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Factors affecting the regular monthly payment of electricity bills in Hajvali

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Factors affecting the regular monthly payment of electricity bills in Hajvali

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To quote my favorite author:

“Help will always be given at [AUK] to those who ask for it”-J.K. Rowling.

Table of Contents

List of Tables

List of Figures

Executive Summary

The project considered the problem of nonpayment of electricity bills in Hajvali, Kosovo. In 2014 KEDS declared that around 30% of bills remained unpaid during winter time. If collected they could turn in €200,000 of yearly revenues in Hajvali alone. Identifying the root causes behind nonpayment was the starting point of the project.

Methods of analysis included surveys, regression analysis, and interviews. Forty surveys were conducted with citizens and three professional interviews with a) the director of energy supply for KEDS, Alper Erbas, b) the director of the budget of Kosovo, Agim Krasniqi, and c) Nexhat Syla from the Ministry of Labor and Social Welfare. Minitab software was used for the regression to test the statistical significance of each of the factors.

From the data collection, several factors came out as important in explaining the low collection rate of electricity bills. The primary factor was the lack of monthly disposable income, where some household's energy bills consumed around 30% of the total family budget during the winter season. Secondary factors included customers' dissatisfaction with the current distribution system, and their lack of energy efficient measures in consumption patterns. There were other factors discussed more thoroughly on the project.

From the Minitab results, the lack of disposable income and awareness of customers about tariff structures (lack of efficiency measures) were statistically significant at 10% alpha. A normality and an independence test was run on the only significant quantitative variable (lack of disposable income) to account for any outliers and possible errors in the procedure.

The key recommendations proposed to increase the bill collection rate in Hajvali include:

1. Electricity cut offs to all debtors and appliance of reconnection fees
2. Re-introduction of cheaper tariffs during the day time

Other secondary recommendations that could possibly aid in higher collection rate consist of:

3. Educational programs, seminars, or advertisements to increase awareness about energy efficiency (a TV advertisement of 1 minute would cost between €180 to €720).

4. Increase in transparency of KEDS electricians when picking up monthly balance inquiry
5. Adjustment of the social assistance fund with changes in electricity prices
    - An increase of prices by 10% per eurocent of kWh would increase subsidies by €43,920 on a yearly basis in Prishtina municipality which also included Hajvali

Chapter 1. **Introduction**

Currently in Hajvali, a community just outside of the capital of Kosovo, the bill collection rate of electricity in winter time is only 70%. Unpaid bills create issues on several fronts, first the decrease revenues for the Kosovo Energy Distribution Services (KEDS), which means that there is less money to purchase electricity, and make improvements in service. The second is that unpaid bills contribute to higher prices for paying consumers, as non-payments are calculated into the price of electricity. Third, non-payments may add additional pressures on the social funds available to low income consumers. Improvements to the electricity social assistance fund would decrease the society's deadweight loss, ensuring that the citizens' taxes are being allocated properly amongst the low income households. The objective of this analysis is to identify the critical factors behind nonpayment of electricity bills in the area, as to aid in improvement of payment rates.

In order to provide context to the problem the project outlays the electricity situation in the United States, Europe, and Kosovo in specific in terms of energy sources and service quality, electricity prices, payment patterns, social assistance for the low income families, and degree of efficient consumption on the household level. Primary data including surveys and three interviews were collected to obtain a thorough analysis on the factors behind nonpayment of bills in Hajvali. Surveys provided an insight on the households' point of view, the interviews obtained the perspectives of KEDS (the distribution system) on current payment rates and future plans, and the government on the current social assistance fund for the low income families. Furthermore, to determine which factors may affect payment, an ordinary least-squares regression was applied to the household survey data to test the statistical significance of each factor. Based on the results, targeted recommendations were proposed in how to approach the problem of nonpayment and increase the efficiency of the assistance fund

The project consists of 8 chapters and 4 appendices. Chapter 2 focuses on the United States and Europe's electricity situation in terms of the factors outlined above. Chapter 3 narrows down to Kosovo's energy generation and possibilities for further expansions, the distribution system and its privatization, problems and losses with transmission, price affordability and comparisons with neighboring countries, as well as current problems with bill collection. Chapter 4 includes explanations about methodologies used to collect primary data for Hajvali as very

little exist already, and explains some of the project's limitations. Chapters 5 and 6 present primary data results from collected surveys and interviews and graphically explain the factors behind low bill collection rates. Chapter 7 analyzes in detail the results from the previous chapters and compares them to similar studies both on the national as well as the international level. It also provides suggestions in conducting other researches on Hajvali and Kosovo. Lastly, Chapter 8 provides some main recommendations in how to increase bill collection rate in Hajvali and improve the social assistance fund given the already established factors. The appendices are composed of survey and interview questions, voluntary declaration of households regarding electricity theft, and the regression analysis of the factors.

Chapter 2. Overview of electricity situation in United States and Europe

2.1. Why do we need electrical energy; is it a basic human right?

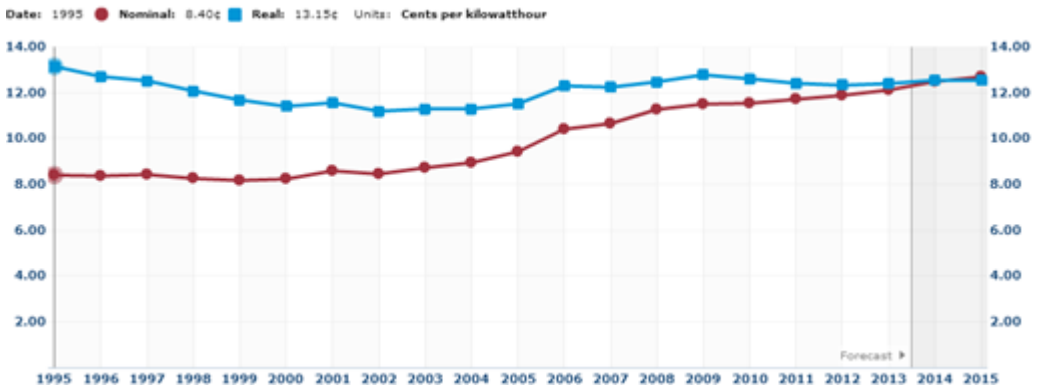
Electricity has become crucial to everyday activities and it is categorized as a basic human right. It is in the last twenty years with the sessions of the Commission on Sustainable Development and the World Summit that the issue of electrical energy as a human right has started to emerge (WEHAB , 2002).Lack of access to electrical services is directly related to poverty. Approximately, one third of the global population does not have access to electricity at all, indicating a lack in the possibility of prospering both economically and socially (World Energy Assessment, 2004). It is thus crucial to understand that electricity on itself might not be a basic human right "but it is critical for the fulfillment of all basic needs" (Bradbrook, 2005). Efforts to improve electricity access worldwide started with the World Energy Assessment Report in 2000, and Commission of Sustainable Development (CSD) which proposed that all governments in countries with a lack in electricity access should strengthen national and international agreements to improve energy accessibility within the country and diversify the sources of energy (World Energy Assessment, 2004). Energy availability also indicates reasonable prices that are affordable to consumers (World Energy Assessment, 2004). Even though parts of the world are still lacking electricity access, the mere fact that it was raised as an issue in the World Summit indicates that measures are being taken and hopefully in the near future people will not only have electricity access, but will be able to afford utility bills and be diligent enough to pay for them (United Nations, 2005)

2.2. Electricity situation in the United States

In 2013, United States generated about 4,058 billion kilowatt-hours of electricity, with the main sources of generation being: coal 39%, natural gas 27%, nuclear 19%, hydropower 7%, other renewables taking a 6% share, and petroleum with other gases taking up roughly 1% each (U.S Energy Information Administration, 2014). Electric and natural gas utilities are regulated by state, federal, and government agencies that control prices in the market and the availability of supply.

The electricity utility industry is regulated to satisfy its consumers and provide economically reasonable prices. Thus, the industry sets prices using a cost of service approach in

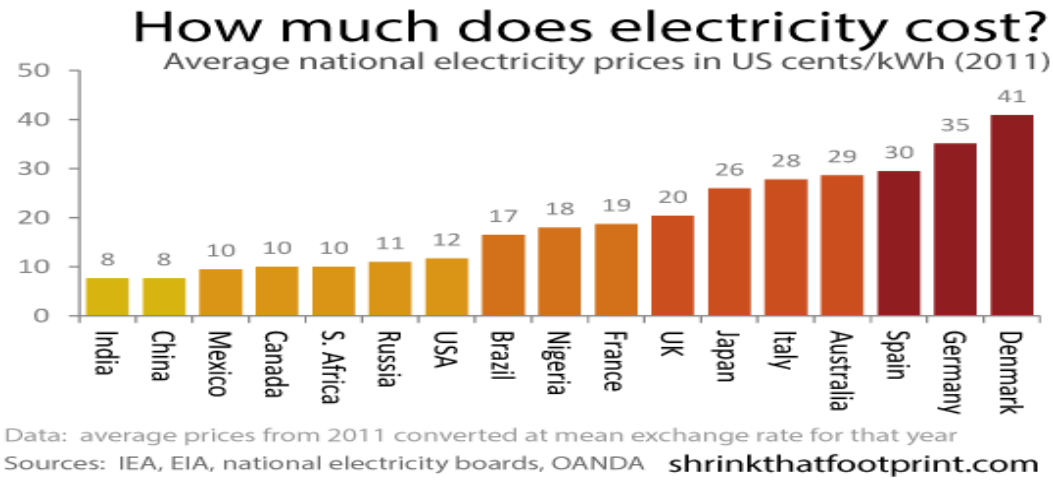
determining a fair price for electrical service (Electricity Regulation in the U.S; A guide, 2011). The current energy prices in U.S vary from state to state with Hawaii paying as high as 36.41 dollar cents (36.90 eurocents) cent per kilowatt hour on the residential level while Washington around 8.83 dollar cents (7.50 eurocents) per kilowatt hour as of October 2014 (U.S Energy Information Administration, 2014).



Source: U.S Energy Information Administration (2014)

Figure 2.2-1: U.S average electricity prices in cents per kilowatt-hour

Error! Reference source not found. shows average U.S electrical prices in cents per kilowatt-hour. It has both nominal and real data for residential electricity prices. As it can be observed, 2009 marked a peak of 12.78 dollar cents (10.85 eurocents) on average per kilowatt-hour with late 2013 falling to 12.40 dollar cents (10.53 eurocents). It is forecasted that prices will stay relatively the same throughout 2014.



Source: The Energy Collective: The Average Price of Electricity, Country by Country (2013)

Figure 2.2-2: Electricity prices relative to purchasing power

There is a direct link between energy consumption and prices up to a certain point. Usually, as with every economic relationship, the lower the price of electricity, the higher the consumption. (Washington Post, 2014). However beyond a certain point because of inelasticity in demand, higher prices will not decrease demand, as is the case with Hawaii that spend $200 on average on electricity (Washington Post, 2014).

Figure 2.2-2 compares relative prices of electricity in U.S cents/kWh. It is crucial to consider prices in relation with the purchasing power of the specific country. Doing that deflates or inflates prices in accordance with the purchasing power, making comparisons more reasonable and reliable. When compared to the rest of the world, the U.S citizens pay less for electricity than most of Europe. India, China, Canada, etc. however pay less than the U.S in relative terms.

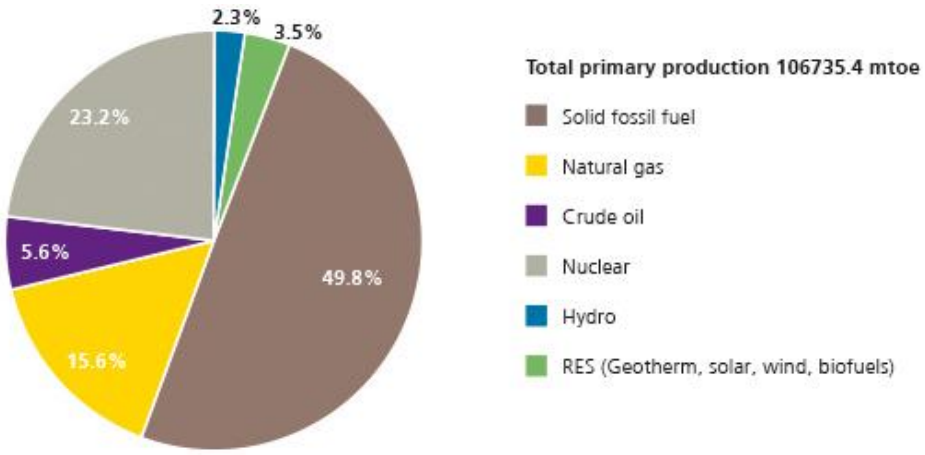
Consumers in U.S must pay their electricity bills or else they will be disconnected and prohibited from using electrical energy. The utility companies across the states are flexible by offering packages to people based on levels of income. The Low Income Home Energy Assistance Program (LIHEAP) is a program of U.S Department of Health and Human Services that provides federally funded assistance for the low income people in utility bills, including here electricity. People who qualify must have yearly levels of income of $17,505 for a single person

household and $60,135 for a household with eight people. Households that are already part of an existing social assistance program are automatically eligible for electricity assistance (Government Benefits Program, 2015).

The population of U.S has different sources of access to improve awareness about applying energy efficiency in household consumption patterns. The Environmental Protection Agency (EPA) is one medium through which the citizens can inform themselves about efficient measures. As EPA reports, if the citizens are aware of efficient consumption, they can help reduce the national demand for electricity up to 20% by 2025. Moreover, consumers save 10%-20% of their money on a monthly basis if they increase the measures of efficiency, thus increasing bills' affordability (EPA, 2014). Currently, electric and natural gas companies are establishing different programs for their customers in raising awareness about energy efficiency leading to cheaper electricity bills (EPA, 2014). The programs include educational sessions, audits and suggestions for increasing efficiency, and increasing awareness about purchasing efficient appliances that carry the Energy Star logo (EPA, 2014).

2.3. Electricity situation in some European countries

The European Union member states together with countries of Southeastern Europe (Albania, Bosnia and Herzegovina, Croatia, Republic of Macedonia, Serbia, and Kosovo) have established the Energy Community Treaty in 2006 (EU Legislation, 2006). The treaty's main objectives are to create an integrated energy market, enhance competition, improve the environmental situation, and enhance the security of supply (EU Legislation, 2006). Figure 2.3-1outlays the main sources of electricity generation in the Energy Community Treaty member states. 49.8% comes from solid fossil fuel such as coal. The rest constitutes of nuclear sources and natural gas. There is little generation from hydropower or renewables.

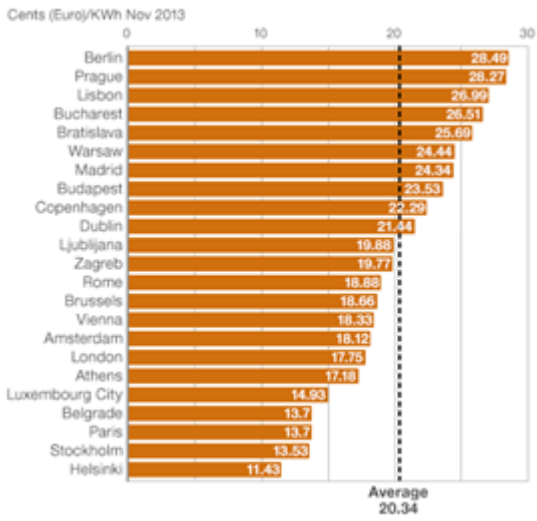


Source: Energy Community Treaty (2012)

Figure 2.3-1: Energy Community Generation Sources in 2012

Even though the power distribution in Europe is very diverse, European Distribution System Operators (DSOs) generally provide highly reliable and qualitative service to European customers (EuroElectric, 2011). In order to improve the quality of the service, DSOs are planning to make investments on refurbishing current capacities, build new capacities, and introduce electric vehicles to improve the distribution system (EuroElectric, 2011). By 2020 they are also planning to equip around 80% of the European population with smart meters which will help both the distribution system in constant improvement of quality, as well as customers by tracking their level of consumption (EuroElectric, 2011).

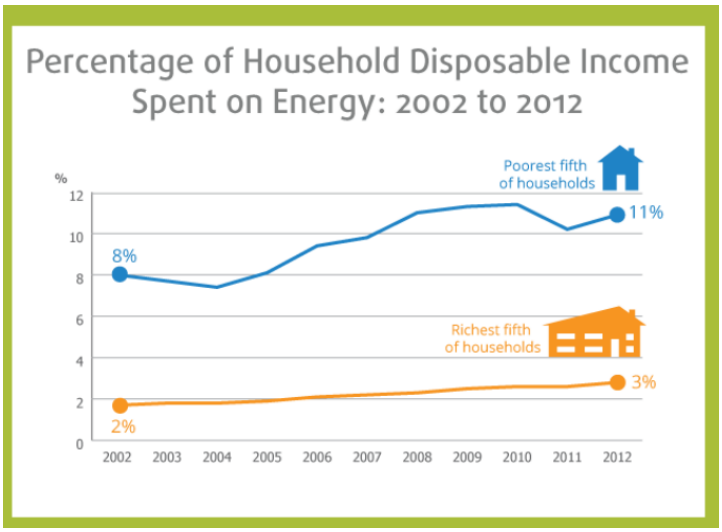
The Energy Community Treaty is trying to privatize energy sectors which supposedly deliver more competitive, better, and cheaper energy to its consumers (European Commission, 2014). However, when compared to the United States, Europeans still pay higher prices for electricity consumption in relative terms. According to the Daily Caller News Foundation "homeowners in Europe are more concerned about paying their electricity bills than their mortgage loans" (Daily Caller News Foundation, 2014). A survey conducted by the foundation found out that more than 17,000 surveyed European households are struggling to pay their electricity bills, referring to the latter as a luxury good not a necessity. This phenomenon is present in Kosovo as well. Increasing electricity prices are endangering people's access to it because of affordability issues.



Source: Anderson. R (2013), *Who Pays the Most in Europe*

Figure 2.3-2: Who pays most in Europe for electricity

Figure 2.3-2 points out that in Europe, Berlin, Germany ranges among the highest tariffs, paying 28.49 cents per kilowatt-hour on average; while Helsinki, Finland has a tariff of a 11.43 cent per kilowatt-hour as of November 2013 (Anderson, 2013). High energy prices in Germany partly stem from shuttering the existing nuclear reactors ever since the Fukushima disaster, which used to provide around 25% of Germany's electricity (Anderson, 2013). A main reason behind high electricity prices in Germany has to do with lack of competition. The country currently has four electric utilities that control around 80% of the market and are also in charge of the distribution networks, a fact that puts independent producers at a disadvantage (The Economist, 2009). Thus, increasing competition in the energy sector might help in making electricity more affordable across customers.



Source: Office for National Statistics; Full Report: Household Energy Spending in the UK, 2002-2012 (2012)

Figure 2.3-3: Percentage of Household Disposable Income Spent in Energy in U.K

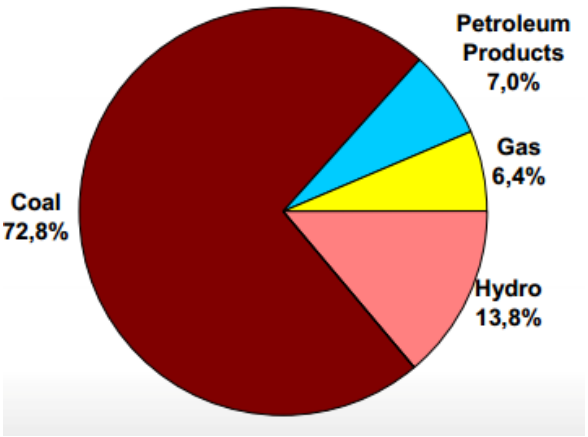
Furthermore, Figure 2.3-3 points out that in the United Kingdom, from 2002 to 2012 prices have risen by 56%, accounting for inflation. This in turn led to an increase in electricity payments as a percentage of total household consumption (3% in 2002, 5% in 2012) (Office for National Statistics, 2012). For the poorest fifth percent electricity accounts for a large percentage (as much as 11%) of disposable income and it is in these households that the collection rate of bills is the lowest (Office for National Statistics, 2012).

European citizens on general must pay their electricity bills or risk disconnection. Countries in Europe provide different programs of social assistance to help citizens with electricity bill payment. United Kingdom for example offers different electricity subsidization programs especially during the winter months. For example, the winter fuel program subsidizes electricity during the winter months to citizens born before 1952 that are thus eligible for retirement (Energy UK, 2012). The Warm Front program provides assistance in bill payment and insulation to all families below the poverty line that have children less than 16 years of age, or pensioners (Energy UK, 2012) .Other subsidies across Central and Eastern Europe include: no disconnection of delinquent residents, price discounts to families with medical problems, and cash transfers to help low income families with their utility bills (World Bank, 2000). However,

the subsidies only cover roughly one-third of the poor in total, indicating that there are many ways to improve on the efficiency and quality of such funds (World Bank, 2000).

The European Union has also tackled the issue of energy efficiency in European countries. The Action Plan for Energy Efficiency, "Realizing the Potential" intends to reduce energy demand up to 20% by 2020 through increasing the household and commercial energy efficiency (European Commission, 2009). Such measures would also be beneficial for the household level by making bills more affordable and increasing bill payment. Strategies to incentivize such behaviors across the household level include: purchasing of combined refrigerator/freezer and other electric appliances labeled as energy efficient, moving the production center toward efficient appliances production, making buildings more energy efficient, and financing energy efficiency (European Commission, 2009). In general, the EU countries are trying to switch from direct energy subsidies to targeted subsidies for low income families (such as limiting energy spending to a maximum of 20% of their income) (World Bank, 2014). Measures undertaken by EU have contributed to decreasing electricity consumption. On the last decade, energy consumption decreased by 1.55% on the residential level and 7% on the agricultural level (European Commission, 2009).

2.4. Electricity situation in the Balkans



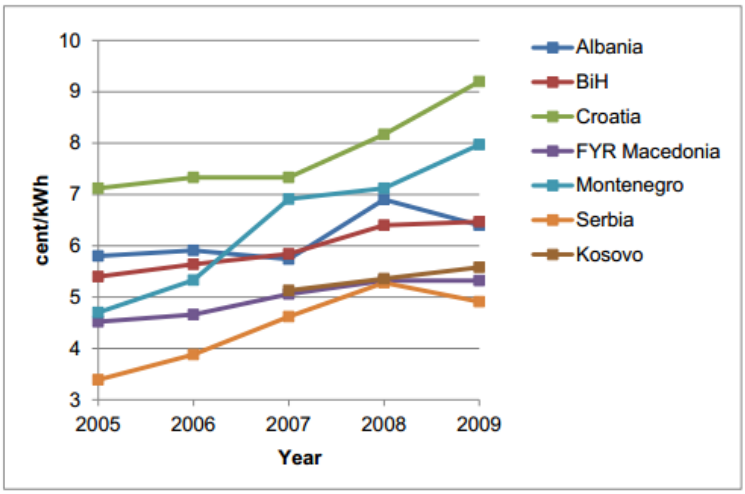
Source: Energy Institute Hrvoje Pozar, Croatia (2013)

Figure 2.4-1: Electricity Generation sources in the Balkans

The Balkans region including Croatia, Bosnia and Herzegovina, Kosovo, Albania, Montenegro, Serbia, and Macedonia are located in the Southeastern part of Europe. As Figure 2.4-1 illustrates, this region mainly relies on coal for electricity generation (72.8%), followed by hydropower, petroleum, and gas (Energy Institute Hrvoje Pozar, 2013). On individual basis Albania relies on hydropower, Kosovo on lignite, Macedonia on lignite, hydropower, and fuel oil, Serbia on coal, Croatia on hydro and thermal power plants, Macedonia on geothermal and hydropower, while Montenegro on hydroelectricity (Ciemat, 2013).

Since the break-up of Yugoslavia in the 1990s, energy infrastructure has been poorly maintained, destroyed and slow to rebuild. During Yugoslavian years, the Balkans was a net exporter of energy whereas currently they are a net importer, and the region experiences supply shortages and inefficiencies in distribution and transmission (Ciemat, 2013). Many of these inefficiencies stem from obsolete infrastructure built in the 1960s and 1970s combined with lack of maintenance .There are huge electricity losses, low rate of electricity payments, unused potential of hydropower, and inefficient electricity supply which increases the need for imports (Energy Institute Hrvoje Pozar, 2013).

Figure 2.4-2 shows the average prices in cents per kilowatt-hour of different countries in the western Balkans. All countries have had a steady rise from 2005 up to 2009 with Croatia having the highest prices while Serbia and FYR Macedonia lowest price in cents per kilowatt-hour. Kosovo has remained relatively stable from 2007 to 2009 with price of electricity ranging between 5-6 eurocents/kWh. The Balkans region generally pays lower prices for electricity when compared with the rest of Europe in absolute rather than relative terms (Ciemat, 2013).



Source: Ciemat; Bringing Europe and Third countries closer together through renewable energies (2013)

Figure 2.4-2: Average price in cents per kilowatt-hour in the western Balkans

However, despite the low pricing of electricity, Balkan companies face substantial problems with collection of bills, probably stemming back to constantly increasing prices of electricity in comparison with the standard of living. For example, increases in electricity consumption in Albania is stymied by high rates of electricity theft and non-payment of bills, which have increased costs above the point where the marginal revenue equals the marginal cost (Bushati et al., 2012). Because profit maximization is defined as the point where the marginal cost and marginal revenue are equal, it can be indicated that the electricity company of Albania (KESH) may be operating at a loss. Prime Minister Edi Rama reported that as of 2014, 91% of households and 81% of business owed money to the electricity distribution utility. To quote Rama, "in October 2012, 33.6% of electricity produced ended up lost or stolen while in November 2012, the loss rate was 43%, and in December 2012 it had jumped to 55% with businesses not paying around 94 million euros to the distributor CEZ Shperndarje" (Ballkan Insight, 2014). According to BBC Albania, in the entire country and especially in the northern part electricity remains amongst the top unpaid utilities (BBC Albanian, 2006). When asked, the people of Shkodra, in the northern part of Albania, justify nonpayment of their electricity bills with the lack of investment resulting in uninstalled or broken electric meters, insufficient 24/7

power supply, or the feeling that they spend much less than what appears on the monthly bills (BBC Albanian, 2006). A citizen of Shkodra claims

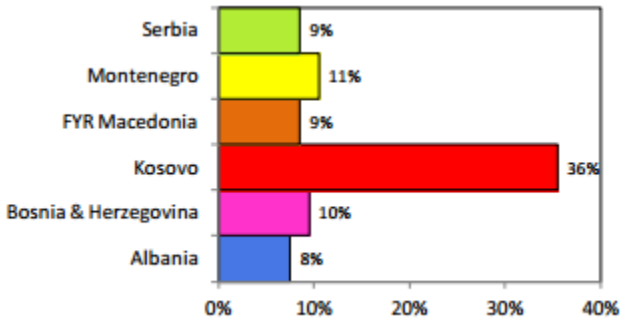
> "I don't think it's reasonable to pay 36,000 Lek (€257) this month when I don't even have an electric meter installed that would show how much electricity I'm consuming on a daily basis. I don't want to pay for electricity I have not consumed given that I live in a two room apartment with 14 hours of shortage per day" (BBC Albanian, 2006).

Macedonia faces similar problems with bill collection. According to an article of Zhurnal TV, citizens of Skopje had three months starting from August 2014 to decide on their energy supplier. The electricity company planned to add flexibility to the payment options which would enable the citizens to choose a preferred payment plan (Zhurnal, 2014).

Serbia has also substantial problems in the collection of bills, partly because of expensive bills that do not match with consumption (In News, 2014). The Electric Power of Serbia (EPS) proposed some suggestions in 2012 to help the debtors pay their current bills with different installments without including interest. When only 15% of half a million debtors decided to agree to the payment plans, EPS warned the citizens that it would cut off electricity to all residences and firms whose debt is more than 10,000 dinars (€81.74) (Serbia Energy, 2012). The debts that stem from uncollected bills both on the household as well as commercial level accounted for €1 billion in 2013. EPS has only collected around €19 million (Ballakn Insight, 2013). People complain that part of the reason of nonpayment include unrealistic amounts of debt. A Serbian resident claimed that his bill for December 2013 reached a skyrocketing amount of 159,038.39 dinars (€1,300) while the electrical company responded to this as a malfunction in the electric meter (Ballkan Insight, 2013). High monthly bills that according to citizens' claims do not match with consumption may be part of the explanation behind difficulties in collection of bills in Serbia.

The Balkan region has made some attempts to introduce electricity subsidization for low income families as electricity prices are high compared to the purchasing power of the citizens. In Macedonia in 2009, there were some efforts from the government of Nicola Gruevski to set up assistance funds for the low income families in order to help them pay a part of their electricity bills. The total fund set aside for such cause is around 4.7 million euros, which could help around

50,000 to 60,000 families in need as Fatmir Besimi, the minister of economy stated (Nedelkovski, 2009). A UNDP research project in Croatia has also been conducted to identify low income families and provide them with electricity assistance, especially during the winter months (UNDP, 2012). However, electricity subsidies in the Balkans have mostly manifested themselves on the macro level rather than focusing on electricity subsidization to the households (World Bank, 2014). As Figure 2.4-3 points out, there have been general energy subsidies throughout the Balkans. Kosovo's subsidies constitute of the largest amount, taking a share of 36% (World Bank, 2014).



Source: World Bank: *Financing Energy Efficiency Measures for Residential Building Stock* (2014)

Figure 2.4-3: Energy Subsidies per GDP

The Balkans region is not efficient in electricity consumption patterns. An Energy Community report in 2012 concluded that there is a huge saving potential in the Balkans if measures such as insulation, modern boilers, efficient lighting, and purchasing of energy efficient appliances are undertaken (World Bank, 2014). Moreover, improving energy efficiency creates potential for economic growth where around 2.5 billion euros can be saved if energy efficient measures are undertaken (World Bank, 2014). Increases in efficiency could also contribute to the household level, making bills more affordable and thus increasing the payment rates across the Balkans. However, there are certain barriers to implementing energy efficient measures in the Balkans including underdeveloped energy efficient markets, current energy subsidies set in place (over consumption possibilities), high costs of financing but low income of families, and inappropriate electric meter installation (World Bank, 2014).

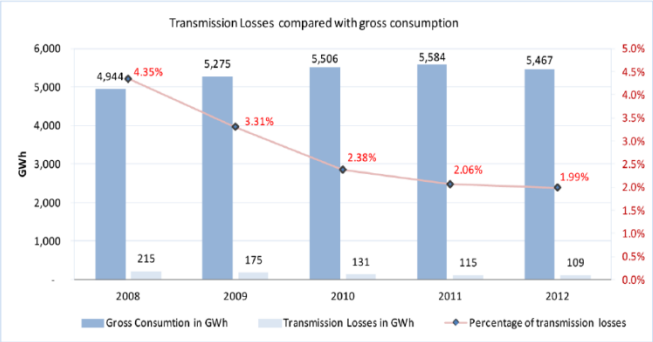
Chapter 3. Overview of electricity situation in Kosovo and Hajvali

3.1. Energy generation and quality of service in Kosovo

Kosovo is very rich in lignite, with reserves located in regions of "Kosove" and "Dukagjini" which hold around 12.5 billion tons of this resource (MEM, 2009). Because of its lignite abundance, 98% electricity generation is produced from the two lignite power plants, "Kosovo A" with an installed capacity of 800 MW, and "Kosovo B" with a capacity of 678 MW. The plants are located in Obiliq, just outside of Prishtina, the capital city (Ciemat, 2013). However, because of high depreciation of equipment and lack of maintenance, the two power plants provide much less energy than their nameplate capacity.

Currently, Kosovo has two main energy enterprises that regulate and distribute electricity to its citizens. Kosovo Energy Corporation (KEK) was a publicly owned company in control of power generation and distribution, and the management of lignite assets. On the late 2000's Kosovo Energy Corporation (KEK) with only 400,000 regular customers out of 1.8 million citizens was losing around €20 million while it was owned by the state. Thus in May 2013, the KEK's electricity distribution system was privatized by Limak-Calik into KEDS (Kosovo Energy Distribution and Supply Company). Limak-Calik planned to invest €390 million to improve the security of power supply and raise the collection bills (IFC, 2013). Kosovo Transmission and Market Operator (KOSTT) is the second enterprise established in 2006 in control of operating, planning, maintaining, and developing transmission networks and its interconnections around the country. It is also responsible for the operating of the wholesale electricity market in Kosovo and security of supply (MEM, 2009).

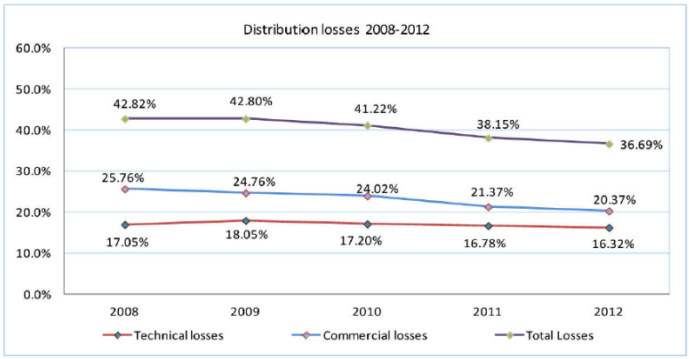
Despite the enterprises set in place to regulate electricity and high abundance of lignite reserves, Kosovo is still a net importer of electricity due to insufficient availability of electrical energy. Lack of domestic electricity supply also stems from transmission losses (mainly due to equipment depreciation) defined as the loss of electricity power while passing through the transmission lines (World Bank, 2009).



Source: MEM (2009).

Figure 3.1-1: Transmission losses compared with gross consumption

Figure 3.1-1 points out that from 2008 up to 2012 there have been constant transmission losses in the distribution system. In 2011, transmission losses were around 2.06% of the overall gross consumption, and this number slightly fell to 1.99% in 2012 (MEM, 2009). Losses indicate less electricity supply to fulfill electricity demand, which might prompt additional imports to reach the energy balance on a daily basis.



Source: MEM (2009).

Figure 3.1-2: Distribution losses in Kosovo in 2008-2012 period

The electricity distribution system is prone to technical and non- technical losses. Technical losses occur naturally because of old or malfunctioning distribution lines. Non-technical losses are caused by external factors such as low bill collection rate, electricity theft, or errors in billing. Figure 3.1-2 depicts losses in distribution divided into technical and non-technical (commercial) losses. Total losses in 2008 reached a peak of 42.82%, while falling

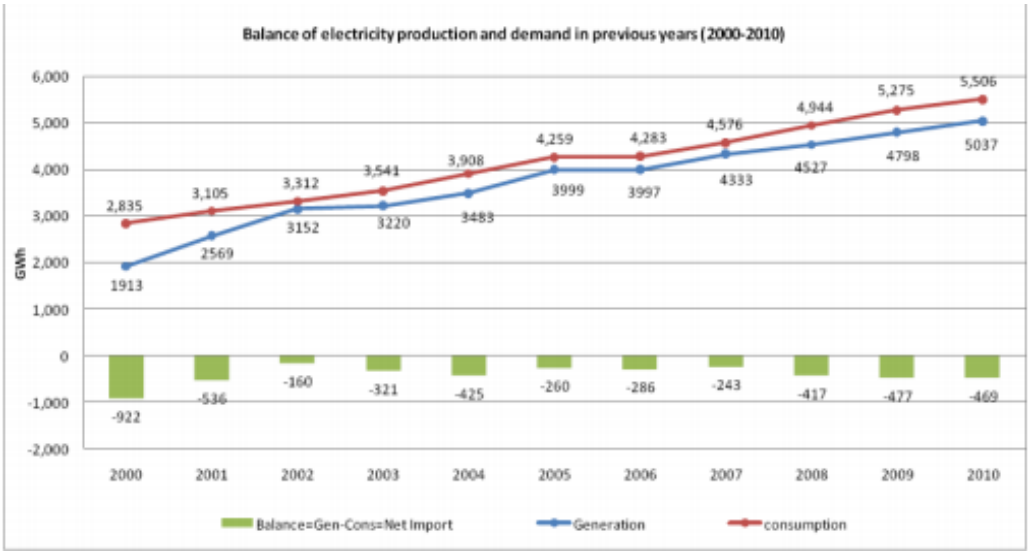
throughout the years to 36.69% in 2012. Commercial losses fell to 20.37% in 2012 from 25.76% in 2008, indicating that there might have been some improvements in reducing bill errors, detection of thefts, or increases in bill collection rate. However, 20.37% of electricity as of 2012 was still being lost because of the above mentioned reasons (MEM,2009). Addressing the issue of nonpayment of electricity bills, and identifying the main factors behind them might reduce commercial losses and help towards increasing electricity supply in the country.

3.2. Future plans for improving the quality of service in Kosovo

In the near future, "Kosovo A" is planned to close down given that it emits a lot of pollution and has been considered by many as the largest source of pollution in Europe (Ciemat, 2013). In June 2014, "Kosovo A" had an explosion in which two people died and 13 were injured. Ever since, the power plant is shut off and the country is generating electricity only from "Kosovo B" which also needs rehabilitation in order to comply with EU standards (World Bank, 2014**).** However, Kosovo B is unable of producing enough electricity to satisfy domestic demand, thus the need for electricity imports has risen. This will probably lead to further increases in electricity prices, making electricity less affordable to an average household.

Many plans have been developed to construct a new power plant, Kosova e Re (New Kosovo), which would initially contribute with a planned 2000 MW of electricity, making Kosovo the leading exporting country for energy in the Balkans (Azemi, 2013). Later on, because of possible high emissions of toxics and resistance in investing, the Kosova e Re power plant starting capacity was diminished to 600 MW which would cost around $2 billion. The project was supported by the World Bank and United States but Kosovo Civil Society Consortium for Sustainable Development (KOSID) opposed the construction of the power plant for the following reasons: investing in efficiency and rehabilitating the two existing plants would result to be much cheaper and environmentally friendly, and because the country is planning to join the EU in the future it must invest in renewable energy sources and decrease CO_2 emissions as much as possible rather than making another investment that would negatively contribute to the health of its citizens (Azemi, 2013). The construction of Kosova e Re however would generate enough domestic supply and also improve Kosovo's terms of trade. Abundance of electricity would be reflected in lower prices to the consumers, and possibly increase the bill collection rate.

3.3. Electricity demand and forecasts for the near future in the country



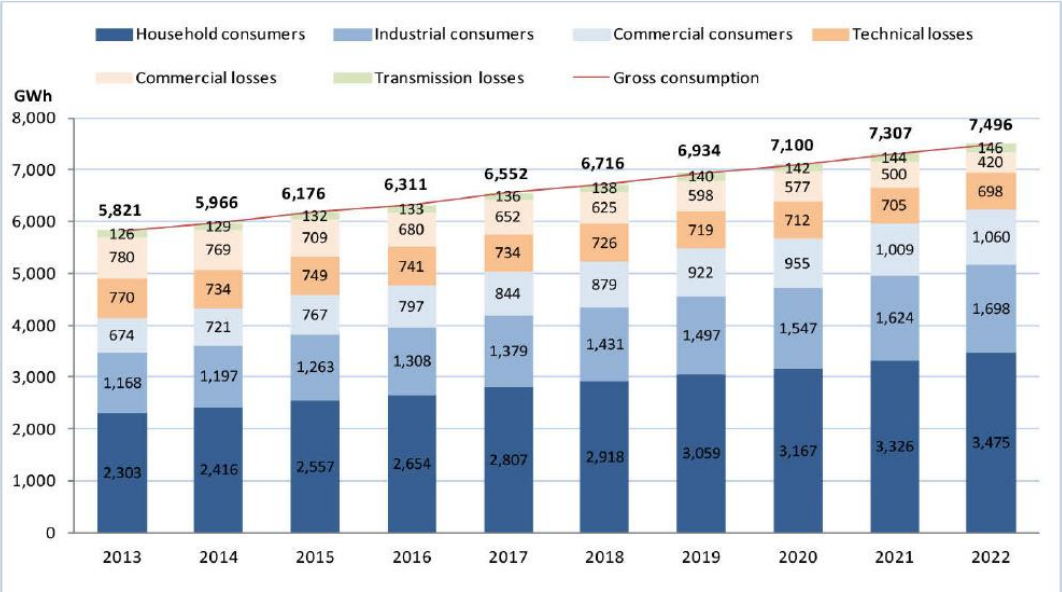
Source: Energy Regulatory Office (2013)

Figure 3.3-1: Balance of electricity production and demand in previous years

In the 2000-2010 decade, electricity consumption has been noted with an annual average growth in demand of 7.1%, which can be explained by increases in massive utilization of electricity for space heating, increases in economic development of the country, and unnecessary increases due to lack of consumptive control especially in the Serbian minority that refuse bill payment because of political reasons (MEM, 2009). Net energy demand peaked in 2011 with 1,126 MW in wintertime (MEM, 2009). As it can be seen inFigure 3.3-1, consumption (the red line) of electricity outgrows production (the blue line) for the whole decade of 2000-2010, with import of electricity being around 10% of the total electricity consumption. Increases in electricity import can possibly be reflected in higher electricity prices, increasing costs to the consumers and making bills less affordable to them. Less affordability will then translate to lower bill collection rates and unhappier customers.

The increase in electricity demand varies from sector to sector. Throughout the last decade, household demanded around 57.7% of electricity on average, commercial firms around 18.8% while the industries a mere 19.8% (MEM, 2009). Demand is forecasted to increase for the

period of 2013-2022, from 5,821 GWh in 2013 to 7,496 GWh in 2022. As Figure 3.3-2 indicates, there will be small increases in the household sector, while the industrial and service sectors are expected to have larger increases in electricity demand. (MEM, 2009).



Source: MEM (2009).

Figure 3.3-2: Forecasted increases in demand of electricity divided in sections of consumers

To prevent absurd price increases, investments must be undertaken to generate domestic electricity supply. In the near future Kosovo must either invest in Kosova e Re, rehabilitate the two power plants, or seek other alternatives of generating energy to meet the demand, lower the prices which would inevitably contribute to a higher bill collection rate, and possibly begin to export some of its electricity (MEM, 2009).

3.4. Electricity prices in Kosovo

Kosovo's economic growth has been slow in the post-war period. With the industrial sector lacking in development, the country is a net importer of goods even though it is rich in natural resources. According to Kosovo Agency of Statistics, the general unemployment rate is 35.1% with youth unemployment (15-24 years of age) striking a 55.3%. The real GDP growth as of 2012 was 2.5%, exports constituted of €276,100 million while imports €2,507,609 million (Kosovo Agency of Statistics, 2014).

Electricity is becoming a luxury good in the country because of constant necessity for imports that will increase in the next 10 years if nothing is done in generating domestic energy supply to meet the constantly rising demand. An increase in imports will be translated to higher prices and even lower rates of bill collection because of unaffordability issues on the household and commercial level.

In comparison to the region Kosovo pays more cents per kWh (5 cents per kWh on average) than Serbia and Macedonia and less than Albania, Montenegro, and Bosnia and Herzegovina. E.U member countries on the other hand pay on average three times more on electricity than Kosovo (KOSID, GAP, and FIQ, 2013). However, when taking into account the relative purchasing power, electricity prices are not affordable to a large part of the population. In a survey conducted by CENR, 31% of Kosovo's homes are spending 10%-20% of their family income on electricity bills and around 28% are spending between 20% to 30% (Bowen et al., 2013).

3.5. Electricity affordability and bill payment in Kosovo

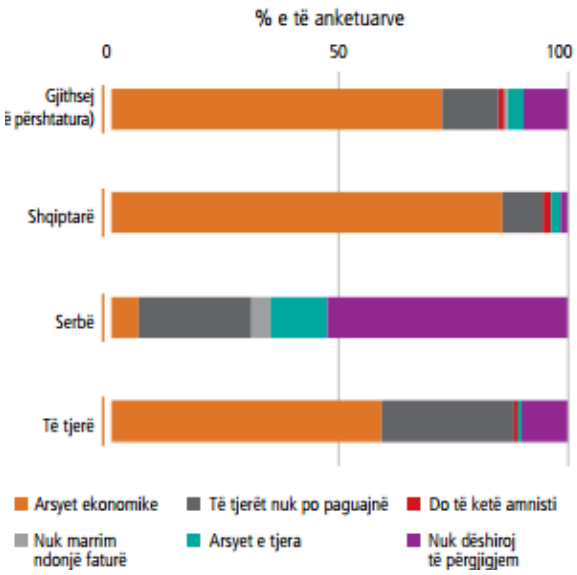
The bill collection in Kosovo has been a problem since the after war period. In 2005 KEK introduced the "load shedding regime" in an "ABC region system" in which it deliberately cut power on a daily basis to the A, B, and C regions (with A having one hour reduction in energy out of six while C as much as two hours reduction out of six). This regime was put in place mainly to incentivize bill payment, where higher paying areas (A) would be rewarded with more power supply during the day (Verena Knaus and Gail Warrander, 2011). If prices continue to rise however, the percentage of unpaid bills will probably increase and something has to be done to figure out the main reasons behind low bill collection rate, and find ways to increase bill payment.

Despite KEK's 2005 attempts to improve bill collection rate, consumers are not diligent enough and keep avoiding payment. Ministry of Energy and Mining reports that Kosovo could improve its bill collection rate if technical improvements are made in the distribution network. To elaborate, the distribution sector should have a detailed balancing system to quantify lost energy for technical losses. Furthermore, expansion of accessibility and security of electric meters both in residencies and industries is required in order to quantify electricity consumption

properly where tampering is impossible and thus account for non-technical losses. One such strategy called "Smart" metering has already been introduced in the region of Prishtina (MEM, 2009). The study suggests strengthening of the judicial system with penalties to be issued and arrests to be made in cases of electricity theft. Electrical power should be cut off in all cases of unpaid bills. Other solutions include amending the criminal code to ensure penalties are in place, and request to prepare a two-year action plan for increasing bill collections to an appropriate rate (MEM, 2009).

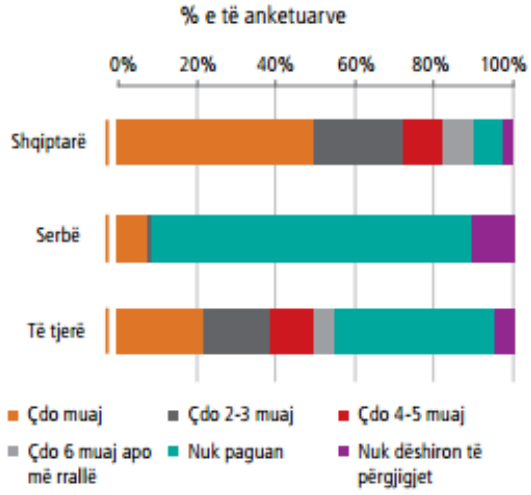
As of 2009, theft and nonpayment of bills accounted for roughly 44% of electricity that had been consumed; this amounted to approximately €100 million per year. KEK's failure to collect bills properly was one of the main reasons behind its privatization (IFC, 2013). Citizens especially in rural areas were refusing to pay their bills with the justification that KEK was not being transparent and they were paying more than they were consuming. To quote a bill collector in the region of Deçan "the country dwellers steal around 60% of their electricity consumption. [T]he village I live in has accumulated around €200,000 from after the war period" (Kosovo 2.0, 2014).

UNDP conducted a study where different ethnic groups in Kosovo were asked to describe the frequency of payment of bills and the reasons behind not being able to pay. The study was conducted during 2007 and included more than 1,300 participants from all Kosovo ethnicities. There might be some bias in the sampling selection given that population statistical data have not been updated for the last 30 years (UNDP, 2007). Figure 3.5-1 shows the frequency in bill payment (orange= every month, gray= every 2-3 months, light gray= every 6 months or less, blue=no payment, red=every 4-5 months, purple=decides not to answer) of citizens of Kosovo divided Albanian, Serbian, and others based on ethnicity (UNDP, 2007). 53% of Albanians declared of paying their bills regularly while only 11% of Serbs surveyed reported a regular payment of bills (UNDP, 2007).



Source: UNDP: Energy prices and economic trends (2007)

Figure 3.5-1: Frequency of monthly bill payment



Source: UNDP: Energy prices and economic trends (2007)

Figure 3.5-2: Reasons behind nonpayment of bills

Figure 3.5-2 shows the reasons behind not paying electricity bills divided again in the same ethnic groups (orange=economic reasons, light gray= there is no bill receipt, dark gray=others are not paying as well, blue=other reasons, red=there will be subsidies,

purple=choose not to answer). More than half of the total responded that the main reason of nonpayment relates to economic problems (especially amongst the Albanian ethnicity). The second reason relates to group thinking where citizens find it reasonable to avoid bill payment because there are many others that act the same (UNDP, 2007). It is interesting to note that more than half of Serbs interviewed decided not to answer the question, possibly because of political and historical reasons (UNDP, 2007). However, even if consumers were not paying their bills they were still enjoying electricity supply under KEK's supervision. 81.1% of Albanian and 78.4% of Serbians interviewed reported that even though they have a utility debt, they have never been curtailed of electric power (UNDP, 2007).

3.6. Social assistance fund for low income families in Kosovo

Because of the low standards of living and high electricity prices relative to purchasing power, a social assistance fund is set up to subsidize electricity to all families below the poverty line (less than €1.72 per day for adult), and families of war veterans or martyrs. The fund was set up in 2005 and is an agreement between KEK (now KEDS), Ministry of Labor and Social Welfare, and Ministry of Economic Development. As outlined on Law No.4/L-233, the electricity assistance fund is part of the general social assistance scheme and applies to all low income families or families of war veterans that are currently receiving social assistance from the government (Republic of Kosovo, 2014). There are €4.5 million allocated each year for electricity subsidization that are given directly to the distribution company. Each family eligible for assistance receives 400 kWh subsidization on a monthly basis. The kWh per month are distributed linearly throughout families regardless of size (Republic of Kosovo, 2014). There is room for improvement in this aspect given that smaller sized families should be subsidized with less kWh per month when compared to larger families. Providing a small family with 400 kWh per month might lead to the point of consumption at which the marginal benefit would equal 0 and thus distort the proper allocation of citizens' taxes. Improvements of the assistance fund are further elaborated in Chapter 8.

3.7. Degree of energy efficient consumption patterns in the country

During the recent years Kosovo has started to increase measures of energy efficiency. On June 2011 the Assembly of Republic of Kosovo adopted Law no. 04/L-016 on energy efficiency

(INDEP et al., 2012). The law follows the Action Plan established for the European Union and makes sure that energy efficient measures are undertaken on the household level. Some of the main incentives to increase energy efficiency so far include: labeling of energy efficient appliances, excise taxes on incandescent light bulbs to switch citizens' behavior towards purchasing efficient bulbs, mandatory applications of energy efficiency measures on construction sites, and the application of cheap tariff rates (INDEP et al.,2012).

A World Bank research project on energy efficiency for Kosovo reports that the country has high energy efficiency potential. Applying measures of efficiency on the household and commercial level could help decrease the demand for electricity and lower the need for imports, improving Kosovo's terms of trade (World Bank, 2014). Energy efficient measures could also save €18.85 million of budgetary money (World Bank, 2014). If such measures were applied, they could help in deflating monthly electricity bills in the household level thus making electricity more affordable and increasing the bill collection rate.

Hajvali overall electricity situation

3.8. Quality of service in Hajvali and customers' complaints

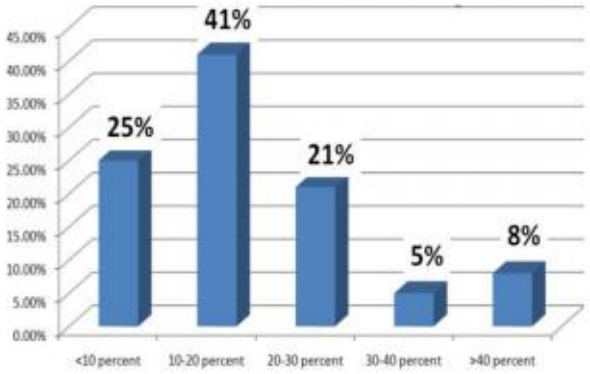
Within Kosovo however, there are many individual communities with specific electricity problems and customers' behavior. For example, Hajvali is a community about 4km southeast of Prishtina (the capital city) with approximately 7,931 inhabitants and 240 regular consumers. Customers of this region are not happy with the energy cut offs during the summer given that they claim to be paying their electricity bills on a regular basis. A resident of Hajvali claims that the regular electricity cut offs are unfair both to him and the citizens who are diligent in paying their monthly bills (Zeri report, 2014). Many believe monthly billing is higher than actual consumption (Zeri report, 2014).

Hajvali has faced other problems with electricity supply during 2014. A report of Koha Ditore claims that while performing a necessary intervention, KEDS workers have mistakenly entangled the electricity supply lines, thus causing damage to several electric utilities across Hajvali. A resident reports that despite the 6 hour cut off, the supply lines were misplaced, endangering the destruction of the machinery and the residents. The resident had to hire a private

electrician whom he paid in order to fix the mistake because KEDS was unaware of the negligence of its workers (Koha Ditore report, 2014).

The winter seasons however are the hardest in Hajvali, where consumers face constant power cuts. In January 2015 for example, the snowfall has immensely worsen the situation of the citizens of Hajvali who are facing as much as 24 hours electricity cut outs as well as poor power whenever it is available. Guri Shkodra, a KEDS official has reported that the whole village is supplied by weak and old distribution systems (which were already in place when the distribution system was privatized) which might explain the reasoning behind the cut outs (Klan Kosova report, 2015).

3.9. Electricity affordability and bill payment in Prishtina and Hajvali



Source: Bowen. B et al. (2013), Kosovo Household Energy Consumption; Facts and Figures

Figure 3.9-1: Percentage of income spent on electricity bills

Affordability of bills is a serious issue in the capital city as well. From a study conducted by CENR in 2011, in Prishtina (Kosovo's capital city which is near to Hajvali), as Figure 3.9-1 points out, around 10-20% of homes spend approximately 41% of their household income on electricity which indicates that for this 20% electricity is extremely expensive. Less than 10% spend around 25% on electricity and only about 30-40% spends a reasonable amount of 5%

(Bowen et al., 2013). The reason behind low bill collection rate might be lack of disposable income on the household level for regular bill payment.

Hajvali which is just 5 km away from the capital is in no better situation regarding bill payment and affordability. In 2011 KEK faced substantial difficulties with bill collection in this area thus decided to cut off certain consumers whose debt reached numbers as high as €10,000 per home or business (KEK, 2011). The reasoning behind the cut off in electricity is quite clear; the payers are being rewarded with energy supply, the debtors are being denied access to something they are not paying for ("KEDS-I Dyfishon Faturat E Tetorit - Ekonomia" 2014).

The fall/winter season of 2014 has furthermore worsened the complaints of Hajvali citizens in regards to electricity prices and the current situation. Many claim that the October bills are inflated as compared to other months, thus are refusing to pay ("KEDS-I Dyfishon Faturat E Tetorit - Ekonomia" 2014). Additionally, consumers are unhappy that KEDS increases the electricity cut offs and demands immediate payment mostly during the winter season when the consumption and the electricity prices are higher ("KEDS-I Dyfishon Faturat E Tetorit - Ekonomia" 2014). Some consumers of both Hajvali and Prishtine have gone further and accused the distribution system of intentionally inflating the bills. Guri Shkodra an official from KEDS however denies that such thing has ever happened given the already established digital electric meters and the high transparency of KEDS officials with the consumers, to which some of the consumers highly disagree ("KEDS-I Dyfishon Faturat E Tetorit - Ekonomia" 2014).

3.10. Energy efficiency in Prishtina and Hajvali

Kosovo Energy Efficiency Agency (KEEFA) is currently planning to apply energy efficient measures in the municipalities of Kosovo, including the capital city, Prishtina (part of which is also Hajvali). The project includes: identification of needed areas for investment in Prishtina, preparation of Municipal Energy Efficiency Plans (MEEPs), and establishment of Municipality Energy Offices (MEOs) to carry out efficient implementation plans (World Bank, 2014). Energy efficiency measures will be possibly completed by 2020 and are all on the municipal levels including Prishtina, and other 14 municipalities (World Bank, 2014).

Chapter 4. Methodology of data collection

4.1. Investigation steps

Research studies on electricity in Kosovo have been mostly done on a macro level (focusing on the distribution and transmission systems, the existing major resources of lignite, and the old power plants), primary data had to be collected in order to conduct the analysis on the household level. The project investigation followed a series of steps. First, forty families in Hajvali were surveyed to collect both quantitative and qualitative data that do not exist in literature reviews. Second, an interview was conducted with the director of energy supply in KEDS, Alper Erbas, to get data on the current bill collection rate of the village, penalties taken towards irregular consumers, the gain in revenues if the bills were collected regularly, and other information in regards to the distribution and current tariff structures. The last sets of interviews were conducted with Agim Krasniqi, the director of the financial budget in the Ministry of Finance, and Nexhat Syla from the Ministry of Labor and Social Welfare. The purpose of these interviews was to acquire a deeper understanding of the current social assistance fund established to help low income families with the regular payment of electricity bills. Despite the secondary data already available on Law No.4/L-233 about social assistance schemes, the interviews with the aforementioned were seen as appropriate to get an idea of the establishment and difficulties of the social fund on a day to day basis. Moreover, the interviews were seen as necessary to collect information focusing specifically on the financial assistance provided by the government in electricity subsidization which is a part of the general assistance scheme. A regression using Minitab was also conducted to test the statistical significance of each of the factors.

4.2. Sampling methodology

Hajvali currently has around 2,300 households (houses as there are no apartment buildings) with approximately 8,000 inhabitants. Due to time constraints, 40 surveys have been conducted with the households within a range of three weekends. The sample size is greater than 30, the required threshold beyond which any sample will start to follow the normal distribution. 20 surveys were first pre-tested on the village to check the quality of the questionnaire and the responsiveness of the households. These 20 surveys are not included in the report due to differences between questionnaires and the impossibility of comparisons. They served only in

enriching and modifying both the questionnaire and the approach of the surveyor towards the subjects. The participants in the study were ensured at all times that the study is being conducted for student researches only. All the students participating in conducting the surveys were from RIT/AUK Center of Energy and Natural Resources (CENR) and had all been through Human Subject Assurance Training online to protect the identity of subjects before going out in the field.

The sampling methodology included a mix of stratified and systematic sampling. The subjects were stratified based on street names, from which then every 5^{th} household was picked to be surveyed. Google Map and Atlas maps were used to mark out the streets of Hajvali (Deshmoret e Gollakut, and Fitorja as the main ones), and the elementary school "Shkendija" together with the mosque served as orientation and starting points to conduct the surveys. The households already visited were marked off the map (in rough estimations as the maps were not detailed enough) as to ensure that no same household was visited twice. The combination of sampling methodologies was done in order to reduce bias and get a more representative sample of the population. In order to conduct a thorough analysis and introduce as little bias as possible within the time permit, special attention was paid to the sampling methodology and the designing of the questionnaire. The questionnaire was designed in such a way as to not allude to particular, desired answers. The questions are mostly multiple choice, or a ranging of strongly agree to strongly disagree, with only a few being opinion questions. They are also coded in numbers as to help in transferring the raw data to Excel and other statistical software for further studies of the energy center at AUK.

The questionnaire contains questions in regards to income and difficulties in paying bills regularly, degree of efficient consumption patterns of households, and opinions about quality of service. It was designed and tested in coordination with CENR staff, in order to introduce as little bias to the questionnaire and ask the proper questions following IRB Protocol. It is divided into sections about general information and the sources of household income of the subjects, opinion questions, behavioral questions, and questions about current electric appliances that are divided according to usage (entertainment, heating/cooling, cooking, or cleaning).

When conducting the surveys, students always went in groups of two as to ensure that everything said by the subject was being captured, reducing the errors, and increasing the level

of safety as most of the surveys were conducted inside the houses. The families interviewed were really friendly, thus contributing to a welcoming environment where focusing on gathering information became less of a pressure from both sides. Lastly, the student status of the surveyors, and the anonymity of the survey helped greatly in the availability of the subjects to answer questions

4.3. Regression analysis

A regression analysis was seen as appropriate to test the statistical significance of each factor (Appendix B). Variables were chosen after the review of literature to account for the most important factors. The dependent variable is dummy in nature (qualitative) and consists of the frequency of financial difficulties in regular payment of electricity bills. It coded with 1 if subjects answered they often faced difficulties with bill payment and 0 if otherwise. The independent variables (factors behind nonpayment) were chosen after the conduction of analysis and consist of: winter monthly bill as a percentage of monthly disposable income, the degree of KEDS officials' transparency when picking up monthly balance inquiry, awareness of consumers about tariff structures and cheaper electricity times, availability of CED or incandescent lights in the house, whether consumption of electricity line up with monthly payment, whether consumers look/do not look at efficiency labels when buying appliances, and the frequency of leaving appliances on all the time. Most of the independent variables are also qualitative in nature thus coded with 1 or 0. R-squared was used to test the general significance of the model, and the p-value of each individual factor was compared to the alpha level of 10%. A normality and an independence test were also conducted for the statistically significant variables to test upon randomness and normal distribution of data.

4.4. Strengths, weaknesses, and limitations of the project

The main constraint of the project was the time limit to conduct research. The forty surveys with the households out of the current 2,300 families represent only 1.7% of the population of Hajvali, a really small percentage that could include within a lot of bias, potentially decreasing the reliability and reference to the study. Moreover, around 22 households refused to answer the questionnaire because of other occupations at the time. Thus, whenever a household refused to

answer, the house next to it was picked for surveying, disrupting the flow of every 5th house to be surveyed and possibly introducing some bias to the study.

If there were no money and time constraints, further analyses could have been done in regards to how many kWh would be saved for a period of time such as a month, or a year if inefficient appliances such as refrigerators, water heaters, or even something as simple as efficient light bulbs were replaced with energy efficient ones. This would then indirectly contribute to the affordability of the bills due to less kWh consumed in households within a month's period, thus possibly increasing the monthly bill collection rate.

From the interview with KEDS, the unavailability of a hands-on on raw data about bill collection rate has possibly introduced further bias to the analysis as it is presented only from KEDS' point of view. From the interviews with the ministry officials, the forbiddance of recording of dialogues might have led into missing some points and not presenting all information discussed. Moreover, from these interviews, both Nexhat Syla and Agim Krasniqi had difficulties answering questions that related specifically to electricity subsidization.

For the regression analysis, there were probably other software options which could have been used that give more accurate results on qualitative data. Minitab, which is mostly used on quantitative data because of less coding options for qualitative variables, was the only available software at the time. Thus, given that most of the factors are qualitative in nature, there might have been error in coding as Minitab can only code variables as 1 or 0 and there are no other options that could have been useful in coding multiple choice or frequency questions. The sample size is also small, which might have introduced some possible bias to the end results.

Lastly, logistics factors and weather conditions have contributed to collection of surveys on the region mostly restricted to the mosque and the elementary school of Hajvali, as lack of asphalted roads, difficulties in mapping, the threshold of 40 surveys, and the approach winter solstice (as most surveys needed to be completed during day time for safety reasons) have made it impossible to go further down on the areas of the village.

Chapter 5. Analysis: Affordability and bill payment

When addressing the issue of low payment rates of electricity bills in the region of Hajvali, several factors arise as to why households do not pay their monthly bills. The factors are grouped in terms of affordability (including here the established social assistance fund for electricity subsidization), overall level of satisfaction with the quality of KEDS' service, and degree of efficient consumption patterns. These factors are outlined below:

- Affordability
    - *Lack of disposable income, with electricity consumption consisting of a large share of the household monthly financial resources*
- Satisfaction level with the quality of service
    - *Lack of transparency from KEDS and the belief that there are large discrepancies between what consumers use and what they are actually charged for.*
    - *Disappointment with the quality of service (poor power or energy cut offs) and the constant increase in eurocent per kWh*
- Degree of efficient consumption patterns
    - *Old and inefficient electric appliances, including but not limited to refrigerators, water heaters, washing machines, and incandescent light bulbs, all of which lead to higher kWh spent on a monthly basis, thus inflating monthly bills in monetary terms and making them less affordable to the households*
    - *Lack of education in the energy consumption area, lack of knowledge about tariff structures, and inability to adhere to cheap tariff structures due to unavailability of constant water supply*
- Theft of electrical energy*[1]

[1] not thoroughly documented and also KEDS interviews didn't reveal, but there were households (5%) that voluntarily declared in engaging in electricity theft. For more see Appendix A

Affordability of bills and payment rates

5.1. Bill collection rate and KEDS plans to increase payment

As Alper Erbas pointed out during the interview, KEDS' electricity bills are issued on a monthly basis and the electric meters are checked regularly to see if they are functional. Ever since the distribution system was privatized, the bill collection rate has increased by 3%. However, problems still arise in consumers' part, as Figure 5.1-1and Figure 5.1-2 illustrate. During the winter time only 70% of KEDS bills are collected monthly, while in summer the percentage of monthly collected bills rises to 85%. This indicates that 30% and 15% respectively remain uncollected.

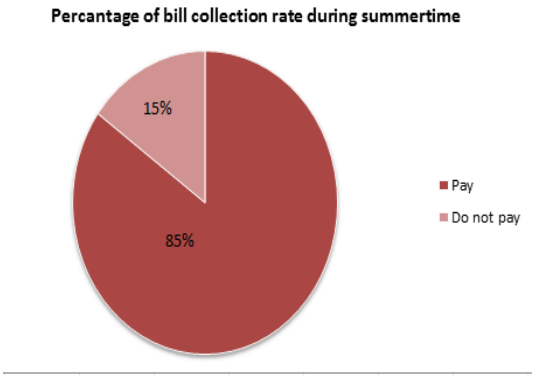


Figure 5.1-1: Bill collection rate in Hajvali during summer

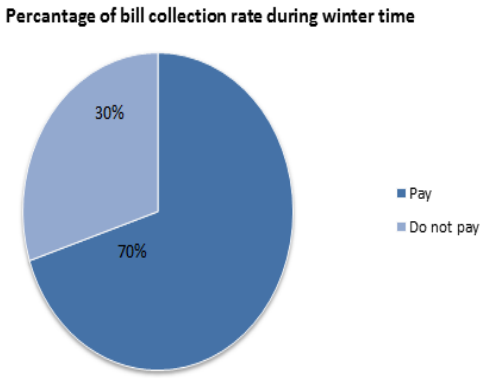


Figure 5.1-2 Bill collection rate in Hajvali during winter

Currently, according to Mr. Erbas, the average debt per household in Hajvali reaches an amount of €109, even though each customer that is not regular in payments is given a 15 day notice on electricity disconnection. This is high compared to the capital's equivalent of €40. Hypothetically, a 100% bill collection rate in Hajvali would result in an additional of €200,000 gain in revenues annually. For Prishtina, the monetary gain would be €1.5 million. This would in turn result to higher profits for the company, possibly indirectly improving the distribution system through monetary investments from KEDS.

From the interview with Mr. Erbas, one of the primary strategies of KEDS' improvement of collection rates and detection of any irregularities is immediate replacement of old and defective meters with new ones. In addition, in the future they also plan to put in place connection fees to every citizen that has been disconnected from electricity because of nonpayment of bills, as to incentivize the citizens to pay their bills on time. Other plans include portfolio expansion of different payment plans for people with low incomes that have the financial means of still agreeing to the payment plans through personal debit cards. However, if the consumers fail to pay on time, KEDS is planning to charge an interest rate for any delays in bill payments. The plan however is still on drafting procedure. They currently apply tariff structure as to make electricity more affordable at certain times of day. This plan will possibly increase the bill collection rate in the village as well as Kosovo as a whole.

5.2. Lack of disposable income

Lack of monthly disposable income available to pay the electricity bills has emerged as one of the key factors as to why there is a low payment rate in the village. When interviewed, Mr. Erbas also believed that the main reason behind nonpayment of electricity bills is the low income of the families as compared to the high price of electricity on relative terms. The reasoning behind the unaffordability is quite clear; the officially declared unemployment rate is 35.1% and youth unemployment (15-24 years of age) reaches 55.3%. These percentages clearly indicate that the population of Kosovo lacks regular sources of income given that quite a portion are unemployed which might reflect on their irregularities of electricity payments.

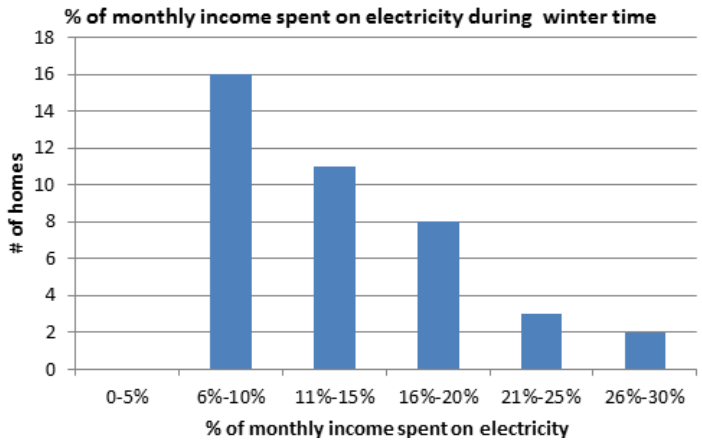


Figure 5.2-1: Percentage of monthly income spent on electrical winter bill

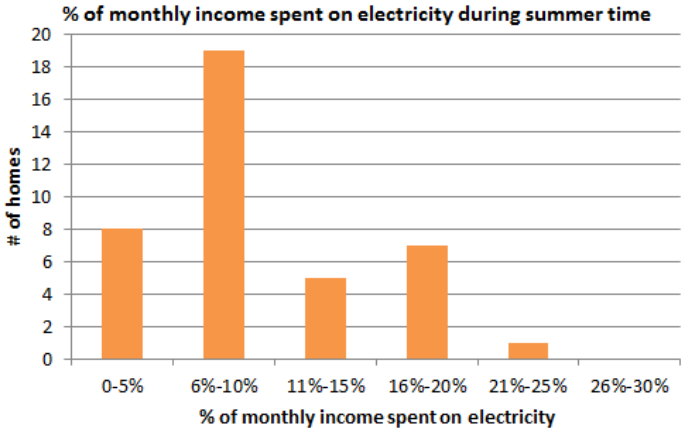


Figure 5.2-2: Percentage of monthly income spent on electrical summer bill

Figure 5.2-1 and Figure 5.2-2 present a graphical display of the percentage of monthly disposable income (with remittances) that goes to the payment of electricity bills during the winter and summer time in Hajvali, as concluded from the survey results. From the 40 households, there are 2 families where electricity consumption reaches as high as 30% of monthly income during winter time. This is a huge amount compared to UK's office for national statistics which states that the poorest fifth of households in UK spent around 8%-11% of their disposable income on energy from 2002 to 2012 (UK Office for National Statistics, 2014). In Hajvali however, during winter time 16 families out of 40 consume more than 11% of their monthly income on electricity. There are 2 households out of the total 40 that spend as much as 30% of their monthly disposable income on the electricity bills. In summer the number is

reduced to 13, and there are no families spending more than 25% of their budget on electricity utility bills.

Figure 5.2-3 presents a graphic display of the monthly disposable income of surveyed households. Three houses have income levels from €0-200; 18 houses have monthly incomes of €201-400, and only 2 households have incomes of above €1,000 a month. Given that many of these households are extended, 28 households out of 40 have levels of monthly income below €600, which might explain somewhat the reasoning behind nonpayment of bills in terms of unaffordability.

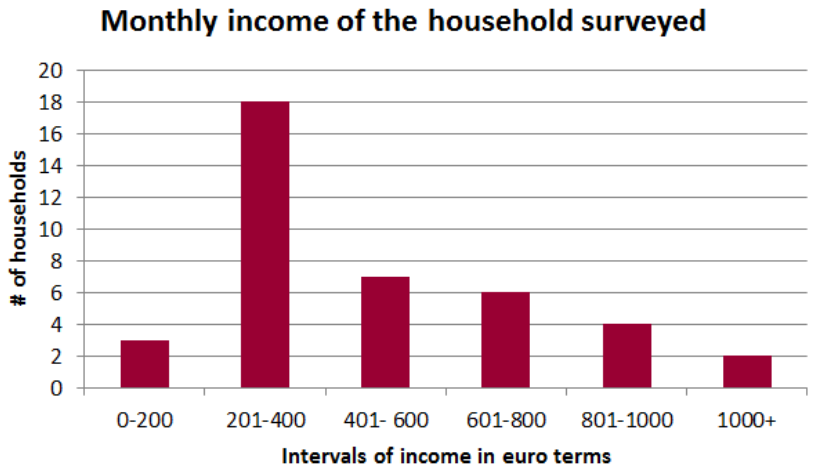


Figure 5.2-3: Monthly income levels of the households surveyed

Figure 5.2-4 shows a chart of the percentage of employed people on a household. The bar chart clearly illustrates that in 16 of the households less 21% of the household residents are employed full or part time, with only 3 households having more than 60% of its residents in the labor force. The higher the number of people employed as compared to the total residents, the higher the income, thus the higher the possibility of affording electricity bills. Given that most of the households however have less than 40% of the residents in the labor force, it is quite reasonable to assume that the monthly bills are unaffordable.

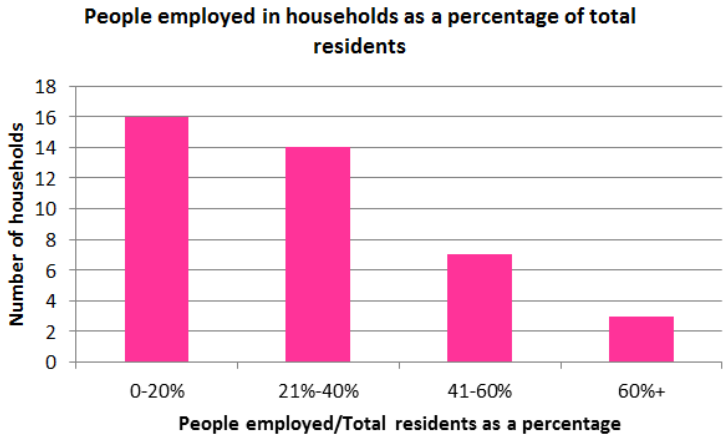


Figure 5.2-4: People employed in households as a percentage of total residents in the 40 houses

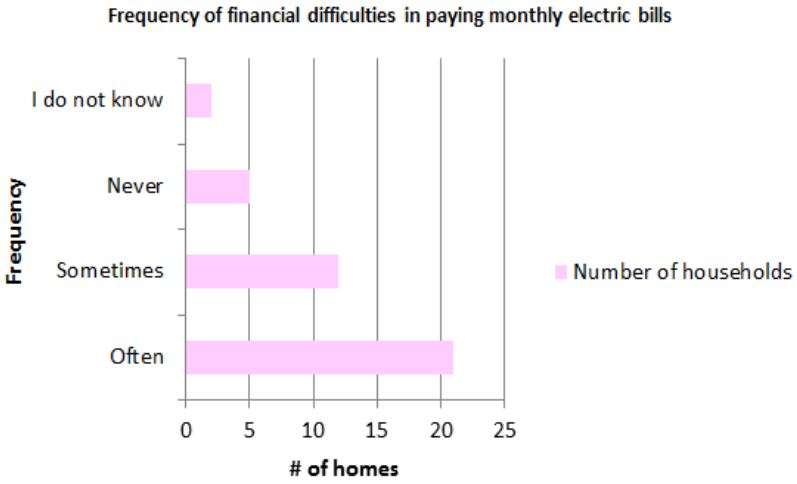


Figure 5.2-5: Household frequency of financial difficulties in paying monthly bills

One last question was asked regarding the financial availability of the families to pay their monthly bills on a regular basis. Instead of being asked whether they pay, households were rather asked whether they find themselves in difficulties in allocating the proper amount of financial resources each month to pay the electricity bills.

Figure 5.2-5 illustrates that 21 of the 40 households often find difficulties on a monthly basis to allocate financial resources in paying electricity bills, while only 5 never have any financial

problems paying their bills on a monthly basis. The 21 households (52.5%) that often have financial problems with paying their monthly bills are more likely prone to not paying regularly

5.3. Electricity subsidization

From the interviews conducted with Nexhat Syla and Agim Krasniqi the following points regarding the existing fund to help the low income families with their electricity bills were found:

- From 2005, around €4.5 million are being allocated to the general social assistance scheme that goes both to families with low income (€1.72 per day per adult) as well as families of martyrs, war invalids, and civil victims. The number has not been adjusted for increases in electricity prices, or inflation.
- This agreement is between Ministry of Labor and Social Welfare, Ministry of Economic Development, and KEK, now KEDS.
- The assistance fund for electricity is a part of the general social assistance scheme and covers the first 400 kWh of monthly consumption and is not adjusted for increases in electricity prices (which with the given threshold of 400 kWh would mean fewer families are being covered).
- The 400 kWh are applied linearly to all low income families without taking in consideration the size of the households and the income levels.
- There is no special fund for electricity consumption (such as last resort destination for families that are at the point of being disconnected but are unable to pay) apart from the one under the general assistance scheme.
- Because of disputes between KEK and KEDS ever since the privatization, an annex agreement has been signed on 27th of May, 2014 to settle these disputes in which the following have been reached:
    - €1,715,979.78 for the period of January-May 2013 was given to KEK to subsidize the consumers for the first four months
    - €2,765,736.85 for the period of May-December 2013 was given to KEDS to subsidize the consumers for the remaining eight months

- The subsidies from the KEDS' side have been completed and the money has been spent, but KEK has not continued to subsidize and allocate the rest of the money, which they are refusing to do given that now KEDS has control over collected revenues.
- The subsidies for 2014 consumption will be allocated with 2015's financial budget as were those of 2013 allocated in 2014. Thus families' consumption of electricity on 2014 will be paid to the distribution system in 2015.
- The families under the social assistance fund are reviewed on a monthly basis to make sure they still fulfill all the criteria to receive assistance

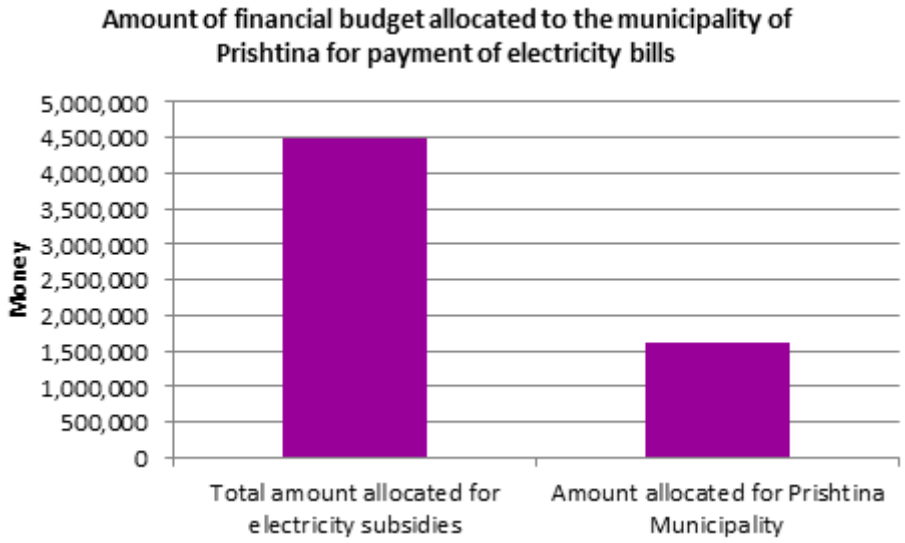


Figure 5.3-1: The financial budget allocated to Prishtina for subsidization of electricity

Figure 5.3-1 illustrates the total amount of the 4.5 million being allocated only in the municipality of Prishtina (which also includes Hajvali) as data to Hajvali only were not available from the ministry at the time asked. €1,608,000 euros out of €4,500,000 or 35% of the total amount of the budget is spent yearly to cover around 1,800 households with roughly 7,000 household members in the municipality of Prishtina (Hajvali is under this municipality) that are below the poverty line (less than €1.72 per day per adult).

5.4. Low transparency

Another factor identified while conducting the surveys that plays an important role to the low collection rate of electricity bills is the belief of the citizens that KEDS is lacking in transparency when measuring monthly consumption in kWh, claiming that there appear to be discrepancies between what citizens pay and what they actually consume.

Figure 5.4-1 shows a graphical display of answers from the questionnaire on the question: "rate the degree of frequency when KEDS officials inform you about monthly consumption in terms of kWh when they come to read it off of the electric meters". Out of the forty households, 28 answered that the only thing electricians do is come and read the electric meters, without any information in regards to what's their spending that particular month or any advises on when it's cheaper for them to consume electricity. Only 5 households said that officials do inform them of kWh spent on a monthly basis.

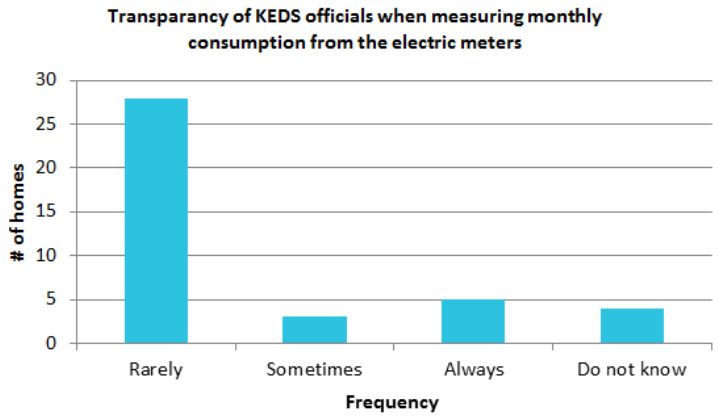


Figure 5.4-1: Transparency of KEDS officials

Consumers are generally skeptical when it comes to the honesty and transparency of the distribution system. Both the primary data collection and the literature review provide evidence in consumer's beliefs that they are somehow being cheated as the monthly electricity bills are unreasonably high. Thus, a higher transparency of KEDS officials when measuring monthly consumption on the household level (such as explanation to the consumer of how much has been spent on kWh rather than just gathering the needed information), might aid in lowering the suspicions of citizens given that they are presented with the kWh and monetary conversions are

easily done. This might possibly lead to higher bill collection rates given that more consumers believe that they pay fairly for their consumption.

Table 5-1 also reports that 27 out of the 40 households think that there are misalignments between what they spend and what they get charged for electricity, claiming that they don't spend that much. Even though there is lack of education in this specific field and inability to properly correlate kWh with money terms, the psychological belief that they are being fooled since no one is being transparent to them may have a big effect on their payment rates. From the household surveyed, 67.5% of the surveyors believed that they get charge a higher price on a monthly basis than they actually consume. With higher transparency more consumers would agree that they are not being fooled and might start to take responsibility and pay for what they consume. Additional monitoring devices may be needed to give consumers information about their electricity spending. This includes looking at the consumption of appliances, lighting and heat for the household.

Table 5-1: Reflectiveness of monthly bills in consumption

Do you think the price you pay for energy lines up with your consumption of energy on a monthly basis?	Respondents	Percentages
Yes	8	20%
No	27	67.5%
I don't know/No answer	5	12.5%

5.5. Low satisfaction with service quality

Lastly, price increases in the recent years, and the constant power cuts/poor electrical power play an important role in explaining the behavior of the citizens of Hajvali. Figure 5.5-1 shows the responses of the subjects when asked on the frequency of power cut offs and poor electric power on a daily basis. Fifteen households responded on frequent power cut offs (3-4 hours during winter, 0-2 during summer) and poor electric power on a daily basis. The latter factor according to them ruins household appliances and adds unnecessary financial costs of replacing them, especially during the winter time.

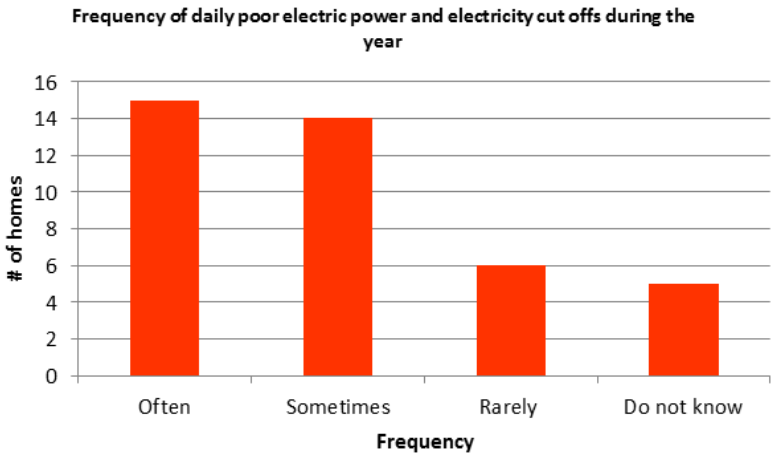


Figure 5.5-1: Frequency of poor service on a daily basis

An improvement in the distribution system may leave consumers more satisfied which might indirectly lead to increased awareness and higher level of responsibility to pay for a strong, non-stop electric supply. It is just like with any other commodity; the higher the quality the more desired by consumers, and the higher the probability they will pay for it if it is an inelastic commodity.

Figure 5.5-2 shows the responses of the households when asked if they have noticed any changes in the price of electricity during the recent years. Thirty-one have reported that they think it has increased, 4 reported that price has stayed the same, 0 say it has decreased and 5 reported on not knowing. Maybe thus, another reason why there is a 70% collection rate during the winter and 85% during the summer is because according to consumers they are paying a higher price for a service that has not improved on quality.

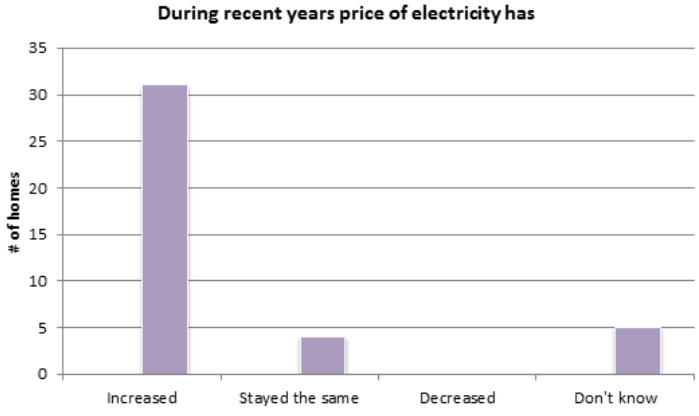


Figure 5.5-2: Electricity prices over the years

However, despite customers' complaints and unhappiness with the current system, Mr. Erbas, claims that the bills are issued on a monthly basis and if asked by households, officials will provide the kWh spent on each month, and will advise the consumers in efficient spending. Moreover, consumers can also check themselves on the invoice the kWh spent per month on both the cheap and the expensive tariff structure. Still, that might not be sufficient to ensure them of transparency given that many don't understand kWh and how they are translated into money terms.

Chapter 6. Analysis: Energy inefficient consumption patterns

6.1. Tariff structure lack of knowledge and carelessness is turning off appliances

Households in the village of Hajvali are really efficient in some fields of energy consumption, while lacking knowledge in many other ways there are to efficiently use the energy consumed. For example, it is interesting to note that generally the households surveyed were really efficient in terms of heating; as Figure 6.1-1 illustrates. Only 3 out of the 40 households used heating as its primary source; the rest used substitutes such as wood or central heating with coal. Households were careful to close doors as to not let the heat escape on winter time, and were aware that insulation is a great choice of conserving energy if the financial resources permit.

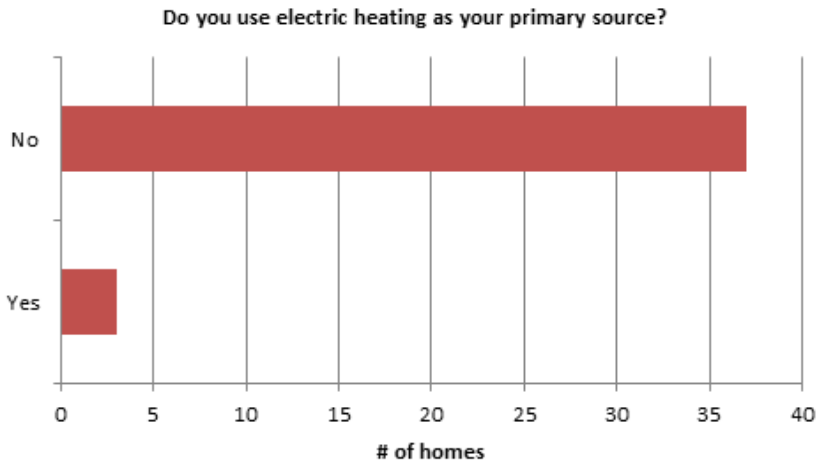


Figure 6.1-1: Use of electricity as primary source of heating

However, a really interesting observation emerged while conducting the surveys; the households were conserving energy in the ways they knew, but very few houses thought of efficient appliances, light bulbs, or even cheap tariff structures as a way to conserve electricity. This probably roots back in history where there was no sufficient knowledge of all the possible ways of conserving electricity. In the recent years, there might not have been enough educative programs to make the average citizen aware of all the possible ways to conserve electricity. If the population was to be educated in this field then probably houses would see a deflation of the monthly electricity bills, making them more affordable in the household level, and thus possibly

increasing the monthly collection rate. Table 6-1 gives a percentage of subjects with the highest educational degree obtained from the head of the household.

Table 6-1: Educational degree of the subjects

Educational degree	Number of respondents	Percentage of homes
Primary school	4	10%
High school	27	67.5%
Undergraduate degree	9	22.5%
Graduate degree	0	0%

Four of the subjects have finished elementary school, 27 have a high school diploma, 9 have an undergraduate degree, while 0 have a graduate one. Maybe thus, people with lower levels of education have a higher probability of lacking knowledge in efficient electricity consumption given that they were exposed to less sources of information about energy efficiency throughout their lifetime. Figure 6.1-2 portrays graphically the knowledge of the households about the tariff structures (cheaper electricity during different times of the day, which could incentivize the houses to use electricity when it is cheaper, thus leading to lower prices of monthly bills). The majority, 62.5% of homes knew that electricity was cheaper during certain times of the day.

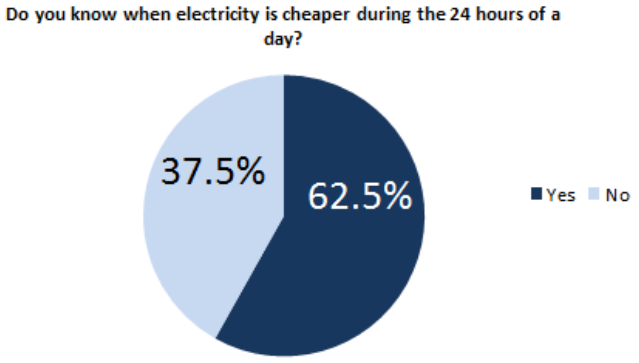


Figure 6.1-2: Knowledge of households about tariff structure

However, 37.5% were unaware, thus were washing clothes or using the water heater when electricity is most expensive. This issue must be addressed and the problem should be approached from different viewpoints, such as using the appropriate types of media to target citizens of the villages that might not be computer-literate or illiterate overall. That will necessarily lead to higher energy prices that would possibly not have been present if all 100% of subjects were aware of when electricity is cheaper during the night.

Moreover, even if all households were aware of tariff structures there is another problem that arises as to why consumption of electricity when it is cheaper would not be quite possible. The tariff structure currently applied indicates that electricity is at its cheapest peaks from 10 P.M to 7A.M every day. However, some activities such as washing clothes, dishes, cleaning the house, or heating water would not be possible during the night given the lack of water supply (also lack of well of hydro pumps). Figure 6.1-3 points out that out of the 40 households, 23 reported of having water supply through the night (57.5%) while 17 (42.5%) reported of not having water during the night.

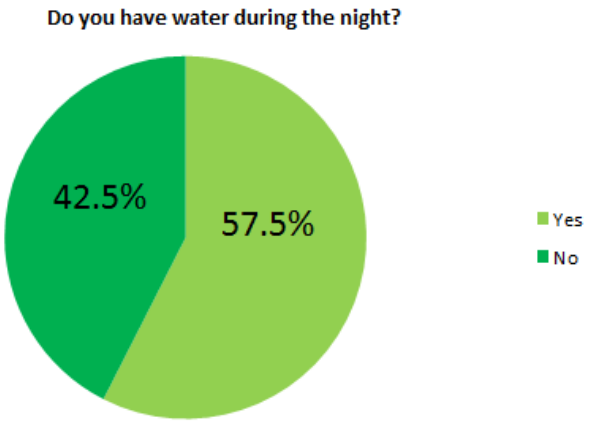


Figure 6.1-3: Availability of water supply through the night

A question addressed to Mr. Erbas related to whether they have thought of any strategies in synchronizing with the water company to make electricity cheaper when there is availability of water. However, Erbas reported that because the problem with the water supply is mostly

prevalent in Prishtina, that problem should be solved by the water company and is not an issue of KEDS.

Thus, the lack of synchronization between the water and the electric company to either make water available when electricity is cheaper, or vice versa has inevitably harmed consumers who are aware of tariff structures but cannot consume electricity when it is cheap because of no water supply and no wells or hydro pumps to make up for the lack of it during the night. Because of no other choice but to do some activities when electricity is expensive, these households have to pay expensive monthly bills that consume a large percentage of their total disposable income.

Furthermore, Figure 6.1-4 looks at the behavioral patterns of individual households in regards to conserving energy. When asked how often they forget to turn off lights, TV, water heater, or computers when not in use, 6 subjects reported they do it often, 12 reported sometimes, 14 said rarely, and 8 didn't pay much attention thus didn't know. With more carefulness from the household's side to shut off appliances or apply the option of automatic sleep mode, monthly bills would be deflated and thus possibly more affordable to the household level.

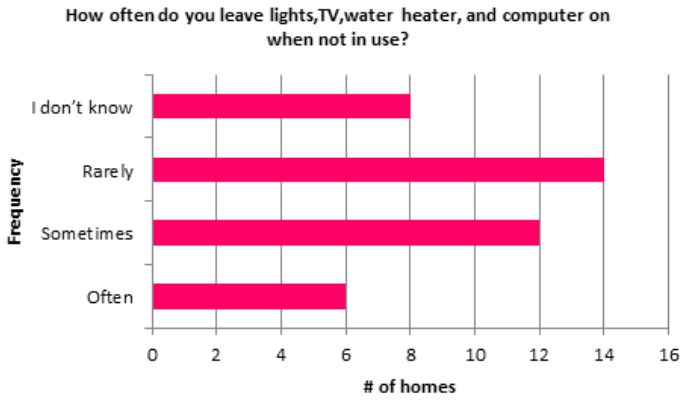


Figure 6.1-4: Frequency of forgetting to turn off appliances

6.2. Inefficient electric appliances

Mr. Erbas noted that the electric appliances that consume most of electrical energy are:

- Refrigerators
- Washing machines
- Water heaters
- Electric heaters

Because only three of the forty households interviewed used electric heating, the paper will only analyze the average purchasing dates of refrigerators, washing machines, and water heaters. Figure 6.2-1 lists these three appliances and the range of year purchased for the forty households surveyed.

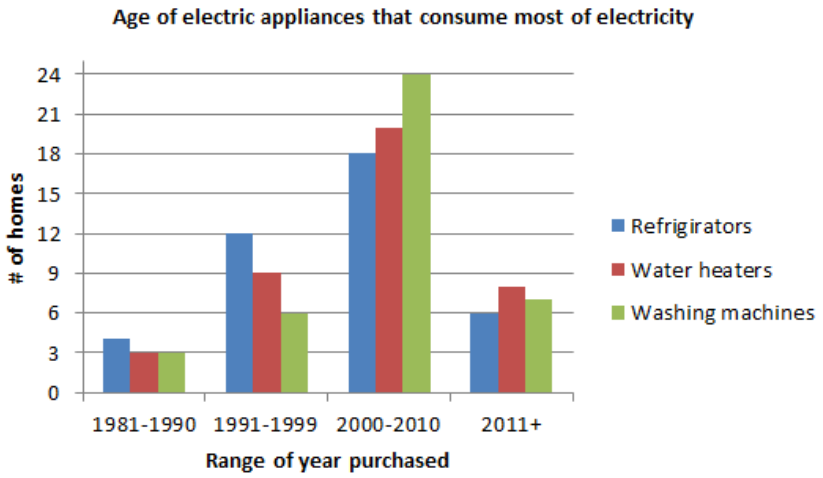


Figure 6.2-1: Frequency of looking at the energy efficiency label of new appliances

Most of the appliances were bought in the range from 2000 to 2010. However, there are in total 16 refrigerators, 12 water heaters, and 9 washing machines purchased before 1999. 10 of these appliances were purchased before the 1990's, indicating that there is a low likelihood that they are energy efficient, especially the refrigerators that have most likely become obsolete due to constant use. However, even though most of the appliances were purchased during the after-war period, they are not necessarily energy efficient in nature given that most subjects responded that they would rather look at the price rather than the energy efficient label when buying new appliances

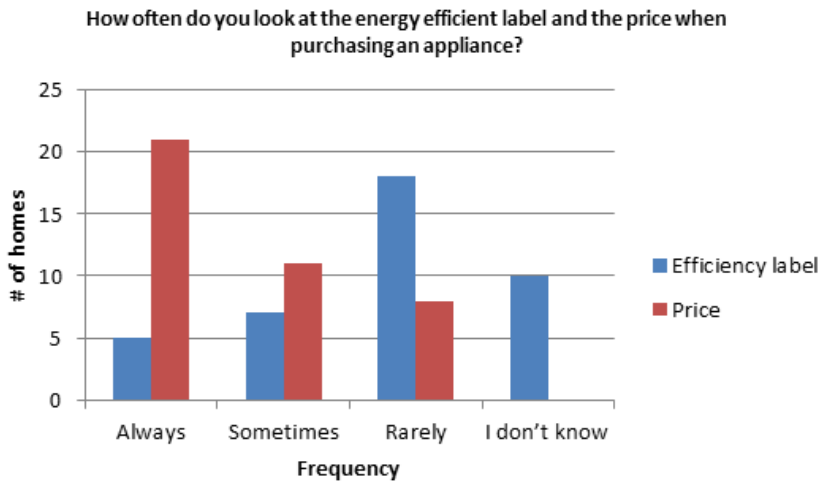


Figure 6.2-2: Frequency of looking for the energy efficient labels when purchasing

Figure 6.2-2 illustrates the answers of subjects when asked whether they look at the efficiency label or price when buying new household appliances. It is important to keep in mind that the price and efficiency are not mutually exclusive; subjects had to choose the frequency in both answers. 5 of the households answered that they tend to always focus on the efficiency label rather than the price; 21 answered they always focus on the price. Eighteen reported that they rarely look at the efficiency while only 8 answered they rarely look at the price. Ten answered of not really knowing at whether they look at the efficiency label or not, while none said they don't know if they look at the prices. Thus, because energy efficient appliances' purchasing price tends to be more expensive in the marketplace, the likelihood is that not many households purchase efficient appliances to start with. The lack of the latter indicates that on average, households consume more electricity than necessary, thus contributing to the unaffordability of the bills. If consumers were to be educated in becoming diligent about energy efficient labels such as Energy Star, they might pay a higher price for the appliance initially but profit a lot more in the long run.

Table 6-2 displays the percentage of households that have efficient light bulbs on their homes, vs incandescent ones, or a combination of both. 47.5% use incandescent lighting, while only 20% use CFL or LED lighting, with the rest using a combination of both. Given that CFL consume on average 767 kWh/year, LED consume around 329 kWh/year, while incandescent 3285 kWh/year which also have a shorter life, one can conclude that switching to efficient

lighting alone can contribute to deflation of monthly electricity bills, possibly leading to a higher payment rate.

Table 6-2: Types of light bulbs in the households

Type of light bulb	Percentage of homes
Incandescent	47.5%
CFL/LED	20%
Combination	32.5%

6.3. Future possibilities

Hajvali's citizens lack knowledge in efficient consumption patterns. However, the population could be taught new ways of conserving energy via seminars or consultations with professionals on the field. As Figure 6.3-1 shows of the 40 households surveyed, 33 reported that they would like to be consulted by professionals in how to use energy more efficiently so that the monthly bills become cheaper. The other 7 declared that they are already aware of enough ways to conserve energy, or don't have enough free time to attend seminars or listen to consultations.

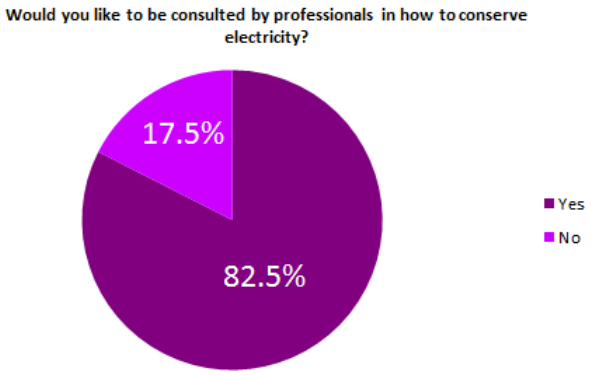


Figure 6.3-1: Consultation by professionals

Chapter 7. Discussion of results and comparisons between studies

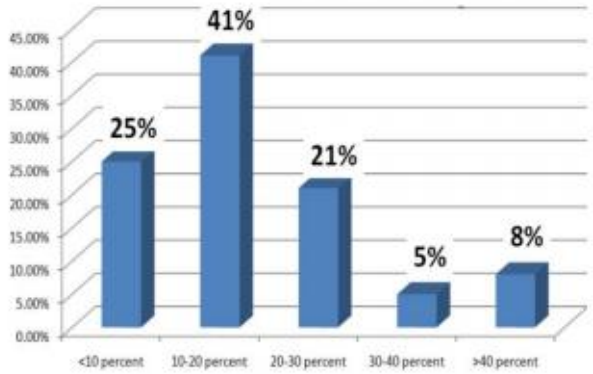
The project was a five month investigation on identifying the factors behind nonpayment of bills in Hajvali, a community just outside of the capital. Some of the main factors explaining the nonpayment and consumers' behaviors are:

- Bill non-affordability
- Dissatisfaction with the service quality
- Lack of knowledge about efficient appliances and tariff structures

7.1. Analysis on bill affordability and study comparisons

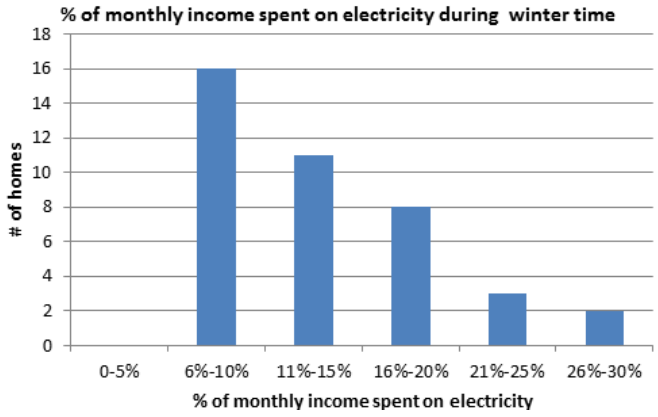
The price of electricity in Kosovo is 5 cents per kWh, lower than most European countries in absolute terms, but when taking into consideration the standard of living, the price becomes unaffordable to the population as a whole given that roughly 29.7% of Kosovo's citizens are below the poverty line (with less than €1.72 on a daily basis for adult) and 10% are extremely poor (€1.20 adult equivalent per day) as of 2013 (Consumption Poverty Report, 2011).

Thus, lack of disposable income appears to be the biggest reason behind irregular payment of electricity bills in Hajvali. Twenty-eight households out of the 40 surveyed have income levels below 600 euros on a monthly basis and most of them are extended rather than nuclear. 21 answered that they often find themselves in difficult financial positions when it comes to allocating the money for regular payment of bills. There are households that spend as much as 30% of their monthly budget on electricity utility bills. On the macro level, from a study conducted by AUK Center of Energy and Natural Resources, around 28% of the Kosovo's population spends 20%-30% of their monthly budget on electricity (Bowen et al., 2013). The graphical displays of the literature review and survey findings are presented in Figure 7.1-1 and Figure 7.1-2 respectively.



Source: Bowen. B et al. (2013), Kosovo Household Energy Consumption; Facts and Figures

Figure 7.1-1: Prishtina's electricity bill as a percentage of total income



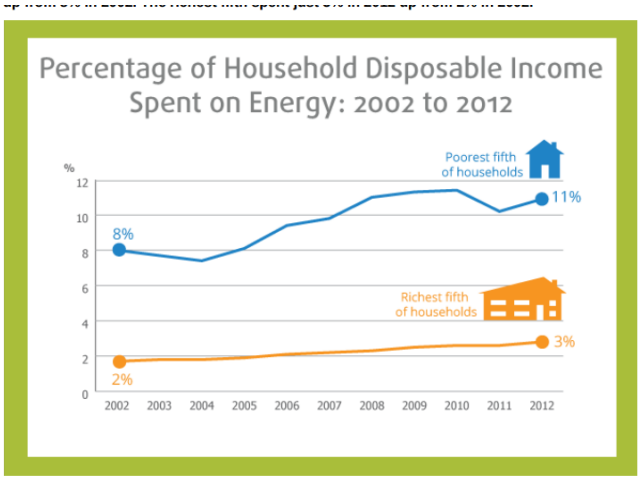
Source: Bowen. B et al. (2013), Kosovo Household Energy Consumption Patterns

Figure 7.1-2: Percentage of monthly income spent on winter bill in Hajvali

On Prishtina's level, the population spends more on electricity than the Hajvali area. However, certain similarities emerge when comparing the two; both samples clearly point out that electricity is taking a large share of monthly disposable income, making it less affordable to the average citizen.

Furthermore,

Figure 7.1-3 presents a graph of UK percentage of household disposable income that was spent on electricity from 2002 to 2012. It can be observed that the poorest fifth of the households as of 2012 spent as much as 11% on electricity on a monthly basis, while the richest fifth only 3%. On the other hand, Hajvali citizens spend much more when compared to UK. The majority of houses (27 out of 40) spend between 6%-15% on electricity bills.

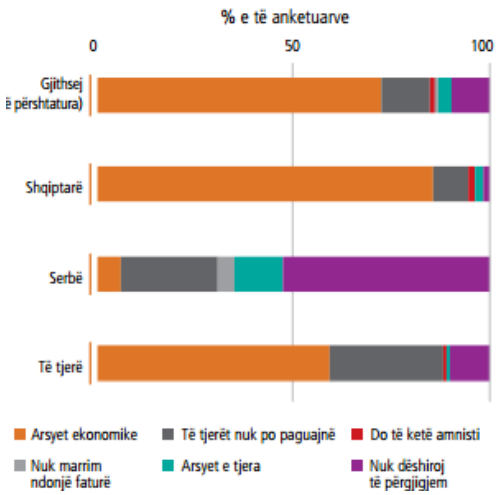


Source: Office for National Statistics; Full Report: Household Energy Spending in the UK, 2002-2012 (2012)

Figure 7.1-3: Percentage of Household Disposable Income Spent on Energy in UK

The data of the surveys also support the UNDP findings of the macro level; the orange, representing lack of income as a factor behind nonpayment of bills, dominates amongst the Albanian ethnicity as it can be observed in Source: UNDP: Energy prices and economic trends (2007)

Figure 7.1-4. The surveys also concluded that the majority of homes have financial difficulties in payment of bills as Figure 7.1-5 points out. Based on the sample studied from Hajvali, the situation has not much improved since 2007. Citizens are still finding themselves in financial difficulties when it comes to paying their electricity bills.



Source: UNDP: Energy prices and economic trends (2007)

Figure 7.1-4: Reasons behind nonpayment of bills

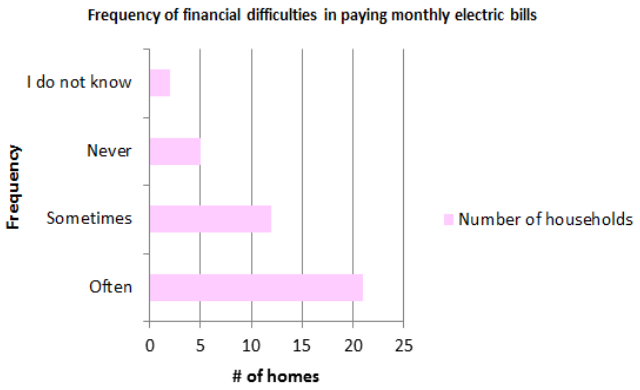


Figure 7.1-5: Frequency of financial difficulties in paying monthly bills

However, despite the high prices of electricity, KEDS has no other choice but to keep up with the market demand and introduce further increases to the prices. This comes partly because of insufficient domestic supply, where around 10% of electricity is being imported from neighboring countries (Task Force on European Integration, 2012). Furthermore, the transmission system is old and inefficient, where commercial and technical losses were 36.69% of total electricity production as of 2012. Lowering the prices thus is not an option; KEDS might try to invest in strengthening the transmission system, rehabilitating the two existing power plants, or build up a new power plant, but there is little possibility of prices going down.

7.2. Analysis on service quality and study comparisons

Dissatisfaction with the service quality might make citizens less diligent about regular bill payment and thus decrease the bill collection rate. From the survey answers,15 households (37.5%) reported that they have frequent power cuts and poor power, 14 (35%) said they face the problem of poor power and cuts every now and then, 6 (15%) reported on rarely encountering problems with available electricity while 5 (12.5%) said they don't really know. From the data collected, it is clear that customers are not happy with the quality of service and thus might refuse payment for something they don't like.

There are also many citizens of Hajvali that believe the price of electricity does not line up with their consumption patterns. When asked whether they believe the price of electricity lines up with consumption, 67.5% of the sample answered no, 20% answered yes, while 12.5% did not know or gave no answer. This is also the case in the macro level, as Zeri newspaper reports (Zeri report, 2014). In October 2014, many citizens filed complaints and lined up outside of KEDS' building to demand answers in sudden inflation of their monthly bills. There are consumers who claim to pay as much as 50% more for electricity on October 2014 as compared to September (Zeri report, 2014). The belief of the citizens is not supported by actual data but it is still present both in the results of this project as well as other newspaper reports around Kosovo. KEDS agrees that the complaints increased but they consider it to be quite a normal situation given that the winter months are approaching and the electricity tariffs are generally higher. Guri Shkodra, an official of KEDS claims that there is no way for mistakes in the system; consumers are charged what they spent on the respective months; the electric meters are digital, new, and have been properly checked from the respective ministries prior to installation (Zeri report, 2014). However, the belief is there and must somehow be addressed as there will be an increase in the bill collection rate if the citizens trust the system, the power is strong, and there are immediate penalties put in place in case of nonpayment. The distribution company needs to win customers' trust in regards to fairness in billing.

7.3. Analysis on efficient consumption and study comparisons

Lack of knowledge about tariff structures and efficient electric appliances are yet other factors contributing to inflation of monthly electricity bills and thus irregular payments because of affordability problems. From the surveys collected, 37.5% of the 40 households did not have knowledge about the current tariff structures, and only 5 households looked at the efficiency label when purchasing new appliances.

Table 7-1 and Table 7-2 respectively present a comparison between the macro level studies in E.U, USA, and Prishtina with Hajvali in regards to using efficient light bulbs in the households. In 2007, 46% of EU households used efficient lightbulbs, in 2010 in Prishtina, Kosovo 33% use efficient light bulbs (Bowen et al., 2013). The project investigation further more narrowed the research to find out that as of 2014, 32.5% of homes in Hajvali (from the sample) use a type of fluorescent lights, indicating that compared to the capital the percentage is quite high, and the Hajvali citizens may be more efficient in choices of light bulbs as compared to Prishtina.

Table 7-1: Fluorescent lightbulb use across EU, USA, and Prishtina

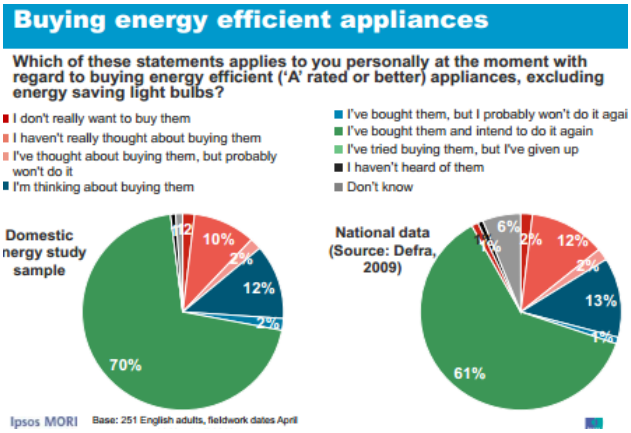
Region	Any type of Fluorescent
EU (Average)	2007=46%
USA (EIA)	1993=42%
Prishtina (Kosovo)	2010=33%

Source: (Bowen, Myers, Myderrizi, Hasaj, & Halili, 2013)

Table 7-2: Hajvali fluorescent lightbulb use from primary data

Type of light bulb	Percentage of homes
Incandescent	47.5%
CFL/LED	20%
Combination	32.5%

Figure 7.3-1 and Figure 7.3-2 compare a UK study on energy efficiency conducted by Intertek in 2011 with the Hajvali sample in regards to the frequency of checking for energy efficient labels when buying new appliances.



Source: (Jean-Paul Zimmermann et al. 2012)

Figure 7.3-1: UK study on whether households buy efficient appliances

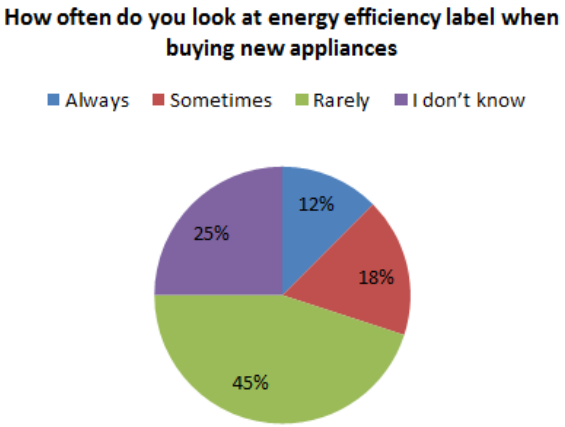
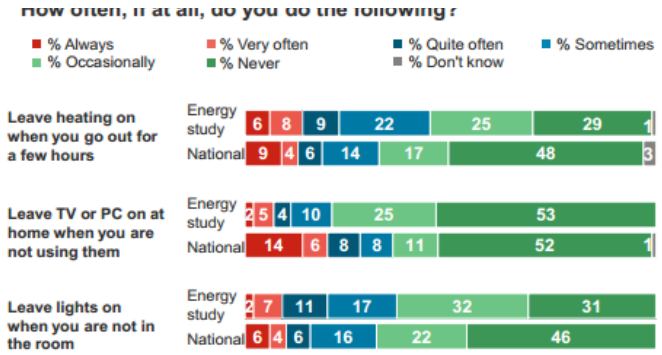


Figure 7.3-2: Hajvali study on whether households buy efficient appliances

61% on the national level and 70% of the sample size in UK report that they have bought energy efficient appliances and intend to do it again, while an insignificant percentage doesn't know what efficient appliances (Jean-Paul Zimmermann et al. 2012). Contrary to UK, surveys collected in Hajvali report that 45% rarely buy energy efficient appliances and 25% are not even

aware what energy efficient appliances are. The population of Kosovo and Hajvali in this case needs to be educated in this particular field as Kosovo is lacking behind in comparison to more developed countries.

Lastly, Figure 7.3-3 and Figure 7.3-4 compare the results of this project with the UK report on household electricity survey in 2011when asked on the frequency of forgetting to turn off appliances.



Source: (Jean-Paul Zimmermann et al. 2012)

Figure 7.3-3: UK report on forgetting to turn off appliances

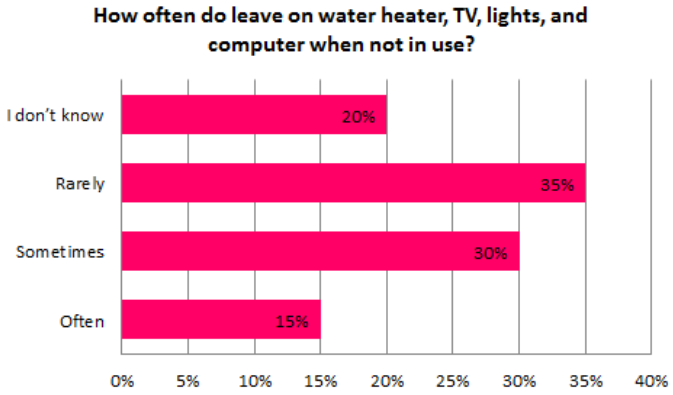


Figure 7.3-4: Hajvali report on forgetting to turn off appliances

Up to53% of households in UK report that they never forget to turn off electric appliances such as TV, water heater, lights, and others when not in use. There is a very small percentage both on the national level and of the sample that forget the appliances on (Jean-Paul

Zimmermann et al. 2012). The surveys conducted in Hajvali however give slightly different results. 35% of the households rarely forget the appliances on, while 15% report on often forgetting to turn off appliances. When comparing the two studies, Hajvali citizens are more negligent towards turning off appliances when not in use than the UK counterparts. This indicates that electricity is being wasted in Hajvali on the household level and consumers are paying more on a monthly basis for an electricity bill that would have been much lower if the consumers were more diligent.

Chapter 8. Recommendations and conclusions

Nonpayment of electricity bills is a serious issue that brings along substantial consequences to KEDS as well as the well-functioning of the economy of Kosovo in general. As such it must be addressed properly. Since the potential root causes of the problem were identified in the previous chapters, there are some possible recommendations presented below that could aid in increasing the bill collection rate and improve the efficiency of the currently established electricity fund:

1. Disconnection from electricity supply to all debtors and application of reconnection fees
2. Re-introducing cheaper tariffs during the day time
3. Education of Hajvali's citizens on energy efficiency and tariff structures
4. Increasing the transparency of KEDS electricians to ensure consumers that they are being charged for actual consumption
5. Improvement of the currently established social assistance fund for the low income families

The sections to follow will address each recommendation in detail and present monetary approximation of costs when available and appropriate.

8.1. No payment, no service

Electricity as any other commodity good available in the market demands regular payment for any kWh consumed throughout the month. Thus, the families that are above the poverty line but are not regular on their bill payment should be disconnected from the supply system following a one month notice. As Mr. Erbas reported, each household in Hajvali can be individually disconnected from the system without causing damage to the neighboring households. This is already being applied throughout the country to some degree; however there are certain improvements that can be made to strengthen the current system outlined in the bulleted list next page:

- Increase the deadline notice to 30 days rather than 15
- Attach a separate sheet of paper to the bill to notify the consumers of payment deadline
- Apply reconnection fees to households that have been disconnected due to nonpayment, either linearly or depending on the amount of time elapsed since the last disconnection

A debtor of electricity as of January 2015 receives a notice of disconnection from the supply network 15 days prior to the deadline. Consumers however might not be able to allocate the needed amount of money within a two weeks' time. Increasing the disconnection notice to 30 days prior the deadline might make them aware of the consequences to follow ahead of time, and meanwhile give sufficient amount of days to allocate the proper amount of money. Moreover, the notice can be attached in a separate sheet of paper rather than the receipt as it would increase the probability of the customer noticing the date of the deadline. Given that there are approximately 2,300 households in Hajvali and a sheet of paper costs around 3 eurocents, KEDS would have to spend an additional €828 on a yearly basis to print the notices on additional sheets of paper.

Lastly, appliance of reconnection fees to every debtor that has been disconnected from the supply network because of irregular payments would probably induce customers to be more diligent in the payment deadlines. The fees could either be applied linearly to all disconnected customers without taking into account the passage of time, or increase with increases in time elapse since the last disconnection. So, the fee can either be applied as percentage of total payment, much like an interest rate, or it can be stationary to all families. Market conditions should be analyzed in order to choose the best combination to KEDS without harming the customers. The strategy is quite reasonable given that KEDS has 100% of market share in electricity distribution and customers have no other substitute company to consume electricity from.

8.2. Re-introduction of cheaper tariffs during the day time

Before the electric meter installation across the country, Kosovo citizens could use electricity on the cheap tariff during some hours of the day as well as night time. Now, the cheap tariff only applies throughout the night, hurting customers that don't have nonstop access to

water. From the sample of Hajvali, 42.5% didn't have water during the night time, making it impossible to use electricity at that time for activities that require water. Re-introducing the cheap tariff throughout certain hours during the daytime would probably aid in deflation of monthly bills, increase their affordability and consequently the bill collection rate.

8.3. Educating the citizens toward a more energy efficient lifestyle

From the results section, it is apparent that the sample of Hajvali is energy efficient in some ways already known to them but lack knowledge in other spheres of energy efficiency. For example, as Table 8-1 points out, there are many households that are unaware of additional ways of conserving energy such as knowledge about tariff structures, purchasing of energy efficient appliances and efficient light bulbs, or turning off appliances when not in use.

Table 8-1: Percentage of households that are energy inefficient

Lack of knowledge about tariff structures	37.5%
Don't know what energy efficient appliances are	25%
Often leave electric appliances on when not in use	15%
Rarely search for energy efficient label when buying new appliances	45%
Have electric appliances purchased before 1990s	25%
Have incandescent lights	47.5%

It is thus necessary to undertake actions in educating the population about additional ways of conserving energy. Some ways to approach the problem are listed below:

- TV, newspaper, or social media ads on energy efficiency
- Seminars or educational programs for the general population
- Through KEDS electricians' instructions when picking up monthly balance inquiry
- Through salespeople informing citizens about energy efficient appliances when purchasing from a store

Educating the citizens through television or newspaper advertisement would mainly help in targeting the older population but could potentially help raise awareness about energy efficiency. The three national televisions of Kosovo charge on a range of €3-€12 per second of advertisement depending on the chosen launch time (Independent Media Commission, 2011). Given that on average an advertisement to raise awareness is maximum 60 seconds long, the price for a single television advertisement could range anywhere between €180 to €720. On the other hand, social media advertisement via Facebook, Twitter, Instagram, etc. might as well come for free without incurring additional charges. The advertisements on social media should mainly target the younger generations who are computer-literate.

Educational programs or seminars are yet another way of increasing awareness about additional ways of conserving electricity. When asked, 82.5% of the interviewed households reported that they would like to be consulted by professionals in increasing the measures of energy efficiency. Given that the customers are already willing to participate in such programs, it would be a good strategy to organize seminars all over the country on one, two, or three sessions. Participants can be charged a small amount of money which might cover up the transportation costs of the tutors. A cost benefit analysis can be further done on such matter to see whether taking this approach would be profitable and increase the bill collection rate.

Lastly, KEDS electricians or salespeople can be middlemen between different ways to conserve energy and the average citizens. It would be a good strategy also for KEDS as they would not incur additional costs in making sure the electricians are also advising households about energy efficiency whenever they pick up the monthly balance inquiry. Moreover, salespeople on different stores could also advise the citizens about energy efficient appliances and their benefits on the long run.

8.4. More transparency, happier customers

From the results, one can observe that out of the 40 households surveyed, 5 were frequently consulted by KEDS officials on a monthly basis in regards to kWh spent on the respective time period. 28 households or 70% reported that electricians only measure the kWh spent on the electric meters and head off without any individual explanations to the residents in regards to electricity consumption and charges. Moreover, 67.5% of the households had a belief

that monthly electricity bills are inflated and they are being charged more than they consume on the respective month. Even though the kWh spent are presented on the invoice every month, it would be of additional benefit if all KEDS electricians explain to the individual households the kWh spent that particular month both in the cheap and expensive tariff. This would then ensure the customers that the kWh on the electric meter matches with the respective invoice. The strategy is advantageous from the consumer's point of view as well as KEDS given that the latter will encounter no additional costs in implementing the strategy, but will possibly help in increasing the trust of its consumers and as a result the bill collection rate.

8.5. Improvement to the social assistance fund

Kosovo's citizens that live below €1.72 per day per adult and families of martyrs and war veterans are entitled to receiving social assistance from the government. The electricity social assistance fund is part of the general assistance scheme and covers the first 400 kWh a month for all families within the scheme. The fund has been established in 2005 and ever since an approximate amount of 4.5 million euros is being allocated annually for electricity consumption and paid directly to the distribution system. However, there are certain adjustments to be made in regards to the social assistance fund in order to increase its efficiency and use. The possible modifications are presented below:

- Adjustment of the budget with changes in electricity prices
- Taking into consideration the size of the family when offering assistance for electricity payment
- Establish a last resort fund for low income families that have received a disconnection notice and have passed the threshold of 400 kWh
- Settle the disputes between KEK and the ministry as far as subsidizing electricity for the low income families.

Firstly, according to Nexhat Syla, an official from the Ministry of Labor and Social welfare, the amount of 4.5 million euros for electricity subsidization has remained stationary ever since 2005. Increases in electricity prices have not been taken into account which indicates that fewer families are being subsidized with electricity from the 4.5 million euros. Thus, adjusting the budget with increases in electricity prices would ensure that all low income families

of the social assistance scheme are still being covered. There are approximately 1,830 families that are covered by the social assistance scheme in the municipality of Prishtina as of October 2014 according to Nexhat Syla (data specifically for Hajvali were not provided) with 400 kWh per month. Currently, the price of electricity is 5 eurocents per kWh, indicating that on a yearly basis around €439,200 are being spent on electricity subsidization for the 1,830 families. Assuming that the price of electricity increases by 10% to 5.5 eurocents per kWh with the number of families under the social assistance scheme remaining constant, €483,120 will have to be allocated for electricity subsidization, an additional €43,920 for Prishtina alone. This would however ensure that all low income families are being covered with electricity subsidization and no family is left out because a limited, unchanging budget. The summary is outlined below in Table 8-2.

Table 8-2: Additional monetary subsidies if eurocents per kWh went up by 10%

Families	1,830
Increase in eurocents per kWh	10%
Additional costs	€43,920

Secondly, the assistance fund currently subsidizes the first 400 kWh of electricity to all low income families linearly without considering the family size. However, taking into account the size of the family might increase the efficiency of the fund. Thus, as Figure 8.5-1 illustrates families with fewer members, will have a lower threshold of kWh (such as 200 kWh) subsidization given that on average they spend less electricity on a monthly basis. On the other hand, extended families of many members will be covered with a higher threshold of kWh per month as they tend to consume more electricity. This would ensure equality and fairness to all covered families. Moreover, this would reduce the possibility of a deadweight loss or a free rider problem given that smaller families will be provided with a lower threshold subsidized per month, reducing the probability of overconsumption and increasing the efficiency of the fund.

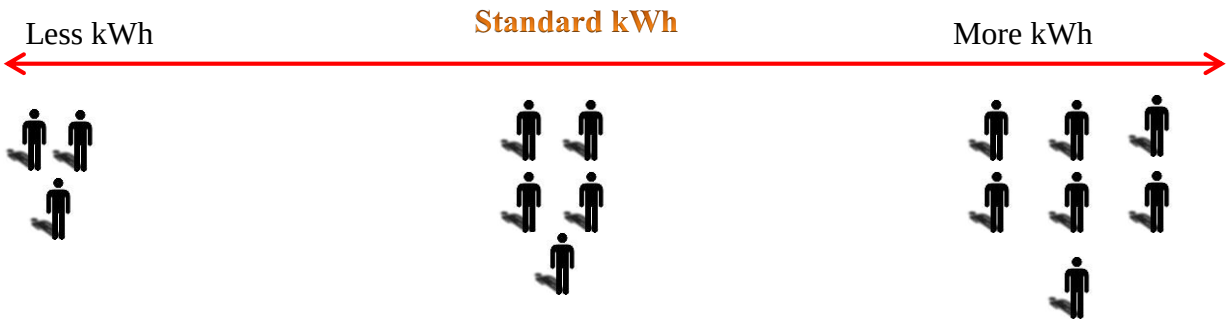


Figure 8.5-1: Improvements to the fund to reduce overconsumption

Thirdly, low income families might every so often pass the threshold of 400 kWh per month and receive a disconnection notice. However, given the low level of income generated on the household level, families will often find difficulties in allocating the money for bill payment and thus might risk disconnection. An establishment of a last resort social assistance fund might help the families overcome the situation. However, the use of the fund from a certain family has to be restricted to a certain number of times as to prevent overuse and decreases in its efficiency. The fund would serve as a safety net to all low income families that cannot allocate the needed money for monthly payment.

Lastly, as of 2014 KEK has had a dispute with the Ministry of Labor and Social Welfare, the Ministry of Economic Development, and KEDS in denying subsidization of €1,715,979.78 for electricity consumption of low income families in the first half of 2014. The issue between KEK, KEDS, and the ministries should be addressed immediately as otherwise the low income consumers will risk disconnection since electricity has not yet been subsidized for the January-May period by KEK.

8.6. Conclusions and future directions for other studies

The project tried to identify some of the factors behind nonpayment of electricity bills in Hajvali. It started with a general review of the electricity situation in United States, Europe, and Kosovo in terms of bill affordability, efficient consumption, and service quality, then narrowed down to the situation in Hajvali. After the identification of factors, an analysis was conducted to elaborate further on the gathered data and make comparisons with other studies. Finally, some

recommendations which would benefit both customers and KEDS were proposed to increase the bill collection rate, and improve the efficiency of the social assistance fund.

Because of the time constraint however, the project didn't take into account other factors as to why the citizens behave in such ways. Even though slightly covered in appendix A, another reason why people don't pay their bills is because even if disconnected from the system, they engage in electricity theft. Figuring out what percentage of Hajvali citizens steal their electricity and what measures can be taken from KEDS to stop such behavior, would enrich the study even more.

Additionally, the same study can also be done on Prishtina and Kosovo as a whole as there are very few researches conducted on the household level. Other researches can also expand to the industry sections of either Hajvali or any other region and compare between the commercial and household sectors in terms of energy efficiency, affordability of bills, and satisfaction with the service quality. Having sufficient knowledge about reasons behind nonpayment of bills makes it easier to address the issue and possibly increase the collection rate.

Lastly, KEDS has claimed on several of its reports that Hajvali has an old distribution system that needs reparation. This opens up further opportunities for cost benefit analyses on the costs of reconstructing this system and the benefits it would bring to the citizens. Analysis can be done on the costs of a new transmission system or rehabilitation of the current, and the possible increases in bill collection rate that come as a result. If the bill collection rate increases enough as to cover and exceed the costs of reconstruction, the project will be worth taking.

The conducted research together with the above proposed ideas for future studies on the topic would help enrich the project, and would possibly help in increasing the bill collection rate of electricity bills across the country. Additionally, they could aid in improvement and renovations of the transmission systems, decrease the amount of illegal behavior such as electricity theft, and help in increasing energy efficiency in household and commercial consumption patterns.

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Appendix A. Theft of electricity

Theft of electricity might be a big contributor to the reasons behind nonpayment of bills. However, because it is a delicate topic, the questionnaire did not contain any questions in regards to theft of electricity and KEDS officials did not provide a specific amount. Still, other studies can be conducted on the theft rate of electricity in Hajvali since there is proof that electricity is being stolen. As Figure A-1 shows, two of the forty households reported voluntarily that they don't pay their bills because even if they are disconnected from the service they engage in electricity theft.

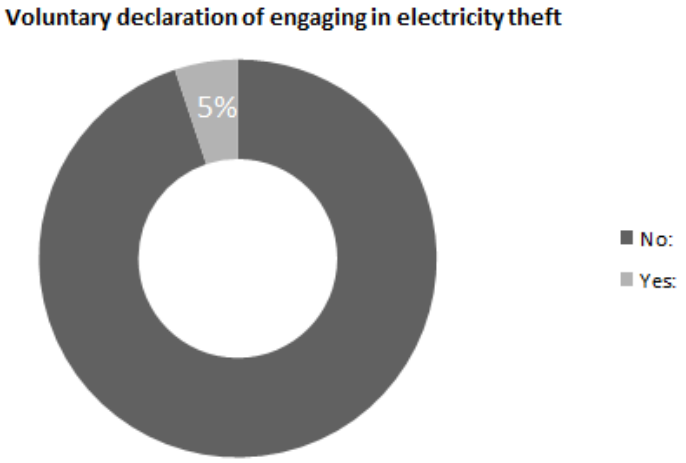


Figure A-1: Voluntary declaration of engagement in electricity theft

Appendix B. Regression analysis and the statistical significance of the factors

A statistical test was seen as appropriate to observe whether the factors are statistically significant in explaining the nonpayment of electricity bills within the sample. Table B-1 lists the dependent and the independent variables as well as the statistical significance of each. Level of error (alpha) is assumed to be 10% given that the sample size is too small. Every variable with a p-value below 10% is considered to be statistically significant in explaining the dependent variable. The raw data can be observed in **Error! Reference source not found.**

Regression Analysis: Difficulties versus Winter bill/, Transparancy, ...

```
The regression equation is
Difficulties in paying bills = 0.480 + 1.96 Winter bill/Income
                               - 0.176 Transparancy of KEDS
                               + 0.259 Tariff structure
                               - 0.097 CED or incandecscent
                               - 0.106 Pay lines up with consumption
                               - 0.080 Look at efficiency
                               + 0.023 Leave appliances on


Predictor                       Coef  SE Coef      T      P
Constant                      0.4796   0.2338   2.05  0.049
Winter bill/Income            1.9634   0.9681   2.03  0.051
Transparancy of KEDS         -0.1762   0.1254  -1.41  0.170
Tariff structure              0.2588   0.1464   1.77  0.087
CED or incandecscent         -0.0967   0.1542  -0.63  0.535
Pay lines up with consumption -0.1059   0.1272  -0.83  0.412
Look at efficiency            -0.0798   0.1232  -0.65  0.521
Leave appliances on            0.0228   0.1313   0.17  0.863


S = 0.372069   R-Sq = 30.8%   R-Sq(adj) = 15.6%
```

Figure B-1: Minitab table of regression analysis

Table B-1:Variable Definition

Variable	Description and statistical significance
Difficulties in payment of bills on a monthly basis	This is the dependent variable. Consumers were asked to answer on the frequency of difficulties in paying monthly electric bills, rather than directly being asked in whether they pay or not. In Minitab Yes, they have

	regular problems with payment of bills is coded with 1 and 0 if otherwise.
Winter monthly bill as a percentage of monthly disposable income	Because winter bills take up a larger share of monthly household disposable income, this is the only variable tested for in regards to income. It is the only quantitative variable thus it needs no coding. Its p-value is 0.051<0.10, making it statistically significant in explaining the dependent variable at alpha level of 10%. It has a positive correlation with the dependent variable, indicating that an increase in % of winter bill to total income, will increase the frequency of difficulty in paying bills on a monthly basis.
The degree of KEDS officials' transparency when measuring the electric meters	This variable is qualitative in nature thus it is coded as 1 if the KEDS officials are transparent with consumers in explaining monthly consumption, and 0 if otherwise. The p-value is 0.17 meaning it is statistically insignificant in explaining the model at 10% alpha.
Awareness of consumers about tariff structures and cheaper electricity times	The variable is also qualitative in nature. It is coded with 1 if the consumers are **not** aware of the current tariff structure and 0 if otherwise. The p-value is 0.08<0.10, making it statistically significant in explaining the model. It has a positive correlation with the dependent variable, meaning that the more the consumer are **not** aware of tariff structures, the more difficult they find it to pay their monthly bills.

CFL or incandescent lights in the house	The variable is qualitative in nature and is coded with 1 if the households have incandescent lighting 0 if CFL. The p-value is really high thus it is statistically insignificant at 10% alpha.
Does consumption of electricity line up with monthly payment?	The variable is qualitative in nature and is coded with 1 if consumers think what they pay is fair and 0 otherwise. The p-value is high thus it is statistically insignificant at 10% alpha.
Consumers look/do not look at efficiency labels when buying appliances	The variable is qualitative in nature and is coded with 1 if consumers often look at efficiency labels when buying appliances and 0 otherwise. It is statistically insignificant in explaining the model.
The frequency of leaving appliances on all the time	The variable is qualitative in nature and is coded with 1 if the consumers leave appliances on all the time and 0 if otherwise. It is statistically insignificant in explaining the model
R-squared	The coefficient of determination or r-squared is 30.8%, meaning that 30.8% of all variability is explained by the current variables. The other 69.2% remains unexplained by the independent variables.

Two of the seven main factors in explaining the difficulties in monthly payment of bills are statistically significant in explaining the model. The rest are not maybe because of the small sample size that might not have been really representative of the whole population of Hajvali village. Also the dependent variable and almost all independent variables apart from percentage

of winter monthly bill to total monthly income are qualitative in nature thus there might have been errors on coding, given that Minitab can only code variables as 1 or 0 and there are no other options. For example, on the frequency of looking at energy labels when buying new appliances, the variable was coded as 1 if often and 0 if otherwise. If there had been other options available such as 2 for sometimes, and 3 for rarely, then maybe the Minitab output would have given out more significant variables. On the other hand, if variables were quantitative in nature the results would have probably been more significant due to the nature of the software that is mostly designed for quantitative rather than qualitative ways to measure data.

Winter bill as a percentage of monthly disposable income and the knowledge of tariff structures are the only two variables statistically significant in explaining the model. Running the regression on only these two variables gives out p-values that are smaller than 0.05 for both, indicating that they are significant at 5% level of error if they were the only variables picked in explaining the model. Figure B-2 provides a graphical display of the normality and independence test for the winter bill as a percentage of monthly income given that it was the only quantitative variable.

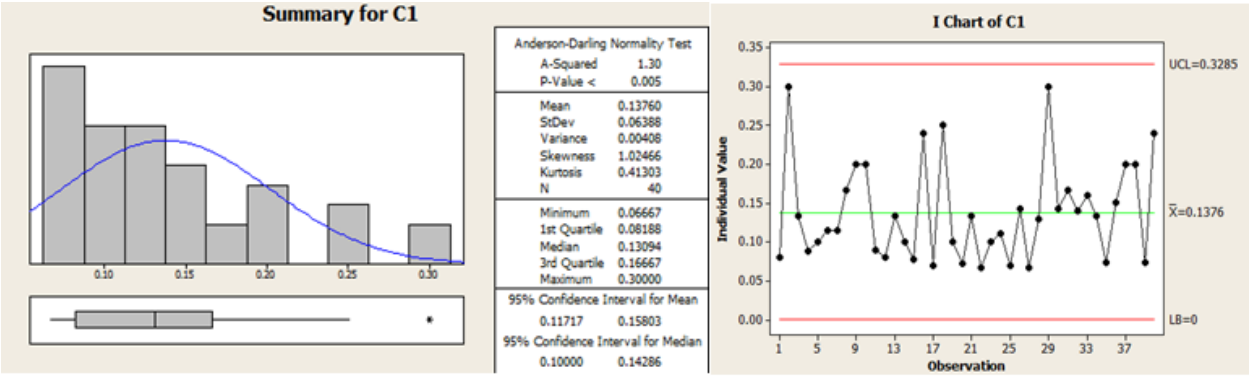


Figure B-2: Normality and independence check of winter bill/income

The data are not normally distributed given that most of the percentages belong in the lower range of 0-20% of total household consumption. However, there are five houses in which monthly electricity bill takes up more than 20% of the household income. There are two outliers to the data as two houses out of forty spent 30% of their disposable income on payment of electricity bills. However, the data seem to be independent over time given that none of them is

above or below the control limits of 0 and 0.3285, and the data are distributed below and above the mean in no particular order (no 6 rising or 6 falling in a row). On average, a household out of the 40 surveyed spends 13.76% of its monthly budget on electricity. If is worth keeping in mind that most of the houses had less than 20% of its residents employed.

Appendix C. Interviews

1.Interview with Agim Krasniqi:

1) How is the social assistance fund allocated in terms of electricity?
2) Is the electricity fund part of the general social assistance scheme?
3) Does the budget go directly to KEDS or is it sent to the families on a monthly basis?
4) Is there any fund of last resort for all families that risk disconnection from the service?
5) Are other utilities also subsidized from the government or is it just electricity?
6) What are the ways to improve the current assistance fund?

2.Interview with Nexhat Syla:

1) How much of the 4.5 million euros of the assistance for electricity goes to the municipality of Prishtina?
2) Do you have any data for Hajvali?
3) How many families are covered in the municipality of Prishtina and Hajvali?
4) Has the fund of 4.5 million euros increased accordingly with the increases in energy prices?
5) Have you encountered any problems in the continuation of the fund ever since the distribution system was privatized into KEDS?
6) Is the 400 kWh per month rate standardized to all families? Do poorer or larger families get a higher threshold of assistance?
7) How many times a year is the fund refreshed to see if the families still fulfill all criteria of social assistance?
8) What improvements are you planning to make in the future?

3.Interview with Alper Erbas:

1) What is the bill collection rate in the village of Hajvali and in Prishtina on a yearly basis? In winter? In summer?

2) What is the average debt per household on an annual basis? The village as a whole? Prishtina?
3) What are your strategies to motivate people to pay their bills?
4) Do people disconnected from the service because of nonpayment pay a penalty fee when they reconnect to electricity and does this fee increase the longer they don't pay?
5) Is the energy transmission system built in such a way that it can turn off electricity in certain parts of the village of Hajvali without harming the rest?
6) What would the monetary gain be in approximation if the bill collection rate was higher for Hajvali and Prishtine in general?
7) What appliances consume most of the energy? Please elaborate
8) Are the bills issued in a regular monthly basis?
9) Do the houses in Hajvali have electric meters installed? Do they work properly?
10) In your opinion what is the main reason behind nonpayment of bills?
11) Is there any NGO or government fund you are aware of that offers financial assistance to those who are unable to pay their utility bills?
12) What are your plans for helping the low income group with the payment of bills?
13) Do you have any approximation of what is the increase in percentage terms of the bill collection rate ever since the privatization?
14) What measures are taken towards people that engage in electricity theft? Do you have a rough idea of how many households steal their electricity in Hajvali (the ones detected)?
15) Have you ever considered synchronizing with the water company to provide cheap electricity to the households when there is water availability

Appendix D. Survey questions

Family Background

F1. Type of Family

Nuclear	1
Extended	2

F2. Number of People in Household

	M	F
Total (without diaspora)		
Employed		

F3. Are you the main income earner in this family?

Yes	1
No	2

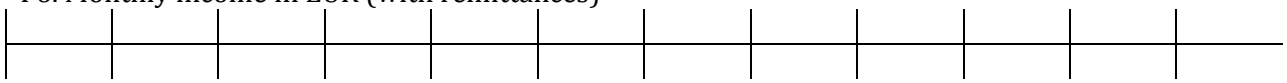
F4. Are you aware of any governmental assistance programs which support you with paying electricity bills?

Yes	1
No	2

F5. Do you receive any special governmental assistance for the payment of electricity bills?

Yes	1
No	2

F6. Monthly income in EUR (with remittances)



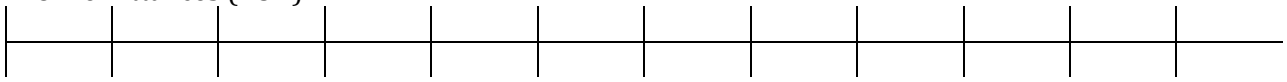
0 100 200 300 400 500 600 700 800 900 1000 1000+

□ Prefers not to disclose

F7. Frequency of remittances if any:

Weekly	1
Monthly	2
Semi-annually	3
Yearly	4
Occasionally	5
As needed	6
None	7
Other	8

F8. Remittances (EUR)



0 100 200 300 400 500 600 700 800 900 1000 1000+

□ Prefers not to disclose

F9: What is the highest educational degree you have obtained?

Elementary	1
High School	2
Undergraduate	3
Graduate (MS,MA,PhD)	4
Other	5

Heating/Cooling

H1: Do you use electric heating as your primary source of heating?

Yes	1
No	2

H2. Can you tell us about the following appliances in your home?

Heating/Cooling	Age
Electric Space Heater	
Portable electric heater	
Electric quartz heater	
Air conditioner	
Water heater/boiler	

H3. Please select your primary, secondary, and tertiary heating systems or sources that you use in your home?

		Primary	Secondary	Tertiary
A	Wood Cook Stove	1	2	3
B	Wood Stove	1	2	3
C	Pellet Stove	1	2	3
D	Central Heating	1	2	3
E	District Heating	1	2	3
F	Electric Space Heater	1	2	3
G	Portable Electric Heaters	1	2	3
H	Electric quartz heater	1	2	3
I	Other:	1	2	3

H4. Utility Room Appliances

Utility Room Appliances	Age
Washing machine	

H5. - Table

		Always	Sometimes	Rarely	Don't know
A	Do you look at energy efficiency labels when I buy new appliances	1	2	3	4

H6. Do you know that the cost of electricity varies by time?

Yes	1
No	2

H7. Table

Kitchen Appliances	Age
Refrigerator	
Chest freezer	

H8. Table

	Often	Sometimes	Rarely	Don't know
Do you leave your TV, water heater, PC, or lights on at home when you are not using them?	1	2	3	4

H9. Table

Lighting	Tick what applies
Incandescent light bulbs	
CFL/LED bulbs	
Combination	

Electricity/Water

E1. Please provide information on the following appliances:

Other	Quantity	Age
Electric generator		
Well pump		
Tank pump		

E2. How much EUR, on average, do you pay for electricity during the following seasons?

A	Summer	
B	Winter	

E3. How often do you have financial problems paying the following bills?

		Often	Sometimes	Never	Don't know/No answer
A	Electricity	1	2	3	4

E4. What is the frequency of electricity cut offs and poor power?

A	Often	1
B	Sometimes	2
C	Rarely	3
D	Don't know	4

E5. Do you have water during the night?

Yes	1
No	2

E6. Do you communicate with KEDS employees when they come to register electricity consumption on electric meters? *(Do they tell you how much kWh you have consumed?)*

Yes	1
No	2
Sometimes	3
Do not know	4

E7. Would you please rate the quality of the electricity distribution services?

		Very good	Good	Average	Bad	Very bad	Don't know
A	Before Privatization	1	2	3	4	5	6
B	After Privatization	1	2	3	4	5	6

Behavioral Patterns

B1. Do you think electricity prices have increased during the past years?

Increased	1
Stayed the same	2
Decreased	3
Don't know	4

B2. How often do you look at the energy efficient label and the price when purchasing a new appliance?

	Always	Sometimes	Rarely	Don't know
Price	1	2	3	4
Efficient Energy label	1	2	3	4

B3: In your opinion do monthly bills line up with consumption of electricity?

Yes	1
No	2
Do not know	3

B4. Which of the following energy-saving measures are you planning to apply in your household in the near future?

		Will Apply	Will Not Apply	Have already applied	Didn't Consider
A	Energy-saving light bulbs	1	2	3	4
B	EE household appliances	1	2	3	4
C	Solar panels/photovoltaics	1	2	3	4
D	Wall insulation	1	2	3	4
E	Floor insulation	1	2	3	4
F	Double-glazed windows	1	2	3	4

Follow Up

Z1. Would you like to be consulted by professionals for energy efficiency?

Yes	1
No	2