

## ANALYSIS OF ELECTRICITY DISTRIBUTION AND CONSUMPTION SYSTEM IN KYRGYZSTAN



# **ANALYSIS OF ELECTRICITY DISTRIBUTION AND CONSUMPTION SYSTEM IN KYRGYZSTAN**

*This document was prepared by a team of experts from public organizations in Kyrgyzstan, with support from the World Resources Institute (USA) and Prayas Energy Group (India)*

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*This report covers a segment of social reality, related to residential electricity consumption. Recommendations are underpinned by the review of results of quantitative and qualitative surveys carried out from February to March 2013. The survey covered the total of 1800 respondents aged 18 to 75; the sampling was formed based on data from the National Statistics Committee. The survey was conducted in seven regions of Kyrgyzstan and the Bishkek city; urban and rural population representatives were surveyed in every region of the country. The data received from the nationwide survey can be extrapolated to the whole population of the Kyrgyz Republic.*

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<http://electricitygovernance.wri.org>

The Electricity Governance Initiative (EGI) is a unique network of civil society organizations dedicated to promoting transparent, inclusive and accountable decision-making in the electricity sector. We facilitate collaboration of civil society, policymakers, regulators, and other electricity sector actors using a common framework to define “good governance.”

Since 2005, we have worked with civil society organizations around the world to complete assessments of electricity governance in their respective countries, and to advocate for improvements in governance. More than 30 organizations around the world are now partners in the Initiative. World Resources Institute (WRI) serves as the global secretariat for EGI, with Prayas Energy Group (PEG) acting as the Initiative’s special knowledge partner.

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### **Civic Foundation UNISON, Bishkek, Kyrgyzstan**

[www.unison.kg](http://www.unison.kg)

The Civic Foundation UNISON is an independent non-profit organisation, which operates since 2002 in the field of sustainable environment and energy at the levels of legislation, analytic research and practical activity at the nation-wide and regional scales. In 2008, CF UNISON has joined the international EGI network and since 2010 is the Co-Chairperson of the Supervisory Council of the Fuel and Energy Complex Transparency Initiative and leads the CC-ECA network.

### **Civic Centres for Electricity Consumer Advocacy (CC-ECA)**

[www.zppe.net.kg](http://www.zppe.net.kg)

The network of Civic Centres for Electricity Consumer Advocacy (CC-ECA) is a voluntary association of civil society organisations working on a wide range of electric supply matters at the local level with the view of sustainable and innovative development of law knowledge of electricity consumers for the purposes of progressive and mutually beneficial cooperation with power distribution companies. Activity of the CC-ECA network is based on legitimacy, equal involvement, openness, transparency, collaboration and electricity access quality.

### **Fuel and Energy Complex Transparency Initiative (FECTI)**

[www.energoforum.kg](http://www.energoforum.kg)

The Fuel and Energy Complex Transparency Initiative of the Kyrgyz Republic has been established based on the Decree of the President of KR No. 49 dated 20 July 2010. FECTI has been created for the purposes of introduction of transparency and public discussion principles in the fuel & energy complex management and regulation procedures; enhancement of responsibility and reporting of managing bodies of sector enterprises; and minimization of potential corruption activities in the power industry.

*The Electricity Governance Initiative tools have been available owing to support of the Open Society Foundation (OSF).*

## Acknowledgements

This paper is the second publication related to analysis of the Kyrgyz power industry management system and prepared using the international methodology of the Electricity Governance Initiative (EGI) – the unique network of civil society organisations working since 2005 on implementation of good governance system in power industries of many countries of the Southern Asia, Africa, Latin America, Central Asia and in USA.

It was only five year ago that Kyrgyzstan joined the EGI Programme and the first analysis of power industry management system at large was published; however, a great deal of significant changes occurred during this short period. Since 2010, the Fuel and Energy Complex Transparency Initiative (FECTI) has been successfully put in practice in Kyrgyzstan, including a set of mechanisms for improvement of information accessibility and public involvement in the management process. Civic Centres for Electricity Consumer Advocacy (CC ECA) have been efficiently launched in regions to work immediately with communities and electricity consumers. These initiatives enabled considerable savings for both the government budget and individual consumers through introduction of transparency and reporting procedures, and activation of complaint and public involvement procedures<sup>1</sup>. Establishment of power industry transparency is just an outset of long and difficult path, but we may positively state that Kyrgyzstan is at the inception stage of development of the good governance system, which is a unique development way for Central Asian countries.

I express my deep gratitude to developers of methods and tools of the Electricity Distribution Interface Toolkit (EDIT), which has allowed changing the approach to national energy management assessment by shifting the vision and attitude from judging if made decisions are correct or not towards better understanding of the process impact on decision results. First of all, I convey my gratitude to the World Resources Institute represented by Ms. Davida Wood, the EGI Programme Coordinator, and our partners Mr. Shantanu Dixit and Ms. Ashvini Chitnis from Prayas Energy Group, and over 100 experts from different countries for their contributions to establishment of the Power Industry Governance Programme and the management system analysis and evaluation methodology.

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*Nurzat Abdyrasulova,  
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Bishkek, 2013*

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<sup>1</sup> <http://electricitygovernance.wri.org/news/2011/10/festi-international-conference>

## **Executive Summary**

The public service quality is an important aspect of provision of access to electricity. Power outages and voltage jumps adversely affect life quality and production performance, which makes wealthier households and companies turn to stand-alone energy sources such as diesel generator sets whereas the poor are forced to receive low-quality or insufficient electric energy. At the same time, it is obvious that one needs objective information about problems encountered by consumers and measures taken by the supplier to solve them; this, in turn, may improve the quality of decisions to be made at the power distribution level, considering the real state of affairs.

This paper is based on the survey conducted by the Working Team of civil society experts of Kyrgyzstan, using the Electricity Distribution Interface Toolkit (EDIT) methodology proposed by the Electricity Governance Initiative (EGI) Programme. This toolkit was created by the World Resources Institute (Washington, USA) and the Prayas Energy Group (Pune, India) to empower civil society and consumer groups to understand problems and challenges relating to electricity delivery and enable informed engagement with suppliers, government and other related agencies, thereby contributing to improved service quality to electricity consumers.

The Electricity Distribution Interface Toolkit (EDIT) is a platform enabling consumers' understanding of, and participation in electric supply matters. EDIT is aimed at the following:

- Provisions of consumers and their communities with tools for interaction with energy companies, utilities, local self-governments and other relevant bodies in order to contribute to improvement of energy sector indices such as reliable access to electricity;
- Documentation of electric supply problems from the consumer viewpoint; creation of power distribution companies' client base with better understanding of power industry problems; and capacity building for promotion of more efficient policy and regulatory decisions;
- Facilitation of establishment of consumer protection unions and associations to enhance decision making processes in the power industry; and
- Development and encouragement of the local initiative potential beyond the Electricity Distribution Interface Toolkit so that to improve servicing and electric supply quality in other partner countries of the Electricity Governance Initiative.

The EDIT toolkit comprises several components enabling multifaceted look into key sector problems and challenges facing consumers, and entertaining of all stakeholders' opinions. In the first toolkit component, sector problems are examined with use of a check list (see Annex 1) covering those issues, which are most likely to concern residential electricity consumers, such as billing, blackouts issues, etc.

The second component is aimed at complementing the obtained results through engaging with key informants – representatives of power distribution companies, local self-governments, consumers societies and civil society institutions.

The methodology was adapted to Kyrgyzstan power sector specifics by experts from the Civic Foundation UNISON (Kyrgyzstan) and tested in August 2012 during a two-stage pilot survey of 50 respondents in rural and urban areas, in the Bishkek City and the Chui Province, and 300 respondents in two provinces in the south and the north of the country. For the purposes of this survey, we have questioned 1800 respondents in all seven provinces of Kyrgyzstan and in the Bishkek City as well as 60 officers of energy companies and local self-governments.

The paper comprises two main parts: the review of the Kyrgyz power industry for the past five years and the management analysis and assessment at the power distribution level. The questionnaire for population, underlying this analytical survey is presented in the Annex.

The first part is dedicated to the Kyrgyz power industry review with chronological discussion of the following energy sector problems in the past five years:

- energy crisis in 2008-2009,
- power transmission and distribution problems in electrical networks in 2010-2012, and
- electricity deficit in 2012,

and with explanation of causes and consequences, and measures taken by the Kyrgyz Government to eliminate them.

The second part provides the analysis of the Kyrgyzstan electric energy distribution system, based on the conducted national survey. This part addresses the following aspects:

- Analysis of electricity distribution and consumption systems; electricity as a commodity in terms of quality of electricity and its delivery, electricity metering and losses, and payment of consumed electricity bills;
- Electricity as a service in terms of electric network connection, taking of electric meter readings, delivery of consumed electricity bills, provision of bill payment facilities, and settlement of disputes;
- Consumer awareness by evaluation of consumer awareness of existing electric energy regulations and standards, complaint procedures, and consumer awareness of alternative energy sources and consumer information sources; and
- Service improvement measures, which are necessary in the opinion of consumers.

The report preparation work group in its conclusions and recommendations has proposed the following main advices on improvement of consumer service quality in some areas, based on the survey conducted with use of EDIT methodology:

- Restoration of population confidence in power distribution companies' services and their management;
- Establishment of efficient and transparent interaction with mass media;
- Establishment of communications with consumers and arrangement of feedback;
- Introduction of advanced information technologies;
- Standardisation of customer relations on specific issues;
- Reforming of personnel management and enhancement of educational components; and
- Extension of interaction with other stakeholders, particularly, self-governments.

Hopefully, this review would represent the range of opinions of residential consumers and electricity suppliers on key electricity distribution issues, enable better understanding of sector problems, and promote strengthening of positive interaction among electricity consumers and suppliers, the government and other relevant departments and institutions.

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## PART I. REVIEW OF THE ELECTRIC POWER SECTOR OF THE KYRGYZ REPUBLIC

### Introduction

In the Kyrgyz Republic, development of its electric power industry started as early as in 1930-es with construction of a series of small HPPs on the Alamedin River and continued at different pace for over 70 years, accruing high-power stations including unique ones, backbone power lines and extensive distribution networks.

After gaining the independence and abandonment of centralised planned economy management, the Kyrgyz power industry has encountered a number of problems still lacking optimal solutions. The economy shifted to the market path, thus having charged the power industry with both sustaining the proper performance and ensuring self-support and self-financing of the industry. The market offers completely different approaches to incentives, pricing processes and choice of economic partners. The market also creates a novel perception of a customary and familiar “light” as a commodity to be consumed subject to strict and adequate payment. Finally, the market brings up essential questions concerning property and management in the power industry complex: Are state-owned enterprises able to efficiently produce a private commodity? What must be the mechanisms and tools of public regulation in the industry? What are the power industry outlooks for private investors? Can the industry become competitive on the regional market?

These and many other similar factors have created new settings where the power industry began losing its potential. The management quality considerably deteriorated, fixed assets were not updated as necessary, and electricity losses grew wide-scale. Under these circumstances, it was decided in 1997 **to deregulate and privatise the national power industry**. Through all these years, reforms stipulated in the approved programme went on somehow or other; however, instead of expected improvements in efficiency and power supply quality, electricity consumers felt increasingly worsening situation. Often, results of such reforms received negative assessments from both population and supreme public authorities.

#### Summary of the Kyrgyzstan power industry

As of 1.01.2013, the total capacity of power plants made 3787 MW, including 20 HPPs with the total capacity of 3071 MW and two TPPs with the installed capacity of 716 MW and annual power output up to 15 bln kWh. Notably, hydraulic power plants account for 81 % of the national power output.

Kyrgyzstan power networks include high voltage transmission lines of 110-500 kV voltage (6642 km) and 35 kV voltage (4613 km); high voltage substations of 110-500 kV voltage (190 units) and 35 kV voltage (334 units); as well as 0.4-6-10 kV transmission lines (50,700 km) and 6-10/0.4 kV substations (23,689 units). According to the Kyrgyz Republic Government estimates, the fixed capital/assets depreciation ratio in the power industry in 2010 made 35.7 %<sup>2</sup>.

The primary goal of the *Kyrgyzenergo OJSC Deregulation and Privatisation Programme* (Resolution of the Kyrgyz Government No. 239 dated 23 April 1997) was to improve performance of power industry companies through demonopolisation and creation of appropriate conditions for development of competitive environment on the local electricity generation market<sup>3</sup>. Other goals of the Programme included:

- Attraction of local and foreign investments in the industry and prioritisation of Kyrgyzenergo restructuring; and
- Facilitation of the power industry development with maximum use of available potential reserves of hydropower resources.

<sup>2</sup>Mid-Term Power Industry Development Strategy of the Kyrgyz Republic for 2012 to 2017, Resolution of the Kyrgyz Government No. 330 dated 28 May 2012

<sup>3</sup> The Kyrgyzenergo OJSC Deregulation and Privatisation Programme ([Resolution](#) of the Kyrgyz Government No. 239 dated 23 April 1997)

According to the Kyrgyzenergo Deregulation and Privatisation Programme, Kyrgyzenergo was functionally broken up into generation, transmission and distribution companies.

## 1. Causes, nature and impacts of the power crisis (2008-2009)

In early spring 2008, the principle of continuous, reliable, quality and affordable power supply of consumers, underlying the Kyrgyz power industry and formalised in the national legislation, was infringed. The **energy crisis** burst in the country, having resulted in limited power supply (rolling blackouts) to consumers including both individual enterprises and residential areas for the whole period of morning and evening electric peaks<sup>4</sup>.

The main cause of crisis was the water wastage on the Toktogul Reservoir, which had to ensure steady operation of the Toktogul HPPs system (Toktogul, Kurpsay, Tashkumyr, Shamaldysay and Uch Kurgan HPPs). By April 2008, the Toktogul Reservoir storage achieved the amount of 6.4 bln m<sup>3</sup> – the critical level where HPP hydraulic turbines cannot operate because of the risk of their damage and stoppage (Fig. 1).

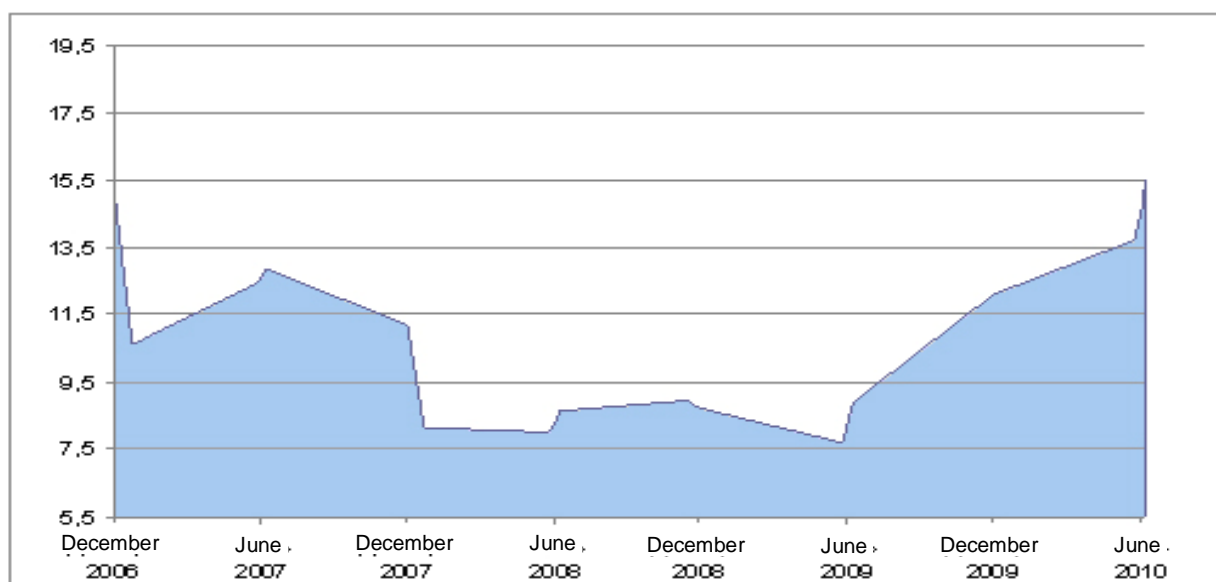


Fig. 1. Dynamics of the Toktogul Reservoir Storage in 2006 to 2010, bln m<sup>3</sup>  
Source: MEI KR

In this situation, these power plants drastically reduced their electricity generation. Thus, as reported to the Kyrgyz Government, electricity generation amounted to 11.6 bln kWh in 2008 (79 % of the amount in 2007) and 11.06 bln kWh in 2009 (75 %). Whereas 85 % of electricity in the country is generated by hydraulic power plants, such a reduction has led to the power shortage. This shortage cannot be made up from the Central Asian power system since the member states of the system (Kazakhstan, Tajikistan, and Uzbekistan) faced difficulties in supplying their consumers with electricity themselves.

In order to preserve power equipment of the Toktogul HPPs system and maintain integrity of power grids, the country has introduced a **limited consumer power supply regime**. This regime (for the first time in the long-term operation of the Kyrgyzstan power system) was introduced by the Resolution of the Kyrgyz Republic Government No. 135 dated 9.04.2008 “On the Measures for Necessary Impoundment of the Toktogul Reservoir and Preparation of

<sup>4</sup> In some cases, blackouts lasted 8 to 16 hours a day including in health care and education facilities.

Economic Branches and Population of the Kyrgyz Republic for the Autumn-Winter Season of 2008/2009”.

It was noted in the Resolution, that *“difficult weather conditions, unbalanced demands of the Kyrgyz Republic economy and population for fuel and energy resources, absence of an efficient management tool for power consumption regimes, deterioration of heat supply quality and infringement of established region-wise power consumption limits, all this has led to uncontrollable growth in electric energy and power consumption in the energy system of the Kyrgyz Republic”*. The Resolution stipulated:

- For ministries, state committees, administrative departments and other executive bodies, province state administrations and local self-governments of the Bishkek and Osh cities, the state-owned Komur company, Kyrgyzzhilkommunsoyuz (housing and utilities association) Electric Plants OJSC, Kyrgyzstan National Power Grid, Severelektro, Oshelektro, Vostokelektro, Zhalalabatelektro, Kyrgyzgaz, Kyrgyzneftegaz and Bishkekteploset – to make sure that electric loads preventing power outages are equipped with self-contained power supply from diesel/petroleum generator sets or storage batteries;
- Together with the Bishkek City Mayor’s Office and Severelektro OJSC, to implement a pilot project for installation of prepayment electric meters in one of the Bishkek City districts;
- For power distribution companies, to establish the level of electricity losses up to 30 % as to results of 2008;
- To develop and approve the Fuel-Energy Balance of the Kyrgyz Republic for the period from 1 May 2008 to 1 May 2009, and bring it to the notice of province state administrations and local self-governments of the Bishkek and Osh cities;
- During drafting of the Republican Budget for the year 2009, to envisage necessary funding of transition of electric boilers to alternative fuels.

The following was implemented as additional measures taken by distribution companies to limit consumer power supply on their control areas:

- Reduction of voltage levels in 0.4 kV power grids to the lowest standard margins (180-190 V), which has considerably deteriorated the quality of supplied electric energy and simultaneously increased the number of damaged electric appliances;
- Country-wide disconnection of residential consumers from individual three-phase electric heating and hot water supply systems.

It was also decided to accelerate construction of the **Kambarata HPP-2** (of 360 MW design capacity).

In addition, in order to ensure sustainable development and stable and reliable functioning of the power industry of the Kyrgyz Republic, as well as to create conditions for attraction of investments, the Government of the Kyrgyz Republic adopted the Resolution No. 699 dated 12.11.2009 *“On the Mid-Term Tariff Policy of the Kyrgyz Republic for Electrical and Thermal Energy for the Period from 2010 to 2012”*, whereby tariffs were increased 2 times for electricity and 3 times for thermal energy; later on, this has caused vast dissatisfaction of Kyrgyzstan population with the supreme authority’s actions.

Introduction of the limited consumer power supply regime in electrical networks produced extremely negative effect on technical condition of electrical grid and station equipment (transformers, switches, etc.) of all energy companies, which has resulted in accelerated deterioration of, and increased damage to the equipment. Consequences of this limited consumer power supply showed, inter alia, in that in winters 2008/2009 and 2009/2010 Kyrgyzstan school children were released for indefinite vacations with resulting decline in their academic progress; furthermore, there were some cases of infant deaths at maternity hospitals. At the same time, some institutions and industrial productions suspended or ceased their activity due to regular power blackouts and low quality of electricity.

Moreover, the introduced limitations were another way for energy company staff to receive illegal rewards for either non-disconnection of facilities from, or their re-connection to an electric grid.

## **2. Electricity transmission and distribution problems in electrical networks and taken corrective actions (2010-2012)**

Measures taken by the Government of the Kyrgyz Republic and energy companies, made it possible to impound the Toktogul Reservoir to the amount of 10.2 bln m<sup>3</sup> by spring 2010; this enabled **lifting of limitations placed in consumer power supply in 2008** beginning from 21 March 2010.

However, this was not the end of troubles with consumer power supply. These were related to the fact that the electricity demand including the same accumulated during the term of limitations (2008 to 2009) exceeded the capacity of existing power grids of Kyrgyzstan, and to the increased dependence of own electricity transit from the south to the north of our country on capacities of backbone networks passing through Uzbekistan and Kazakhstan. Furthermore, the potential delivery of electric energy generated by the Toktogul HPPs system from Uzbekistan power grids has dwindled as initially electric energy from these HPPs (except the Toktogul one) is supplied to Uzbekistan grids and only then is delivered to grids of our country. This set of limitations has originated an **actual threat to the energy security of Kyrgyzstan** since should any neighbouring country secede from the Central Asian energy grid (as it has happened before), the northern part of the Kyrgyzstan power grid would incur an electricity deficit in winter time up to 740 MW, which makes nearly 40 % of the demand.

As such, the acute need arose for accelerated renewal and development of backbone and distribution power networks; therefore, the following projects were proposed for implementation:

- **Datka-South (Rehabilitation of transmission lines in southern Kyrgyzstan)** – construction of power transmission lines from the Toktogul HPPs system, bypassing the territory of Uzbekistan (the total length over 250 km), and enhancement of electrical substations' capacities in the Osh, Batken and Zhalalabad Provinces. The project implementation was commenced in August 2011 by TBEA (China) on account of the loan from the Chinese Government (US\$208 mln) and would be completed in May 2013;
- **Datka-Kemin PTL and Kemin Substation** – construction of a 410 km long 500 kV power transmission line from the Datka Substation (Zhalalabad Province) to the Kemin town (Chui Province), and construction of the 500/220 kV Kemin Substation (1005 MVA capacity), and capacity enhancement of the Datka Substation by 502 MVA and the Ala Archa Substation (Bishkek) to 400 MVA. The project started in June 2012, following ratification of the Agreement between the Kyrgyz Republic and PRC, and signing of the contract with TBEA (PRC). The total project cost is US\$389.78 mln. Implementation term is 3 years. The Project is financed out of proceeds of the loan from the Chinese Government.



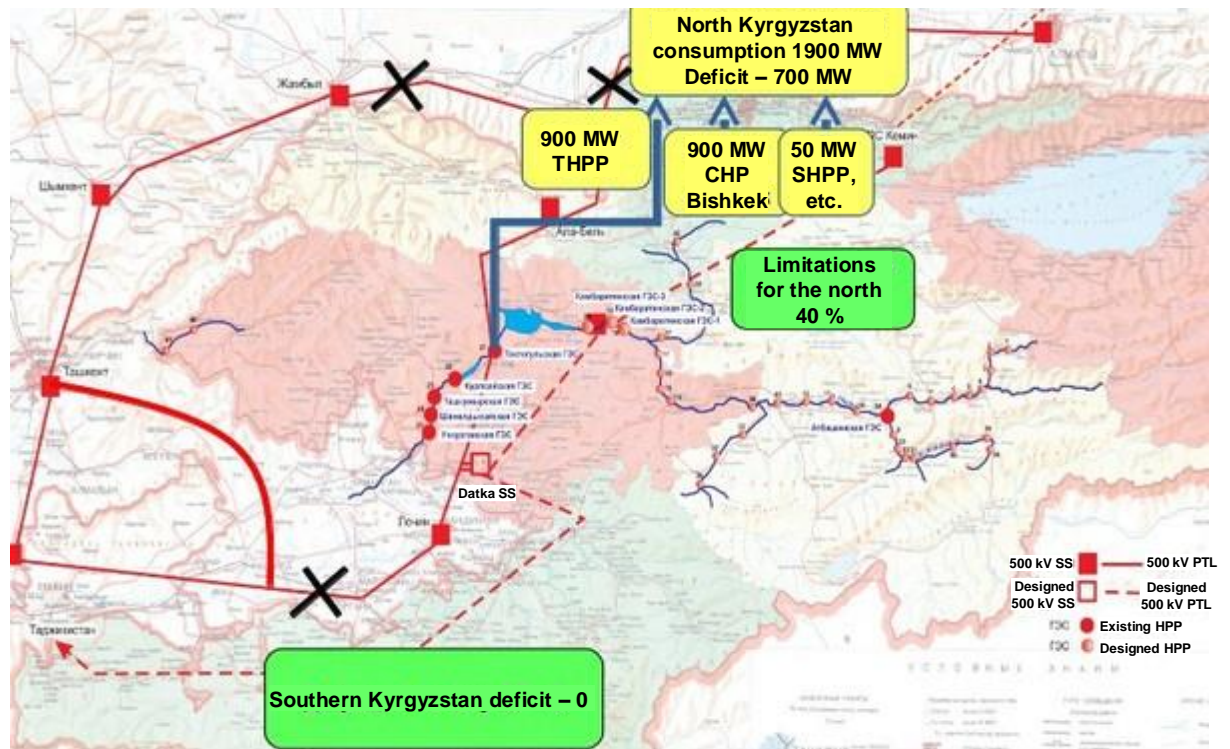


Fig 2. Kyrgyzstan energy system's operation regime after commissioning of the Datka 500 kV SS and 220 kV PTL in the southern part of the country

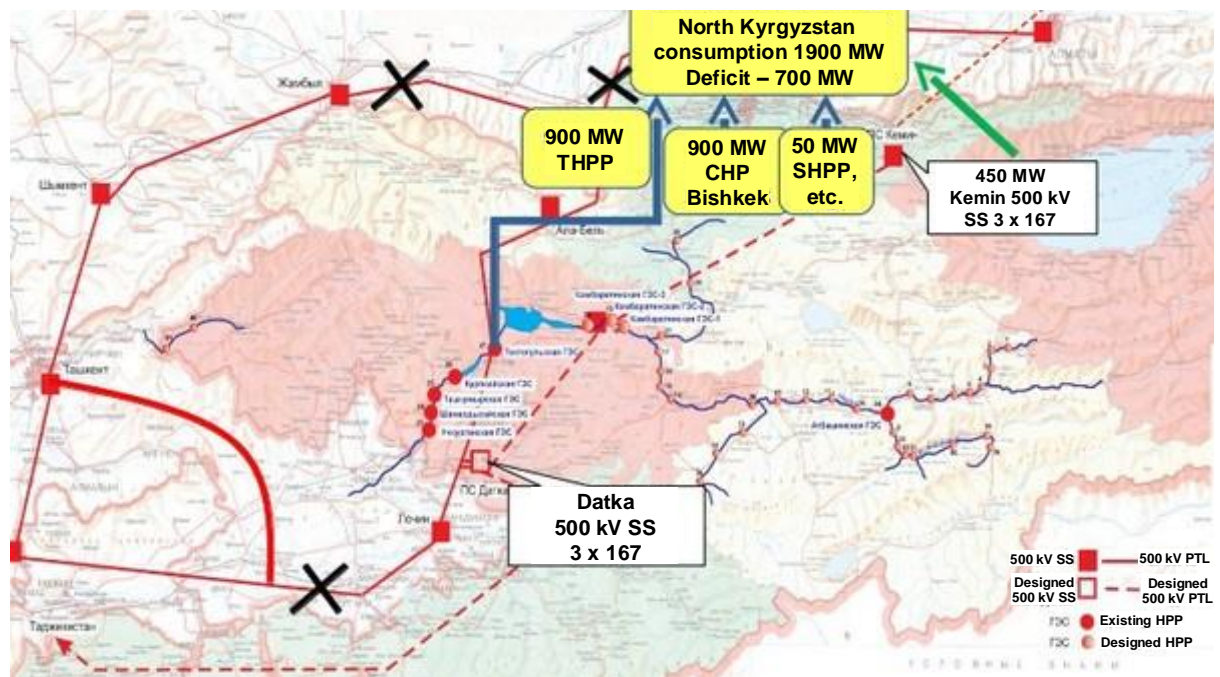


Fig. 3. Electric power balance after commissioning of the Datka-Kemin project, according to FS data by Auriga Co.<sup>5</sup>

- **Rehabilitation and modernisation of backbone and distribution networks in Bishkek and Osh cities**, approved by the Order of the Ministry of Energy and Industry of the Kyrgyz Republic No. 13 dated 1.02.2012. This provides for enhancement of transformer capacities of twenty three 35, 110 and 220 kV substations in Bishkek and Osh cities in 2012, construction of a 35 kV substation in

<sup>5</sup> Source: [http://koom.kg/view\\_material.php?id=249](http://koom.kg/view_material.php?id=249)

Osh and a 110 kV substation in Bishkek, replacement of 10, 6 and 0,4 kV underground cable lines of the total length of 118.3 km in Bishkek and Osh in 2012. For these purposes, 1150 transformers and 10/04 kv package transformer substations have been purchased in 2012-2013. The Project is financed, inter alia, out of proceeds of the loan from the World Bank and KFW (Germany). The Project completion is scheduled for 2014.

The measures aimed at renewal and development of electrical networks under the above projects in the Kyrgyzstan power industry enabled generation and transmission to consumers of more than 15 bln kWh of electricity in 2012 including almost 1.3 bln kWh for export. However, the threat of repeated “congestion” in electric networks (both backbone and distribution ones) has not been eliminated and it would inevitably show up as soon as new electricity generation capacities are commissioned.

### 3. Electricity deficit in Kyrgyzstan and measures for its elimination (2012)

Electricity generation in 2011-2012 at the rate of 15 bln kWh a year was the maximum possible for Kyrgyzstan considering the existing composition and technical condition of generation facilities. The signs of **forthcoming deficit of electrical capacity and energy** began to actively appear in early autumn-winter period of 2011/2012. The winter 2012/2013 has shown that in terms of generation the Kyrgyzstan energy system has exhausted all its potential and virtually has no reserves in case of an emergency. Thus, in late December 2012 when a hydraulic turbine generator (of 300 MW capacity) on the Toktogul HPP had failed, the capacity deficit in the energy system could be compensated only owing to neighbouring Kazakhstan, which activated a stand-by unit on the Dzhambul Thermal Power Plant for this purpose.

In order to mitigate the burden on power plants and (backbone and distribution) networks, where rehabilitation activities are at the very beginning, the Kyrgyz Republic Government has adopted the Resolution No. 763 dated 30.12.2011 “On the Measures for Reduction of Electricity Consumption in Morning and Evening Peak Hours in the Energy System of the Kyrgyz Republic”. The above Resolution ordered:

- *To withdraw previously issued electrical heating connection specifications from those consumers, who violate provisions of power supply contracts;*
- *To disconnect consumers using electricity for heating and hot water supply, electric heating equipment and sauna equipment (except public bath), car washing plants and electric boilers at the capacity exceeding that allowed in specifications;*
- *To prohibit issuing of specifications for connection electrical heating and warming until the Datka-Kemin 500 kV line and Kemin 500 kV substation are commissioned;*
- *For the Kyrgyzstan National Power Grid OJSC, Severelektro and Vostokelektro, subject to technical feasibility for the period from 1 April to 1 October, until the Datka-Kemin 500 kV line and Kemin 500 kV substation are commissioned, to issue specifications for connection of small and medium business facilities with the right of using electric energy for production purposes, but not for heating, hot water supply, cooking and electrical warming;*
- *For Oshelektro and Zhalalabadelektro OJSC together with the Kyrgyzstan National Power Grid, to issue specifications for connection of new facilities without the right for using electric energy for electrical heating and warming, subject to absence of network overload including 35 kV substations and their feeding 110 and 220 kV substations; and*
- *For the Kyrgyzstan National Power Grid, to place limitations where necessary for major industrial consumers fed by overloaded substations in morning and evening peak hours down to the emergency reservation according to power supply contracts.*

It is evident from the above Resolution that its primary goal is to physically restrict the access to power supply for both those consumers, who are already connected to electrical grids and those consumers, who are going to be connected.

Electricity distribution companies
<p><b>Severelektro OJSC</b></p> <p>Severelektro is a leading power supply company of the Kyrgyz Republic. Currently, the company operates under market economy conditions and on the self-repayment basis, and is responsible for electricity distribution and sale, and maintenance and servicing of 35-10-6-0.4 kV power distribution networks including power transmission lines of the total length over 21,000 km within Chui and Talas Provinces and the Bishkek city. Severelektro consists of 17 single-area power systems (SAPS) including two of them in the Bishkek City: the Western and Eastern SAPS.</p> <p>Severelektro official website: <a href="http://www.severelektro.kg">http://www.severelektro.kg</a></p>
<p><b>Vostokelektro OJSC</b></p> <p>Vostokelektro performs its activity for distribution and sale of electric energy in the Issyk-Kul and Naryn Provinces of the Kyrgyz Republic, and consists of 14 SAPS. Vostokelektro's electric networks include sixty two 35 kV substations and over 1000 km of 35 kV transmission lines, nearly 3000 10-6 kV substations and about 12000 km of 10-6-0.4 kV power lines.</p> <p>Vostokelektro official website: <a href="http://www.vostokelektro.kg">http://www.vostokelektro.kg</a></p>
<p><b>Oshelektro OJSC</b></p> <p>Oshelektro is responsible for electricity distribution and sale, and maintenance and servicing of 35-10-6-0.4 kV power distribution networks located within the Batken and Osh Provinces and the Osh City.</p> <p>Oshelektro consists of 13 SAPS including two of them in the Osh City: the Western and Eastern SAPS. Oshelektro operates 13,000 km of overhead and 600 km of cable power transmission lines of 35-10-6-0.4 kV voltage, and 4626 transformer substations.</p> <p>Oshelektro official website: <a href="http://www.oshelektro.kg">http://www.oshelektro.kg</a></p>
<p><b>Zhalalabadelektro OJSC</b></p> <p>Zhalalabadelektro is a power distribution company performing its economic activity within the Zhalalabad Province. Zhalalabadelektro supplies and sells electric energy to 185,062 residential consumers and 9,906 industrial, agricultural, commercial and other customers in the Zhalalabad Province.</p>

With the view of eliminating the electric capacity and energy deficit in Kyrgyzstan, which had occurred in autumn-winter periods of 2011/2012 and 2012/2013, the Government enhanced its **processes for implementation of construction projects of new hydraulic power plants on the Naryn River** – the Kambarata HPP-1 (1900 MW capacity) and the Upper Naryn HPPs system including Akbulun HPP and Naryn HPPs 1, 2, and 3 (of the total capacity of 191 MW). For this purpose, two interstate agreements initiated by A. Sh. Atambayev, the President of the Kyrgyz Republic, and V. V. Putin, the President of the Russian Federation, have been signed on 20 September 2012:

- *the Agreement between the Government of the Kyrgyz Republic and the Government of the Russian Federation on construction and operation of the Kambarata HPP-1; and*
- *the Agreement between the Government of the Kyrgyz Republic and the Government of the Russian Federation on construction and operation of the Upper Naryn system of hydraulic power plants.*

To date, both Agreements have been ratified by both Kyrgyz and Russian Parliaments, which launches implementation of projects costing over US\$2 billions. Implementation of the above projects is expected to be completed within the next 8-10 years, i.e. by 2022-2023, and electricity generation on these stations when commissioned at their full (design) capacity would amount to 6.1 bln kWh a year.

However, it should be noted that these projects were developed more than 30 years ago by Soviet engineering companies, but no work was commenced on them. The necessity of construction of the above hydroelectric power plants was also mentioned in the **National Energy Programme of the Kyrgyz Republic for the period from 2008 to 2010 and in the Fuel Energy Complex Development Strategy till 2025 approved by Resolutions of the Kyrgyz**

**Republic Government No. 47 dated 13.02.2008 and of the Kyrgyz Republic Parliament No. 346-IV dated 24.04.2008. Nevertheless, no actions were taken on these projects in the past 4 years.**

Furthermore, according to the Action Plan for implementation of the Mid-Term Power Industry Development Strategy of the Kyrgyz Republic for the period from 2012 to 2017, approved by the **Resolutions of the Government of the Kyrgyz Republic No. 330 dated 28.05.2012, the Ministry of Energy and Industry together with Electrical Plants OJSC were charged with rehabilitation of the Bishkek CHP (with estimated investments amounting to US\$150 mln) in 2012-2013. However, no practical steps were taken to discharge this commission, and its due date was postponed to 2014-2017.**

Besides, completion of the Kambarata HPP-2 and bringing its capacity to the design value (360 MW) is impossible without the seasonal storage reservoir of the Kambarata HPP-1 (4.5 bln m<sup>3</sup> of water) as HPP-2 lacks water in wintertime when the maximum electricity consumption is observed.

The forecast for potential elimination of the electricity deficit in the next 10 years and establishment of necessary capacity reserves to ensure sustainable operation of Kyrgyzstan energy system and development of industrial enterprises and housing and utilities sector, is very unpromising for the following reasons:

- According to the *National Sustainable Development Strategy of the Kyrgyz Republic for the period from 2013 to 2017*, the growth of electricity consumption (by 3-5 % a year) considerably surpasses that of new capacities. This implies that during implementation of the construction projects of the Kambarata HPP-1 and the Upper Naryn HPPs system (about 10 years), the deferred demand for electricity would amount to at least 40 % (6 bln kWh) of its generation level in 2012 (15 bln kWh). Therefore, commissioning of the above HPPs at their full (design) capacity would allow covering of accumulated (deferred) electricity demand only, without establishment of needed reserves and lifting of consumer power supply limitations already placed in 2012;
- The current capacity deficit in the Kyrgyzstan energy system would increase due to the fact that existing power plants have been in operation for over 30 years and need major repairs, which would take a time period with simultaneous decommissioning of generating units of the total capacity of 300-700 MW/year. Furthermore, the total repair work may last 5 to 7 years;
- Considering that nearly 90 % of electricity generation sources' capacity falls at hydraulic power plants located on the same river, there is a higher risk of reduced power generation due to diminished runoff in low-water periods occurring once in 3-4 years.



## PART 2

### ANALYSIS OF ELECTRICITY DISTRIBUTION SYSTEM IN KYRGYZSTAN

#### Introduction

Recently, the issues of electricity supply and consumption in the Kyrgyz Republic emerge increasingly, revealing various aspects of interrelations between electricity consumers and power distribution companies – mostly, in a negative light – and reflecting experience of both citizens and communities facing some electricity supply problems of technical or legal nature. Media communities actively discuss electricity thefts by consumers (according to power distribution companies) and electricity metering manipulations conspired between consumers and inspectors as well as data tampering by supplier representatives and other conflicting events and incidents in the power distribution sector. On the other hand, it is obvious that existing interrelations between the parties cannot be understood with objective information about problems encountered by consumers and measures taken by the supplier to solve them; this, in turn, may improve the quality of decisions to be made at the power distribution level, considering the real state of affairs.

The second part of this paper consists of two main sections discussing electricity on two sides – as a commodity and a service, and contains results of the *assessment of electricity distribution system* of Kyrgyzstan as received in course of the nationwide survey of citizens on the issues confronting them as electricity consumers. These results have been correlated with macro parameters of the national power sector. In addition, consideration has been given to public awareness in the sphere of electricity supply and consumption, and to measures for improvement of consumer service system.

In course of the survey, some assumptions and suppositions were made:

- Due to insufficient and partial data on survey population and units (residential electricity consumers), it was decided to use data of the Kyrgyzstan National Statistics Committee on the number of households according to the 2009 census;
- During the sampling procedure, the main statistic requirement on that every sampling unit can be included in the sample was fulfilled (as of the survey time, all electricity consumers have had equal opportunities to be included in the sample and interviewed within the framework of the conducted survey;
- One household was conditionally equated to one consumer (according to the 2009 census data of the Kyrgyzstan National Statistics Committee, the number of households in the country made 1.144.781). According to energy companies, the number of residential consumers in 2011 was 1.1 mln;
- Respondents were surveyed in wintertime (February to March 2013), when the electricity demand was the highest and latent problems broke surface. The results were correlated then with those from the pilot survey conducted in summertime;
- The population survey outcomes were complemented with results of interviewing of other electricity distribution system parties in order to exclude the dependence of results on survey time and location, and once-only experiences of consumers.

The survey was conducted in all seven provinces of Kyrgyzstan and in the Bishkek city. Urban and rural population representatives in every region of the country were included in the sample. Thus, the scope of quantitative survey covered:

- 1800 respondents aged 18 to 75, of them 704 (39.7 %) respondents in towns, 1027 (58.0 %) respondents in villages and 42 (2.4 %) respondents in semi-urban centres;
- sixty in-depth interviews with representatives of local self-governments (LSG), province and state administrations and energy companies.

The scope of qualitative survey embraced:

- four focus-groups: two focus-groups in each of the north and the south of the country.

The data received from the nationwide survey can be extrapolated to the whole population of the Kyrgyz Republic.

## ANALYSIS OF ELECTRICITY DISTRIBUTION AND CONSUMPTION SYSTEM IN KYRGYZSTAN

The **electricity distribution** process is an important stage on the route of electric energy transmission and conversion from a source to an electrical receiver – here, a residential consumer. Moreover, it is important not only to deliver electricity generated by power plants to consumption areas with minimum losses, but also to competently and effectively **distribute electricity** among consumers.

The distribution system has been designed and is operated to fulfil continuous power supply and load demands from an enormous number of different consumers, and feed transformer capacities and cross-sections of overhead and cable line wires are determined considering the design load value and operation procedures of consumer electric installations. Where distribution system's transmission lines are operated under design loads, the electricity quality would be standard and technical losses of electric energy would be minimal.

At the same time, the structure of electricity consumer service system – reading of electricity meters, collection of payments for consumed resources and other communication mechanisms between suppliers and consumers – is of crucial importance and greatly affects fixed and variable costs of electricity suppliers and the energy system as a whole.

Both parties of the electricity distribution system are discussed below based on the analysis of existing relations between electricity suppliers and consumers, beginning from grid connection through communication and complaint procedures to final consumption.

### 1. Electric energy as a commodity

Nowadays, electric energy is a primary resource. While it is involved in a variety of human activities, in most cases no other energy source can substitute for it. Electric energy is generated, sold and purchased, i.e. is a commodity, although the completely unique one with specific properties – for example, you one store generated electricity – yet, having its quality parameters and price (tariff).

*“Electric energy is a commodity, we (SAPS) also have to settle with suppliers.”  
From an interview with a SAPS director, March 2013.*

This section covers general characteristics of electricity as a commodity – e.g., metering of, and payment for electricity consumed – in terms of electricity distribution system parameters: technical and commercial losses of electric energy financial standing of suppliers, etc.

#### 1.2. Electricity quality and delivery

The notion of electricity quality differs from that of other commodities. The electricity quality manifests itself indirectly through electrical receivers' performance and, when used in manufacturing of other products, substantially influences economic production indicators and manufactured product quality – poor-quality electricity may result in damage to expensive equipment, disturbance of production cycles and manufacture of low-grade products.

In addition, it is important that faulty electricity cannot be replaced by seller with a better analogue as is the case with the majority of other commodities. While in some Western countries advanced metering systems are capable to measure only that electricity which is up to the established standards, in Kyrgyzstan consumed electricity of any quality is automatically metered in full.

In conformity with an electricity supply contract, the electricity supplier must provide consumers with **continuous, reliable, safe and quality electric energy**:

- Electric energy shall be deemed quality where the mains voltage fluctuation is  $\pm 5$  % of the rated voltage (209 to 231 Volt), and  $\pm 10$  % of the rated voltage (198 to 242 Volts) in emergency cases;
- Continuity of power supply is ensured where a nonscheduled outage occurs only once a month for not longer than 24 hours.

As discussed in the first part of this book, the 2008 energy crisis entailed some forced measures to restrict power supply of all consumers by rolling blackouts, and the mains voltage reduced to the lowest specified limits (180 to 190 Volts). In order to improve power supply quality, distribution companies repair transmission lines and equipment, and install new transformers, wires and cables. According to energy companies, 521 transformers have been installed and replaced in the country during the period from 2009 to 2011<sup>6</sup>. Nearly a quarter of respondents are aware of newly installed equipment. According to survey results, installation of new transformers and transmission lines in the past 3 years was mentioned by 24.7% of respondents in the Zhalal-Abad Province, 24.6% in the Issyk-Kul Province, 18.1% in the Bishkek City and 17.5% in the Naryn Province. The lowest figure (1.4%) was in the Batken Province.

However, survey results confirm that consumers still experience difficulties related to low voltage and power outages. Respondent answers to the question “Have you had any problems with mains voltage (low voltage, voltage fluctuations) and power outages (for different reasons) in the past 3 years?” are summarized below:

### *Mains voltage*

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- 51.0 % of respondents claimed they had had mains voltage problems;
- Such problems occurred mainly in wintertime – 82.8% vs. 14.6% the year around and 2.3% in summer;
- The share of voltage problems was higher in towns (58.5 %) than in rural areas (44.3 %). Perhaps, this is due to higher expectations of mains voltage level with urban population possessing a greater variety of domestic appliances as compared to rural population;
- In terms of provinces, the highest shares of voltage problems were noted in:
  - the Bishkek City – 76.2 %,
  - Issyk-Kul Province – 58.1 %,
  - Chui Province – 49.8 %,
  - Zhalal-Abad Province – 49.0 %, and
  - Naryn Province – 36.3 %,
- Despite the low voltage level reported by the majority of surveyed consumers, just less than 2 % of respondents buy additional electric equipment (most frequently, voltage stabilizers and less frequently – uninterruptible power sources and invertors) themselves so that to improve electricity quality.

### *Electricity delivery*

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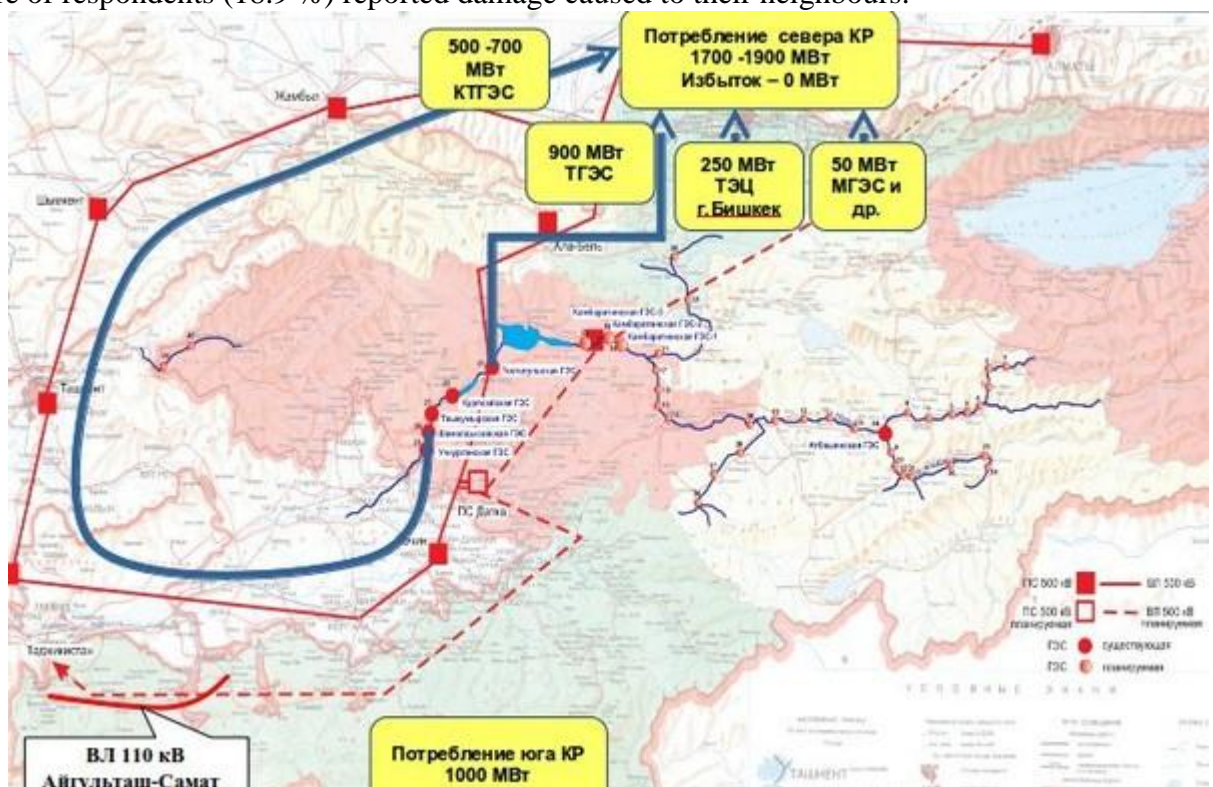
- More than a half of respondents experienced power outages;
- Outages also most often happen in wintertime (78.2 %) as compared to 19.3 % the year around and 1.9 % in summer;

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<sup>6</sup> From the letter of the Minister of Energy and Industry of the Kyrgyz Republic, February 2013.

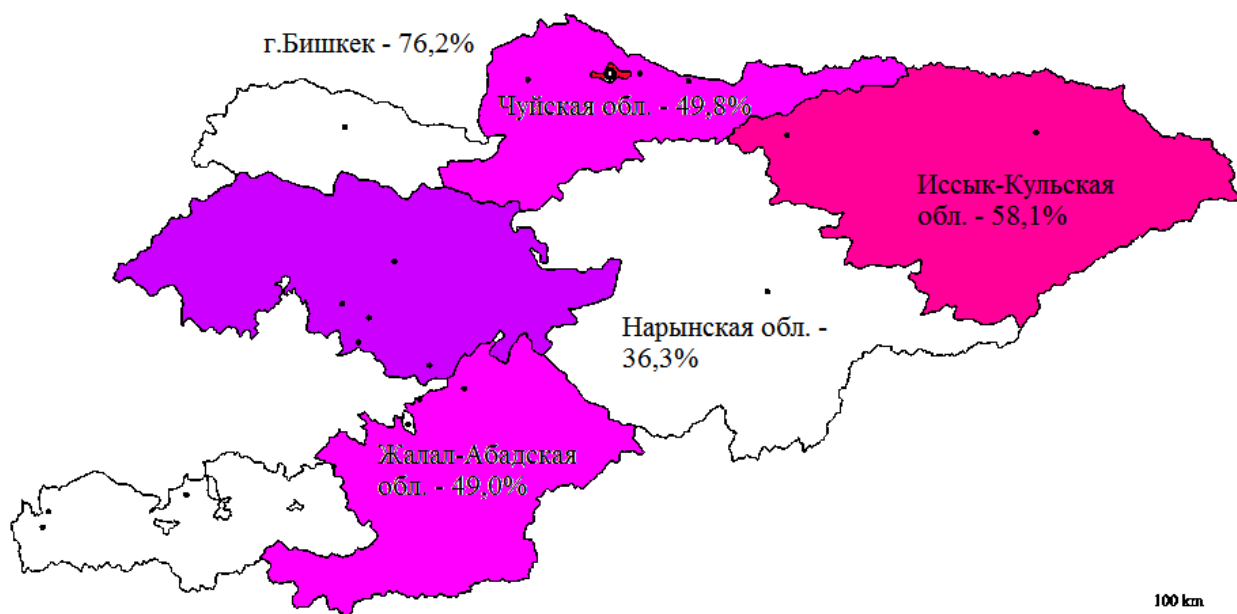
- The shares of outages for technical reasons in urban and rural areas were approximately equal (73.6 % and 77.3 % of respondents, accordingly);
- Different reasons for outages (in the consumers' opinion) were cited:
  - technical reasons (breakdown, failures of lines/grids, transformers) – 76.9 %;
  - shortage of electricity in the area – 64.5 %, and
  - short-term outages due to power line surges – 38.4 %.
- In terms of provinces, the highest share of outages for technical reasons was noted in the Zhalal-Abad Province (94.4 % of respondents), while in the Issyk-Kul Province the most frequent are scheduled (planned) blackouts (mentioned by 90.5 % of respondents) and surges (62.0 %).

Furthermore, respondents reported *domestic appliance damages* due to delivery of substandard electricity. According to survey results, 18.9 % of households stated that their appliances (TV sets, refrigerators and other household devices) were damaged. Almost the same share of respondents (18.9 %) reported damage caused to their neighbours.



Picture 4. Cartographic representation of the Kyrgyz energy system<sup>7</sup>

<sup>7</sup>Source - [http://koom.kg/view\\_material.php?id=249](http://koom.kg/view_material.php?id=249)



Picture 5. The level of the voltage problematic, result of the survey

The survey results and the scheme of transmission lines of Kyrgyzstan indicate that in terms of power supply northern regions of the country are the most vulnerable, particularly the Issyk-Kul Province (90.5 % of outages and 58.1 % of low voltage cases). If no measures are taken to eliminate the existing deficit of electrical capacity and energy in Kyrgyzstan as showed up in autumn-winter periods of 2011/2012, then it may result in imminent outages and reduced electricity quality in all provinces of the country.

### 1.2. Electricity metering and losses

Another key aspect of power industry is the electricity metering, which immediately influences one of final sector figures – electricity losses. Currently, this is a part of common problems taking place in production activities of Kyrgyzstan energy system's business units. As a matter of fact, the better the consumed electricity metering at various stages, the lower losses and costs for electricity distribution companies.

As early as 4 years ago, the total electricity losses (both technical and commercial) in the Kyrgyz energy system exceeded 50 % of energy generated in the country. While the current level of electricity losses has declined almost by half, yet it remains unreasonably high.

A number of steps have been taken at different management levels to reduce the electricity losses level. For instance, based on results of the year 2008, the Government of the Kyrgyz Republic by its resolution has established the value of electricity losses up to 30 %<sup>8</sup>. In addition, the Government charged relevant organizations with tight control of measures for reduction of technical and commercial electricity losses, and legislate "severe punishments for theft of energy resources, especially to power industry staff"<sup>9</sup>. However, provisions of these resolutions are still of current concern, particularly with regard to measures aimed at stiffening punishments for electricity thefts.

In 2010, when implementing the Fuel and Energy Complex Transparency Initiative (FECTI), the Ministry of Energy and Industry of the Kyrgyz Republic has introduced

<sup>8</sup> "On the measures for accumulation of necessary amount of water in the Toktogul Reservoir and preparation of economic branches and population of the Kyrgyz Republic for the autumn-winter period of 2008/2009", No. 135 dated 9.04.2008.

<sup>9</sup> Resolution of the Government of the Kyrgyz Republic No. 279 dated 13 May 2003 "On the mid-term tariff policy for electrical and thermal energy in 2003 to 2006"



Agreements on Activity<sup>10</sup> to be made between the Ministry and each electricity distribution company, which **establish a number of targets for every year (allowable level of losses, projected collection rates for supplied electricity, monthly reduction of receivables, etc.).** For example, for Severelektro OJSC - the electricity distribution company serving the Chui and Talas Provinces of the country- the established target of actually determined total losses made 25 % by the end of 2010 and 19.5 % by the end of 2011. Following introduction of Agreements on Activity, in 6 months of 2011 the total electricity losses in distribution companies' grids made 1185 mln kWh or 22.2 % of receipts, which is by 5.7 % lower than in the same period of 2010; of them, technical losses amounted to 18.2 %, and commercial losses – to 4.0 %<sup>11</sup>.

In order to lower energy demands, electricity suppliers arrange strict metering of consumed energy resources, having ensured reliability, transparency and efficiency of electricity metering. To solve this task, they make the following provisions:

- All-round installation of electricity meters with consumers;
- Sealing of meters to preclude a possibility of their illegal “backward movement”;
- Replacement of electricity meters with more accurate and reliable ones, of higher precision class;
- Removal of meters to inspector's access area and prevention of consumers from tampering of counting mechanisms;
- Replacement of transmission line wires with self-supporting insulated conductors (preclusion of “throwing on” and electricity consumption bypassing a meter); and
- Transfer of sales inspectors to feeder-wise servicing with assignment of persons accountable for the amount of electricity delivered to any given feeder.

In addition to these provisions, electricity distribution companies together with local self-governments under the supervision of the Government of the Kyrgyz Republic implement different pilot practices with use of loan and grant funds from international financial institutions for reduction of technical commercial electricity losses. Such practices have not been formalized yet in regulations and guidelines.

- Installation of intelligent meters with the system for remote meter reading, disconnection and connection of consumers, limitation of power, and balancing of electric energy (supply of 110.136 electronic meters is expected under the Power Distribution Grid Efficiency Improvement Project being implemented by Severelektro OJSC<sup>12</sup>);
- Staged introduction of the Automated Information and Measurement System for Electricity Control and Metering (AIMS-ECM) and the Automated Enterprise Control System (AECS), which, according to companies' assurances, would reduce electricity losses down to 15 % when implemented in full;
- Installation of prepayment card meters, which are capable to control power supply depending on actual payment and require use of electronic plastic cards with data on effected payments (to be installed in pilot areas – 1000 meters in each of Vostokelektro and Severelektro, etc.).

The surveyed confirmed that the majority of consumers had been involved in meter replacement and upgrading activities. According to results of the pilot survey conducted in

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<sup>10</sup> Website of the Fuel and Energy Complex Transparency Initiative: [http://energoforum.kg/index.php?act=view\\_material&id=165](http://energoforum.kg/index.php?act=view_material&id=165)

<sup>11</sup> Excerpted from the speech of Ms. Roza Otunbayeva, the ex-President of the Kyrgyz Republic, at the International Conference “Formation of the Dialogue on the Fuel and Energy Complex Transparency Initiative”, 26 September 2011, see the report on the conference at [http://energoforum.kg/index.php?act=view\\_material&id=189](http://energoforum.kg/index.php?act=view_material&id=189)

<sup>12</sup> Website of Severelektro OJSC: <http://www.severelektro.kg/ru/news-invest>

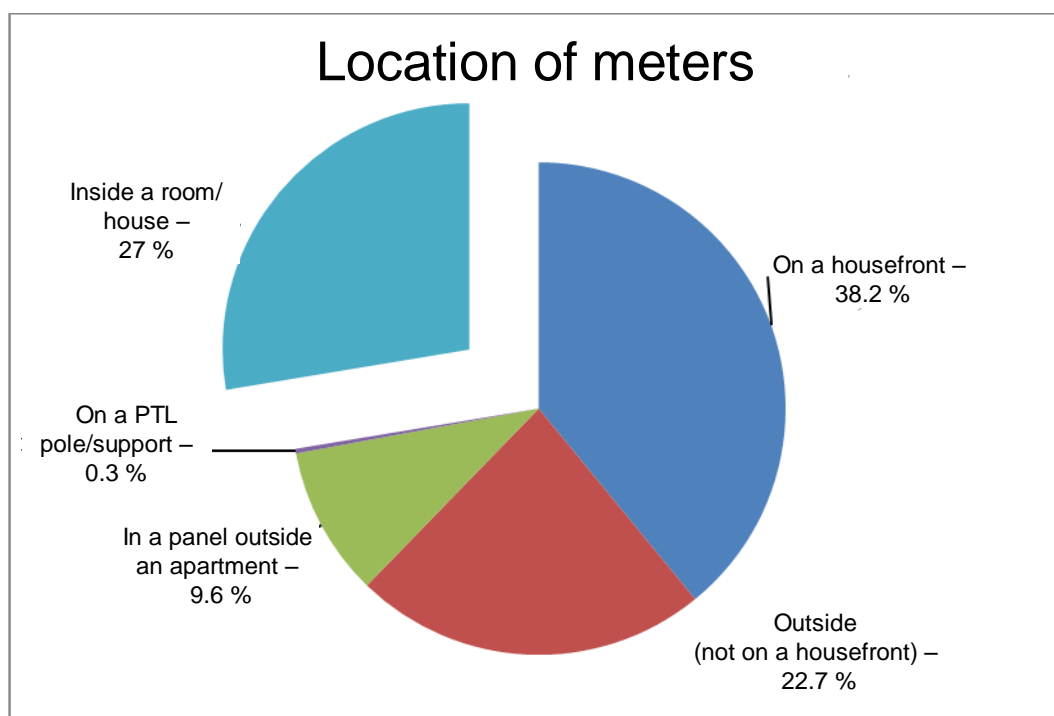
summer 2012, over 80 % of respondents have had their meters replaced within the past 10 years, while according to the nationwide survey, meters of 53.2 % of respondents have been replaced in the past 3 years. At the same time, 58.2 % of respondents having claims to electricity metering (less than 7 % of survey participants) reported existence of old meters. However, it is difficult to correlate these data with statistics on total electricity losses since reliable calculations of commercial and technical losses are unavailable. Nevertheless, as was also mentioned in the USAID report on outcomes of a pilot project for replacement of consumer meters (2002 to 2005), the trend of electricity losses reduction from almost 40 % to the technically acceptable level of 10-12 % as observed during the project implementation, has not survived. It follows that reduction of electricity losses down to an acceptable level is not a direct consequence of meter replacement.

- At the time of conducting the survey, meters were installed at 99.5 % of respondents and not installed at 0.5 % of respondents;
- Among installed meters, 52.7 % were mechanical meters and 47.3 % – electronic ones;
- 5.2 % of respondents have their meters installed before 1990, 59.6 % – from 1991 to 2010 and 35.2 % of respondents – from 2011 to March 2013; 25.3 % of respondents stated that they did not remember when their meters had been installed;
- From 2011 to 2012, meters were replaced in:
  - the Chui Province – 48.3 % of respondents;
  - the Zhalal-Abad Province – 43.1 %;
  - the Issyk-Kul Province – 28.6 %;
  - the Talas Province – 14.3 %; and
  - the Batkent Province – 10.8 % of respondents.

In addition to replacement of old meters with new electronic ones or those of higher precision class, respondents indicated other reasons of meter replacement:

- replaced with new meters – 45.5 % (the biggest share of replacements was in the Naryn Province – 68.2 %);
- Removal of meters outdoors – 26.7 % (the biggest part of meters was removed in the Issyk-Kul Province [79.7%] and the least part was in the Naryn Province [2.3 %]);
- replaced due to defects – 11.9 % (the biggest share of replacements was in the Batken Province – 42.9 %);
- meters burnt out (the biggest share of burnt-out meters was in the Bishkek City [12.5 %] and least share was in the Zhalal-Abad Province [2.5 %]); and
- meters were stolen – 0.4 % (the biggest share of stolen meters was in Bishkek – 1 %).

According to electricity distribution companies, another problem is that the majority of meters are still located inside consumer rooms, which is fraught with potential deliberate damaging of a counting mechanism, hinders timely meter reading and deteriorates metering reliability. However, data received from the survey of consumers indicate that only 27 % of meters are inside consumer rooms and premises, while others are within the reach of distribution company staff.



However, removal of meters from rooms to an environment exposed to weather impacts affects their integrity, and the main claim among consumers having their meters outdoors was “burnt by the sun” (6.4 % of respondents). The experience of civic consumer protection centres proves that meters are frequently damaged when put in unspecified conditions, and given the vagueness of responsibility allocation between consumers and suppliers, the concerns of consumers about integrity of meters and, in some cases, about metering reliability are justified.

In apartment houses, 40.5 % of respondents stated that their meters were installed in panels outside their apartments, while 23.2 % of respondents had their meters installed within apartments.

### 1.3. Payments for consumed electricity

Another key issue of the electricity distribution sector is the payment of electricity bills, which is directly related to financial standing of distribution companies. A consumer must pay for consumed electricity in time and in full. Recently, owing to **strengthened governmental regulation of utilities’ activity, enhanced management of distribution companies and increased material incentives of inspectors**<sup>13</sup>, **collection of payments including residential ones has been improved. The rates of collection of residential payments for the commercial output were as follow:**

- In 2008 – 82.1 %,
- In 2009 – 89.7 %,
- In 2010 – 86.0 %, and
- In 2011 – 92.5 %.

The survey has confirmed that population pays for consumed electricity in time: 95.8 % of respondents pay their bills monthly and 90 % pay on the due date. Other 4.2 % of households responded that they paid within different terms (once in 2 months and less often).

<sup>13</sup> Website of the Ministry of Energy and Industry of the Kyrgyz Republic, the draft Power Industry Development Strategy for the period from 2012 to 2017

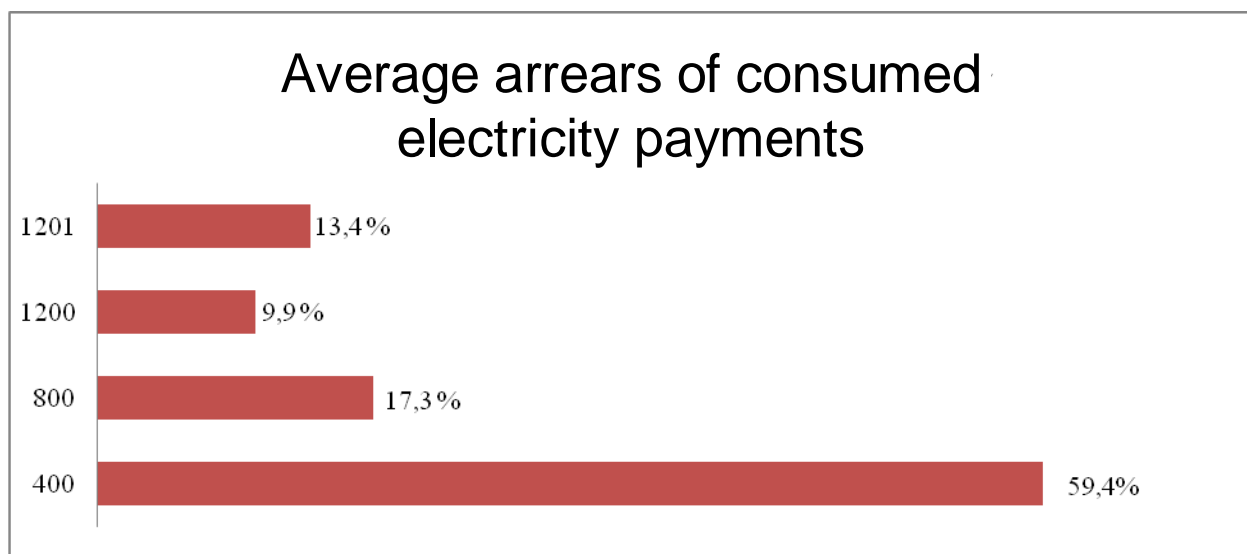


The national average payment for consumed electricity is 387.7 Soms; the payment in summertime makes 211 Soms and in wintertime – 620.6 Soms. The information about consumed electricity payment in summer and winter (based on survey results) is presented below.

Table 1. Payment for consumed electricity (Soms, on the average)

#	Region	Monthly average	Summertime	Wintertime
1	Issyk-Kul Province	382.2	210.5	651.1
2	Naryn Province	551.9	220	747.7
3	Talas Province	386.5	250.9	904.4
4	Chui Province	452.2	232.2	651
5	Osh Province	336.2	206.2	559.1
6	Batken Province	333.7	185.4	637.4
7	Zhalal-Abad Province	344.2	146.5	463.2
8	Bishkek City	405.7	254.0	688.5
	<b>National average</b>	<b>387.7</b>	<b>211.3</b>	<b>620.6</b>

According to survey results, 11.2 % of respondents were in arrears of consumed electricity payments. The average arrear per a household was 882 Soms; in rural areas, average indebtedness is almost two times higher than in urban ones: in villages, the average amount of arrears makes 1194 Soms vs. 672 Soms in towns and 215 Soms in semi-urban centres. In terms of provinces, the highest figures of late electricity payments are in the Chui Province (44.8 % of respondents) and the Osh Province (42.8 %), which correlates with data of Severelektro and Oshelektro energy companies showing high figures of receivables.

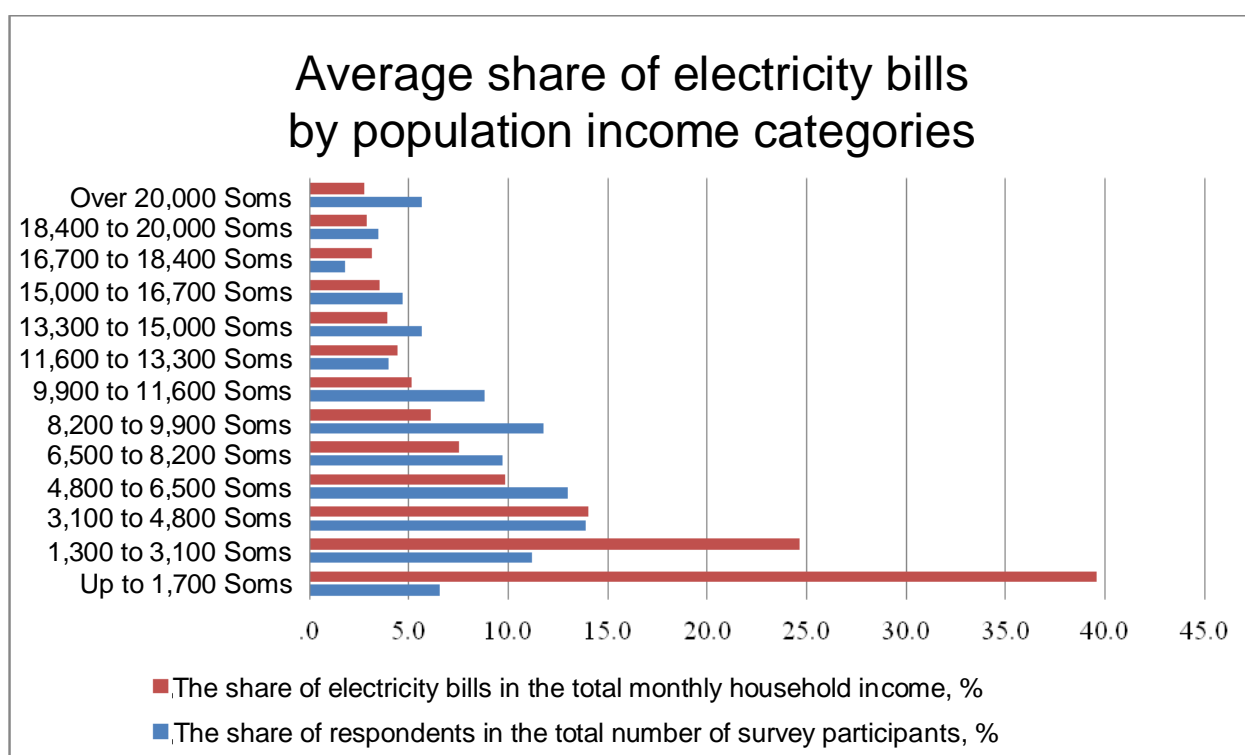


Non-payments and high electricity losses greatly affect the financial and economic performance of electric energy suppliers. The accounts receivable of energy companies influence their financial relations with other economic entities and fulfillment of credit and tax liabilities to the budget, thus creating a hazardous chain of mutual non-payments. Availability of debtors of a company results in a multitude of problems in relations with its creditors – first of all, electricity suppliers (generation and transmission companies) as well as the state budget and shareholders. The existing information about accounts receivable of companies from the very beginning of their establishment (2002) shows that this indebtedness has tended to grow only and virtually never has decreased in spite of several attempts of the government to kill this trend. As early as in late 2003, Boards of Directors of distribution companies wrote of the indebtedness

for the amount of 1078 mln Soms out of almost 3 bln Soms. However, this indebtedness continued to grow. According to information presented by the Government of the Kyrgyz Republic to the Parliament, the accounts receivable of distribution companies as of the end of 2009, even after repeated charge-offs amounted to “over 2.5 bln Soms, of them 1.8 bln Soms being bad debts”. During 2010, reduction of indebtedness of companies was to a higher extent attributable to unjustified relief of debts accrued over the previous period under the guise of bad debts, rather than positive results of production and commercial operations of companies.

It is worthy of note that previously a great number of infringements and shadow arrangements for misrepresentation of actual values of receivables and consumed electricity has been revealed by the Supervisory Council of FECTI during its analysis of losses and by international consultants in course of their diagnostic assessment of the management system. Together with data on high collection rates for residential consumers, this leads to the obvious conclusion that it is not the collection system implementation and organisation but a higher managerial level where a primary concern of distribution companies lies in.

Until recently, system electricity losses and accounts receivable magnitude affected the electricity tariff value through the economic figure of QFD (quasi-fiscal deficit) in accordance with the previous tariff policy<sup>14</sup>. Use of this approach introduced under the Memorandum between the Government of the Kyrgyz Republic and the International Monetary Fund implies shifting the excessive system electricity losses and receivables to compliant payers by means of increase in tariffs to cover the lack of funds due to the above reasons. Thus, in 2008 pursuant to obligations for reduction of QFD level as against GDP, electricity tariffs were increased as from 1 July 2008; in particular, residential tariffs rose from 62 to 70 Tyin/kWh. Then, following an attempt to increase electricity tariffs in April 2010 and subsequent rush of political disorders and overthrowing of the former government, the tariff remained the same and did not change any further.



<sup>14</sup> Mid-term electricity tariff policy of the Kyrgyz Republic for the period from 2008 to 2012, Annex 2, approved by the Resolution of the Government of the Kyrgyz Republic No. 164 dated 23.04.08.

According to the conducted survey, which has covered various social strata, the average consumption per household makes 553.9 kWh/month, while expenses “for lights” vary from 40 % to less than 2 % of the household income.

## 2. Electric energy as a commodity

Interrelations between consumers and suppliers consist of four main consecutive processes. These are connection, supply of electricity to houses/apartments, metering of delivered electricity and payment for consumed electric energy. This cycle recurs until a consumer pays for consumed electricity without fail. Once the consumer stops payment for consumed electricity, the cycle discontinues.

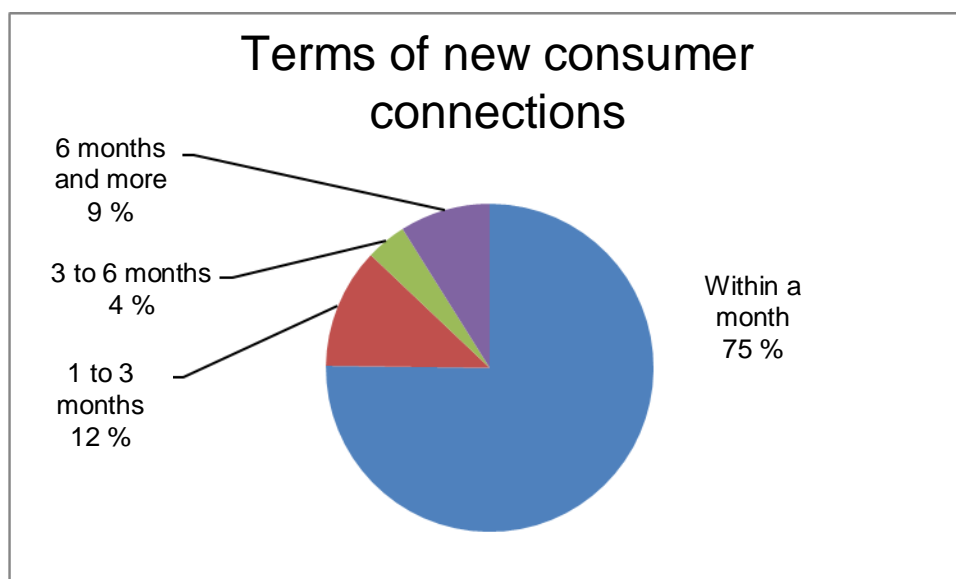
*“I can say that more than 3-4 years ago we have had major problems with population in this regard, related to frequent outages, difficulties in consumed electricity payment due to dissatisfaction of people, accuracy of electricity bills delivered by inspectors, and so on.” From an interview with a chairperson of an Ayil Kenesh, March 2013.*

*“To date, the quality of electricity supply to population is somewhat better than in previous years; however, a lot more must be done to eliminate dissatisfaction of people at all.” From an interview with an official of the Osh Town Hall, March 2013.*

### 2.1. Grid connection

According to survey results, 5.6 % of respondents (or nearly 65.000 consumers a year when extrapolated to the total number of consumers) have applied for grid connection within the past 12 months.

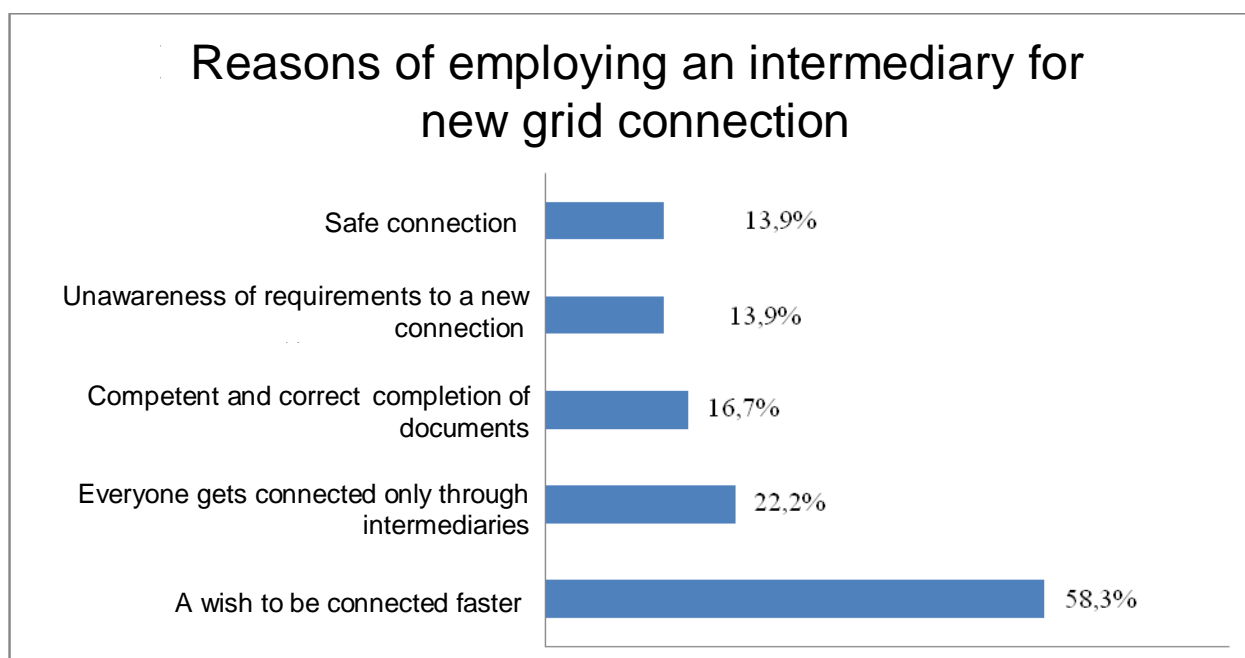
- The majority (85.9 %) of connected consumers are from private houses, while others are from multi-storey apartment houses (7.1 %) and buildings under construction (7.1 %);
- Connections accounted for 41.0 % in towns, 55.0 % in villages and 4.0 % in semi-urban centres. The most of connections (33.0 %) falls to the share of Bishkek; 29.0 % of households have been connected in the Zhalal-Abad Province, 13.0 % in the Chui Province, and less than 10 % in other provinces.



Though, when connecting to a power grid, consumers faced some difficulties of various natures:

- Red-tapery in the connection procedure (requirements and the number of documents related to a new connection): a low grade (1 to 3 points) was given by 42.9 % of respondents and a high grade (5 to 7 points) – by 31.4 % of respondents;
- Relatively poor accessibility of information on a new connection: a low grade (1 to 3 points) from 46.6 % of respondents and a medium grade (4 points) from 9.7 %. For 33.0 % of connected respondents, the information was easily accessible;
- In terms of provinces, the least informed are residents of the Osh and Batken Provinces: 62.5 % and 66.7 % of respondents gave 1 and 2 points, accordingly, while in the Talas Province 100 % of respondents gave 5 points (easy accessibility of information on a new connection).
- Though, rural residents gave the lowest grade for accessibility of information: 1 to 3 points on a 7-point scale from 59.6 % of respondents.

Therefore, consumers frequently resort to intermediary services to accelerate the connection process; however, according to survey results, 36.4 % of respondents have given a low grade (1-3 of 7 points) to this opportunity.



In most cases, the following persons intermediated the connection:

- private electricians – 40.5 %,
- supplier personnel – 37.8 %,
- friends – 8.1 %,
- relatives – 5.4 %,
- neighbours – 2.7 %, and
- others – 5.4 %.

The most of connections in urban areas (46.7 %) were made by private electricians, while in rural areas these were made by supplier staff (45.0 %). Grid connection by a private electrician was mentioned by 71.4 % of respondents in the Osh Province and 50 % in the Bishkek City. Suppliers have made 100 % of connections in the Talas Province, 100 % in the Batken Province, 66.0 % in the Chui Province and 57.1 % in the Zhalal-Abad Province. However, 37.4 % of respondents have noticed poor professional qualification of supplier representatives.

Consumers also pointed to expensiveness of a new grid connection: it was expensive for 55.7 % of respondents while inexpensive only for a quarter of respondents. On the average, a

new connection with issue of a receipt cost 711 Soms to 2.9 % of respondents while without receipt it cost 969 Soms to 2.4 % of respondents.

## **2.2.Electricity meter reading**

- According to survey results, meter readings are taken monthly with 95.6 % of respondents or less frequently, once in two months with other respondents; the reading intervals are as follow:
  - From 1<sup>st</sup> to 10<sup>th</sup> day with 10.2 % of respondents,
  - From 11<sup>th</sup> to 20<sup>th</sup> – 29.1 %,
  - From 21<sup>st</sup> to 31<sup>st</sup> – 23.3 %, and
  - 37.4 % do not remember the dates.
- Meter readings are transferred to an inspector in the following main ways:
  - Taking readings by inspectors in the presence of consumers – 78.5 % (this option is oftener used in rural areas than in towns);
  - Writing of readings on house gate/apartment door – 8.1 % (this option is the most common in Bishkek and the Chui Province – 34.1 % and 81 % of respondents, accordingly, with less than 1.8 % in other provinces); and
  - Other 13.4 % of respondents cited different options such as a call or a message to the inspector, etc.

## **2.3.Delivery of bills for consumed electricity**

- According to survey results, 95.7 % of respondents receive their bills for consumed electricity from inspectors; 2.8 % of respondents either receive bills at home or pick up themselves; and 1.5 % of respondents pick up bills at power distributors, SAPS and supplier/inspector offices.
- Electricity bills are brought in the following periods:
  - From 1<sup>st</sup> to 10<sup>th</sup> day with 10.1 % of respondents,
  - From 11<sup>th</sup> to 20<sup>th</sup> day – 17.3 %,
  - From 21<sup>st</sup> to 31<sup>st</sup> – 33.9 %, and
  - 35.9 % do not remember the dates.
- 25.9 % of respondents regularly sign for receipt of bills, 18.4 % do so sometimes and 55.7 % never sign;

Электр энергия учун эсеп билдирме  
Счет-извещение за электроэнергию

Эсеп/Чет 058113033 Учк 38 Каттам/Маршрут 3806  
Аты/Имя/И.О ЧЕЧЕБАЕВА  
Дареги/Адрес ЧУЙ 97-1  
20.02.2009-20.03.2009 чейин/Период с 20.02.2009 по 20.03.2009  
Көрсөткүч/Показания 5141(К)

Эсептенилчаны	КВтс/КВтч	Накта/Мин
Эл.энергия	105,00	23,50
Эл.энергия/Эл.энергия	13,00	13,00
Ашыкт/Ашыкт/Период/Мин	170,03	2,55
Эл.энергия/Эл.энергия	256,92	3,85
Туум/Пеня	9,33	
Борд/К.телем/Итого к оплате		270,10
05 011 232 2		

5141

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Электр энергия учун эсеп билдирме  
Счет-извещение за электроэнергию

Эсеп/Чет 058113023 Учк 39 Каттам/Маршрут 3806  
Аты/Имя/И.О ЧЕЧЕБАЕВА  
Дареги/Адрес ЧУЙ 97-1  
20.02.2009-20.03.2009 чейин/Период с 20.02.2009 по 20.03.2009  
Көрсөткүч/Показания 5036(К)

Күн-Аны	Тариф	Чыгым Расход	Накта/Мин
28	0,70	105,00	23,50

Эсептенилчаны  
Туум/Пеня 9,33

Эл.энергия/Эл.энергия	Чыгым Расход	Накта/Мин
13,00	13,00	13,00
Ашыкт/Ашыкт/Период/Мин	170,03	2,55
Эл.энергия/Эл.энергия	256,92	3,85
Борд/К.телем/Итого к оплате		0,09
Ашыкт/Ашыкт/Период/Мин		

Эсеп 11.03.2009 жазылган  
Счет выдан 22.03.2009

Ушундуктан ААККО АО-го электр энергия  
Билим берүү жана илим министрлиги  
Визиттер/Энергия  
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Электр энергия/Счет 3806 т. 939995  
Эсепти 3 жылда/Счет 3806 т. 939995

Picture 7. Template of electricity bill

- Nearly 80 % of respondents understand the bill items; however, the most unclear items are “connection charge” (33.2 % of respondents) and “advance payment” (28.3 %).

#### 2.4. Provision of places for bill payments

On the national average, consumers may choose among several options of payment for consumed electricity. Most of respondents pay their electricity bills:

- to an inspector – 33.7 %,
- at a post office – 31.0 %,
- at a supplier’s office (distributor/SAPS office) – 22.5 %,
- through payment terminals – 4.0 %,
- at a shop – 3.5 %,
- at a bank – 2.8 %,
- at a special pay-office – 1.2 %.

The survey also showed that almost all consumers have convenient places to pay for consumed electricity:

- the way from home to a power distributor’s office takes 6 to 15 minutes for 52.5 % of respondents;
- 15 minutes for 32.4 %; and
- more than 16 minutes for 15.1 %.

## Main reasons of using post offices for payment of electricity bills

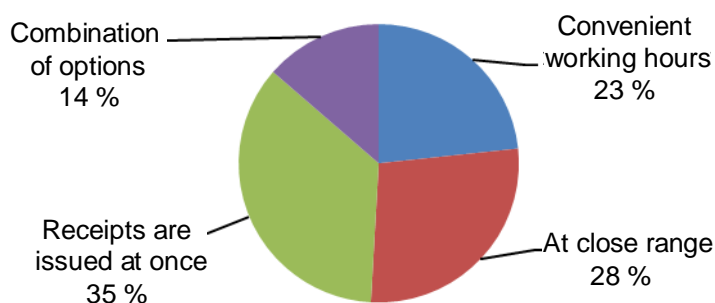


Table 2. Places of payment for consumed electricity (%)

Region	Power distributor	Post office	Terminal	Bank	Inspector	All but terminals
Issyk-Kul	5.4	<b>80.8</b>	0.6	4.2	0.6	0.6
Naryn	33.8	<b>65.0</b>	-	1.3	<b>45.0</b>	-
Talas	7.1	<b>72.9</b>	-	-	10	33.3
Chui	27.6	27.6	3.6	3.6	27.3	3.6
Osh	23.7	11.6	3.3	5.8	<b>58.8</b>	3.3
Batken	<b>47.3</b>	-	1.4	-	<b>64.9</b>	1.4
Zhalal-Abad	<b>45.5</b>	4.7	1	2.7	<b>52.8</b>	0.3
Bishkek	18.4	<b>66.9</b>	24.8	18.1	5.2	-

The table below shows that in southern regions more than 50% of respondents pay electricity bills to inspectors. In northern regions, except for the Chui Province, 27.3 % of respondents pay bills through channels other than inspectors. In rural areas, these options were chosen oftener than in towns (49.5 % vs. 11.1 %).

### 2.5. Settlement of disputes

Every stage of interaction with suppliers involves potential confrontation with various problems, for example, failure of a counting mechanism, inaccuracy of consumed electricity bill, etc.

#### *Claims on meter performance*

- 4.9 % (of 100 %) of respondents encountered electric meter problems; furthermore, rural area residents have more claims on meter performance than residents of towns and semi-urban centres,
- Of them, 3.9 % (80 %) turned to suppliers (SAPS, power distributors, energy companies), other 20 % of respondents turned to private electricians or friends;
- In terms of provinces, claims most frequently were lodged in:
  - the Zhalal-Abad Province – 20.5 % of respondents,
  - the Osh Province – 18.2 %,
  - the Bishkek City – 17.0 %, and
  - other provinces – less than 14 % of respondents.
- According to survey results, 57.4 % of respondents stated that their claims were registered,

- and the problem was solved in 70.7 % of cases;
- the average term of consideration was 14 days; and
- respondents spent 339 Soms at the mean for settling of their claims.

#### *Claims on consumed electricity bills*

- respondents find discrepancies between bills and actual readings – 20 % of respondents,
- 7.4 % of respondents applied for correction of bills, while others did not appeal anywhere;
- the bill was corrected in 80.5 % of cases;
- correction took 8 days at the average; and
- 57.9 % of respondents were satisfied with the correction procedure.

#### *Claims on electricity payment procedure*

In the past three years, 13.3 % of households have been disconnected for late payment; of them, 61.5 % of households have been disconnected one time, 22.9 % – 2 times, 10.2 % – more than 3 times.

Most frequently respondents have been disconnected in the Zhalal-Abad Province – 20.8 % against 16.0 % in the Bishkek City, 14.1 % in the Osh Province, 12.3 % in the Talas Province, 11.4 % in the Issyk-Kul Province, 9.8 % in the Chui Province, and 7.5 % in the Naryn Province.

Payment of electricity bills was delayed for less than 7 days by 32.1 % of respondents, 2 to 3 weeks – by 35.0 %, 1 to 2 months – by 21.8 %, and over 3 months – by 11.1 % of respondents.

The largest number of non-payers is in the Chui Province – 20.7 % of respondents have not paid for more than 3 months against 16.4 % in the Zhalal-Abad Province and 11 % in each of Talas and Issyk-Kul Provinces.

Inspectors gave consumers 19 days on the average to pay off their debts.

*“When a consumer receives a bill for over 100 Soms and wilfully defaults, then we climb a pole and cut off his/her house from electricity. Then, he/she pays 263 Soms for disconnection and connection – at least 363 Soms in total.” From an interview with a SAPS job foreman, March 2013.*

Arrears without actual disconnection were charged to 44.6 % of respondents. Connection was restored on the same day for 35.1 %, on the next day for 34.2 %, in two days for 22.7 % and in more than two days for 8.0 %. The majority of households (78.2 %) paid for re-connection. Of them, 79.7 % of payments were made to power suppliers. Electricity bills are satisfactory for 68.7 %, partially satisfactory for 25.3 % and unsatisfactory for 4.3 % of respondents.

However, some respondents (5.8 of 100 %) did not complain to their suppliers for the following reasons: disbelief at addressing a claim/complaint as intended (42.8 %); taking too much time/repeated visits to suppliers (37.1 %); and unawareness of contact points (20.0 %). The rest of respondents provided other answers.

### **3. Consumer awareness**

The level of consumer awareness/knowledge plays a crucial part in resolving of arising energy supply problems, and, generally, consumer awareness is of great importance for effective communications between electricity suppliers and consumers. In course of provision of the service – supply of electricity – a consumer must know basic rules and appeal to them.



### 3.1. General information

Below you can find the results of population survey on the main facts, which must be known to residential electricity consumers and may be touched upon in relations with suppliers.

#### *Electric meter owner*

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- Less than a half of respondents (42.3 %) are aware that electric meters are owned by suppliers; 45.1 % consider them to be the property of consumers; and 12.6 % of respondents do not know who owns meters,
- In terms of provinces, the most informed of this issue are residents of:
  - the Talas Province – 63.8 %,
  - the Chui Province – 54.9 %,
  - the Issyk-Kul Province – 47.9 %; and
  - the Osh Province – 42.9 %,

The least informed are residents of the Batken and Naryn Provinces: 84.0 % and 59.3 % of respondents, accordingly, stated that meters are owned by consumers.

#### *Electricity tariff value*

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- Notably, population is well informed of electricity cost: 86.9 % of respondents have indicated that they pay 70 Tyins per one kilowatt of consumed electric energy,
- However, some respondents stated that they paid 75 Tyins/kilowatt,
- According to survey results, the majority of population (perhaps, due to politicization of the tariff issue) is aware of tariff-setting bodies, and, in the opinion of respondents, decisions on raising electricity tariffs/prices are made, first, by the Ministry of Industry (79.5 %), second, by the Zhogorku Kenesh (78.8 %), by the Kyrgyz Government (74.7 %), and suppliers (39.3 %).

#### *Legislative rules and standards*

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- The survey results have shown very poor awareness of existing regulations and standards in the power industry; when answering to the question “What are the legislative rules and standards of residential electricity supply, which must be followed by suppliers?”, respondents have indicated the following options only:
  - the State Standard “On the power quality” – 24.8 % of respondents,
  - the Law “On the Power Industry” – 26.2 %, and
  - the Civil and Administrative Codes – 5.0 %.

### 3.2. Complaint procedures

The quality servicing centres established under single-area power systems by the FEC Transparency Initiative are the formal channel to handle consumer complaints. However, the survey results have shown that:

- Only 15.4 % of respondents know of such centres,
- In terms of provinces, the most informed are residents in the Zhalal-Abad Province (36.2 %), in the Osh Province (21.3 %), in the Bishkek City (11.6 %) and in the Chui Province (10.1 %). In other provinces, less than 10 % of respondents know of quality centres.
- In the past 3 years, only 14.2 % of respondents turned to a customer quality servicing centre.
- Most often they do so in the Batken Province (39.3 %), in the Bishkek City (18.9 %) and in the Talas (14.3 %), Chui (13.2 %), Osh (12.7 %) and Issyk-Kul (4.2 %) Provinces. In the Naryn Province, none of respondents turned to a quality servicing centre.

For particular problems in the sphere of electric energy supply:

- In case of electricity meter problems – 65.3 % of respondents are informed of a complaint/claim lodging procedures. The best informed are respondents in the Issyk-Kul Province and the worst informed are those in the Naryn Province (90.2 % vs. 42.7 %);
- In case of electricity supply problems – 49.3 % of respondents are aware of contact points at energy supplier offices. The best informed are respondents in the Zhalal-Abad Province (20.9 %), in the Bishkek City (19.6 %), in the Chui Province (15.1 %) and in the Osh Province (15.3 %). 15 % of respondents in other provinces and 5.6 % in the Batken Province know the contact points.

### **3.3.Additional information**

Energy saving and use of additional external energy sources such as diesel generators or photovoltaic cells exert substantial influence on the sector structure.

#### *Knowledge of power saving measures*

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- 60.2 % of respondents are aware of power saving measures;
- The main measures listed by respondents include:
  - thermal insulation of buildings – 37.9 %,
  - switching off the light if not needed – 36.0 %,
  - use of energy-saving lamps – 18.5 %,
  - winterization of windows and doors – 3.6 %, and
  - other mentioned measures include firing a furnace instead of using an electric heater and unplugging of chargers if not needed, etc.
- The necessity of energy saving is favoured by 34.4 % of respondents and disfavoured by 65.6 %; in rural areas, the share of consumers supporting reduction of electricity consumption is higher than in towns (43.6 % vs. 23.9 %), with 90 % of respondents seeing the reason in cost saving and 10 % choosing other options;
- In terms of provinces, reduction of electricity consumption is supported by 59.5 % of respondents in the Naryn Province, 54.6 % in the Zhalal-Abad Province, 49.0 % in the Osh Province, and 4.5 % in the Talas Province.

#### *Knowledge of renewable energy sources and attitude to them*

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- Renewable energy sources are familiar to 4.5 % of respondents; the level of awareness in urban areas is higher than in rural ones (5.4 % vs. 3.6 %), and in semi-urban centres it achieves 19 %;
- The best informed of renewable energy sources are respondents living in:
  - the Bishkek City – 7.3 %,
  - the Naryn Province – 6.4 %,
  - the Zhalal-Abad Province – 6.3 %, and
  - other provinces – less than 4 % of respondents.
- Among informed respondents, the known energy sources are distributed as follows:
  - Solar energy – 78.2 % of respondents,
  - Wind energy – 37.2 %, and
  - Biogas generators – 52.5 %.
- The following reasons of dissatisfaction with RES have been stated by consumers:
  - Complicated operation – 37.9 %,
  - High initial investments – 27.6 %,
  - High maintenance costs – 13.8 %,

- Unprofitability – 10.3 %, and
- Unreliable power supply – 10.3 %.

### 3.4. Information sources

The survey showed that information campaigns carried out in the past 3 years had covered only 6.5 % of respondents, which pointed to inadequately efficient information efforts of distribution companies. Furthermore, according to consumers, 35.6 % of information campaigns known to them were implemented by distribution companies, while others were arranged by international financial institutions, civil society organisations (18.5 %), municipal utilities and local self-governments (5.2 %).

- In particular, for the ways of turning to an electricity supplier in case of various problems, the following main sources of information were cited:
  - Neighbours, friends – 31.8 % of survey participants,
  - Advices on bills – 25.1 %,
  - Local mass media – 6.7 %,
  - Own experience – 6.9 %,
  - Advertisements – 5.6 %,
  - Inspectors – 4.7 %, and
  - Other respondents chose a combination of different options of information sources.

## 4. Improvement of servicing quality in the view of consumers

This section presents a value judgement by consumers of their relations with suppliers, and proposals on improvement of electricity supply quality.

Respondents were offered to grade professional qualification of electric energy supplier on a 7-point scale. According to survey results, professional qualification was given a high grade (5 to 7 points, 41.1 % of respondents), medium grade (4 points, 21.2 %) and low grade (1 to 3 points, 20.5 %). The respondents, who had had voltage problems in the past 3 years, evaluated the professional qualification of providers lower than those who had not had such problems (see the table below).

Table 6. Evaluation of supplier's professional qualification

	Points		
Have you had mains voltage problems in the past 3 years?	1-3 (low)	4	5-7 (high)
Yes	28.0 %	24.4 %	31.3 %
No	12.7 %	17.6 %	51.3 %

Generally, respondents evaluated their experience of relations with suppliers as:

- Excellent/good – 39.1 % of respondents,
- Average – 21.1 %; and
- Not good enough – 17.2 %.

Respondents evaluated their interaction experience with inspectors higher than with suppliers; results are as follow:

- High grade – 54.4 % of respondents,
- Medium grade – 19.7 %; and
- Low grade – 12.2.

Furthermore, in course of the survey, respondents were offered five options of answers about improvement of the population servicing quality. The options concerned improvement of

regulatory framework, procedural matters, professional qualification, interaction with population and failure-free operation of grids.

According to survey results, the following is required to improve population servicing quality:

- Involvement of competent personnel and inspectors of SAPS – this is the opinion of 65.0 % of respondents;
- Quality and timely repair and modernization of power grids and equipment – 64.9 %;
- Introduction of amendments to legislative and regulatory bases – 41.7 %;
- Permanent and close interaction with population rather than occasional activities – 41.5 %; and
- Training of inspectors in interaction with consumers – 36.4 %.

Respondents were offered the choice of 10 answer options in order to determine the priority problems of the energy sector. According to survey results, respondents have identified the following three priority areas in the energy sector:

- Reduction and prevention of failures – 57.6 %,
- Training of professional power engineers and operators – 54.0 %, and
- Construction of new facilities – 40.2 %.

Further, the following noteworthy areas were mentioned:

- Reliable and affordable electric energy supply to whole population – 31.3 %,
- High commercial losses – 29.9 %,
- Justification of electricity tariffs – 26.4 %,
- Appropriate legislative framework and its implementation – 15.5 %,
- Management and quality servicing of consumers – 9.6 %,
- Winterization and technical upgrading of grids/equipment – 7.2 %, and
- Fighting corruption and the sector transparency – 1.5 %.

## **CONCLUSIONS AND RECOMMENDATIONS**

The power industry is of paramount importance in development of all national economies as any goods and services production process is related to electricity consumption processes. Generally, the performed study for evaluation of the electricity distribution system with interviewing of different stakeholders on the problems encountering them in this sphere, allows reviewing some important gaps in the power industry management process at the level of electricity distribution and consumption.

Based on the study conducted with use of the EDIT methodology and considering the revealed electricity distribution shortcomings, the Working Team has developed basic recommendations to improve consumer servicing quality, which can be divided into several lines:

### **a) Restoration of population confidence and public relations**

- Proactive response to any questions and addresses of consumers in common mass media referring to public statements of the company management on community relations and expert opinions of company representatives on various matters;
- Provision of efficient and positive PR support to customer-oriented measures with shifting from negative stereotypes to a company image aimed at partnership relations with consumers;
- Firm guarantee of consumer protection in case of potential power outages or low-quality electricity supply, in accordance with legislation;

- Use of different coverage opportunities for mass media, provision of transparent, trustworthy and consistent information with elimination of apparent inconsistencies in the company behaviour;
- Strengthening of interaction with local mass media for beforehand consumer notification of scheduled repairs and power interruptions, and for explanation of reasons, duration and nature of off-schedule outages; and
- Regular assessment of efficiency and performance of the client relations department and press office, in order to review key indices dynamics in terms of community attitude to the company, and to adjust prospects.

**b) Communications with consumers and feedback arrangements**

- Regular and efficient awareness campaigns on various power supply topics; continuous and close interaction with communities;
- Acceptance of addresses by all available interaction channels (telephone call, post, e-mail) irrespective of jurisdiction and prompt response within the terms established by the legislation;
- Expansion of public information channels on various power supply and consumer servicing matters (reverse side of an electricity bill, post offices, etc.);
- Prioritisation of complaints handling; e.g., complaints related substantially to health and safety must be handled immediately;
- Establishment of a system for consumer information and notification as necessary with use of various means, such as telephone messaging, autoinformer messaging, SMS, e-mailing, issuing of own printed/online publications for consumers, etc.;
- Standardisation of professional ethics requirements to inspectors and other staff immediately contacting with consumers, including requirements to appearance, communicational culture, competence, and culture of staff interaction with residential consumers, etc.;
- Consideration of provision of all inspectors with business cards; and
- Arrangement of efficient informing on complaint mechanisms – servicing quality centres.

**c) Infrastructure arrangements – information technologies**

- Clear definition of authorities and delimitation of a community liaison office/hot line, press office and a committee for supervision of customer servicing quality;
- Establishment and maintenance of a client information database that enables logging of customer relations and personalised client servicing in customer multiplicity settings;
- Provision of waiting and servicing conditions convenient for customers;
- Application of up-to-date technologies in servicing of visiting customers with reduction client servicing time, e.g. by means of information displays or electronic line management, which also would enable optimal allocation of work time and personnel resources;
- Improvement of distant client servicing system and ensuring of simultaneous handling of a great deal of telephone calls on various power supply matters;
- Updating of power distribution companies' websites with posting of full and detailed information for consumers on all potential issues and inclusion of explanations on appealing and dispute settlement mechanisms; and
- Wider application of standard online and printed forms for requests, applications and appeals from consumers, categorised by matter types (electricity quality, new connection, billing and electricity meters, etc.).

***d) Standardisation of customer relations on specific issues***

- Revision of the electric grid connection procedure to reduce administrative barriers and reduce the practice of community resorting to private electrician services or using unauthorised problem solutions;
- Guaranteeing of consumer protection in case of potential damage of a meter located outside households and explanatory activities on responsibilities;
- Improvement of billing documents issuing procedure and preclusion of possibility of technical or software errors;
- Revision of electricity bill contents to make it understandable for consumers (e.g., to simplify Connection Payment and Advance Payment items);
- Improvement of in-house electricity billing and payment communications, reduction of a practice of disconnections and virtual connection charging;
- Standardisation of consumer information document forms (bills, receipt vouchers, disconnection notices, etc.) and their delivery terms and completion rules; and
- Introduction and simplification of a reimbursement procedure for damaged domestic appliances; provision of clear and detailed explanation of the procedure; and improvement of reporting accountability to communities.

**e) Human resources**

- Introduction of a corporate recruitment standard and training of managers in personnel development;
- Improvement of personnel management efficiency; prompt internal assignment of jobs in case of inspectors' transfers to other units, dismissals, and leaves; and
- Training of inspectors in interaction with consumers; considering staff turnover, application of different experience retention approaches, such as mentoring, etc.

**f) Interaction with other concerned parties**

- Expanded cooperation with post offices and mobile operators to establish formal payment channels and reduction of cash payments to inspectors;
- Enhancement of interaction with local administrative bodies (within their mandates) for:
  - Coordination of scheduled power equipment repairs, and
  - Provision of new consumers and new districts with power facilities,
- Expansion of cooperation with other organisations and parties in terms of energy saving awareness (shifting from directive instructions to client-oriented approach and partnership).

It was the first time that a power industry study was conducted in Kyrgyzstan, based on the international methodology for evaluation of the electricity distribution system and with collection of objective evidences through a country-wide survey. The analysis of customer relations procedures and methods, and problems encountered by electricity consumers partially reveals the gaps between current approaches and those leading to efficient and quality servicing of consumers as the clientele of power distribution companies.

We seek to establish a constructive dialogue among all stakeholders and hope that further integrated studies may help tracking of changes in the decision-making system and influence of such changes on the quality of decisions and management of electricity distribution processes.

## General power industry information in diagrams and tables

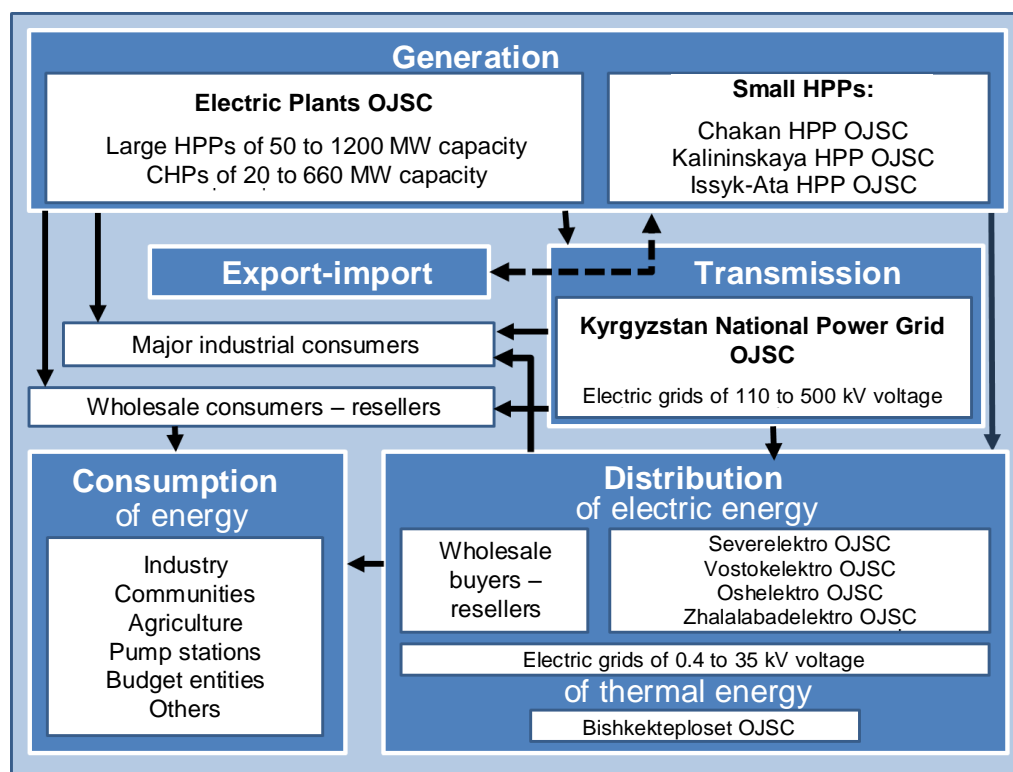


Fig. A1 Functional structure of power supply companies and electricity flows to local consumers and for export to CA UES

Source: V. M. Kasymova, *Incomes and Expenditures of Open Joint Stock Energy Companies of the Kyrgyz Republic*; published on FECTI website, Bishkek, 2012

**Table A1. Kyrgyzstan largest power plants**

#	Electric plant name	Installed capacity, MW
1	Toktogul HPP	1200
2	Kurpsay HPP	800
3	Tash-Kumyr HPP	450
4	Shamaldy-Say HPP	240
5	Uch-Kurgan HPP	180
6	Kambarata HPP-2	120
7	At-Bashi HPP	40
8	Bishkek CHP	666
9	Osh CHP	50
10	Total	3746

Source: MEI KR, 2013

**Table A2. Electricity generation by HPPs and CHPs, mln kWh**

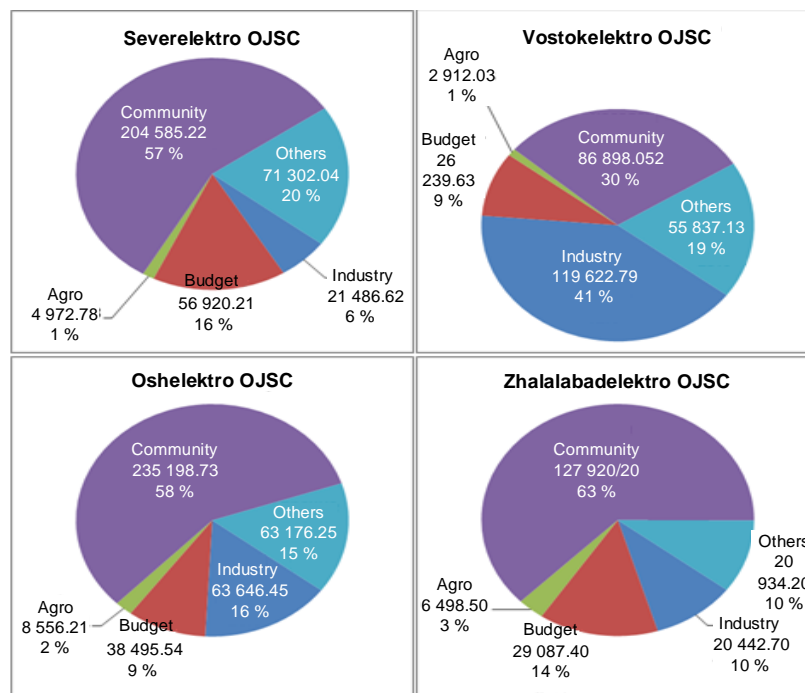
#	HPP, CHP	2009	2010	2011
1	HPP	9925.4	11070.0	14129.2
2	CHP	964.0	787.2	827.9
3	Bishkek CHP	948.2	787.2	827.9
4	Osh CHP	15.8	0	0
5	Total	10889.3	11857.2	14957.1

Source: MEI KR, 2013

**Table A3. List of transmission lines, transformer substations, capacity and length<sup>6</sup>**

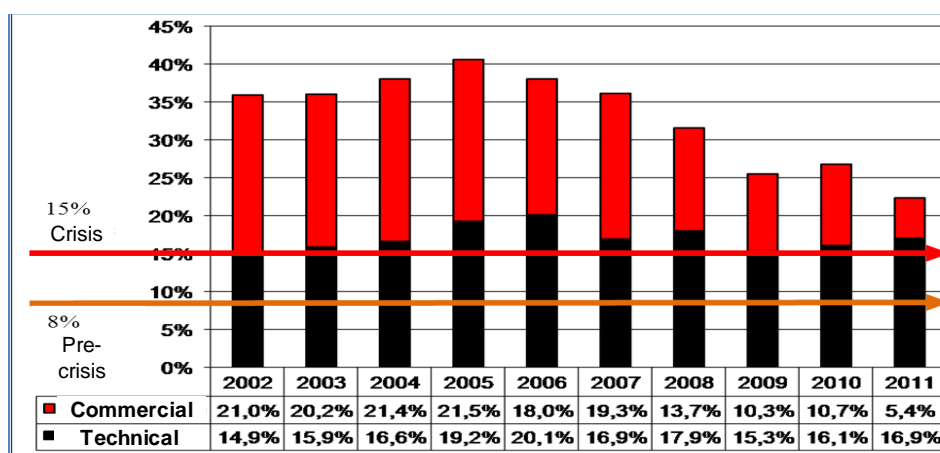
#	Transmission lines	Length, km
1	At 500 kV voltage level	596
2	At 220 kV voltage level	1749
3	At 110 kV voltage level	4510
4	At 35 kV voltage level	4613
5	35-500 kV transformer substations	490 units
6	Installed capacity of transformers	8947.93 MVA

Source: MEI KR, 2013



**Fig A2. Structure of PDC receivables by consumers in 2011**

Source: V. M. Kasymova, *Incomes and Expenditures of Open Joint Stock Energy Companies of the Kyrgyz Republic*; published on FECTI website, Bishkek, 2012



**Fig A3. Dynamics of electricity losses at PDC by types in the period from 2002 to 2011**

Source: V. M. Kasymova, *Incomes and Expenditures of Open Joint Stock Energy Companies of the Kyrgyz Republic*; published on FECTI website, Bishkek, 2012



## Information about respondents

### *Housing property*

According to survey results, 93.8% of respondents have their own housing, 5.2% rent their houses and 1.0% has chosen other options. In terms of housing types, these are private houses (79.6%), apartments in multi-storey houses (16.5%), half-houses (1.6%), and one-off houses (1.6%). Other types were mentioned by 1.0% of respondents.

### *Fuel types used for heating and cooking*

The survey has shown that irrespective of seasons respondents use for cooking and heating the following fuel types: coal (40.9%), firewood (38.2%), electricity (37.5%), gas (22.6%), and casings (17.2%); 7.9% of respondents use district heating.

The following fuel types are used additionally for heating of houses/apartments: coal (63.8%), electricity (34.2%), firewood (31.0%) and casings (14.7%).

In terms of regions, the prevalent fuel types are: coal (29.3%) in the Osh Province, firewood (26.3%) in the Zhalal-Abad Province, casings (36.0%) in the Osh Province, electricity (23.8%) in the Chui Province, and gas and district heating (100%) in the Bishkek City.

In northern regions, the most frequently used energy sources are: firewood (59.9%) in the Issyk-Kul Province, electricity (51.3%) in the Naryn Province, coal (88.6%) in the Talas Province, electric power (45.5%) in the Bishkek City, and coal (46.0%) in the Chui Province.

In southern provinces, the most frequently used energy sources are: coal (54.3%) in the Osh Province, electricity (50.5%) in the Batken Province and firewood (60.5%) in the Zhalal-Abad Province.

Table 7. Used fuel types/energy sources

Fuel type/ energy source	Northern regions									
	Issyk-Kul		Naryn		Talas		Bishkek		Chui	
	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
Coal	66	39.5	35	43.8	62	88.6	83	25.5	167	46.0
Firewood	100	59.9	16	20.0	27	38.6	35	10.7	119	32.8
Casings	50	29.9	39	48.8	19	27.1	5	1.5	45	12.4
Electric power	96	57.5	41	51.3	24	34.3	148	45.4	160	44.1
Gas	24	14.4	0	.0	5	7.1	147	45.1	81	22.3
District heating	6	3.6	5	6.3	2	2.9	77	23.6	16	4.4

Table 8. Used fuel types/energy sources

Fuel type/ energy source	Southern regions					
	Osh		Batken		Zhalal-Abad	
	Qty	%	Qty	%	Qty	%
Coal	215	54.3	40	42.1	67	22.4
Firewood	163	41.2	46	48.4	181	60.5
Casings	111	28.0	5	5.3	34	11.4
Electric power	88	22.2	48	50.5	68	22.7

Gas	80	20.2	16	16.8	53	17.7
District heating	24	6.1	0	0.0	13	4.3

### *Availability of domestic appliances*

The most common domestic appliances of consumers are TV sets (69.2%). These are followed by such electric devices as refrigerators (75.9%), DVD players (68.3%), washing machines (66.4%), electric cookers (56.8%), electric heaters (36.3%), satellite antennas (21.1%), computers (15.7%), hot-water boilers (13.1%) and laptops (6.1%).

Respondents in the Chui Province have the largest number of electric cookers – 22.8%, as compared to 20.1% in the Osh Province, 15.5% in the Bishkek City, 14.1% in the Zhalal-Abad Province and 12.1% in the Issyk-Kul Province. Less than 7 % of respondents have electric cookers in each of the Naryn, Talas and Batken Provinces.

### *Incomes and material situation of households*

According to survey results, the total monthly family income (accounting for all types of incomes including salaries) made up to 4800 Soms or 100 US dollars for 31% of respondents, 4800 to 9900 Soms or 207 US dollars for 34.4% of respondents, and over 207 US dollars for 62.0% of respondents. The average family size was 4.5.

According to survey results, electricity as an energy source within a region prevails in the Naryn Province (53%), Bishkek City (45.4%) and Batken Province (50.5%).

In terms of material wealth, results obtained in course of the survey are tabulated below.

Table A4. Material wealth level

Material wealth level	Qty	%
We have not enough money for food	34	1.9
We have enough money for food, but hardly we can buy clothes and footwear and pay for utilities	441	24.7
We have enough money for food, clothes, footwear and payment for utilities. Moreover, we have some savings. However, we cannot afford buying of durable goods such as a refrigerator or a TV set.	618	34.6
We can buy some expensive durable goods but we cannot buy everything we want	542	30.3
We can afford buying everything we want	151	8.5
Not specified	14	0
<b>Total</b>	<b>1786</b>	<b>100.0</b>

**Electricity Distribution Interface Toolkit (EDIT)**  
**Component B – Consumer Survey**

**Survey Checklist / Questionnaire**

I represent the Civil Foundation "UNISON". We are currently conducting a survey to study the problems associated with the electricity supply and consumption faced by the population of the Kyrgyz Republic. You've come to the list of interviewees randomly. Your answers will be used in summary form, and your participation in the study will remain anonymous. Do you agree to answer the questionnaire?

**Questionnaire**                      № \_\_\_\_\_

**Section A: About the consumer and type of connection**

1. Name of respondent \_\_\_\_\_
2. Age of respondent \_\_\_\_\_ years
3. Education *1. Lower secondary 2. High school 3. Technical college 4. Bachelor degree 5. University degree*
4. Professional qualification of respondent: \_\_\_\_\_
5. Address: \_\_\_\_\_
6. Do you have single phase or three phase electrical meter? *1. Single phase 2. Three phase 3. Don't know (?)*
7. How long have you been a consumer of electricity?  
*1. less than 1 year,*  
*2. 1-5 years,*  
*3. 5-10 years,*  
*4. 10-20 years,*  
*5. 20+ years*

**Section B: New Connections**

1. Have you applied for connection to the electricity grid to the supplier within 12 months?  
*1. Yes 2. No ---- → go to section C*
2. Did you get connection ...?  
*1. Less than 1 month, 2. 1 -3 months, 3. 3 -6 months, 4. 6+ months*
3. Did you involve any intermediary (apart from formal, prescribed process) while getting new connection?  
*1. Yes 2. No ---- → go to question 4*
- 3.1. Please specify category of intermediary -  
*1. Friend 2. Relatives 3. Private electrician 4. neighbor 5. Utility staff,*  
*6. Other (pl. specify) \_\_\_\_\_*
- 3.2. Why did you involve the intermediary? **No more than 3 options**  
*1. Ensure timely connection*  
*2. Help with shortcomings in legal and documentation requirements*  
*3. Lack of understanding of process and requirements*  
*4. Ensure specific connection type*  
*5. Everybody gets connections through intermediaries only*  
*6. Because it's not expensive and fast*
4. How much did you pay for new connection?  
 4.1. receipted charges \_\_\_\_\_ soms    99. No unreceipted charges \_\_\_\_\_ soms  
 99. No



6. How metering have been done? Please explain \_\_\_\_\_  
 -----→ go to question 15
8. Could you please remember, how many times the meter was changes last 5 years? \_\_\_\_\_ times  
 99. Not changed ---→ go to the question 10
9. Why was the meter changed?

Reasons for meter changed <b>Burnt – code 1</b> <b>Lost – code 2</b> <b>Stolen – code 3</b> <b>Movement to outside/inside - code 4</b> <b>Changed to new model - code 5</b> <b>Disrepair - code 6</b>	When (year)?	How many did you paid for the new meter?		Number of days required for the meter change?	Who made works on meter change?	Please, explain
		Official charge (KG soms)	Additional charges (KG soms)			
<b>Type a code</b> _____		_____ soms 1- no charges	_____ soms 1- no charges		1. Supplier 2. Others	
<b>Type a code</b> _____		_____ soms 1- no charges	_____ soms 1- no charges		1. Supplier 2. Others	

10. Have you had any complaint about the functioning of meter during last 5 years?  
 1. No -----→ go to the question 15  
 2. Yes, -----→ pl. explain \_\_\_\_\_
11. Have you send the complaint to utility or private organizations/persons?  
 1. Yes 2. No -----→ go to the question 14  
 11.1. If yes, to whom?  
 1. Supplier (RES, energy company... ) 2. Private electrician  
 3. Familiars 4. Others \_\_\_\_\_
12. Did you seek for help to anyone for making a claim (complaint)? 1. Yes 2. No
13. Have you registered your complaint with supplier? 1. Yes 2. No  
 13.1. Was it resolved to your satisfaction? 1. Yes 2. No-----→ go to the question 15  
 13.2. In how many days? \_\_\_\_\_ days  
 13.3. How much you had to pay to resolve the complaint? \_\_\_\_\_soms  
 99. Nothing -----→ go to the question 15
14. Why do not you filed a complaint to the supplier?  
 1. Do not trust that complaint will be addressed  
 2. Costly to approach utility for redress  
 3. Takes lot of time / many visits to solve problem  
 4. Do not know procedure and whom to approach  
 5. Almost can not see the controller to send a complaint  
 6. Others \_\_\_\_\_
15. Rate your overall satisfaction about metering of electricity on 7-point scale where 1 - least satisfied, 7 - most satisfied)  
 1 2 3 4 5 6 7 99. Hard to answer N/A.

#### Section D: Billing& Payment

1. What is billing frequency / periodicity (How often controller provides energy bill for payment ....)?  
 1. Monthly, 2. Bi-monthly, 3. Quarterly, 4. Half-yearly 5. Occasionally
2. Do you pay for electricity ...?

1. Monthly, 2. Bi-monthly, 3. Quarterly, 4. Half-yearly 5. Occasionally

3. How much do you pay per month? \_\_\_\_\_soms

3.1. In summer \_\_\_\_\_soms 3.2. In winter \_\_\_\_\_soms

4. How do you usually get bills?

1. Personally collect from utility / staff/others,
2. Controller brings to home
3. Sometimes collect, sometimes delivered

5. Please remember, when the controller brought the bill last month, the date? \_\_\_\_\_ day

98. Did not bring 99. Don't remember

6. Does controller bring bills each month at one and the same number or different numbers?

1. The same day 2. Different 99. Don't remember

7. Do you pay bills in a timely or untimely manner last 12 month?

1. in time 2. untimely

8. How often the controller offers you to sign a protocol of a presentation of bills?

1. Regularly 2. Sometimes 3. Never

9. Does your bill clearly, in easy to understand manner, state:

		Yes	No
9.1.	Period of bill	1	2
9.2.	Meter readings for the period of bill	1	2
9.3.	Total consumption for the bill period	1	2
9.3.	How the bill / payable amount is calculated?	1	2
9.4.	Charges / total bill payable	1	2
9.5.	Applicable tariff / charges	1	2
9.6.	Manner / modes of paying bill	1	2
9.7.	Last / expected date of payment	1	2
9.8.	Implications of late payment / non-payment	1	2
9.9.	Prepayment	1	2
9.10.	Penalty	1	2
9.11.	Debt for connection	1	2

10. Which bill payment options are made available by the utility in your region?

1. Visiting utility office 2. Post offices 3. Terminals  
4. Banks 5. To controller 6. All (except terminals) 7. Other (please specify)

11. Which payment option do you use most? **Please tick ONLY ONE option!**

1. Visiting utility office -----> go to question № 12  
2. Post offices -----> go to question № 13  
3. Terminals -----> go to question № 14  
4. Banks -----> go to question № 15  
5. Via controller -----> go to question № 16  
6. Other (please specify) -----> go to question № 17

**12. Visiting utility office / counter**

1. Why do you use visiting utility office? 1. Convenient 2. Nearby 3. Get immediate receipt / confirmation 4. Offers maximum period for payment 5. No line 6. Others \_\_\_\_\_

2. How much do you spend for bill payment? 1. 5 minutes 2. 6 -15 minutes 3. more than 16 minutes

**Interviewer -----> go to the question № 18!**

**13. Through post offices**

1. Why do you use post offices? 1. *Convenient* 2. *Nearby* 3. *Get immediate receipt / confirmation*  
 4. *Offers maximum period for payment* 5. *No line* 6. *Others* \_\_\_\_\_
2. Have you had any problems because not timely transfer of mail payment to the supplier?  
 1. *Yes* 2. *Sometimes* 3. *Never*
3. How much do you spend for bill payment? 1. *5 minutes* 2. *6 -15 minutes* 3. *more than 16 minutes*

**Interviewer -----→ go to the question № 18!**

#### **14. Through terminals**

1. Why do you use terminals? 1. *Convenient* 2. *Nearby* 3. *Get immediate receipt / confirmation*  
 4. *Offers maximum period for payment* 5. *No line* 6. *Others* \_\_\_\_\_
2. Is the process of electronic payment easy / convenient? 1. *Easy* 2. *Hard*
15. Do you find any difficulty in mobilizing money for bill payment? 1. *Yes* 2. *Sometimes* 3. *No, never*
4. How much do you spend for bill payment? 1. *5 minutes* 2. *6 -15 minutes* 3. *more than 16 minutes*

**Interviewer -----→ go to the question № 18!**

#### **15. Banks**

1. Why do you pay via banks? 1. *Convenient* 2. *Nearby* 3. *Get immediate receipt / confirmation*  
 4. *Offers maximum period for payment* 5. *No line* 6. *Others* \_\_\_\_\_
2. Is the process of payment via banks easy / convenient? 1. *Easy* 2. *Hard*
3. Do you find any difficulty in mobilizing money for bill payment? 1. *Yes* 2. *Sometimes* 3. *No, never*
4. How much do you spend for bill payment? 1. *5 minutes* 2. *6 -15 minutes* 3. *more than 16 minutes*

**Interviewer -----→ go to the question № 18!**

#### **16. Controller**

1. Why do you pay via controller? 1. *Convenient* 2. *Comes to home* 3. *Get immediate receipt / confirmation*  
 4. *Could be paid at home* 5. *No line* 6. *Others* \_\_\_\_\_
2. Is the process of payment via controller easy / convenient? 1. *Easy* 2. *Hard*
3. Do you find any difficulty in mobilizing money for bill payment? 1. *Yes* 2. *Sometimes* 3. *No, never*
4. How much do you spend for bill payment? 1. *5 minutes* 2. *6 -15 minutes* 3. *more than 16 minutes*

**Interviewer -----→ go to the question № 18!**

#### **17. Other way of payment** Please, explain \_\_\_\_\_

1. Why do you use this way of payment? 1. *Convenient* 2. *Nearby* 3. *Get immediate receipt / confirmation*  
 4. *Offers maximum period for payment* 5. *No line*  
 6. *Others* \_\_\_\_\_
2. How much do you spend for bill payment? 1. *5 minutes* 2. *6 -15 minutes* 3. *more than 16 minutes*

18. How often during the past 12 months, your account to be paid did not correspond to the actual meter readings? 1. *Often* 2. *Rarely* 3. *Never*

19. Have you approach for bill correction to anybody?

1. *Yes* 2. *No* ----→ go to the question № 20

To whom? \_\_\_\_\_

1. Did you pay anything for rectifying the bill? 1. *Yes* 2. *No*
2. Was your complaint addressed satisfactorily? 1. *Yes* 2. *No*
3. In how many days was your complaint resolved? 1. *Yes* 2. *No*
4. Are you satisfied about the procedure and timeline for bill correction? 1. *Yes* 2. *No*

20. Have you experienced disconnection for non-payment any time during last 3 years?

1. *No* ----→ Go to the question №24



2. Yes----→ how many times? \_\_\_\_\_times 99. Don't remember
- 20.1. How long was the period of non-payment? 1. More than 3 months 2. 1-2 months 3. 2-3weeks 4. Less than 7 days
- 20.2. How big was the debt? \_\_\_\_\_soms
- 20.3 Does utility send notice of disconnection before disconnecting supply for non-payment? 1. Yes 2. No----→ Go to the question №21
- 20.4 Charges have to be paid in how many days after receiving the notice? \_\_\_\_\_days 99. Don't know
21. Did you invoice debt without actually disconnection? 2. Yes 1. No 99. Don't know
22. Within how many days after payment of required charges was the connection restored? 1. Same day 2. next day 3. two days 4. more than two days
23. Did you paid for connection? 1. Yes 2. No----→ Go to the question №24
- 23.1. To whom did you pay? 1. to supplier 2. to private electrician 3. Both supplier and private electrician
24. Rate your overall satisfaction about billing and payment on 7-point scale where 1 - least satisfied, 7 - most satisfied)
- 1 2 3 4 5 6 7 99. Hard to answer N/A.

### Section E: Supply Quality and Interruptions

1. Do you experience either low-voltage or high-voltage problems during last 3 years?  
1. Yes 2. No ----→ Go to the question №6
- 1.1. How often? 1. Whole year 2. Mainly in winter 3. Mainly in summer
2. Did you approach utility for improving voltages during last 12 months? 1. Yes 2. No----→ Go to the question №3
- 2.1. Was your problem resolved? 1. Yes 2. No----→ Go to the question №4
- 2.2. In how many days? \_\_\_\_\_days ----→ Go to the question №4
3. If you did not approach utility, then why?
1. No hope of improvement
  2. Do not know who to approach
  3. Need to pay extra charges to utility / intermediary
  4. Need to spend a lot of time
  5. Far distance to supplier
  6. Utility demands charges for rectification
  7. Other \_\_\_\_\_
4. Have you or your neighbors experienced any damage to equipment due to voltage fluctuations during last 3 years?

	Yes	No
1. you	1	2
2. your neighbors	1	2

If no ----→ Go to the question №6

- 4.1 Did you of your neighbors get any compensation for damage to equipment?  
1. Yes 2. No----→ Go to the question №6

5. Did you have to pay anything to intermediary for getting compensation?  
1. Yes 2. No

6. Do you experience supply interruption due to following reasons during last 3 years?

	Yes	No	Don't
--	-----	----	-------

				know
1	Due technical reasons, failure, failure in the lines / network transformer	1	2	3
2	Due generation / supply shortage	1	2	3
3	Due of the voltage-line surges	1	2	3

**If No by all options---- → Go to the question №10**

7. How often?

1. Whole year 2. Mainly in winter 3. Mainly in summer

8. Did you approach the utility about reducing such supply interruptions?

1. Yes 2. No---- → **Go to the question №8.3**

8.1. Was your problem resolved? 1. Yes 2. No---- → **Go to the question №9**

8.2. how many days did it take? \_\_\_\_\_ days ---- → **Go to the question №9**

8.3. If you did not approach utility, then why?

1. No hope of improvement
2. Do not know who to approach
3. Need to pay extra charges to utility / intermediary
4. Need to spend a lot of time
5. Others

9. Did you approach other organizations on disconnections issues during 3 years?

1. Yes 2. No ---- → **Go to the question №10**

9.1. To whom? **No more than 3 options**

1. Region state organizations
2. Oblast state organizations
3. Municipality
4. Local authorities (ayyl-okmot)
5. Parliamentarians
6. Non-governmental organizations
7. Consumer organizations
8. Others \_\_\_\_\_

9.2. Was your problem resolved? 1. Yes 2. No---- → **Go to the question №10**

9.3. If solved, how? \_\_\_\_\_

10. Are there in your area new transformer units or electricity line to improve power quality during last 3 years?

1. Yes

2. No---- → **Go to the question №13**

99. Don't know ---- → **Go to the question №13**

11. On your opinion, on whose balance they are?

1. Utility 2. Neighbors ( group of persons) 3. Other 99. Don't know

12. Who is working on equipment maintenance?

1. Supplier 2. private electricians 3. Local authorities 4. Neighbors ( group of persons)
5. Others \_\_\_\_\_ 99. Don't know

13. How is the protection of this equipment and the protection of the population?

1. At the expense of raising funds for the protection of equipment by villagers
2. Conducted outreach informational campaign by provider and leaders for the village population and children
3. Supplier
4. By local authorities
5. Others \_\_\_\_\_

14. Do you use any following devices in your home?

	No	Number	How much KG soms did you	When do you use it typically?	How much KG soms do you spend for
--	----	--------	-----------------------------	----------------------------------	--------------------------------------

			spend for it?		operation?
Voltage stabilizers	99	Yes --> _____ units		1. Summer 2. Winter 3. Whole year	
Inverters / UPS	99	Yes --> _____ units		1. Summer 2. Winter 3. Whole year	
Generators (pl. specify type and capacity)	99	Yes --> _____ units		1. Summer 2. Winter 3. Whole year	

15. Please tell, who is responsible for quality of electricity? \_\_\_\_\_

16. Rate your overall satisfaction about supply quality on 7-point scale where 1 - least satisfied, 7 - most satisfied)

1 2 3 4 5 6 7 99. Hard to answer N/A.

## F Consumer Awareness

1. Do you know specifically whom to approach (within the utility) in case of any deficiency in service?

1. Yes 2. No ---- → Go to the question №2

- 1.1. Specify how did you know about it?

1. advertisement, 2. information on bill, 3. neighbors, 4. Local media 5. Other \_\_\_\_

2. Do you know about Centers of Quality of Services under your RES (region of electrical networks)

1. Yes 2. No ---- → Go to the question №3

2.1. If yes, how did you know? please specify \_\_\_\_\_

2.2. Did you communicate with them during last 3 years? 1. Yes 2. No

3. Do you know of any mechanisms to use with complaint on electricity supply?

1. No

2. Yes ---- → please, specify

4. On your opinion, on whose balance is the meter? 1. Supplier 2. Abonent 3. Don't know

5. Do you know where to go if you will have any problems with meter?

1. Yes 2. No ---- → Go to the question №6

5.1. Please define, where

1. \_\_\_\_\_ 2. \_\_\_\_\_

6. Do you know who decides the tariff payable by you? Step by step?

		1 step	2 step	3 step
1	Ministry of Energy	1	1	1
2	Parliament	2	2	2
3	Government	3	3	3
4	Regulatory body (please specify _____)	4	4	4
5	Supplier (counter, RES)	5	5	5
6	Market	6	6	6
7	Others			

6.1. How many do you pay for 1 kWh of electricity? \_\_\_\_\_ KG tyin 99. Don't know

7. Do you know any legally defined standards / norms of service quality that utility has to adhere to?

1. GOST "On quality of electricity"

2. Law "On electricity"

3. Civil, Administrative Codes

4. All mentioned above

99. Don't know

5. Please name the rights powers of the supervisor/controller? **No more than 3 options**

1. *Take meter readings at any time*
2. *Bring a bill in a timely manner*
1. *Take meter readings during the daytime*
2. *Accept payment for electricity*
5. *Identify illegal violation*
6. *Identify and calculate the amount of penalty*
7. *Free to enter the house in*
8. *Others* \_\_\_\_\_

9. Please list rights of consumer in case of disconnection of electricity (filling Act) by the controller?

1. *Sign Act on disconnection*
2. *Call to manager of controller*
3. *Request a rationale for development of the act (disconnection)*
4. *Do not sign the Act*
5. *Invite witnesses on making the Act*
6. *Others* \_\_\_\_\_

10. Please list the main responsibilities of the consumer of electricity. **No more than 3 options**

1. *To pay bills for electricity timely*
2. *To keep electricity meter*
3. *To follow safety regulations for installation and use of electricity*
4. *Inform controller about meter readings*
5. *Not to steal electricity*
6. *To follow technical instructions on connections*
7. *Not to use industrial equipment for domestic purposes*
8. *Others* \_\_\_\_\_

11. Have there been awareness programs in your neighborhood about energy conservation / safety etc. during last 3 years?

1. Yes 2. No -----→ **Go to the question №13.**

12. If yes, do you know who?

1. *Ministry of Energy*
2. *Distributing company, utilities,*
3. *Municipalities*
4. *IFIs, NGOs,*
5. *Others, specify* \_\_\_\_\_

99. Don't know

13. Do you think that your family should reduce your electricity consumption?

1. Yes 2. No -----→ **Go to the question №14.**

13.1. If yes, why? \_\_\_\_\_

14. Are you aware of any energy conservation measures to reduce your usage?

1. Yes 2. No

15. Please list, what actions are you taking to reduce your energy consumption **No more than 3 options**

1. *My home is well insulated*
2. *Energy-efficient light bulbs are installed everywhere*
3. *Turn off the lights when not needed*
4. *Watch for chargers and appliances in standby mode, turn off when not needed*
5. *Drown the stove instead of electric heaters*
6. *Insulate windows and doors in preparation for winter*
7. *Using economic devices with high-class energy efficiency*
99. *Nothing*

16. Are you aware of any renewable energy equipment that you can use?

1. Yes 2. No -----→ **Go to the question №19**

8. Please list them.

1. \_\_\_\_\_ Do you use it at home? 1. Yes 2. No
2. \_\_\_\_\_ Do you use it at home? 1. Yes 2. No
3. \_\_\_\_\_ Do you use it at home? 1. Yes 2. No

17.1. Are you satisfied with the equipment –

1. Fully satisfied ---→ **Go to the question №18**
2. somewhat satisfied
3. not satisfied

17.2. If not satisfied, why?

1. Hard to use
2. No benefits
3. High initial investment
4. Unreliable supplier
5. High cost of maintenance

18. Rate your overall satisfaction about your awareness and knowledge's about rights and responsibilities of consumer? Supplier?

	Fully satisfied	Partly	Not satisfied	least satisfied	N/A
Supplier	1	2	3	4	99
You as consumer	1	2	3	4	99

#### Section G: Comments / suggestions by consumer to improve electricity service

1. How would you rate a professionalism of representatives of energy companies on 7-point scale where 1 – very low, 7 – very high?  
1 2 3 4 5 6 7 99. Hard to answer
2. Please explain \_\_\_\_\_
3. How would you rate your overall experience of electricity supply on 7-point scale where 1 – very bad, 7 – very good?  
1 2 3 4 5 6 7 99. Hard to answer
4. Please explain the reasons \_\_\_\_\_
5. How would you rate your experience with controller on 7-point scale where 1 – very bad, 7 – very good?  
1 2 3 4 5 6 7 99. Hard to answer
6. How would you rate you're the quality of electricity supply during last 3 years on 7-point scale where 1 – going better, 7 – going worst?  
1 2 3 4 5 6 7 99. Hard to answer
7. What are the key improvements / changes that would be needed to improve quality of electricity service delivery? **No more than 3 options**
  1. Provide a legal and regulatory framework
  2. To train controllers on communication with customers
  3. Ensure the involvement of competent staff
  4. Permanently and to work closely with the public, not from time to time
  5. A quality and timely repair and renovation of electrical networks
  6. Others \_\_\_\_\_
8. In your opinion, what are the major issues that government / utility need to address in the electricity sector? **No more than 3 options**
  1. Preparation of professional power engineers and operators
  2. Qualitative legislative framework and its implementation
  3. High commercial losses
  4. Reduction and prevention of accidents
  5. Construction of new facilities - the new hydro and thermal power plants
  6. Preparing for winter maintenance and update network
  7. Low voltage power supply in winter

8. *Justification electricity rates*
9. *Uninterrupted power supply for all*
10. *Transparency in the sector and the elimination of high-level corruption*
11. *Others* \_\_\_\_\_

### **Economic status of the consumer**

1. Please tell is house, where do you live is yours or rented?  
1. *Own* 2. *Rent* 3. *Other*
2. Type of house: 1. *Family house* 2. *Half of family house* 3. *shack / hut* 4. *Building house* 5. *RCC apartment*, 6. *Room in dormitory* 7. *Other*
3. What type of fuel, no matter what time of year, do you use for cooking and heating the house / apartment?  
1. *Coal* 2. *Wood* 3. *Dung* 4. *Electricity* 5. *Gas* 6. *central heating*
4. What type of fuel do you use in additional for heating in winter?  
1. *Coal* 2. *Wood* 3. *Dung* 4. *Electricity* 5. *Gas*
5. Do you have following devices: 1. *TV* 2. *Washing Machine* 3. *Fridgerator* 4. *DVD*  
5. *Satellite* 6. *Electric heaters* 7. *Eelectric stove*  
8. *Computer* 9. *Notebook* 10. *Ariston (water heater)*
6. This is an index of income. Which category roughly equivalent to your total monthly household income, taking into account all types of income, including wages, pensions and other income, excluding taxes and other deductions? **Card №2.**

below 1700 KG soms	1	From 9 900 to 11 600 soms	7
From 1 400 to 3 100 soms	2	From 11 600 to 13 300 soms	8
From 3 100 to 4 800 soms	3	From 13 300 to 15 000 soms	9
From 4 800 to 6 500 soms	4	From 15 000 to 16 700 soms	10
From 6 500 to 8 200 soms	5	From 16 700 to 18 400 soms	11
From 8 200 to 9 900 soms	6	From 18 400 to 20 000 soms	12
		More than 20 000 soms	13

7. How many people live in your household for more than 6 months? \_\_\_\_\_people

8. Choose the answer that best corresponding to the level of your family: **(Only one answer)**

We do not have enough money for food	1
Enough money for food, but buying clothes and shoes and paying utility bills is difficult	2
Enough money for food, clothes and shoes, utilities. We even have some savings. But we can not afford to purchase durable goods, such as a refrigerator or television set	3
We can buy some expensive durable goods (refrigerators, TV), but we can not get everything we want	4
We can afford to buy whatever we want	5

### **Section H: About interviewer**

1. Name \_\_\_\_\_
2. Date of filling the questionnaire \_\_\_\_\_day \_\_\_\_\_month
3. Place of interview 1. *town* 2. *Village* 3. *Urban village*
4. Name of locality \_\_\_\_\_
5. Region 1. *Chui* 2. *Talas* 3. *Naryn* 4. *Issy-Kul* 5. *Osh* 6. *Jalal-Abad* 7. *Batken* 8. *Bishkek*
6. Time of end of interview \_\_\_\_\_hour \_\_\_\_\_min

----X---

### Used abbreviations

ADB – Asian Development Bank  
 CA UES – Central Asian Unified Energy System  
 CHP – Combined heat-and-power plant  
 CIS – Commonwealth of Independent States  
 CSO – Civil society organisations  
 EBRD – European Bank of Reconstruction and Development  
 EGI – Electricity Governance Initiative  
 EU – European Union  
 EDIT – Electricity Distribution Interface Toolkit  
 FEC – Fuel & Energy Complex  
 FECTI – Fuel and Energy Complex Transparency Initiative  
 GDP – Gross domestic product  
 HPP – Hydropower plant  
 IA – Information agency  
 JSC – Joint Stock Company  
 KfW – Kreditanstalt für Wiederaufbau – German Development and Reconstruction Bank  
 KNPG – Kyrgyzstan National Power Grid  
 KR – Kyrgyz Republic  
 KRG – Kyrgyz Republic Government  
 kWh (kilowatt-hour) – amount of electricity  
 LLC – Limited Liability Company  
 MEI KR – Ministry of Energy and Industry of the Kyrgyz Republic  
 MM – Mass media  
 NEP – National Energy Programme  
 NGO – Nongovernmental organisations  
 OJSC – Open Joint Stock Company  
 PDC – Power distribution companies  
 PTL – Power transmission line  
 QFD – Quasi-fiscal deficit  
 REPU – Rules on Electric Power Use  
 RES – Renewable Energy Sources  
 SAPS – Single-area power system  
 SC-FECTI – Supervisory Council of the Fuel and Energy Complex Transparency Initiative  
 SDPK – Social-Democratic Party of Kyrgyzstan  
 SMS – Short Messaging Service  
 State Department – State Department for Regulation of the Fuel & Energy Complex  
 TPP – Thermal power plant  
 TS – Transformer substation  
 UN – United Nations Organization  
 USAID – United States Agency for International Development  
 V (Volt), kV (kilovolt) – unit of voltage  
 W (Watt), kW (kilowatt), MW (megawatt) – unit of power  
 WRI – World Resources Institute  
 WTO – World Trade Organisation  
 ZhK KR – Zhogorku Kenesh (Supreme Council) of the Kyrgyz Republic



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