almost all household categories will benefit, including those classified as poor. For example, with an increase in the “full” rate of ¢ 0.25 kWh to one of ¢ 0.75 (the figure for 2003), the depth of poverty with a poverty line of TJR 10,000 (PPP \$1.42 per person per day) falls by between one and eight percent. While this may not seem significant, the result is important because it is achieved in the face of an increase in the marginal tariff rate. For a discussion of the methodology used in the analysis as well as the definitions of the measure of poverty, etc., see Markandya, Jayawardena, and Sharma (2003).

It is also important to note the secondary benefits of providing electricity. Although these were directly taken into account in the appraisal of the project, they are nevertheless real and important. A recent World Bank study looked at demographic and health data from over 60 low income countries and investigated the determinants of health outcomes using cross-country data between 1985 and 1999 . It found that in urban areas, linking households to electricity is the only key factor that reduces both the infant mortality rate (IMR) and the under-five mortality rate (U5MR), and that this effect is large, significant, and independent of incomes. In rural areas, improving female secondary education is crucial for reducing IMR, while expanding vaccination coverage reduces U5MR. Finally, there are the benefits of improved access for children to learning and to a better quality of life that are not factored in the above assessments.

5. Driving Factors

Starting with the political commitment to rapid economic development after the 1997 Peace Agreement, influential groups such as the Aga Khan Foundation, multilateral financial institutions such as the ADB, IFC, IMF, and the World Bank, as well as donors such as the Swiss Government have all played an important part.

5.1 Commitment and Political Economy for Change

The 1997 peace agreement was an important driving factor for the central government to recognize the developmental needs of the various regions of the country and to commit to the developmental agenda. Soon thereafter, the Tajikistan government and such MFIs as ADB, IMF, and the World Bank worked together to draw up economic stabilization and liberalization programs. Private sector development was a key element of such programs, and private sector provision of electricity was enabled with the passage of an energy law in 2000.

To be sure, there were many opponents within the government to the private sector's involvement; however, there was clear and firm support from President Rakhmanov himself which enabled the project to be realized .

The commitment of the agencies of the Aga Khan Development Network (AKDN, of which AKFED is a part) also was crucial. AKDN agencies have been committed to the country in general and the region in particular since independence and have stayed through the civil war.

5.2 Institutional Innovation

Some of the institutional innovations brought in to the structure of this project included: creation of a full-function regional utility, which meant the monolithic national utility was unbundled in a geographic sense (as opposed to the functional sense of separating generation, transmission, and distribution which was the conventional wisdom at the time); creation of a fully funded social protection mechanism, monitored and administered by a credible third party (in this case the World Bank); and participation of IDA in the financing of a project company in which IFC has a 30percent equity stake.

Process innovations, no less important, include the slow increase (over a 10-year period) to reach steady-state tariffs, and establishment of an escrow account to ensure that the government pays its bills for electricity consumption on time.

5.3 Learning and Experimentation

Without doubt the concept and structure of the project is an experiment and therefore a huge learning experience for all those involved. For the government this is the first sizable private investment in the infrastructure sector. The process of preparing and negotiating the Concession and related agreements itself was completely new to them and (with considerable capacity-building steps taken by the MFIs) proved to be a learning experience. The implementation of the Concession and other agreements is also proving to be yet another learning experience.

For the investor, working with the government on the one hand and with the MFIs on the other also is a learning experience. With the government, the investor's challenge is to build the relationship with both the central and local government and its agencies, and look to the MFIs for support when the agencies appear to misinterpret the provisions of the various agreements, while at the same time fulfilling the covenants imposed by the financiers.

For the MFIs, bringing together the more commercial views of IFC with the more developmental views of IDA has been informative. In addition, various innovations and process elements brought in to reconcile the social objectives of the government with the commercial objectives of the investor is an experiment, underlined by the extremity of poverty in the region.

5.4 External Catalysts

The AKDN, IFC, and the World Bank have been the direct external catalysts, which is not a surprise in a country as dependant on external financial and aid organizations as Tajikistan is. In addition, the ADB and IMF played an indirect role as catalysts to enable the project.

6. Lessons Learned

Even in such a high-risk context as Tajikistan, private provision of infrastructure services is preferable since the private provider will bring in the necessary commercial orientation and can be held accountable for service provision and quality. To enable private provision of infrastructure service in high-risk contexts, however, early stage involvement of an MFI is a prerequisite. Second, combining IDA (or World Bank) with IFC funding in what is effectively a public/private partnership has a significant impact on the capital cost and radically improves the risk profile -- the benefits of this can be captured by consumers in lower tariffs and less steep tariff increases in the early years. In many places income levels are so low that achieving a return on investment requires tariffs that most of the population cannot afford (or where steep tariff increases over a short period are politically impossible) but given the boost of better service from a new investment, incomes -- and tariffs -- may be substantially improved over time. World Bank participation has the additional benefit of more closely involving the government involvement in the venture. Finally, without credible social protection, private investment in a very poor and politically volatile region with little experience with private investment in infrastructure and which requires a significant increase in average tariff levels will not be sustainable. Therefore, "payment for results" in terms of output delivered to the poor is an attractive way to structure such social protection.

Some aspects of this project are unique -- a development-oriented investor such as AKFED may not be available in every country. However, Tajikistan is also unique from the poverty and risks perspective. If the public/private partnership approach outlined here can structure a viable infrastructure project with private sector participation in one of the more challenging countries in the world, it should be applicable elsewhere. In the face of reduced private flows, the World Bank Group has announced its commitment to increased support for infrastructure and one of the avenues under consideration is public/private partnerships. This will require the sort of early-stage collaboration which occurred here -- pilots already are underway in West Africa and an electricity distribution project is being developed in the Kyrgyz Republic along these lines. This approach may offer a vehicle which can attract some new participants, and even persuade some others to return to the power (and other infrastructure) sectors of emerging markets.

References

World Bank and IFC, "Project Appraisal Document for the Pamir Private Power Project", June 4, 2002.

Clarke. D. and R. Sharma, "Private Power in a High Risk Context", Project Finance International, May 29, 2003.

Coudouel, A. and J. Hentschel, in "A Sourcebook for Poverty Reduction Strategies": Part I: Core Techniques, Section 3, 2001.

International Crisis Group, "Tajikistan: A Road Map for Development", April 24, 2003.

Freeman III, A.M., The Measurement of Environmental and Resource Values: Theory and Methods, Resources for the Future, Washington, DC, 1993.

Markandya, A., M. Jayawardne, and R. Sharma, "The Impacts of Infrastructure Investments on Measured Poverty: A Note", mimeo. World Bank, ECA-ECSIE, 2003.

Government of Tajikistan, Poverty Reduction Strategy Paper, Dushanbe, 2003.

World Bank "Making Transition Work for Everyone: Poverty and Inequality in Europe and Central Asia", Washington, DC, 2000.