

**SOCIAL IMPACT OF ELECTRICITY SECTOR REFORM
IN THE KYRGYZ REPUBLIC**

Households, Electricity Sector, Budget

FINAL DRAFT

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The paper was prepared by a team including Julian Lampiotti, Pedro Rodriguez (co-taskmanagers), Grant Milne, Natalia Pisareva and Maria Shkaratan. Ramos Mabugu provided valuable technical assistance with a part of the quantitative analysis. The consulting group from SIAR-Bishkek, contracted to carry out the focus group studies, performed extremely well despite difficult logistics and a pressing schedule. The team is particularly grateful to Ainoura Sagynabaeva (SIAR-Bishkek) for high quality work supervising focus group discussions and presenting the results of the study at the PRSP Forum in Almaty (November 2002). Thanks are offered to the many participants in the focus groups and key informant interviews who offered their sincere views on electricity reform in an open and transparent manner. Gil Yaron provided invaluable comments to the final draft.

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Abbreviations

CIS	Commonwealth of Independent States
CSAC	Consolidated Structural Adjustment Credit
DCH	District Central Heating
DFID	Department of International Development (UK)
Disco	Distribution company
ESI	Electricity Supply Industry
GDP	Gross Domestic Product
Genco	Generating company
GWh	Gigawatt hours
HBS	Household budget survey
KWh	kilowatt hour
LPG	Liquid propane gas
MLSP	Ministry of Labour and Social Protection
NSC	National Statistics Committee
SEA	State Energy Agency
Transco	Transmission company
UMB	Universal monthly benefit
USD	United States dollar

Exchange Rates – Som/US\$

1995	10.820
1996	12.803
1997	17.357
1998	20.767
1999	39.025
2000	47.717
2001	48.440

EXECUTIVE SUMMARY

This Poverty and Social Impact Analysis (PSIA) examines electricity sector reforms in the Kyrgyz Republic. The Kyrgyz government and supporting international partners are trying to strike a balance between prudent fiscal policy, increasing the financial viability in the power sector, and protecting the poor against rising electricity tariffs. Reforms are ongoing. This analysis examines existing trends and makes recommendations for improving outcomes. The PSIA is linked to the World Bank's Consolidated Structural Adjustment Credit (CSAC) program, which supports the Kyrgyz Government's efforts of putting the electricity sector on a financially sustainable basis and which already helped the government to reduce quasi-fiscal operations from 17 percent to 10 percent and to restructure the energy sector to make it more transparent and sustainable. Despite some hesitancy on moving further, the government has recently indicated its intention to continue this restructuring through creating a private-public partnership in the distribution sector through a concession arrangement.¹

Energy sector inefficiency and subsidization creates enormous burden for public finances and waste in a country that is highly indebted and in dire need of resources. Currently these losses are covered from the revenue received from the Intergovernmental Irrigation Agreements as well as some other sources, insufficiency of which leads to financing through asset depreciation. The reduction of energy sector quasi-fiscal deficit, generated through low prices for all types of consumers, as well as commercial and non-collection losses, is one of the main concerns for the Government. Residential electricity prices at US\$0.009 per kWh are still well below the cost recovery level of US\$0.023 per kWh and constitute roughly one tenth of the price in most other countries in the region. Total network losses (combined commercial and technical have more than tripled since 1990 and now are at the level of 40 percent of generation.² The main concern was that despite substantial residential tariff increases the performance of the sector does not improve, causing declining service levels and increasing commercial and non-payment losses and ultimately leading to the collapse of the sector. The recently proposed by the government sector management reform will be a major step in an effort to control losses, increase sector efficiency and restore the quality of service. Power and District Heating Rehabilitation Project will support reforming end-user metering, billing and collection systems.

¹ Kyrgyz Republic: Country Assistance Strategy, April 2003

² Energy Sector Brief, 2003

Impact on households

Residential electricity consumption is dropping and households', particularly the poor, are spending a larger percentage of their income on electricity. Household survey data indicates that the bottom quintile is spending a larger share of income on electricity than the top quintile and that this difference is increasing. While reported expenditures cannot be disaggregated into current consumption and arrears, making it difficult to conclusively identify who is most affected by the reform, the data do suggest that tariff increases are affecting the poor more than the more affluent groups. That the bottom quintile spends a larger share of their income on electricity than the top quintile suggests that it may be possible to design a heating subsidy that benefits the poor more than the non-poor.

Service quality in large parts of the country appears to be decreasing. Focus group research indicates unscheduled supply disruptions are serious in all regions, especially in rural areas and during the cold winter months. Residential consumers are angry that they are being asked to pay higher tariffs and cost of network repairs without noticeable improvements in service quality and that billing and collection practice is corrupt and non-transparent. Focus group discussions demonstrate that if further tariff adjustments are not accompanied by improved service quality and if billing and collection is not streamlined, it is likely that theft of electricity will accelerate. Household survey data also suggests the quality of service is declining. Improving service quality must be a priority because this will help offset the welfare losses caused by higher tariffs.

Rising tariffs and decreasing service quality may be pushing poor households down the energy ladder. Household survey data analysis shows that the poor rely more heavily on dirtier fuels such as wood, dung, and peat, especially for heating. Focus group discussion indicate that households are likely to use more dirty fuels with further tariff adjustments. Increased use of dirty fuels is closely associated with environmental externalities such as air-pollution and deforestation. These externalities must be taken into account when strategies to mitigate welfare losses from higher tariffs are developed.

Impact on Electric Supply Industry (ESI)

ESI has become increasingly dependent on the residential sector for revenue in recent years. With residential tariff adjustment, sector revenue increased. However, the costs rose as well leading to the net effect of further growth in financial loss. This situation was exacerbated by the decline in net revenue from the sector exports reducing the availability of cross-subsidization. Drop in the collection rate from 65 percent in 1999 to 56-57 percent in 2000

and 2001 was another substantial factor negatively affecting sector performance. Sector technical and commercial losses steeply increased in the beginning of the 1990-s to almost one-third of generation and stayed at the same level. The latter was partly due to increased transparency in accounting brought about by the unbundling of the sector and a lack of maintenance and investment in the low-voltage supply network that serves the residential sector. Investment resources are needed to prevent further deterioration of assets. For the tariff increases to have the intended effect on the financial health of the utility, losses should be reduced, costs reduced and collection rates improved.

Impact on the budget

The reform program appears to have produced large fiscal gains. Subsidies to ESI have fallen from 5.6 percent of GDP (US\$77M) in 2000 to 3.2 percent of GDP (US\$49M) in 2001 and to 2.7 percent of GDP (US\$44M). The challenge ahead for the government is to ensure that the poorest in the country are able to receive enough electricity to meet basic needs without placing an undue burden on the budget or ESI and to mitigate welfare losses due to tariff increases. In order to guarantee access and basic consumption of the electricity by the poor, substantial improvement in targeting of the current programs is needed. CSAC program conditionalities include initiation of the pilots of replacement of price discounts by cash payments, and preparation of the Law on Special Benefits that would improve targeting and monetize the benefits.³

Several alternative strategies can be considered for the transfer of social assistance. These include direct income transfers, targeted vouchers, and lifeline tariffs, each of which has advantages and disadvantages. At the extreme, the cost of providing the first 150 kWh of electricity at the current price is equal to US\$28.3M.⁴ This achieves 100 percent targeting of the poor and the provision of a basic minimum level of electricity for all households at a cost of about US\$10.2 per poor person receiving the transfer. Back of the envelope calculations suggest that providing an equivalent direct income transfer to all households below the poverty line would cost approximately US\$14.6M or about US\$6.4 per poor person. This must be weighed against the social costs of air pollution from the burning of dirty fuels and the environmental costs associated with deforestation and the loss of biodiversity.

³ CSAC Supervision Mission Aide Memoire, March 2003

⁴ Calculated as the difference between cost recovery tariff and actual average tariff times consumption

Public Awareness and Information Dissemination

Ongoing ESI reform in Kyrgyz Republic is creating substantial changes in power distribution, service, billing and pricing. Focus group discussions indicate that there is a poor understanding of the goals and outcomes of the sector privatization and a strong negative attitude toward it. Tariff increases are deeply unpopular given the lack of tangible improvements in electricity supply and service delivery. There is little faith in the present reform. To date, the public relations campaign has produced and disseminated pamphlets, published articles in the newspapers, had information announced on television and radio, and organized various seminars and meetings. A shift in approach from mass media to direct stakeholder dialogue is urgently required and the first steps in this direction have been taken by the Council of Local Self-Government Institutions (CLSG). Additional efforts are needed to increase public awareness of electricity sector reform and related social protection programs. To help address this issue, it is imperative that the ESI delivers on its promise of improved performance. Also the SEA and ESI should implement a public education and consultation program at the community level, with assistance from a suitable local partner.

Recommendations

PSIA analysis suggests that two first-tier issues are of critical importance for the success of the reform: improvements in the quality of electricity service delivery and billing and increased effectiveness of social protection measures.

Reducing the cost of low quality of service delivery and billing to households. If tariff increases are not accompanied by noticeable improvements in supply (reliability and voltage) and service (metering and billing), consumer response would likely be reduced consumption and/or increased theft of electricity and non-payment, which would in turn negatively affect sector performance and result in increased demand for subsidization.. Currently, in addition to increased tariffs, residential consumers have to pay the cost of damaged appliances (due to voltage surges), repairs to intra-village power network, over-billing and unclarity in billing, and informality in payments. Reform of sector management system and increased transparency are necessary to address these issues. Certain incentive measures can be introduced relatively fast to reduce these costs. In particular, tariffs may be linked directly to service quality, with households being charged a fraction of the cost recovery tariff where service is unreliable. The tariff could then be increased as service is improved. Also, consumers may be offered average bills that smooth differences in expenditures in winter and summer months. These measures would require an urgent and costly upgrading of the

metering, billing, and payment systems. Substantial improvement can be achieved if community-based service provision is introduced.

Increased effectiveness of social protection measures. With the current poor targeting of Kyrgyz means-tested social protection system, which reaches below 50 percent of the poor (in some cases, this number could be close to 25 percent), with a high incidence of poverty in the country (49% of the population in 2001), and with the current high coverage of the population by the housing and utility social benefit and privilege system, which is politically difficult to alter, a life-line tariff might be a more cost-effective way of protecting the poor than cash allowances. Although the total cost of the current life line subsidy might be higher than the total cost of an alternative means-tested system, it could be more cost effective in terms of targeting.

When considering the trade-offs between income transfers and lifelines, the environmental and health consequences of increased usage of dirty fuels due to raised tariffs, if any, should be estimated in monetary terms. In an environment of rapidly rising electricity tariffs and increasing enforcement, households will reduce consumption and search for less expensive substitutes. Reducing consumption means limiting reading (as well as other activities) at night and heating during the winter. Substitutes are likely to be dirty fuels, such as wood and coal that contribute to indoor and outdoor air pollution. Reduced heating and use of dirty fuels may have important health consequences that must be taken into account in the design of social risk mitigation measures.

Improving the effectiveness of the current social protection system is critical to avoid the situation when reduced sector subsidization is outweighed, in addition to reduced consumption and increased non-payments, by a surge in social protection costs. On-going work is aimed at designing techniques of using proxies to measure household income and thus increase targeting and at applying demand-driven approach to social protection service delivery as well as at service decentralisation.

INTRODUCTION AND OBJECTIVES

The Government of the Kyrgyz Republic is restructuring the former electric supply company into the Electricity Supply Industry (ESI), comprising of one generation company (Genco), one transmission company (Transco), and four distribution companies (Discos). A regulatory body, State Energy Agency (SEA), oversees energy policy and tariffs. The restructuring sets the stage for privatization and improving ESI's commercial performance. The most recent

estimates indicate that in 2002 tariff subsidies to residential sector only will amount to 2.7 percent of GDP (US\$44M). Losses due to non-collection are estimated at 0.8% of GDP. Technical and commercial losses reach 3% of GDP.⁵ To this end, electricity tariffs have increased sharply in the past two years and are scheduled to continue increasing until they reach cost recovery levels (2.3 US cents/kWh)⁶ and the medium-term target of financial viability for ESI is met. At the same time, in March 2002 the authorities increased budget allocations for programs that provide income-based social protection to eligible energy consumers in an effort to cushion the blow of tariff increases. The reform process is supported by the World Bank's Consolidated Structural Adjustment Credit (CSAC) program, and the activities of other donors including Switzerland, Norway, and DFID-UK.

Tariffs and increased collections are the primary instruments available to achieve financial viability and provide resources for much-needed capital investment in the power sector. Eventually, privatization will result in increased sector competition, lowered costs, efficient pricing and better customer service. Concerns exist, however, that recent tariff increases (March 2001 and March 2002) are not producing the intended results and ESI's commercial performance remains weak. At the same time, tariff increases may be hurting the poor, particularly in rural areas. Focus groups and key informant interviews indicate that the rising cost of utilities, particularly electricity, is perceived as one of the most important development problems – after unemployment and insufficient income (especially from pensions) to meet basic needs.⁷ Although social safety net programs to protect the poor from energy price increases are in place, they are not well targeted.

It is important that as the electricity restructuring program proceeds further within the broader framework of energy reform, the government and supporting international partners must strike a difficult balance between a) prudent national fiscal policy and performance; b) attaining cost recovery and financial viability in the ESI, and; c) cushioning the most vulnerable low-income people against rising tariffs. This report makes a contribution towards helping stakeholders achieve this balance by examining the fiscal and social impacts of the reform program on residential consumers and whether they are consistent with expectations. Section 1 sets the scene by offering brief background information on the Kyrgyz economy and poverty. Section 2 considers national energy supply and pricing. Section 3 examines key household issues identified with the ESI reform. Section 4 discusses the impact of energy

⁵ World Bank staff estimates, source of consumption and generation data – Kyrgyz authorities

⁶ Cost recovery assumes operations and maintenance expenses and depreciation to cover rehabilitation/replacement of assets in the medium term. It does not include a return on assets or a self-financing share. Sources: Kyrgyz Republic Fiscal Sustainability Study (2001), World Bank; CSAC documents, 2002.

⁷ See Annex 1 for a description of study methods and focus group profiles.

reform on ESI's financial performance. Section 5 illustrates the impact of energy reform on the state budget, and in particular the linkages with social protection programs. Section 6 summarizes the key environmental impacts associated with ESI reform and household coping mechanisms. Section 7 assesses the effectiveness of current public information and education programs for the ESI reform, and offers suggestions for improvement.

1. ECONOMIC AND POVERTY REVIEW

1.1. Economic Synopsis

The Kyrgyz Republic has experienced severe macro-economic problems with the transition to a market-based economy. At independence in 1991 the integration between the Kyrgyz and Soviet economies was broken, causing a rapid contraction of the Kyrgyz economy. Between 1991 and 1995, output declined by 50 percent. Real growth was restored in 1996 with the revival of the agricultural sector and the development of the Kumtor gold mine, but only for a short period of time. The Russian crisis of 1998 negatively reflected on the performance of the Kyrgyz economy. The economy recovered in 1999, and the next three years 1999-2001 were characterized by a modest growth at 3.7 percent of GDP in 1999, 5.4 percent in 2000 and 5.3 percent in 2001. Real GDP per capita was US\$308 in 2001, largely unchanged from 1995. Inflation (measured by the consumer price index) has fluctuated sharply over the past five years, declining from 18.7 percent in 2000 to an estimated 7.0 percent in 2001. The exchange rate with major convertible currencies has remained fairly stable over the past two years. The current account deficit was \$US50.3M or 3.3⁸ percent of GDP in 2001. Formal unemployment is an estimated 7.4 percent of the labor force.

Slow restructuring outside of the agricultural sector, expected declines in gold production from the Kumtor mine in the next five years, and low levels of foreign direct investment suggest that the medium-term economic outlook is not particularly positive. Real GDP growth is not expected to achieve the target of 4-5 percent in 2002 and is forecasted at 0.8 percent. Inflation is forecasted to remain in the 4 to 5 percent range through 2003. Unemployment in the formal sector will remain very high and continue to drive informal sector growth. The country will likely maintain its reliance on external assistance to fund its current account deficit, expected to worsen from 1 percent of GDP in 2002 to 3.4 percent of GDP in 2003. This will seriously constrain the government's ability to invest in social and economic development.

⁸ IMF estimates

1.2. Poverty Synopsis⁹

The current population of 5.0 million is growing at an average annual rate of 1.5 percent. The population is still mainly rural (65 percent). In 1998, approximately 53 percent of the population was considered poor, including 21 percent classified as extremely poor (Table 1). These figures have improved through 2001 as a result of economic growth coupled with moderate and marginally declining inequality. The growth was mainly due to the sustained increase in agricultural production since the mid-1990-s that in turn has been caused by structural reforms in agriculture, in particular, a largely equitable land reform.

Table 1. Poverty trends, Kyrgyz Republic, 1998-2001

Poverty Category	1998	1999	2000	2001
Population in general poverty (%)	52.5	51.2	50.7	47.6
Population in extreme poverty (%)	20.7	21.3	19.5	13.5

How do average wages and pensions correspond to the poverty lines? Comparisons of average wages with the 2001 general poverty line of 581 Som (US\$12) per month and with the 2001 extreme poverty line of 387 Som (US\$8) per month demonstrate that low-end wages provide for the level of consumption that is very close to what one adult living at the general poverty line consumes. The situation with pensions is even worse: the bottom one-third of pensions provide for consumption level that would place one adult approximately between extreme and general poverty lines. Average nominal wages from paid employment in 2001 were 1,419 Som per month (\$29US), with a range between eight formal sectors of 618 Som (US\$13) (forestry workers) to 4,731 Som (US\$98) (lending and state insurance). As of January 2001, 529,000 people received some form of state pension¹⁰. For approximately 34 percent of all pensioners, the size of pension is between 400 and 600 Som per month (US\$9-US\$13). Although this proportion of poor pensioners is lower than the proportion of poor in some other social groups (e.g., single mothers, families with many children), pensioners constitute the single largest vulnerable group, which due to its size substantially contributes to the poverty headcount in the country.

What household characteristics increase poverty risk? It has been found that regional dimension, unemployment of the household head, size of household and number of children in it, as well as income sources of the household are the best predictors of poverty status.

⁹ This section uses quotations from and is based on: Kyrgyz Republic: Enhancing Pro-Poor Growth (2002), World Bank

¹⁰ Vashakmadze, E. (2002), Pension System in Kyrgyz Republic. Human Development Sector Pension Group report, World Bank, Washington.

Poverty is higher in rural areas, it continues to significantly exceed urban poverty despite the sustained rural poverty reduction since 1998. An estimated 62 percent of the rural population was poor in 2001, compared to 45 percent of the urban population. While two thirds of the country's population lived in rural areas in 2001, 72 percent of the poor lived in rural areas. Poverty has a clear regional dimension, with Naryn oblast substantially poorer than the rest of the country, and falling behind as other regions benefit from growth far more than the Naryn oblast. Poverty is positively related to the characteristics of the household head: a household is less likely to be poor if the head has university education or is employed. The unemployment status of the household head increases the risk of absolute poverty by 40 percent, and doubles the risk of extreme poverty. The risk of poverty increases with the household size, in particular, households with many children, especially pre-school children have a higher incidence of poverty. Presence of disabled individuals in a household increases the risk of poverty. In addition, the general conditions of poverty are reflected in very poor housing conditions in terms of health and environmental standards, and in terms of utility access and reliability. An implication of these findings is that given these services are subsidized, the rich households, who usually consume more to begin with, receive most of the subsidies.

2. NATIONAL ENERGY SUPPLY AND PRICING

2.1. Energy Supply

Electricity is the single most important source of energy in Kyrgyz, accounting for close to 100 percent of production, consumption, and exports (Table 2). The energy supply system was developed during the Soviet times as one component of a regional market, mixing hydroelectric resources in Kyrgyz Republic and Tajikistan, and fossil fuel resources of Kazakhstan, Turkmenistan and Uzbekistan. Initially, the operational priority for the Kyrgyz Republic hydro system was to provide irrigation water. However, since the collapse of the

Table 2. National energy supply, Kyrgyz Republic, 2000*

Source	Production	Domestic Sales	Net Exports
Electricity	99.98%	99.83%	99.67%
Coal	0.02%	0.05%	0.03%
Natural Gas	0.00%	0.04%	0.04%
Petroleum	0.00%	0.00%	0.00%
Total (kg oil equivalent)	1,261,993,916	664,126,871	264,372,955

* Source: KyrgyzEnergo, SEA and World Bank staff estimates
Kg. Oil Equivalent factors are from Lampietti and Meyer (2002): electricity (0.085); piped gas (0.833); coal (0.541);

Soviet Union in 1991, the country has had to rely more on the domestic energy resources, and the operational priority for the hydro system has shifted from irrigation to meeting domestic energy needs. However, hydroelectric production is insufficient to meet total energy demand, and the country must import fossil fuels.

Electricity

Electrical generation is from five dams and power stations along the Toktogul basin. Energy production in 2000 of 14,844 GWh represented a 13 percent increase over 1999, mainly through expanded hydroelectric generation (DFID 2001). In 2000, the water released through the power stations exceeded the natural rate of reservoir replenishment, based on average rainfall in the region. The current drought requires limiting hydroelectric generation to 11,500 GWh for the next few years to allow the reservoir to gradually return to normal levels and permit the country to honor the Intergovernmental Irrigation Agreement with Uzbekistan for water exports. This raises the specter of the country needing to purchase expensive thermal energy to meet demand in the near future. Approximately 98 percent of the population is connected to the electricity grid. The two percent of households without electricity include those not originally connected to the grid (mostly in Naryn Oblast) and those disconnected for non-payment of bills. While high connection rates are typical for the region, the quality (voltage) and reliability (hours of service) are low.

District central heating

About one-half the urban population, or an estimated 200,000 households have access to district central heating (DCH) in major cities (London Economics 2000; M-Vector 2001). In Bishkek, approximately 78 percent of households have DCH access, and 43 percent in Karakol. In other cities with DCH access (JalaĀ-Abad, Kara-Balta, Tokmok, and Kara-Kul), the level of access is much lower, ranging from 5-12 percent. The DCH systems are generally old and in poor financial health, and hot water supply is disrupted by regular leaks and breakdowns in pumping stations. At the same time, an optimal level of consumption is difficult to achieve since consumers don't have individual heat controls and meters; hence they cannot adjust the level of energy consumption to their individual temperature requirements and/or disposable income.

Piped gas

Approximately 50 percent of total piped gas sales are to the residential sector. Around 30 percent of all urban households have access to piped natural gas, primarily in Bishkek, Osh, JalaĀ-Abad, Kara-Balta and Tokmok. Gas imports from Uzbekistan have been subject to periodic interruptions for political reasons; for example a major supply embargo occurred

during the winter of 2000/2001. The national gas supply sector is in serious financial trouble due to low prices and revenue collections. Part of the problem is that most households do not have meters, which discourages conservation and encourages theft; these so-called “commercial” losses now approach 23 percent of supply. The gas sector reform presently underway consists of restructuring debts, establishing a business plan and proper accounting practices, creating a more appropriate tariff framework, installing meters, and rationalizing subsidies to consumers.

2.2. Energy Pricing

A comparison of energy prices shows that, with the exception of LPG, energy prices in Kyrgyz are significantly lower than in other countries of the region (Table 3). The difference is particularly acute for electricity, which is one fifth of the price in most other countries. This discrepancy is due to a combination of high subsidies and slightly lower costs of hydroelectric generation.

Table 3. Energy prices in Eastern European and Central Asian countries, KgOil Equivalent in US\$, 2000*

Country	LPG	Coal	Electricity	Wood	Piped Gas
Armenia	0.59	0.07	0.56	0.16	0.12
Croatia	0.88	0.21	0.94	0.11	0.25
Latvia	0.35	0.12	0.60	0.17	0.76
Lithuania	0.26	0.13	0.60	0.11	0.20
Moldova	0.41	0.10	0.45	0.10	0.15
Tajikistan	0.33	<0.01	0.03	<0.01	0.06
Kyrgyz	0.33	0.02	0.11	<0.01	0.05

* Kyrgyz prices are for 2002. Source - author's surveys and in-country publications. For all other countries prices are for 2001, source - Lampietti and Meyer (2002).

2.3. Electricity Tariff Reform

Achieving the government’s objective of covering long-run marginal costs by 2005 requires a 37 percent annual average increase in the overall average tariff. Thus far Kyrgyz’ tariff policy has been based on substantial long-term tariff increase, gradual reduction of cross-subsidization of residential tariffs, and providing basic-need levels of electricity consumption at affordable prices. The challenge is to maintain a schedule of tariff increases that would lead to improved efficiency of the ESI and allow for mitigation of social and environmental consequences. The main risk is that in response to substantial tariff increases, households might reduce consumption and/or payments for electricity to a level that would compromise ESI’s profitability.

In the residential sector, six tariff blocks were used until March 2002 (Table 4). This system was simplified and only three blocks were used after March 2002. The lowest residential tariff block is designed to protect the poorest groups in society. Currently this provides the first 150 kWh per month at 43 Tyin/kWh (UScents0.9). For both residential and non-residential consumers, tariff charges increased significantly from 1996 to the middle of 2002. In March 2002, the highest percentage increase in residential tariffs was with the lowest tariff block (105 percent increase). The upper blocks had very modest increases and in the case of the 500-700 kWh blocks, the tariff charge actually declined.

Table 4. Real residential electricity tariffs (1995=100), Kyrgyz Republic, 1996-2002*

Real Price (Tyin/kWh)	Year						
	1996	1997	1998	1999	2000	2001	2002
up to 90 kWh	6.6	7.4	7.6	7.0	7.5	6.8	11.4
90-150 kWh	6.6	7.4	7.6	7.0	9.3	11.4	13.2
150-300 kWh	NA	NA	NA	NA	14.4	20.5	24.4
300-500 kWh	12.0	15.3	16.2	9.0	14.4	25.4	26.5
500-700 kWh	NA	NA	13.9	17.6	23.6	27.2	26.5
700 and higher	NA	NA	NA	20.6	35.2	35.4	35.0

* Note: Consumer Price Index for first half of 2002 estimated at 4 percent, source Annex 2

Tariff adjustment was substantial in the last few years starting in 1995. Since 1999, tariffs were adjusted five times (see Table 5).

Table 5. Tariff adjustments, 2000-2002*

average posted tariffs per 1kWh	10-Jan-00	10-Apr-00	15-May-00	13-Mar-01	15-Mar-02
all consumers, US cents	0.76	0.93	0.86	1.04	1.31
residential consumers, US cents	0.52	0.75	0.58	0.73	1.06

* Average annual residential tariff equaled 0.57 US cents in 2000, 0.83 in 2001 and 0.9 in 2002

3. KEY HOUSEHOLD ISSUES WITH ELECTRICITY REFORM

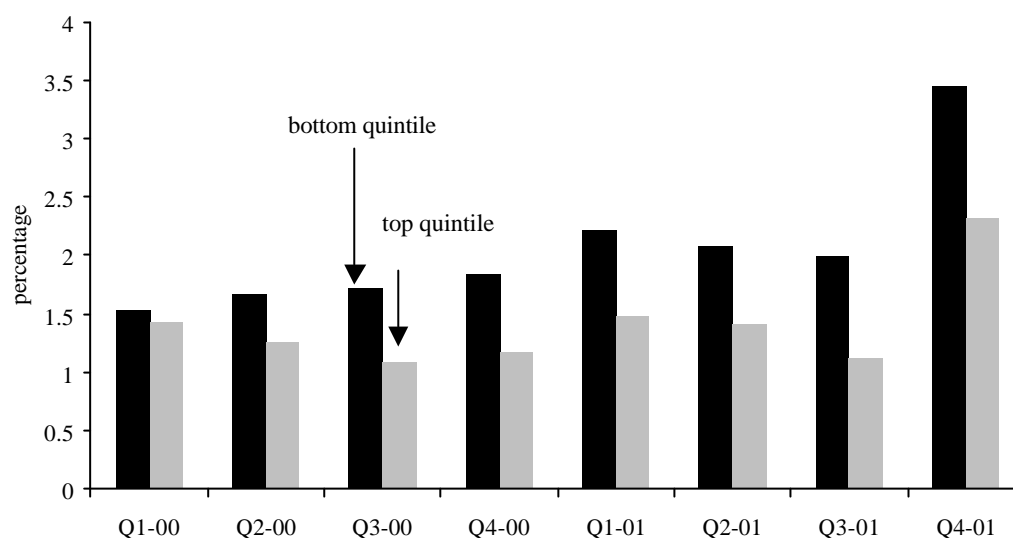
3.1. Increased Expenditures by the Poor

Poor households spend a larger share of income on electricity than the non-poor. In 2001, the poorest quintile spent 2.3 percent and the richest 1.5 percent.¹¹ While this may seem low by international standards, it is important to remember that Kyrgyz Republic is one of the poorest

¹¹ Kyrgyz Republic: Enhancing Pro-Poor Growth (2002), World Bank

countries in the region (per capita GDP of only just over US\$ 300 per year), household budgets are severely constrained and even this share could be noticeable for households.

Figure 1. Share of electricity expenditures in total household expenditure, Kyrgyz Republic, 2000-2001*
(actual payments)



*Source: National Statistical Committee, HBS 2000; 2001

Moreover, there was a rise in the share of expenditures on electricity after tariff increases from 2000 to 2001. It affected the bottom quintile the most (Figure 1). The share of electricity expenditures in the income of the bottom quintile is higher than that of the top quintile, and this difference has been rising since the beginning of tariff reform in January 2000 for all quarters of the year. Expenditures rose particularly sharply with the onset of cooler temperatures in the third quarter of 2001.¹²

The same tendency can be expected in the future as shown by the analysis based on simulations of household electricity consumption patterns by quintile based on the Government's schedule of tariff increases for 2003-2006¹³ and on the National Statistical Committee's assumptions for household income growth¹⁴.¹⁵ In the first scenario - with the assumption that households cannot adjust their consumption of electricity downward and will

¹² It is hard to give a precise estimate of how much the household budgets of the poor were affected because the Household Budget Survey does not have detailed enough information: electricity expenditures reported by households cannot be disaggregated into current consumption and arrears.

¹³ Medium Term Tariff Policy (MTTP) for 2003-2006 envisages annual tariff increases of 11 percent starting in 2004 (Government's decree #279 of May 2003).

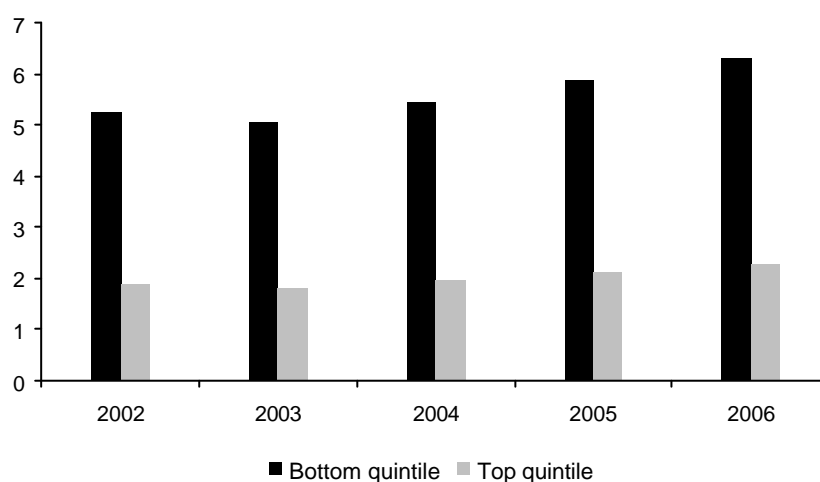
¹⁴ Income increases by 4 percent annually based on the trend observed during the last years of positive GDP growth and structural reform changes.

¹⁵ The analysis was conducted jointly by National Statistical Committee and the World Bank using the Household Budget Survey data.

have (or choose) to pay for the current consumption level at an increased price, - the share of electricity bill in total household expenditure¹⁶ of the bottom quintile will increase from the actual 2002 level of 5.2 percent to the projected 6.3 percent by 2006. The top quintile will increase the share of electricity expenditure in its total expenditure from 1.9 percent in 2002 to 2.2 percent in 2006 (Figure 2).

Another scenario is based on a more realistic assumption that the bottom quintile will have to adjust its consumption downward. If the bottom quintile households reduce electricity consumption to the point allowing them to keep the bill at the 2002 level, their consumption will drop by fourteen percent from the monthly average of 126 kWh in 2002 to 108 kWh in 2006, the level still allowing to satisfy basic needs and not alarming yet.

Figure 2. Share of electricity expenditures in total household expenditure, Kyrgyz Republic, 2002-2006, projected for 2003-2006* (billed amount)



* Source: National Statistical Committee, HBS 2002; estimations of authors

Projections for the top quintile are more difficult to make since it might happen that with economic growth and with improved quality of electricity supply, this part of the population will change its current consumption bundle by adding goods that increase the quality of life including electric household appliances. In this case, the top quintile's consumption of electricity might increase substantially as it happened in some other countries of the region.¹⁷ However, even under the assumption that the top quintile will increase consumption by ten

¹⁶ The amount of the bill and not the amount paid is used. Note that Figure 1 presents data for amount paid. The difference equals current arrears (or current non-collection).

¹⁷ E.g., Georgia, see "Revisiting Reforms: Lessons from Georgia. WB, ECSSD", under preparation.

percent annually, the share of electricity expenditure in their total expenditure will rise only to 2.3 percent in 2006.

To put the Kyrgyz share of electricity spending in total spending in perspective, it is useful to provide international comparison of share of electricity expenditures in total household expenditures. As can be seen from Table 6, household spending on electricity as percentage of total expenditures differs from one country of the region to another, especially this is true for the bottom quintile. The bottom quintile's spending on electricity ranges from 0.9 percent of total spending in Kazakhstan to 8.4 percent in Moldova and the top quintile's from 0.6 percent in Kazakhstan to 3.7 percent in Hungary. The large difference among countries is explained by several factors including level of income and inequality, advancement with electricity sector reform (tariff adjustment to cost recovery level, consumption control and collection enforcement), access to fuel resources and effectiveness of social mitigation of tariff increases. Although electricity expenditures in Kyrgyz Republic are not higher than in such countries as Poland and Hungary, the comparison should be made in the context of per capita income and related flexibility of household budgets and level of household savings, which are much lower in Kyrgyz Republic than in the CEE countries. The situation is most difficult in Moldova, where the bottom quintile households spend 8.4 percent of their total expenditure on electricity as compared to 5.2 percent in Kyrgyz Republic and 6.0 percent in Georgia. High importance of timely implementation of appropriate social mitigation measures related to tariff increases in Kyrgyz Republic and other countries with similar per capita income needs to be emphasized.

Table 6. Percentage of Electricity in Total Household Expenditure^{18 19}

	Georgia	Hungary	Kazakhstan	Kyrgyz	Moldova	Poland
Bottom Quintile	6.0	6.5	0.9	5.2	8.4	5.4
Top Quintile	2.0	3.7	0.6	1.9	2.2	2.4

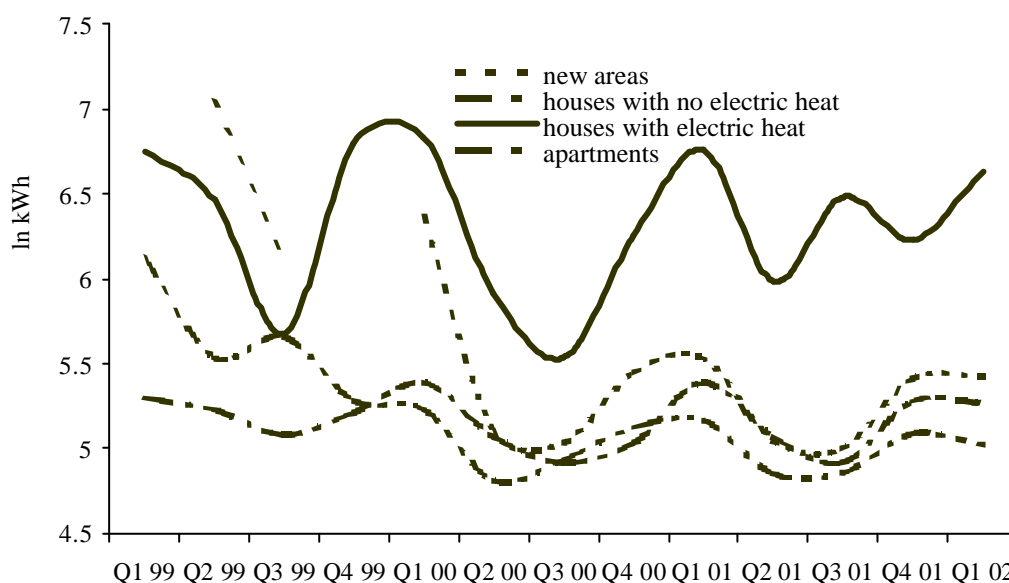
¹⁸ Source: Social Consequences of Electricity Sector Reform, World Bank, ECSSD, ECSIE, ENV, under preparation.

¹⁹ Latest year available: 2000 for Hungary, 2001 for Kazakhstan and Poland and 2002 for Hungary, Kyrgyz and Moldova.

3.2. Reduced Residential Electricity Consumption

Residential electricity consumption has dropped precipitously, from 4,458 million kWh in 2000 to 3,328 million kWh in 2001. As an example, average consumption levels for four different types of household are presented in Figure 2. The data are a sample of residential consumers in Bishkek from January 1999 to March 2002.²⁰ Consumption is highest for households heating with electricity and lowest for those not heating with electricity. A rough calculation of the price elasticity of electricity demand indicates that it is lower for households with electric heating (-0.69) and for apartment buildings (-0.47), and higher for houses without electric heat (-1.11) and housing in the new areas where mostly poor people live (-0.93). The sharp fall in consumption in houses without electric heat and in new areas is consistent with the coping mechanism of increasing use of substitutes for heating, such as coal, in the face of rising electricity prices.

Figure 2. Average household electricity consumption, kWh, Bishkek, 1999-2002^{21*}



* Source: Severelectro, see also Annex 3

Focus Group discussions demonstrated that many households have been reducing consumption of electricity due to tariff increases and that they are planning to substitute electricity with dirty fuels such as coal, wood and oil if prices continue to rise.

- We will install "burzhuikas", we will use wood. (Karakol, urban area)

²⁰ Severelectro billing data was used. See Annex 3 for detailed results.

²¹ The data for 1999 should be viewed with caution since Severelectro officials felt that some of the values were not fully accurate, particularly early in the year. A review of the raw data confirms this.

- *Almost everybody is heating with “burjuikas”, they are used for cooking too. One can see small chimneys sticking out of the windows. (Bishkek, very poor)*
- *We will construct a sandal, dig a hole [in the floor], light fire, put a table above, spread out blanket (korpe). It is harmful for on’s health but what can we do? We’ll be able to eat, it won’t be too cold. (Batken, rural area)*
- *Someone’s house burned. A small piece of wood fell down, they tried to extinguish the fire, but did not have water. (Batken, rural area)*
- *If price rises and we do not have money, we will switch over to the oil-lamp, like in ancient times. (Talas, rural area)*

Some participants of the Focus Groups said that people are frustrated and angry with tariff increases and might even go to the streets if new increases are implemented.

- *What shall we do, there is no coal, no gas, forests are all cut, and nothing is left. (Batken, rural area)*
- *It is better not to increase tariffs at all, because people will start a riot, we are unable to pay for electric power now. (Karakol, rural area)*
- *I think that people will revolt in case of [tariff] increase. (Osh, urban area)*

3.3. Poor Supply and Service Reliability

The focus groups indicated that unscheduled supply disruptions are serious in all regions, but especially in rural areas and during the cold winter months when the electricity demand is high. Only 26 percent of households have less than one service interruption per week. In urban areas the poor suffer the most; 42 percent of the lowest quintile have less than one interruption per week compared to 75 percent of the highest quintile ²² (Figure 3). Interruptions ranged from a few hours to 68 hours (or more) per day in some rural areas. Scheduled power cuts are common and can last as long as 12 hours per day. Generally, people were not notified in advance of scheduled power cuts. A common complaint was that the interruptions often occurred during early morning and late afternoon or early evening when people are preparing food and children are working on homework. These are peak demand periods and suggest that the distribution system in most areas cannot function effectively under heavy loads.

Focus Group discussion confirmed that blackouts are quite common in all areas and many of the participants expressed dissatisfaction with this fact.

- *I am 71, after my daughter died I have to take care of the grandchildren. In March they were turning the light off from 6 to 9 PM, therefore the children were unable to do their homework. In the morning they turn it off from 5 to 9, the very time the children have breakfast and leave for school. (Talas, rural area)*

²² Kyrgyz Republic: Enhancing Pro-poor Growth (2002), World Bank

- *Electricity blackout happen when it gets cold outside (Batken, urban area)*
- *We do not have electricity at the normal time, they just black it out not bothering to know whether you paid for it or not (Batken, urban area)*
- *They turn off the light ignoring the schedule of interruptions. (Batken, urban area)*
- *If we know in advance about disconnection, we can finish our things earlier. (Naryn, rural area)*
- *No one warns us [about electricity cutt-offs]. They turn it off whenever they want to. (Jalal-Abad, urban area)*

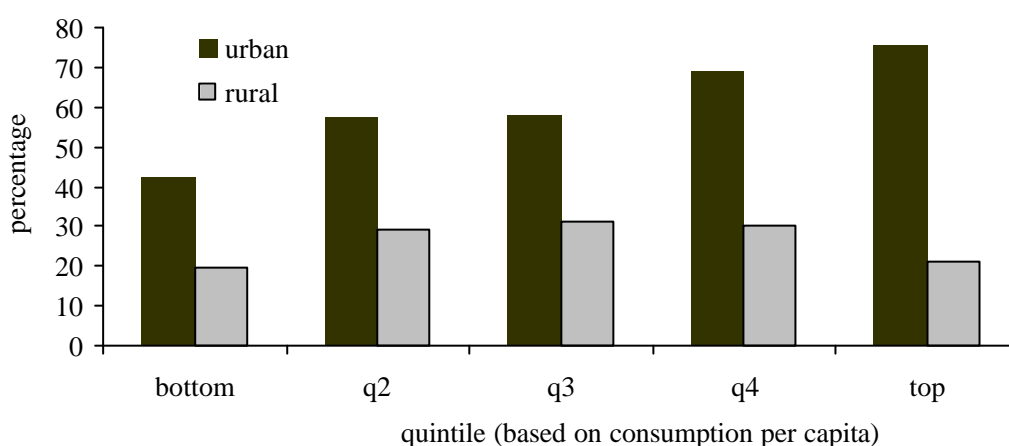
Electricity bills reflect only a small part of total household costs for electricity. Focus group discussions indicate that other important costs include damages to appliances, repairs and informal payments. Many households complained bitterly about changes in network voltage. Surges damage expensive appliances such as TV sets and refrigerators. Low voltage renders them inoperable. A common example heard in rural area focus groups was that refrigerators were not used in the winter because of insufficient voltage. Also, it required as much as two hours to boil water for tea on an electric cooker. Some participants used candles for lighting because it was brighter than light bulbs under low voltage conditions.

- *Our refrigerators get burned down because of voltage surges. (Chui, urban area)*
- *Once I measured voltage, and instead of 220 V it was just 160 V. It is next to impossible to watch TV or read books. (Chui, urban area)*
- *The voltage is constantly weak, we have to cook on fire. (Batken, rural area)*
- *Voltage is constantly changing. TV sets and lamps are broken. (Batken, rural area)*
- *Our refrigerators are burnt down [because of voltage surges]. (Chui, rural area)*
- *We cannot boil water. Voltage is constantly weak. (Chui, rural area)*

Consumers are often forced to pay the cost of repairs to the network. As reported by focus group participants, repairs can take several days or even months. In order to have faulty Disco equipment repaired or replaced (for example a small transformer in a village, power lines that have fallen, etc.), households are usually asked to mobilize cash to the Disco technicians for parts and/or service; otherwise the equipment will not be fixed and supply restored. No invoices or receipts are presented, just a verbal demand from the Disco personnel to gather a certain sum of money if they want the problem fixed. But as many participants stated, even when the equipment is fixed, the electricity can often fail again, at any time. The amount collected from each household ranged from 10 Som (US\$0.2) for minor repairs to 450 Som (US\$9) for major equipment replacement (the average monthly pension is now 550 Som or US\$12). Participants had trouble understanding why they should have to pay ad hoc “fees” for electrical equipment to the Disco in addition to their monthly bill.

- Once there were no light for three days. We [were told] that repairs are needed. For that they requested 7000 soms. We did it ourselves because we did not have the money, and none of the controllers helped us. (Naryn, urban area)
- Once the transformer was broken and for four months there was no electricity, we had to pay 50 soms each so that electricity is switched back. (Batken, rural area)
- We even provide the regional power station with fuel. (Batken, rural area)
- For one year, 25 soms are collected from every family, altogether there are 60-65 families. (Batken, rural area)
- In an emergency situation, we collect 20 soms, sometimes 30 soms from each house. (Jalal-Abad, rural area)

Figure 3. Household access to reliable (interruptions fewer than once per week) electricity by quintile, Kyrgyz Republic, 2001*



*Source: Kyrgyz Republic: Enhancing Pro-poor Growth. World Bank. August 2002.

3.4. Substitution to Alternative Energy Sources

Substitution behavior may be driven by electricity tariffs and low service quality as well as by prices and access to substitutes. Analysis of energy consumption patterns for heating by quintile shows that the poor tend to rely more heavily on dirtier fuels such as wood, dung, and peat that are closely associated with environmental externalities such as indoor air-pollution and deforestation (Table 7 and Figure 4). The better off rely on clean fuels such as electricity, gas, and DCH. The exception is coal, which is used more by the top than the bottom quintile. The reason is both increase in clean fuel prices and reduction in reliable access to them.

Converting unit prices to oil equivalents shows that electricity is by far the least expensive energy source (Table 7). Wood is next, followed by coal and piped gas. LPG is most expensive. While electricity may be inexpensive and easy to use, service reliability is a critical issue that may be driving people to use more expensive fuels.

Prices for electricity, gas and LPG increased substantially during the years of transition. LPG and gas are used less and less often, mostly when there is no other option for fuel for heating and cooking. Coal prices soared to the cost recovery level in the beginning of transition causing consumers to switch to electricity at that time. In the recent years due to strengthening of the disconnection policy as well as due to frequent electricity shortages in rural area, households started switching back to coal.

Table 7. Oil equivalent energy unit costs, Kyrgyz Republic, April 2002*

Energy type	Consumer cost (Som/unit)	Oil equivalent unit cost (Som)
1. Electricity (residential)		
First 150 kWh/month	0.43/kWh	0.037
150 – 700 kWh/month	0.80/kWh	0.068
More than 700 kWh/month	1.10/kWh	0.094
2. Coal	1.5/kg	0.812
3. Piped natural gas	3.0/m ³	2.499
4. LPG	15.0/kg	15.885
5. Wood		
Small logs	1000/m ³	0.215
Residue, branches, etc	500/m ³	0.108

*Note: conversion factor for m³ wood to tonnes is 1.75 (Bull et al 1998). Oil equivalent conversion factors: 1 kWh electricity (0.085); 1 m³ piped gas (0.833); 1 kg LPG (1.059); 1 kg wood (0.376); 1 kg coal (0.541). Source: Lampietti and Meyer (2002), authors' in-country surveys in April 2002.

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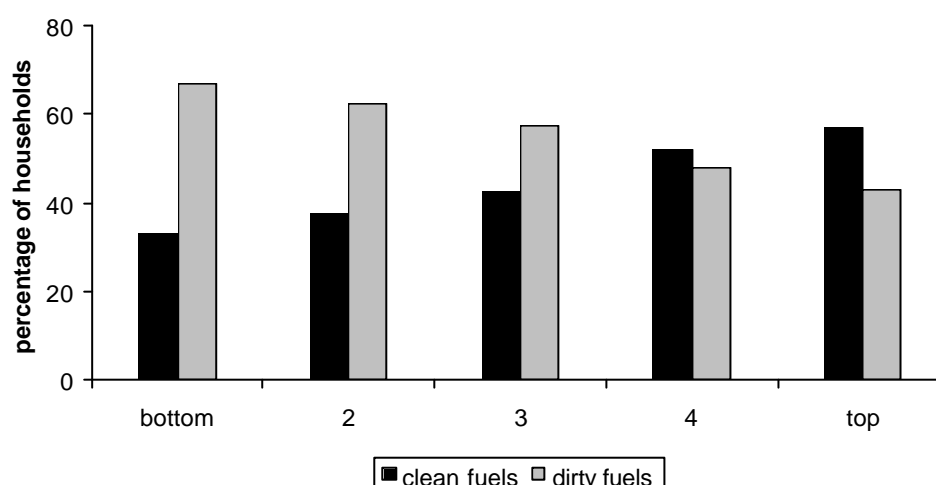
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Table 8. Primary source of energy for heating by quintile, percent of households, Kyrgyz Republic, 2002, Q1-Q2*

Source of energy	bottom	2	3	4	top
electricity	16	16	22	26	20
DH	6	8	14	28	44
gas	5	10	10	22	54
coal	14	16	20	22	28
wood	21	24	21	18	15
dung	25	24	18	17	16
peat	48	14	17	18	4
other	39	20	0	22	18

*Source: DFID-funded energy component of the regular HBS, 2002 (only for the first half of 2002)

Figure 4. Clean and Dirty Fuel Use by Quintiles*



*Clean fuels are electricity, DCH and gas; dirty fuels are coal, wood, dung and peat.

Focus groups indicate that both poor and non-poor tend to rely on wood and dung for heating when possible, both due to increase in prices for clean fuels and due to the lack of access to DCH or gas, the latter being the case for rural areas. Among these fuels, wood appears to be the solid fuel of choice, especially among the poor. Although it is quite expensive to buy and scarce in most Oblasts, many households collect it and thus it is a free source of heat for them. While wood may be viewed as a low-cost alternative to electricity, it is not readily available in many parts of the country and involves considerable effort to collect and use. In urban areas, old buildings are scavenged for wood from flooring and roofs. Among the urban poor focus groups, examples were also given of people stealing wooden benches from parks, and wooden crosses from cemeteries to burn in the winter. In rural areas, households use trees from their own properties or from public areas, such as windbreaks along roads. Fuels such as

dung, and peat are usually not purchased either, but collected. In some cases, the same applies to coal. Coal and wood are often burned together for better coal combustion. Peat is hardly used at all. Dung is commonly used in rural areas.

To the extent that increased usage of dirty fuels is an access issue, there may be room for investments in improving access of the poor to clean fuels. When it is a choice issue driven by budget constraints, then careful consideration needs to be given to the social costs of the negative externality.

Another coping mechanism associated with rising tariffs and unreliable supply mentioned by urban and rural-poor focus group participants was that they used fewer rooms in the winter, dressed warmer, and, where possible, tried to shift some heating and cooking to solid fuel, particularly coal, if available and affordable.²³ Rural poor indicated that they responded to last year's tariff increase by reducing the use of electricity (turning off appliances such as refrigerators and sometimes using candles and kerosene for light). This suggests that one potential area for intervention to mitigate the blow of tariff increases on the poor is investments in energy efficiency. These would enable households to reduce consumption while maintaining the same level of comfort and expenditures.

3.5. Billing Inefficiencies

Many focus group participants suspect they are over-billed. They cite several reasons including unclear calculations by inspectors, lack of knowledge on how to read meters, and uneven treatment of privileges. Following up on billing mistakes involves travel to the Oblast center and many poor focus group participants in rural areas explained that they could not afford the travel costs. Others said they had no idea what to do, where to go, or who to talk to.

- I pay every month, have all the receipts but still have to pay more because they [collectors] put any number they want on the bills. (Batken, urban area)

- They say that I have some old debt and they include it in my electricity bill. (Batken, urban area)

- Some inspectors are honest, some are very rude, and they just want to get the money. If the amount of money seems too little, they start searching the house to see if we are stealing [electricity].(Chui, urban area)

- Six months ago I paid to the controller who was already fired. He collected money and disappeared, and we had to pay again. (Osh, rural area)

²³ It can also be speculated that for some people, the shift to solid fuels comes only after being caught stealing electricity and then having to make a choice between paying for electricity or using alternative fuels.

- Yes, we can [read meters ourselves], but the problem is - they [the controllers] calculate up to 150 kW/hour at one price and above that at other price. (Karakol, rural)

- I have not heard anything about electricity privileges at all. (Chui, rural area)

- We know only that pensioners, Afghan's war and other veterans get privileges. But we do not know about the needy. (Chui, rural area)

- Even those who have privileges, pay the whole sum. (Batken, rural area)

- Inspectors do not understand the meters themselves, tell us that we have debt and make us pay, which is just robbery. (Batken, urban area)

- I, for example, received a letter from social fund that I should have a 50% discount. There is a stamp and a signature, but the controllers still make me pay. (Batken, urban area)

A related point is that controllers do not usually have uniforms or identification. With controllers being changed frequently to different routes, (a Disco approach to reduce field corruption), customers were not always sure that the new person asking them to pay their bill really is the controller and not an imposter. A few examples were given of payments being made to imposters. Where the controller is paid in the field when delivering a bill, some focus group participants indicated that receipts were not always provided. This means that the customer has no documents to prove payment against recorded consumption. If the controller keeps the money, the next month's bill could then show non-payment of the previous bill, with the customer having no recourse to stave off disconnection and every incentive to steal electricity.

Most focus group participants have an electric meter at their residence, usually inside the premises. This makes regular meter reading quite difficult, if people are not home when the controller (meter reader) arrives. In these cases, the controller would estimate the bill. Some participants indicated that they would read their own meters around the time the controller was scheduled to arrive, and post a note on the door, on a fence, etc. Most participants said they could read their own meters, but many did not know how to convert the consumption figures to a cash amount using existing tariffs. The ESI is presently working with clients to relocate meters outdoors. While this would improve the efficiency of meter-reading, a counterpoint raised in two rural and one urban focus groups was that the meters could then be stolen by people who use internal parts for various purposes, or to reconfigure the meter to give lower readings before selling it. Households are expected to pay for new and replacement meter installation, which should be a one-time expense. However, considering possible theft of meters, this expense could be a serious burden for poor households.

One option to reduce corruption and provide customers more control over individual electricity use is to widen the availability of pre-payment meters. This was suggested by a number of focus group participants. According to a recent billing audit (Price Waterhouse Coopers 2002), the certification date on many meters has expired. As these meters are replaced, it may be worth considering the option of giving consumers a choice between regular and pre-payment meters. However, a detailed study needs to be undertaken to determine if this is feasible.

The main concern in the focus groups was that people are being asked to pay more for electricity (through tariff increases in April 2001 and March 2002) without any noticeable improvement in quality of supply and service. The consensus was that electricity supply reliability is deteriorating or staying the same, especially in rural areas. The quality of maintenance was generally rated as inadequate. These patterns cut across regional and welfare groups. Many people reflected with fondness back to the Soviet times when energy was virtually free and service fairly reliable. There is growing anger among many people interviewed at having to pay more money for lower quality electricity supply and service. This suggests that a possible strategy to increase revenue and reduce non-payment would be to link tariffs more closely with service quality.²⁴

3.6. Theft of Electricity

Virtually all focus group participants knew people who were stealing electricity and indicated that it was quite easy to steal electricity either by illegal connections, or by tampering with the meter. Everyone knew a local electrician who could undertake the work. In some cases, the Disco controller was apparently paid to do the work. When illegal repairs or tampering was discovered and reversed, participants said that changing the system back could be done in a few hours. Interviews with controllers suggested that a very high proportion of customers routinely tamper with meters or use illegal connections to obtain electricity. This lends credence to the view that some households will only switch to other energy sources after they are caught stealing electricity and face having to pay for it or use substitutes. Payments required for re-connection if the service was suspended for non-payments can be also very high (e.g., one respondent paid 185 Som (US\$4) for a re-connection). In some cases it takes five or six disconnections before a customer stops illegal activity. With further tariff increases, theft of electricity is likely to accelerate. Controllers suggested that a cash incentive

²⁴ This issue is discussed in greater detail in section 5.

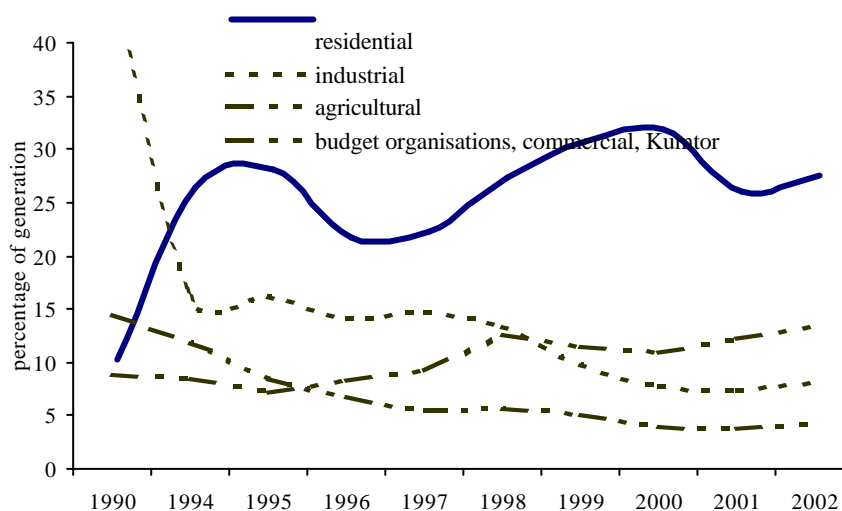
system is needed to reward controllers for reporting electricity theft. This could augment the current system where controllers have a daily quota for gathering bill payments.

- *Illegal connection and other swindles with the gauge are very common in the private sector, especially among those subscribers who use electric heating. (Bishkek, not very poor households)*
- *People are compelled to steal. They do not have money for coal, therefore they find different ways to steal in order to survive. (Bishkek, not very poor households)*
- *If the prices go up, stealing of electric power will become more frequent, because people are unemployed, they have no money. Thus the increase in prices for electricity this year will enlarge the number of people stealing electric power, which in turn will entail the next increase in payment rates. (Bishkek, extremely poor)*
- *We'll be stealing and we'll be using candles. We'll get "burjuykas". We'll find some way out. (Bishkek, extremely poor)*

4. IMPACT OF REFORM ON ESI

Residential sales have become an increasingly important source of revenue for the ESI. Over the 1990s electricity generation remained constant at about 12,500 GWH per annum while consumption shifted from industry and agriculture to the residential sector. In 2002, both industrial and agricultural sales amounted to less than 30 percent of 1990 levels. Starting in 2000, the Kyrgyz economy entered a new period of more stable and broad-based growth. Sales have flattened out with 7-8 percent of generation consumed by industrial sector and 4 percent by agriculture (Figure 5). ESI's ability to leverage increased dependence on

Figure 5. Structure of Electricity Consumption, Kyrgyz Republic, 1990-2002*

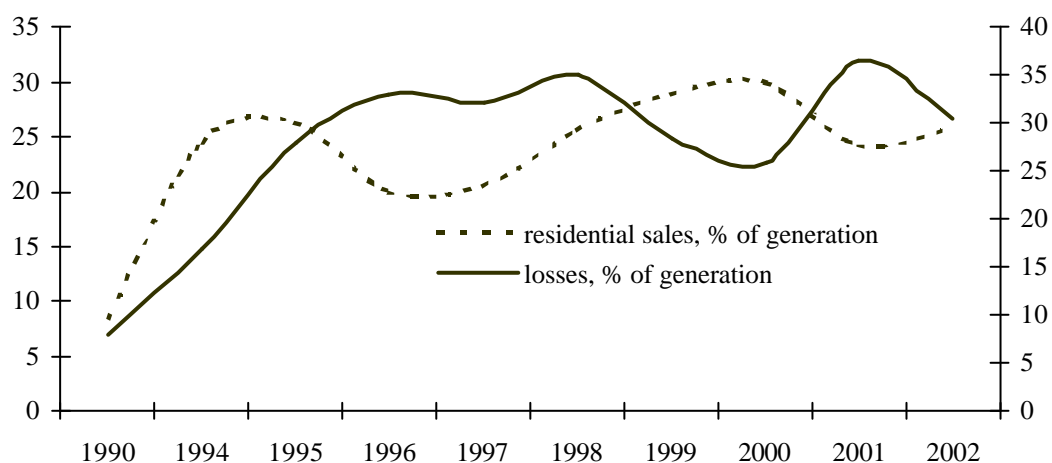


*Projected for 2002. Sources: SEA, Ministry of Finance, ESI and World Bank staff estimates

consumption into revenues has been compromised by low residential tariffs and inadequate collection rates. While residential consumption grew almost three times from 1990 to 1994 and stayed at approximately the same level throughout the rest of the period 1995-2002, prices only increased recently.²⁵

Low tariffs and a deliberate government policy to encourage a shift away from gas towards power resulted in high levels of generation and consumption. The sector is under funded, making it hard to cover the associated increase in required operation, maintenance, and rehabilitation expenditures. Sector losses due to low tariffs, reduced subsidization, non-collection, increased costs of operations and technical and commercial losses²⁶ led to asset depletion. Figure 6 illustrates one component of this picture showing that over the last 10 years technical and commercial losses grew while residential consumption also increased from 8 percent of generation in 1990 to 37 percent in 2001. One explanation is that the residential sector requires a low-voltage supply network, which has not been expanded to accommodate additional demand²⁷, and which suffers from obsolete equipment. The shift to a higher share of residential consumption in total consumption required additional investment. Since financing was not available, further depletion of assets led to increased technical losses.

Figure 6. Losses of Electricity and Residential Consumption, Kyrgyz Republic, 1990-2002*



* Projected for 2002. Sources: SEA, Ministry of Finance, ESI and World Bank staff estimates.

²⁵ See above, section 3.2.

²⁶ Only when the sector was unbundled in late 2001 did it become clear that losses were well above 30 percent of generation. Source: Kyrgyz Public Expenditure Review (2002), World Bank.

²⁷ Residential sales increased from 1,111 MWh in 1990 to 4,458 MWh in 2000 and went down to 3,329MWh in 2001 after tariff increases.

All sectors of the ESI are in a critical financial condition, posting operating losses in 2001.²⁸ Heavy losses from theft and low billing collections contribute to general cash flow problems and an inability to maintain a much-needed capital investment program. On average, approximately half of ESI's total revenues are derived from electricity exports; excluding those from the income and expense statements paints a dismal financial picture. In 2000, the net income (excluding export revenue) was -2,252 M Som (US\$-47), or about -0.15 Som (US cents -0.3) per KWh generated. Adding debt service puts the losses at -0.19 Som (US cents - 0.4) per KWh generated (DFID 2001). Cash flow projections by the SEA show that when export revenues are excluded, annual operating revenue shortfalls from generation, transmission and distribution are expected to increase from 2001 despite tariff increases (Table 9).

Table 9. ESI's domestic sector: main financial indicators, Kyrgyz Republic, 2000-2001*

Financial Indicators	2000	2001	2002
Domestic billing revenue, M Som	2,375	2,834	3,700
Total cost, M Som	3,975	4,452	5,194
Net domestic revenue, M Som	(1,601)	(1,618)	(1,494)
Net export revenues	3,403	1,836	895

*Sources: SEA, Ministry of Finance, ESI and World Bank staff estimates

Table 9 demonstrates that in the last two years ESI's revenue increased, but so did costs. ESI's domestic revenue increased by 459M Som (US\$22.2M) in 2001 and by projected 866M Som or US\$41.3M in 2002. Much of the revenue growth can be attributed to tariff increases. For each 1 percent increase in the average residential tariff, ESI domestic revenue increased by 0.42 percent in 2001 and is projected to increase by 3.43 percent in 2002). For comparison, the domestic costs per one percent increase in average residential tariffs grew by 0.26 percent in 2001 and are projected to increase by 1.87 percent in 2002. As export profit declines, the prospects of cross-subsidization of the domestic sector by export diminishes.

Residential consumption declined precipitously following the 2001 tariff increase, from 4,458 million kWh in 2000 to 3,328 million kWh (Table 10). This was accompanied by a fall in collection rates from 65 percent in 1999 to 56 percent in 2000 and a growing revenue shortfall (accounts receivable). In 2001, the estimated revenue shortfall was just over 400M Som (US\$8.3M), which would go a long way to funding electricity tariff protection programs to

²⁸ The World Bank and other donors (DFID 2001) have already undertaken detailed studies of ESI performance.

the poorest households, or alternatively, shoring up the dismal financial performance of the ESI, and providing funds to improve electricity supply and service.

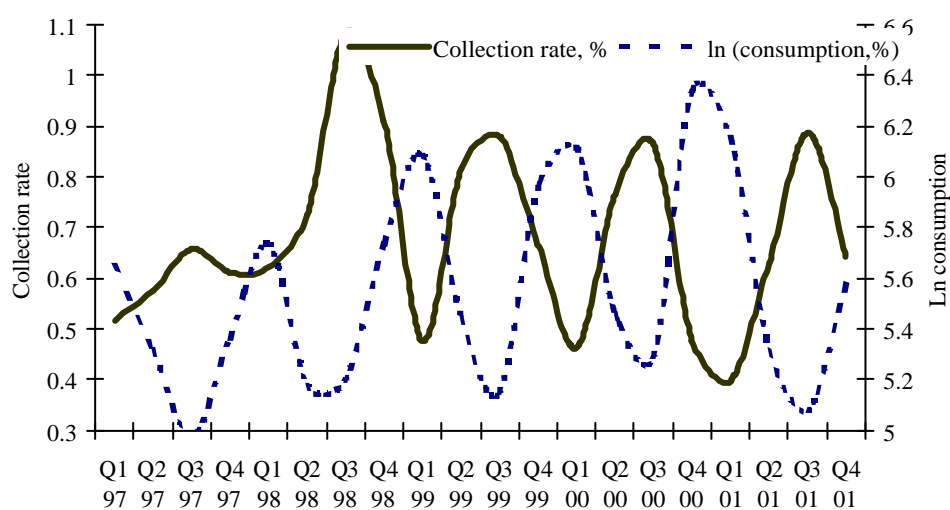
Table 10. Residential consumption, billed tariffs and collection rates, Kyrgyz Republic, 1999 – 2001*

Indicators of Sector Performance	1999	2000	2001
Consumption (million kWh)	3,802	4,458	3,328
Billed tariffs (M Som)	531.8	762.7	929.5
Collected tariffs (M Som)	345.9	438.4	523.5
Non-collection (M Som)	185.9	324.3	406.0
Collection rate (%)	65.0	57.5	56.3

*Sources: SEA, Ministry of Finance, ESI

For the reform program to have the intended effect on the financial health of the utility, collection rates must improve. They increase immediately after prices increase, but this is not sustained. Closer analysis suggests that residential consumers engage in a process of smoothing electricity expenditure over the year. Collection levels rise in the summer months when billings decrease and fall in the winter months when billings increase (Figure 7). It may be possible to improve collections and reduce disconnections by formalizing this process of expenditure smoothing. Focus group results confirm that people generally want to smooth electricity payments. The Discos should assess the possibility of offering customers an option

Figure 7. Residential Consumption of Electricity and Residential Collection Rate, Kyrgyz Republic, 1997-2001*



* Sources: SEA, Ministry of Finance, ESI

of average bills to smooth out the lower bills in summer with the higher bills in winter, when many people struggle to pay for heating. The practice of offering average bills is common in many western countries. Another issue is that households do not have to pay the whole bill. They can pay just a small part and build up arrears. As long as part payment is made, the Discos apparently have legal problems disconnecting the household. A key question that must be answered in order to define the strategy for moving forward is whether arrears are accumulating faster with the poor or non-poor. Depending on the answer, the strategy would either emphasize safety-net measures or collection enforcement means.

Tariff increases, while understood by many people, are deeply unpopular given the lack of tangible improvements in electricity supply and service delivery. The linkage between tariffs, service, and collection rates suggests another approach for tariff policy, which is to link tariff increases directly to service quality. Households could have their monthly bills adjusted by the number of days (or hours) of service and possibly by other characteristics such as voltage or megahertz. Where there are no supply interruptions and where voltage is within agreed tolerance levels, the household would be billed the cost recovery tariff. Where service is unreliable or of low quality, the household would be charged a fraction of the cost recovery tariff, with the level increasing as service is improved. Of course, this still requires substantial increases in enforcement above and beyond the current levels. The difference is that in those areas that do not receive 24 hours of good service seven days a week, there would presumably be tangible improvements associated with price increases. Of course, consistent with the focus groups results this assumes that free-riding is not the major cause of non-payment. The Discos would also have a stronger incentive to improve supply and service.

Smoothing bills and examining a system of linking payments to actual supply and service raises important questions about payment administration. ESI is gradually shifting from using manual “paybooks” to a system where a controller reads the meter each month, the information is brought back to the Disco office where a computerized bill is prepared, and then delivered back to the customer by the controller. Presently about 66 percent of all customers receive a computer generated bill. In some regions, the controller will make a third visit to collect payment. In urban areas such as Bishkek, people receive their bill and then either pay at the local post office or Disco office. In rural areas, most participants prefer to pay the controller directly when the bill is delivered.

Since records are increasingly kept electronically, the computerized billing system should be fairly reliable. Yet, customers often complain that controllers use the fact that billing records are kept electronically as an excuse for over-billing: “the bill is done by a computer, so there is no mistake”. A review of Severelectro billing records for Bishkek revealed a significant number of records that appeared to have inconsistencies. A payment for monthly consumption that exceeds the current bill should reduce arrears; this does not always appear to happen. The opposite case also occurs, where payments less than the current monthly bill do not show up as increased arrears. This means that in some cases, the household may be correct in complaining about billing errors. Records for other Discos could not be examined but it is understood that Bishkek is leading the country in shifting to computerized billing. Yet even the Bishkek officials admitted their software was old and cumbersome. It is imperative that the billing management system of Discos be reviewed and where necessary, upgraded.

The terms of employment for controllers are generally poor. One controller indicated he was paid 600 Som (US\$12) per month but much of this was used to purchase new shoes every 1-2 months. It is suggested that Discos offer improved terms and conditions (including uniforms and proper identification) to controllers as one means of reducing corruption.

5. IMPACT ON THE BUDGET

5.1. Background

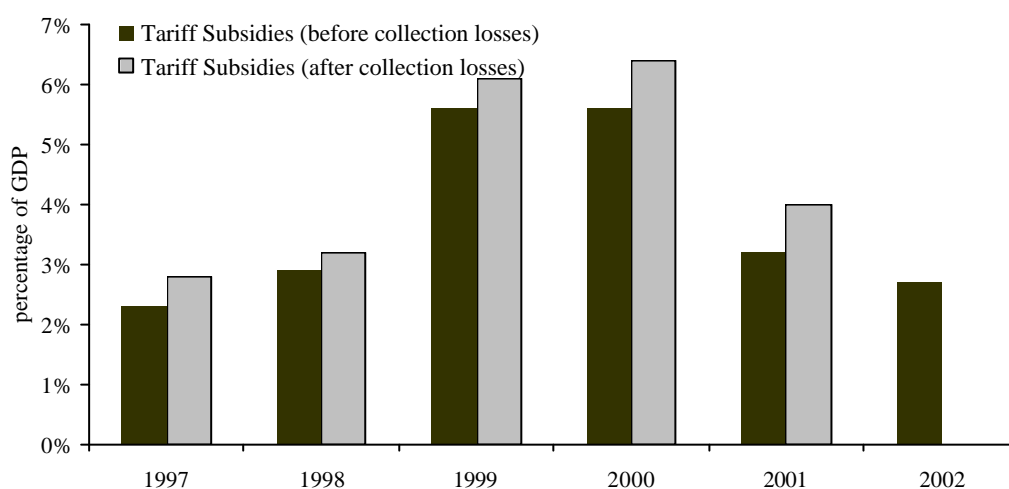
Residential subsidies in Kyrgyz are unsustainable.²⁹ They reached their peak in 1999-2000 due to the combination of low tariffs and high consumption. Tariff reform and a subsequent reduction in consumption resulted in a drop in tariff subsidies from 5.6 percent of GDP (US\$77M) in 2000 to 3.2 percent of GDP (US\$49M) in 2001 and to 2.7 percent of GDP (US\$44M) in 2002 (Figure 8)³⁰. During the same period, losses from residential non-collection stayed approximately at the same level, in the range of 0.77-0.79 percent of GDP (US\$11M-12M). Although direct tariff subsidization decreased, the fiscal/quasi-fiscal effect of this can only be known if weighted against the costs of compensating the poor for the welfare loss due to tariff increases (subsidised life line, tariff-related benefits), to the reduction in tax payments from the electricity sector due to decreased consumption, collection and hence revenue, and environmental degradation increased usage of dirty heating substitutes. The challenge here is to ensure that the poorest in the country are able to receive

²⁹ Cross-subsidization from export, industrial, agricultural and other tariffs is not taken into account.

³⁰ GDP growth equaled 5.3percent in both 2000 and 2001. Calculations are based on the estimate of cost recovery level at US2.3 cents per kWh. Cost recovery assumes operations and maintenance expenses and depreciation to cover rehabilitation/replacement of assets in the medium term. It does not include a return on assets or a self-financing share. Sources: Kyrgyz Republic Fiscal Sustainability Study (2001), World Bank; CSAC documents, 2002.

enough electricity to meet basic needs without placing an undue burden on the budget or ESI, and the cost of it for the state might be substantial. While analyses of “average” national energy consumption and household income suggest that the population as a whole can afford the higher tariffs, concerns are rightly noted about the ability of the poorest groups in society to afford electricity to meet basic needs. The remainder of this section discusses mitigation measures, their cost and efficiency.

Figure 8. Residential tariff subsidies and collection losses, percent of GDP, Kyrgyz Republic, 1997-2002 *



* Projected for 2002. Sources: SEA, Ministry of Finance, ESI, World Bank staff calculations

5.2. Social Protection System

The social protection system inherited from the Soviet period encompasses a complex web of subsidies, credits, and cash support to a wide range of beneficiaries. The support mechanism includes privileges (or price discounts) for electricity and other services, subsidized life-line electricity tariff blocks, socially protected price scheme, and the means-tested UMB. Approximately 3 percent of all Bishkek residents (6,000-7,000 households) also qualify for a housing allowance, which provides payments to households spending more than 30 percent of their income on utilities, excluding electricity.

To illustrate the complexity of the current system, price discounts alone apply to 479,000 people across 23 categories, and cover natural gas, electricity, communal services, transport, medical services, loans, fuel, telephone, subscriptions, coal, grants for Victory Day, sanitarium visits, horses and carts, and other compensations. The number of households receiving energy privileges is an estimated 371,000. The total cost of these protection

measures to the government is approximately 334M Som (US\$6.9M) per year. For comparison, subsidizing 100 percent of the cost of electricity tariff increases for the households living in poverty would have cost the budget 203.6M Som (US\$4.2M) in 2001 and 53.7M Som (US\$1.1M) in 2002. Subsidizing 100 percent of the electricity tariff increase for the extreme poor households would have cost 89.2M Som (US\$1.8M) in 2001 and 23.5M Som (US\$0.5M).

Previous studies have already examined current social protection systems and their effectiveness in reducing the impact of rising electricity tariffs on the poor³¹. The main findings of these studies are that the existing social protection system has neither contributed sufficiently to mitigate poverty in general, nor to mitigate the impact of tariff increases on the poor. Benefit targeting is ineffective, with many poor people failing to receive adequate social protection against tariff increases, while many higher income people qualify and receive support. The system for administering social protection for electricity is rather inefficient and brings high transaction costs for beneficiaries, the Ministry of Labor and Social Protection (MLSP) and Discos. Beneficiaries can apply for, and receive a book of coupons covering the first 150 kWh of electricity, which gives them the right to get adjusted bill. The difference between current price and received discount is to be paid by the MLSP. This process requires considerable time and effort on the part of the beneficiary.

In view of these issues, the government (through the MLSP) has been reviewing the social protection system to consider eliminating price discounts for beneficiary categories that cannot be clearly associated with the poorest households; monetizing all price discounts using a phased approach; and simplifying the application procedure and the scope for delegating responsibility to prove eligibility and provide payments at the community level.

To address social and equity consequences of tariff reform, several actions have already been undertaken. An increase in wages and pensions³² that would more than compensate for the impact of the tariff increase was introduced. Also, budget allocation to the Unified Monthly Benefit and other social protection programs was increased (see Box 1 for a description of the current social protection system and recent changes in it).

³¹ See for example, World Bank (2001); National Statistics Committee (2000); International Development Agency (2002); DFID (2001)

³² Average pensions were increased in 2001 by just under 20 percent.

Box 1. Mitigation of social consequences of power sector reform in Kyrgyzstan

The Kyrgyz Republic operates quite a complex social protection system. There are several social protection programs financed directly from the budget with budget allocation equaling 0.9 percent of GDP in 2001¹:

- Energy price discounts (privileges) of 25percent, 50percent and 100percent for electricity, gas, district heating and coal (up to a fixed upper limit of consumption), for which one-third of Kyrgyz population is eligible.² The program is recognized as the most untargeted and administratively cumbersome.
- The Unified Monthly Benefits (UMB) (a means-tested cash benefit for the poorest families) and the State Social Benefits (categorical cash benefits paid to orphans, certain groups of individuals and elderly people ineligible for pensions), which mainly support food consumption. Although the UMB is the best targeted system in Kyrgyz Republic, it still suffers from large errors of exclusion.
- A means-tested program of housing allowances for apartment buildings in Bishkek.
- A new set of “socially protected prices” (SPP) (for gas, hot water and district heating) for all parts of the country except Bishkek City. It is a means-tested program where all households whose per capita income is below a certain level are eligible for discounted energy tariffs. The program is characterized by complicated and costly application process, while the amount of benefit is not very significant.

To improve the current system, the Government introduced a new draft law on state benefits, which eliminates some privileged categories resulting in eliminating energy related privileges for 19,200 families, establishes more transparent rules for determining the size of benefit, reallocates resources towards vulnerable groups such as disabled people, children with one parent, families with many children, and states that the benefits should be paid in cash.

Considering sharp electricity tariff increases expected in the nearest future, the following additional measures have been undertaken:

- The Presidential Decree of March 2, 2002³ granted monthly entitlement payments to pensions in the range from Som 25 (US\$0.5) to Som 90 (US\$0.9) for those with pension Som 801-900 (US\$17-19) to below Som 200 (US\$4) respectively. Our focus group data confirm that pensioners are considered to be protected from electricity price increases better than other groups.
- Salaries of the social sector employees, which are well below the average wage level in the country⁴, were increased by 15 percent on April 1, 2002⁵.
- The UMB threshold was increased from 120 Som/month (US\$2.5) per capita to 140 Som (US\$2.9).
- SPP scheme included electricity, and its threshold increased from 300 to 350 Som (US\$6.7-7.3)/month per capita. In August 2002, the Government issued a decree⁶ stating that eligibility for electricity compensations within SPP (i) is to be determined by village council⁷ and (ii) on the basis of social passports information. As for now, this innovation has been determined for approbation in 4 pilot raions.

¹ The planned budget allocation was equal to 1.1 percent of GDP.

² Since independence a few new, low-income, categories were excepted as eligible for energy price discounts: families with lost bread-winner, families with children-invalids, UMB recipients, alone pensioners with low pension. Necessary to mention that level of price discount for those categories is the lowest one (usually 25-30percent).

³ On Electricity Tariff Increase-Related Entitlement Payments to Pensioners

⁴ In 2001 average salaries in education were at 853 som/month (\$18), in health – 684 som/month (\$14).

⁵ On Additional Social Security Measures for the Population in the Context of the Electricity Tariff Increase.

⁶ Government Decree #589 as of August 29, 2002.

⁷ The council consists of ail-okmoty head, social worker, representative of Veterans' council and of other NGOs.

⁸ At the same time UMB recipients were excluded from list of privileged people.

One example of regional approach to protecting the poor from tariff increases is Osh Oblast's initiative. It has made significant inroads to alleviate poverty, which in turn may allow poor households to pay their utility bills without relying on complex and cumbersome tariff support programs (see Box 2). Economic development to alleviate poverty requires access to funds or credit by prospective beneficiaries. The Osh program has encouraged the establishment of credit unions who can provide low-cost finance to poor households; 100 now exist with a capital base of 100M Som (US\$2.1M). UNDP has assisted with a micro-credit scheme through local financial institutions. One final observation was that the Oblast office had very clear public information posted to indicate the process that prospective social benefit applicants had to follow, where to go, and what information was required.

Box 2. Osh Oblast's approach to poverty alleviation

The new governor encouraged innovative approaches to social protection. With his support, the Osh Department of Social Protection was empowered to seek donor funds for technical and financial assistance to develop a comprehensive socio-economic data base, which would help identify the poor. At the first step, poor households were identified through the national program aimed at introducing social passports. Osh Oblast then went further to collect more precise data by using records and by intensive field work. The Department staff visited communities – both urban and rural - and asked people to help identify extremely poor households in their street, in the apartment block, in the village, etc. The identified households were then interviewed to gather detailed socio-economic data. As a result of this approach, 48,000 households from 106 villages and different urban areas were identified as qualifying for different forms of assistance throughout the Oblast. Qualifying people were grouped into three categories: pensioners; those earning less than 100 Som (US\$2.1)/month; and those earning between 100 and 300 Som (US\$6.3)/month. The department now has a computerized database with detailed information about its primary client base. The list of qualifying households is shorter than previously and better targeted.

The database is used to target social assistance as well as programs of SME support. Examples of successful programs include creation of farms producing vegetables as well as poultry, duck and goat meat, of craft shops, tailor shops, etc. Program participants are assisted with business plan preparation and receive financial support at the start-up stage of business development.

In addition to income generation programs, social network support programs are being developed, in particular those that encourage communities (families, school children) to assist poor households with establishing gardens, home maintenance, etc. These programs are enhancing community social network support to the poor and thus reduce the demand for state social assistance. They are considered to be an important component in the success of the overall social protection improvement.

The analysis shows that as a result of these projects, the average per capita income has increased in the target group from 79 Som (US\$1.7) to 218 Som/month. In one case, household's monthly income increased from under 300 Som (US\$4.6) to almost 500 Som (US\$10.5). The program is working towards a goal of providing a minimum level of income to poor households of 500 Som (US\$10.5)/month.

The focus groups provided unique insight into the operation of current social protection programs for electricity. Generally, all groups expressed a low awareness of electricity privileges and indicated that few among the participants were receiving any support. With the

exception of people in Osh, few participants knew where to go for help in learning more about what social protection measures they might qualify for. Even where people were receiving electricity privileges, examples were provided where the local Disco controller informed the recipient that the privileges had been cancelled and all electricity costs had to be paid in full. There was wide agreement that benefits are badly targeted and do not reach the poorest people. Among the focus groups in poor areas, the general sentiment was that price discounts would be preferred to cash. The reason was that if a cash benefit were received, it might be spent on other things such as better quality food; then the electricity could be cut off for non-payment. Conversely, the non-poor focus groups tended to prefer a cash benefit. In terms of how to improve the ability of the rural poor to afford electricity, one idea was to reduce the land tax in rural areas. More broadly, focus group participants preferred to have better opportunities to generate increased household income and be in a position to pay their bills.

A fundamental question in the debate surrounding options for social protection against energy tariff increases is whether or not the lifeline tariff block of 150 kWh/month is adequate to provide low-income households with enough electricity to meet basic needs during summer and, more important, during winter. Previously, the first lifeline block applied a low residential tariff to the first 90 kWh of electricity used, but it was recently merged into a broader tariff block up to 150 kWh with a unified tariff of 43 tyn/kWh (US cents 0.9) coming into effect in March 2002. While this simplified the tariff structure, it also represented a 100 percent increase in tariffs from the former < 90 kWh block (21 tyn/kWh or US cents 0.4) and a 13 percent price increase in the former 90-150 kWh block (35.3 tyn/kWh or US cents 0.7).

Unpublished data for 1998 from the SEA showed that for a typical house and a moderately well-off family, just using lights and basic appliances³³ consumed 4.34 kWh/day in summer and 4.81 kWh/day in winter. The seasonal differences are due to increased need for lights and people watching more TV in winter. These daily figures translate to 130 kWh/month in summer and 144 kWh/month in winter. Obviously poor households will not have some of the electrical appliances used in this analysis, such as a vacuum and stereo. But, just using lights, fridge, TV, iron and kettle, still puts daily consumption at 4.14 kWh in summer and 4.60 kWh in winter. Thus, only lights and a few appliances will bring a household almost up to the 150 kWh/month limit. This does not account for heating. The Severelectro billing data for Bishkek illustrated that for all housing types, mean monthly consumption is almost always above 150 kWh. For houses with electric heat, even with the declining trend in consumption

³³ Includes lights, TV, stereo, refrigerator, washer, iron, meat mincing machine, vacuum, kettle and other small appliances.

over the past few years, mean consumption is still as much as five times above the lifeline of 150 kWh/month. For apartments, houses without electric heat, and houses in new areas, the general pattern is for mean monthly consumption to be between one and two times above 150 kWh/month over the year.

Table 11 demonstrates that Bishkek residents' median monthly consumption of electricity in 2000-2002 ranged from 97 kWh in the summer in houses with no electric heat to 402 kWh in the winter in houses with electric heat. Winter consumption, unlike summer consumption, decreased with tariff adjustments, but mostly in the group of households selected from the "new areas", where a prevailing number of them can be considered poor. Households residing in houses where electricity is used for heating apparently had limited flexibility in reducing consumption and still use twice as much electricity as households in other types of dwellings. This observation supports what could be assumed based on common sense - poor families living in houses with electric heat are particularly vulnerable to tariff increases. The data also suggest that for other types of housing, median consumption is very close to the bottom life line block, an observation suggesting that the bottom block of 150 kWh a month is reasonable even for Bishkek, where residents presumably consume more than in rural areas and small towns due to higher incomes and lower availability of substitutes for heating.

Table 11. Median monthly electricity consumption, kWh, Bishkek, 2000-2002*

Housing type	quarter 1 (winter)			quarter 3 (summer)	
	2000	2001	2002	2000	2001
apartments	157	160	155	121	118
houses with electric heat	402	363	334	196	163
houses without electric heat	116	129	127	97	103
new areas	253	155	160	117	121
All households	198	185	176	128	124

* Data for Summer 2002 are not available. Source: Severelectro

While it is difficult to link these results to household income with the existing data, a priority for future studies is to determine if 150 kWh/month can sustain basic living needs including heat, especially for people without access to substitutes. The proposed DFID survey should be able to address this critical question and help the government evaluate potential policies for social protection. For example, it might be possible to mitigate the impact of higher tariffs by providing households, particularly the poor, with more efficient technology or other demand side measures that would allow them to reduce consumption and maintain current expenditure levels. Alternatively it might be possible to adjust the first tariff block unit price according to quality of service (e.g. areas with less than 24 hours a days service pay a fraction of the cost

recovery price) or by location (colder mountain regions versus warmer valleys) and season (winter versus summer). Another alternative is prepayment, especially in advance of winter.

5.3. Estimating the Cost of Social Protection

Social assistance system in the Kyrgyz Republic requires substantial improvements. It is poorly administered and inefficiently targeted. Two means-tested programs - Unified Monthly Benefit (UMB) and housing allowances for apartment buildings in Bishkek – suffer from large exclusion errors. The analysis demonstrates that only 13 percent of extremely poor households receive the UMB.^{34 35} At the same time, 73 percent of the UMB recipients are not extremely poor.³⁶ Problems with implementing the actual criteria for means testing are tremendous. Administration of social protection is weak. At the same time, social protection places a substantial burden on the budget. The Government is supposed to reform social protection programs with the objectives of improving targeting, rebalance the system of social protection toward supporting extremely poor, and restructuring the system of privileges. Total expenditure for Social Protection programs will be kept under 1.4 percent of GDP in 2002-2005 and will further decline to 0.9 percent by 2010.³⁷ Thus the challenge for the government is finding the most effective way to deliver social protection.

Several alternative strategies can be considered for the transfer of social assistance. These include direct income transfers, targeted vouchers, and life-line tariffs, each of which has advantages and disadvantages. The remainder of this section explores the cost-effectiveness of direct income transfers and a lifeline tariff.

Calculations (Table 12) show that the cost³⁸ of providing the first 150 kWh of electricity at the current price is equal to US\$28.3M or 1.9 percent of GDP. This is higher than the 1.4 percent of GDP limit that the Government has set for all social protection programs. It does, however, achieve 100 percent targeting of the poor and the provision of a basic minimum level of electricity for all households at a cost of about US\$12.7 per poor person receiving the transfer.

³⁴ For comparison, using HBS data for June 2001, an estimated 465,500 persons (almost 10 percent of the population) were claiming UMB (average monthly payment of 72.3 Som (US\$1.5)).

³⁵ A study by the Kyrgyz National Statistical Committee found that approximately 20 percent of the very poor received UMB in 1998. (L. Carraro and S. Ibragimova (2000), Effectiveness of Social Assistance in the Kyrgyz Republic, National Statistics Committee, Bishkek, mimeo).

³⁶ Kyrgyz Republic: Review of Social Policy and Expenditures (2001), World Bank; National Statistical Committee. Effectiveness of Social Assistance in the Kyrgyz Republic. Bishkek: National Statistical Committee, 2000;

³⁷ A joint proposal by the Bank and the Government to the Swiss Authorities on Kyrgyz's social sector programs support.

³⁸ The cost recovery tariff of US\$0.023 minus the current tariff of US\$0.009

This can be compared to the cost of providing a direct income transfer. Assume that all 544,727 households below the poverty line will be compensated for the loss of the subsidy on the first block electricity.³⁹ The total cost would be approximately US\$14.6M or just under 1 percent of GDP. Compared to the lifeline this is a net savings of almost US\$14M per year. However, it is instructive to compare this with the cost effectiveness of a direct income transfer. At the current targeting efficiency of only 25 percent, the cost is about US\$25 per poor person receiving the transfer. Making the very conservative assumption that it requires a simple four-fold increase in administrative costs to go from 25 percent to 100 percent targeting efficiency suggests that 100 percent targeting can be achieved at a cost of US\$6.6 per poor person.

Table 12. Cost of life line subsidy and cost of social protection that would provide the poor with the same per capita benefit, Kyrgyz Republic, 2001*

		Total cost (US\$M)	Cost of reaching a poor individual (US\$)	Percentage of GDP (%)
Annual cost of subsidizing the first block of life-line tariffs (100% access, full usage of the first block)		28.30	12.7	1.86
Cost of delivering a benefit equaling per capita gain for the POOR to life line subsidy	Targeting at 100%	14.58	6.6	0.96
	Targeting at 75%	14.37	8.6	0.94
	Targeting at 50%	14.16	12.7	0.93
	Targeting at 25%	13.95	25.1	0.91
Cost of delivering a benefit equaling per capita gain for the EXTREME POOR to life line subsidy	Targeting at 100%	6.39	8.8	0.42
	Targeting at 75%	6.29	11.6	0.41
	Targeting at 50%	6.20	17.2	0.41
	Targeting at 25%	6.11	33.8	0.40

*World Bank staff estimates

There are other considerations to bear in mind when considering the approximately US\$14M difference between the life-line and direct-income transfer. A functioning system to deliver the transfer is not in place and it is not clear when it would be ready to function. If the additional costs of designing and implementing the new cash allowance system are taken into account and if the risk of not being able to introduce it within the period of planned reforms (2002-2005) is considered, the cost of social protection might be much higher than the cost of service delivery presented in Table 12. In addition to reaching 100 percent of the poor, the

³⁹ (US\$0.023 - US\$0.008) x 150kWh

lifeline produces a positive externality in terms of light for reading and other nighttime activities and it reduces a potential negative externality caused by the burning of dirty fuels.

6. ENVIRONMENTAL IMPACT

Moving from electricity to dirty fuels creates a health hazard and an environmental externality from two main causes. The first is substitution away from relatively “clean” hydroelectric power to coal, wood, dung and peat, which contribute to emissions of greenhouse gases during combustion. The HBS energy expenditure data suggest a trend of substitution towards alternative energy sources in urban and rural areas, and across income groups. This was also the conclusion from focus group discussions.

With wood, environmental impacts arise from loss of forest cover, and subsequently, reduced soil stability, increased erosion and degradation of rivers and aquatic ecosystems. While sustainable management of forests can reduce these impacts, in most developing countries illegal and/or poorly controlled harvesting of natural forests is more common. Only 4 percent of Kyrgyz Republic is classified as forest (Brylski et al 2001). Most are classified as “protection forests” but inadequate funding hinders effective conservation management. Many focus group participants and key informants felt there was a noticeable increase in illegal wood harvesting with rising electricity tariffs. Generally, people knew that cutting wood was causing a decline in the already small forest cover; they knew this was wrong and carried longer-term impacts on the environment. Many participants understood the importance of trees in the environment, for example by generating oxygen, and were deeply worried about the environmental impacts from increased use of wood and loss of forest cover; not wholesale clearcutting of large forest tracts, but rather a gradual decrease of individual trees and small stands. Yet the attitude among many participants could be seen in the following statements:

- The trees disappeared during the past 3-4 years...what else can we do, we burn them. (Batken, urban area)

- My heart is aching for the trees, but there is no choice – we have to feed the kids. (Batken, urban area)

- People cut down the trees for firewood along the roads in the winter. They cut them at night. They don't have much choice - the electricity bills are too high. (Jalaa-Abad, rural area)

With peat, the main environmental concern is the loss of an essentially non-renewable biological resource, which has a number of indirect ecological values such as water purification in the lower reaches of many watersheds. While the collection and use of dung

may have few on-site environmental impacts, an economic issue is the value of agricultural nutrients being burned, and subsequent loss of soil fertility.

Discussions with the Chairman of the State Forestry Agency⁴⁰ confirmed that in Soviet times, conventional energy (electricity, coal and DCH) was cheap and reliable. There was no significant demand on forests for energy. The main cause of forest decline was overgrazing in rural areas. In the past decade however, livestock numbers have dropped significantly. At the same time, lack of investment in the energy sector and increasing tariffs, have caused energy “hunger”, especially for poor people in rural areas. There is considerable scope to encourage rural people to plant trees on their land to meet domestic energy needs for heating and cooking. Poplar plantations would be suitable for small-scale agro-forestry since they have low establishment costs (grown from cuttings) and fast growth rates. The Brylski et al study (2001) suggested that poplar plantations on good soils could be established for under \$70 USD/ha with an economic rate of return of 16 percent.

The Swiss Agency for Development and Cooperation is financing the Central Asia Mountain Partnership (CAMP), to support the efforts of local institutions and individuals to improve the sustainability of mountain development. One component is addressing renewable energy and alternative energy solutions in mountain areas. This program is continuing and many lessons can be learned about small-scale forestry investment programs with community participation.

An associated program to promote more efficient stoves and safe burning practices (proper chimney, ventilation, etc.) would also be useful. Simple cooking stoves can be built from local materials (bricks, grass, dung, sand) by someone with basic training; if the materials are purchased, these might cost approximately 50 US\$. The technology exists in many parts of Africa and Asia already. More efficient heating stoves (that may also be used for cooking) can also be manufactured locally for little cost.

The second impact from energy substitution away from hydroelectricity is increased indoor air pollution when solid fuels are burned in poorly designed stoves with inadequate ventilation. With indoor pollution, many participants were using hand-made stoves to burn solid fuel during the winter, in some cases without a chimney or any ventilation. Again, people knew there were health risks associated with the resulting emissions, but felt they had no choice in order to survive the winters.

⁴⁰ Mr. Musuraliev

Compared to solid fuels such as wood, hydroelectric power is preferred in terms of energy efficiency and lower off-site and internal household environmental impacts. However, the reality is that until electricity can be developed as a reliable energy source, and poor people can afford to pay for enough electricity to meet basic needs, there will be sustained demand for alternatives, particularly wood, which can be gathered at low cost.

7. PUBLIC AWARENESS AND INFORMATION DISSEMINATION

Ongoing ESI reform in Krygyz Republic is creating major shifts in power distribution, service, billing and pricing. Such a significant shift in public policy is most effectively planned and implemented with stakeholder participation for two-way sharing of information, issues and opportunities. In the case of ESI reforms in the Kyrgyz Republic, stakeholder participation has been minimal, and limited mainly to information dissemination from the SEA to the public through mass media campaigns. The CSAC TA Program Implementation Unit has worked with the SEA and a local marketing firm to implement the campaign, focused primarily on privatization for gas and electricity sectors, and including tariff increases. To date, the public relations campaign has produced and disseminated pamphlets, published articles in the newspapers, had information announced on television and radio, and organized various seminars and meetings. The main thrust of the program appears to be focused within Bishkek, and at policy makers such as Parliamentarians, and senior officials in the Ministry of Finance, Social Protection Fund, MLSP as the main actors involved in privatization. To date, there has been little, if any, face-to-face contact between the SEA and stakeholders (customers) in rural and urban areas throughout the country⁴¹.

From the focus groups, it is clear that most participants have a very poor awareness of the electricity sector reform program and the main actors such as the SEA. With respect to privatization, there was a poor understanding of the goals and outcomes, and a strong negative attitude towards it. In general, most participants felt that reform was necessary to improve the quality of service and held a glimmer of hope that eventually they would benefit from a higher quality service. Similarly, most people seemed to realize that higher tariffs were necessary to develop better service. However, there was little faith in the present process, driven by a complete lack of trust in the government to act responsibly and in the interest of the people. To help address this issue, it is imperative that the ESI delivers on its promise of improved performance with tangible benefits at the household or village level, such as a new

⁴¹ In fairness to the consulting firm, the terms of reference do not include stakeholder meetings in rural areas, public hearings, etc.

transformer in a village (paid by the Disco and not through extortionate ad hoc collections), fewer power disruptions in winter, improved voltage, and more transparent billing.

A shift in approach from mass media to direct stakeholder dialogue is urgently required. Two mechanisms already exist for such a process. First, the Council of Local Self-Government Institutions (CLSG) presently works closely with local government through 425 village councils and 22 urban municipalities. The CLSG could be an effective option for bridging the gap between central government and local councils in terms of public awareness. Implementing a community based consultation process would require a simple MOU with the SEA, preparation of appropriate materials and information, and training of CLSG local officers in the energy reform process. Second, USAID is providing support to the development of a National Energy Strategy, with training, demonstration projects and public consultations. The program aims to use local NGOs to initiate town/village meetings across the country to the end of September 2002. People could use these forums to raise their concerns about energy reform. Without a stronger dialogue with affected stakeholders, the ongoing reform process will not likely generate the desired level of stakeholder support needed for success.

Annex 1: ASSESSMENT METHODS AND FOCUS GROUP PROFILES

Background

Increasingly, social assessment is being used as a tool to assist in project and program development to provide an objective means of eliciting stakeholder input. Analysts face three major challenges in social assessment (Krueger et al 2001): drawing out information from stakeholders; identifying patterns in the data and understanding reasons for these patterns; and linking stakeholder expressed interests into project/program development goals. A number of methods are available for qualitative assessments; focus groups, Q-sort techniques, ethnographic methods, key informant interviews, rapid rural appraisal, gender analysis, systematic client consultation, beneficiary assessment, and scenario analysis. Each approach has strengths and weaknesses in meeting the three key social assessment challenges. The choice of approach must be based on trade-offs between time, budget, and stage of application in the project cycle. Where possible, more than one method should be used to increase the reliability of results.

Quantitative assessments are based on a statistical analysis of empirical data, from primary surveys, secondary data or a combination of both. Given that qualitative methods cannot be used to make wider inferences, a statistically sound survey can yield data to make regional or national estimates. This report is based on a mix of qualitative and quantitative assessments, using data collected by the consultant and others, during a month-long mission from mid-March.

Qualitative Assessments in the Study

The qualitative assessment in this study used a combination of focus groups and key informant interviews to solicit relevant information on electricity sector reform, social protection and impacts on people in both rural and urban areas, and across poor and non-poor groups. A local market research firm in Bishkek⁴² with extensive experience implementing focus groups for social assessment was contracted.

A total of 17 focus groups were implemented, to provide variation with location, income, and access to different types of energy. A list of questions were developed⁴³ and used in two pre-tests in Bishkek, one for poor and one for non-poor groups. The sessions were limited to 1.5 hours, including time for the group to fill in a small personal data questionnaire for general profiling. The group size was restricted to about 12 people to allow for full participation by each person in the discussions. Following the pre-tests, questions were revised and the focus groups organized in each Oblast. Participants were selected in advance, through a screening process to ensure that the attendees were responsible for paying the electricity bill. In addition, each group was balanced in terms of age, gender, occupation, and ethnic group. Participants were paid a small stipend for their time, following common practice in the country. In urban centers, most sessions were held in government offices where adequate facilities were available. In rural areas, the sessions were mainly held in village schools. All sessions were recorded with a digital video camera to allow more effective review and transcription to English. The consulting firm used the same leaders for all 17 focus groups to ensure consistency of approach.

Key informant interviews were designed to capture different perspectives on critical aspects of energy reform. Interviews were conducted in each Oblast among the following people (usually 10-12 people per Oblast):

⁴² SIAR Bishkek

⁴³ See Annex 1 for a list of questions for the focus groups

- Community leaders
- Government officials
- Large business consumers of electricity
- Small business consumers of electricity
- Meter readers (inspectors or controllers)
- Post office workers (people receiving payments for electricity)
- Condominium leaders
- Zhek leaders
- NGOs

Quantitative Assessments in the Study

Originally, the quantitative data were to be derived from a planned national energy survey, by the National Statistics Committee (NSC) and DFID. A comprehensive questionnaire survey was designed to meet the needs of a DFID energy support project (dealing mainly with tariffs) and also provide detailed household budget data related to energy that would also meet the needs of the World Bank social assessment. The DFID sampling frame was to be based on the NSC household budget survey (HBS) sampling frame. During the planning of the DFID survey however, questions were raised about the HBS sampling frame and field methodology. An external consultant reviewed the HBS approach and raised a number of technical concerns (Munoz 2001). These issues are now being addressed, however, the DFID survey was postponed, pending revisions of the HBS sampling and survey methodology. Thus, detailed data on household income, energy consumption and expenditures were not available. While the monthly HBS data itself has some applications in the social assessment, the records do not include energy consumption, only expenditures. It is impossible to estimate energy consumption from the payment, since the payment might include the month's bill for current consumption, part of the bill, previous arrears, part payment of arrears, etc. Records were obtained from Severelectro for Bishkek that show a better breakdown in electricity payments. Unfortunately, because of legislated confidentiality restrictions by both the NSC and Severelectro, the two data sets could not be merged. Therefore, the quantitative assessment was limited to individual analyses of each data set, as well as other secondary data that were found during the mission. When the DFID survey is eventually completed (possibly late 2002), a better quantitative analysis will be possible. The results of this current report can guide development of questions for the DFID survey.

Focus Group Variation

Oblast	Rural Village(s)	Income Group	Urban Centre	Income Group
Chuy	Kalinovka	Non-poor	Tokmok	Non-poor
Talas	Kalba, Kum-aryk, Atay Ogonbaeva, Kok-Oi	Poor	Talas	Poor
Jalal-Abad	Kumush Aziz, Suzak	Poor	Jalal-Abad	Poor
Osh	Bash Bulak, Ozgur, Kyrgyzstan	Non-poor	Osh	Non-poor
Batken	Jany-Jer, Kyzyl-Djol	Poor	Batken	Poor
Naryn	Doboluu	Poor	Naryn	Poor
Issyk-Kul	Teploklyuchenka	Non-poor	Karakol	Non-poor
			Bishkek	
			1	Poor
			2	Middle class
			3	High income

Focus Group Profile

The focus groups filled in a short questionnaire to provide basic socio-economic information (Table a). A total of 181 people participated in the focus groups with 105 and 76 from urban and rural locations respectively, and 97 and 84 from poor and non-poor income strata respectively⁴⁴. Overall, the groups had reasonably good gender balance and the age of participants ranged from 20 to 73 years. The percentage of working and non-working was almost equal and 19 percent of the participants were pensioners. Across poor and non-poor participants, most variables were quite similar with the exception of unemployed and pensioners, which was higher in the poor groups.

Table a. Summary focus group socio-economic profiles

Variable	Number of Poor		% of Poor	Number of Non-Poor		% of Non-Poor	% Overall
	Urban	Rural		Urban	Rural		
Male	18	25	44	21	14	42	43
Female	36	18	56	30	19	58	57
Working	16	16	33	29	9	45	39
Unemployed	20	19	40	16	18	40	40
Pensioner	17	8	26	4	5	11	19
Student	1	0	1	2	1	4	2
Finished High School	10	36	78	40	27	80	62

⁴⁴ See next page for detailed socio-economic information on the FGs

Focus Group Socioeconomic Data

Poor	Urban					Urban	Urban	Rural					Rural	Rural	Total	Total
	Batken	Naryn	Jalal Abad	Talas	Bishkek	Number	%	Batken	Naryn	Jalal Abad	Talas	Number	%	Number	%	
Number	12	11	10	12	9	54		11	12	11	9	43		97		
Male	3	5	5	1	4	18	33	7	8	5	5	25	58	44		
Female	9	6	5	11	5	36	67	4	4	6	4	18	42	56		
Age range	20-80	27-54	22-76	37-71	41-75			25-51	27-70	25-70	37-71					
Employment:																
Working	3	1	5	6	1	16	30	5	4	5	2	16	37	33		
Unemployed	6	9	2	1	2	20	37	6	5	4	4	19	44	40		
Pensioner	3	1	2	5	6	17	31	0	3	2	3	8	19	26		
Student	0	0	1	0	0	1	2	0	0	0	0	0	0	1		
Secondary done	10	9	5	10	6	40	74	10	9	10	7	36	84	78		
Main electric use:																
Domestic	8	3	6	11	9	37	69	11	10	10	9	40	93	79		
Heating	2	1	1	0	0	4	7	0	0	1	0	1	2	5		
Both	2	7	3	1	0	13	24	0	2	0	0	2	5	15		
Other heating															Count	
Coal	x	x		x	x			x	x	x	x			7		
Wood	x	x		x	x			x	x	x	x			7		
Dung	x			x	x			x	x	x	x			6		
DCH														0		
Electricity	x	x	x											3		
Gas																

Non-Poor	Urban					Urban Number	Urban %	Rural					Rural Number	Rural %	Total Number	Total %
	Issyk Kul	Chuy	Osh	Bishkek	Bishkek			Issyk Kul	Chuy	Osh						
Number	12	10	9	10	10	51		9	13	11		33		84		
Male	3	4	6	4	4	21	41	5	5	4		14	42	35	42	
Female	9	6	3	6	6	30	59	4	8	7		19	58	49	58	
Age range	20-80	35-52	24-47	20-45	20-45			20-61	40-73	21-45						
Employment:																
Working	3	4	5	7	10	29	57	3	2	4		9	27	38	45	
Unemployed	6	6	2	2	0	16	31	4	8	6		18	55	34	40	
Pensioner	3	0	0	1	0	4	8	2	3	0		5	15	9	11	
Student	0	0	2	0	0	2	4	0	0	1		1	3	3	4	
Secondary done	10	9	6	6	9	40	78	7	11	9		27	82	67	80	
Main electric use:																
Domestic	8	10	7	7	9	41	80	7	11	10		28	85	69	82	
Heating	2	0	0	2	1	5	10	1	2	0		3	9	8	10	
Both	2	0	2	1	0	5	10	1	0	1		2	6	7	8	
Other heating															Count	
Coal								x	x	x					3	
Wood								x	x	x					3	
Dung								x	x	x					3	
DCH			x	x	x				x						4	
Electricity	x		x							x					3	
Gas		x		x											2	

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