HASHEMITE KINGDOM OF JORDAN

Electricity Subsidies and Household Welfare in Jordan

Can households afford to pay for the budget crisis?[1]

Background paper for the Jordan Poverty Reduction Strategy

December, 2011

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Introduction

The Government of Jordan (GoJ) is currently facing a major financial crisis in the electricity sector. Due to disruptions of gas supply from Egypt, the cost of producing electricity in Jordan has increased by several folds in 2011. As a result, NEPCO, the public transmission company that bears all the costs of increases in fuel prices, is currently running a deficit of an estimated 100 m. JD per month. According to NEPCO, by the end of 2011, the company's debt will have reached 1.2 bn. JD and an extra 1bn. JD is forecasted for 2012 if gas supply will not resume regularly from Egypt. If NEPCO's debt rises to 2.2 bn. JD by the end of 2012, this would amount to approximately 35% of government expenditure and 11% of GDP.

One of the evident measures to be taken by the government to face the current financial crisis is to increase electricity tariffs. This paper has the objective of estimating the cost recovery capacity of increases in tariffs and the effect of these increases on household welfare. In particular, we wish to estimate how far increases in tariffs can be pushed under different behavioral assumptions. Can cost recovery of the current NEPCO's deficit be achieved by solely increasing tariffs? Economic theory would suggest that this is a sensible approach but the scale of the problem is such that households may not be able to cope. This paper wishes to shed some light on this question.

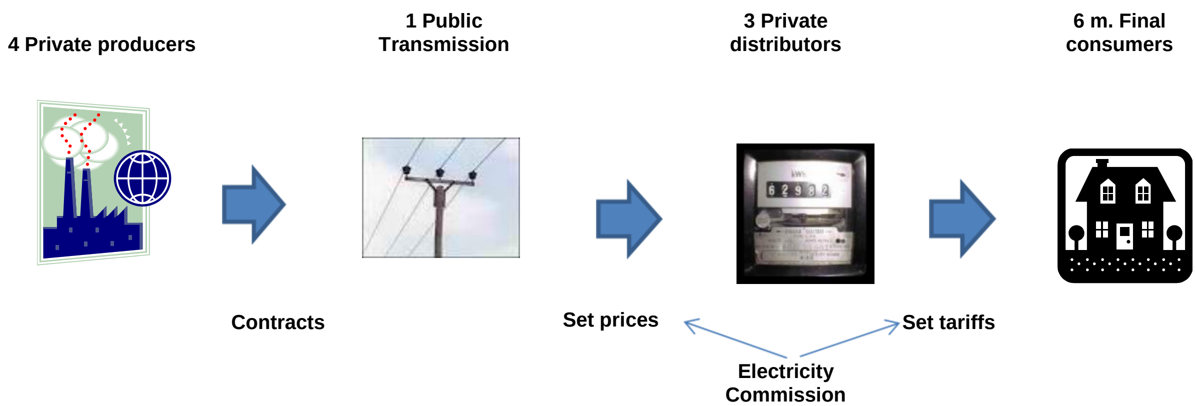
Results suggest that households will not be able to absorb increases in tariffs to cost recovery levels. Increases in tariffs to cost recovery levels would be in the range of 200-500% across the board depending on the assumptions made. With more realistic increases in tariffs in the range of 30-60%, households would be able to cover in between 3% and 25% of the total monthly deficit depending on the assumptions made. These cost recovery levels exclude debt repayments of the cumulated debt and exclude the increased cost for households of general inflation generated by increases in electricity tariffs. This implies that the GoJ will have to think about a multi-tier approach to address the debt crisis and look beyond the electricity system to find financial resources able to pay for the deficit generated by the electricity system. This last issue is beyond the scope of this paper and is only briefly discussed in the conclusions.

History and structure of the electricity system

The electricity system in Jordan can be summarized in a few key developments. The first electricity company of Jordan was created in 1937 under the name of the Jordan Electricity Power Company (JEPCO). In 1967, the Jordan Electricity Authority was established to distribute electricity in selected areas and in 1996 the National Electricity Power Company (NEPCO) was added to manage the electricity network. The Central Electricity Generation Company (CEGCO) was then created to manage all generators while the Electricity Distribution Company (EDCO) was created to manage the distribution of electricity. In 2002, a new electricity law was passed to open the system to the private sector. In 2006 the privatization process initiated and in 2008 two Independent Power Producers entered the market. The privatization process is now being completed with the privatization of the last production company.

The structure of the new privatized system is relatively simple. There are four major private (or almost private) production companies, one public transmission company (NEPCO) and three main private distribution companies (JEPCO, IDECO and EDCO). NEPCO is a public shareholding company, purchases all energy from the producers and resells it to the distributors. The Chart below illustrates the system.

Chart 1 – The Structure of the Electricity System in Jordan



The sale price from the production companies to NEPCO is established by bilateral contracts between NEPCO and the producers. These contracts specify that NEPCO is responsible for the purchase of the fuel necessary for the functioning of the power stations. The sale price from NEPCO to the distribution companies and the tariffs for consumers are established by the government Electricity Commission. The tariffs are revised every two years on January unless exceptional circumstances occur, which was rather frequent during the past few years (see annex).

The existing structure of the electricity system entails that all financial risks are borne by the public NEPCO. The four private producers companies are insulated from the risks associated to changes in fuel prices as the cost of fuel is paid for by NEPCO as stipulated in the NEPCO-production companies agreements. The three private distribution companies are insulated from price increases by the tariff system in place which guarantees a positive return to distribution companies. The final consumers may or may not be subsidized depending on whether the electricity system as a whole has positive or negative returns. As a result of this particular structure, both the private production and the private distribution companies are normally financially viable while the public NEPCO can experience negative balances if fuel prices increase.

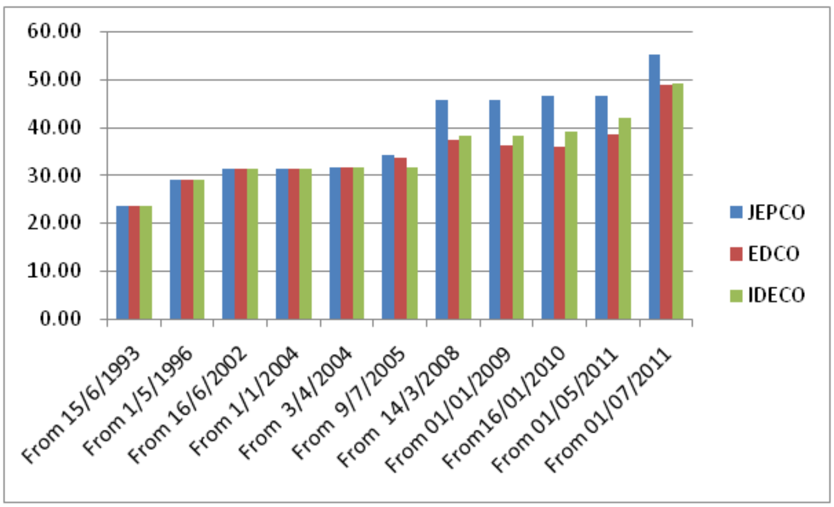
Between 2008 and 2009, NEPCO managed to maintain positive balances but at the end of 2010 the company reported a debt of over 200 m. JD. In 2011 and following the Egyptian revolution, the pipeline that transports gas from Egypt to Jordan has been subject to several bomb attacks (eight to date). This forced the Jordanian production companies to substitute gas with oil as the main source of energy and has resulted in NEPCO paying for an energy bill several folds higher than during the preceding years.

These events have changed drastically the financial situation of the electricity system and are forcing the Government of Jordan to re-think energy policies and find alternative solutions to pay for the accumulating debt of NEPCO.

Tariffs structure and prices

As described in the previous section, the electricity commission sets the sales prices applied by NEPCO to the distribution companies and the tariffs that the distribution companies apply to consumers. The sale price of NEPCO to the distribution companies is illustrated in the figure below (Figure 1). As it can be seen, sales prices have been the same for all companies between 1993 and 2004 and between 2002 and 2004 prices have remained stable. Following the beginning of the privatization process, these prices started to be differentiated across companies based on criteria that are linked to the size of the company. Since 2005 we observe both a differentiation in prices across companies and sharp increases in prices overall. Between 2005 and 2011, the purchase price has been increasing for all companies from about 35 fils/kWh to about 50 fils/kWh.[2] Increases in the latest years have been larger for JEPCO, the largest distribution company.

Figure 1 - Tariffs Paid by Distribution Companies (Fils/kWh)



Source: NEPCO

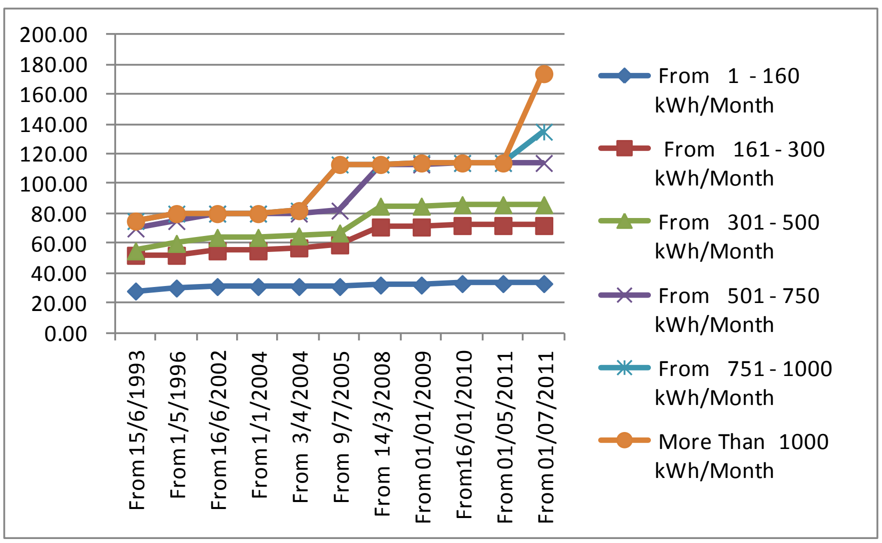
The structure of electricity prices for residential use is a complex science and countries across the world differ widely in such structure. Differences include the number of consumption brackets, the price level per bracket, the differences in prices across brackets, the progressivity or regressivity of the system, the degree of subsidies applied to each consumers' brackets and others (for a review see Foster and Yepes, 2006).

[2] One thousand fils is equal to one Jordan Dinar (JD).

The tariffs structure for consumers in Jordan is divided into six brackets depending on monthly consumption of households and to each bracket correspond an increasing price. According to the latest revision made in July 2011, prices range from 33 fils/kWh for the lowest consumption bracket (1-160 kWh/month) to 174 fils/kHh for the upper consumption bracket (more than 1,000 kWh/month). The tables in appendix provide a complete list of tariffs and all tariffs changes between 1993 and 2011. Figure 2 below depicts such changes graphically.

Monthly tariffs for households have been increasing between 1993 and 2011 from 28 fils/kWh/month to 33 fils/kWh/month for the base rate (1-160 kWh/month). Such increase has been very modest considering that is well below the inflation rate and was clearly aimed at protecting the lowest consumers. However, these tariffs apply to all consumers for the first 160 kWh consumed, which means that all consumers benefit at least in part from these very low tariffs. Tariffs beyond 160 fils/kWh/month have been increasing at a faster rate and they are now comprised in a range between 72 and 180 fils/kWh/month depending on the monthly consumption of households. Large increases in tariffs occurred in 2008 while increases after 2008 have been rather modest for all tariffs brackets except for the two top brackets.

Figure 2 - Tariffs Paid by Households (Fils/kWh)



Source: NEPCO

The structure of the tariffs system is not atypical by international standards. Most countries in the world have tariffs structures that include different prices for different consumption levels although the number of brackets can change significantly as well as the progressivity or regressivity of the system. For example, countries in the EU tend to have decreasing marginal tariffs for higher consumers while other countries including Jordan have higher tariffs for higher consumers (Table 1).

Overall, price levels in Jordan are not low as compared to other countries. For example, in 2002 prices in Jordan ranged from 0.05 to 2.4 USD /kWh/month depending on the bracket (Table 1) with an average expenditure per kWh of 0.08 USD. During the same year, average tariffs in Latin America ranged from

0.04 USD in Argetina to 0.16 USD in Jamaica with an average for the region of 0.09 USD (Foster and Yepes, 2006).

A more accurate and recent comparison can be carried out with the countries of the EU. If we compare the tariffs structure of Jordan with that of EU countries, we find comparable prices, especially with the poorer countries of the Union. This is shown in Table 1. The summary for EU countries is reported into five consumption brackets while Jordan has six brackets. These brackets have also different upper and lower bounds. However, tariffs are easily compared as most brackets overlap and it is evident that tariffs in Jordan are lower than the EU 27 average but higher as compared to one of the poorest countries in the union such as Bulgaria. In fact, for consumption above 500 kWh Jordan's tariffs are higher than the EU average while for consumption higher than 750 kWh Jordan's tariffs are higher than tariffs in Germany. It is only for the lowest bracket (below 160 kWh) that Jordan stands out as compared to the EU 27 for having low tariffs. In essence, Jordanians are not paying particularly low tariffs, not even compared to the EU and the system is already progressive, favoring low levels consumers over high levels consumers.[3]

Table 1 – EU and Jordan tariffs structure (monthly, USD)

EU brackets	EU 27	Germany	Bulgaria
Band DA : Consumption < 83.3 kWh	0.2671	0.3279	0.0930
Band DB : 83.3 kWh < Consumption < 208.3 kWh	0.1828	0.2094	0.0918
Band DC : 208.3 kWh < Consumption < 416.7 kWh	0.1643	0.1817	0.0918
Band DD : 416.7 kWh < Consumption < 1250 kWh	0.1542	0.1659	0.0920
Band DE : Consumption > 1250 kWh	0.1500	0.1610	0.0923
Jordan brackets	**Jordan**		
From 1 - 160 kWh	0.0462		
From 161 - 300 kWh	0.1009		
From 301 - 500 kWh	0.1205		
From 501 - 750 kWh	0.1598		
From 751 - 1000 kWh	0.1892		
More Than 1000 kWh	0.2438		

Source: EU and NEPCO

Estimation of subsidies

We consider as electricity subsidies the excess cost of electricity production, transmission and distribution over cost recovery levels as it is standard approach in subsidies analyses. In the case of Jordan, all the excess cost of the system is borne by NEPCO which makes the evaluation of subsidies somehow simpler than elsewhere. In essence, NEPCO's deficit can be considered as the excess cost of

[3] Note that the average electricity consumption in Jordan is lower than in EU countries and that the fixed cost of electricity supply in Jordan (power plants, power lines, etc.) are spread out over a smaller number of consumers than in the EU. This makes the unit consumer cost higher.

the electricity system and this cost can be considered as the total amount of subsidies present in the system. At present, NEPCO estimates these subsidies to be about 100 m. JD per month.

These subsidies have also quickly cumulated into a substantial debt. NEPCO has started to run into debts in 2010 and this debt has been increasing sharply in 2011 due to the disruption of gas supplies from Egypt. The company now estimates a cumulated debt of 1.2 bn. JD for the end of 2011. If gas supply from Egypt does not resume regularly next year, the company expects the cumulated debt to reach 2.2 bn. JD by the end of 2012.[4] It is therefore estimated that NEPCO's cumulated debt at the end of 2011 will amount to 17.3% of government spending and 5.6% of GDP and that this may rise to 35% of government expenditure and 11% of GDP by the end of 2012.

NEPCO's deficit and cumulated debt are government's responsibility. NEPCO is a public share company and this implies that NEPCO's deficit is publicly financed and that NEPCO's debt is part of the government budget. For example, in 2011 and up to the time of writing, the debt has been financed with government guaranteed bonds issues (515 m. JD at 5-7%) and bank overdrafts (80 m.).[5] Therefore, NEPCO's debt represents a major financial constraint for the GoJ.

The question that we want to address in the rest of the paper is to what extent households can be called upon to pay for the current deficit. How much of the current NEPCO's deficit can households afford to pay? This will not address the question of repayment of the cumulated debt stock but will provide a sense of what can be achieved by increasing tariffs.

Electricity consumption

According to estimates provided by the electricity commission, in 2011 households were expected to consume 33% of the total electricity consumed in Jordan, up from 30.9% in 2007 due to an increase in the number of household consumers, from 1.05 m households in 2007 to 1.26 m. households in 2011 (Table 2). The other major consumers of electricity are the industrial sector, commercial activities and agriculture but households are the major consumer of electricity in the country. They are also the end consumer meaning that the cost of electricity paid for by other entities is expected to be (at least partly) transferred onto consumers via market prices. How much of the increase in tariffs for other entities such as private and public companies is actually transferred onto households cannot be estimated with accuracy. But we could safely assume that households will bear anything in between 33% and 100% of the total increase in tariffs for all consumers.

[4] This information was provided by NEPCO financial department during meetings with World Bank missions in October and December 2011.
[5] According to NEPCO, the company has not been able to borrow from banks because the government has not provided a guarantee letter and because the press has amply reported the difficult financial situation of the company.

Table 2 – Structure of electricity consumption by type of user

	2011 (%)
Household	33.0
Industrial	26.3
Commercial	16.1
Water pumping	14.3
Government	7.1
Others	3.2
Total	100.0

Source: Estimated by the Electricity Commission

Residential customers (households) in Jordan pay a monthly bill based on electricity consumption measured by a meter installed in every household. Figure 3 provides an example of bill paid in Amman with the full description of the contents and the calculation of the final amount. It is shown that the bill contains fixed and variable components. The fixed costs are related to a meter fee, fuel surcharge, TV and garbage fees. The fuel surcharge is currently not applied while TV and garbage fees are collected by the electricity distribution companies on behalf of TV and garbage collection companies. Thus, among the fixed costs, only the meter fee represents revenue for the electricity system. The variable costs are based on consumption in kWh and include consumption according to the various tariffs brackets and a fee levied on residential customers to pay for the connection of customers in rural areas.

Figure 3 – Example and calculation of electricity bill

Electricity Bill			
	JD	kWh	
Consumption (based on tariffs structure)	24.046	401	
Fuel surcharge	0.000		
Meter fees (flat)	0.200		
Rural connections surcharge (1 fil/kWh)	0.401		
TV fee (flat)	1.000		
Garbage collection fee (flat)	2.000		
Total	**27.647**		
Calculation of consumption charge			
Consumption bracket	**Range**	**Tariff**	**Total**
1-160 kwh	160	33.00	5280
161-300 kWh	140	72.00	10080
301-401 kWh	101	86.00	8686
Total	**401**		**24046**

Using the tariff structure, the information provided on the electricity bill and the monthly household expenditure on electricity from the 2010 Household Income and Expenditure Survey (HIES), it is possible to calculate the household consumption of electricity in KWh as well as the number of households falling in each expenditure bracket and the mean household expenditure in each bracket. In fact, in the HIES we can observe all the items present in the bill with the exception of the fuel surcharge (which is not applied) and the rural areas fee (which is 1 fil/kWh/month). The estimations that follow in the paper are therefore based on electricity consumption and meter's fees.[6]

Based on the HIES, the calculation of electricity consumption was made as follows:[7] Let h be the index number for the household with $h = (1, \ldots, n)$, E_h the household expenditure on electricity, p_b the tariff for each tariff bracket, b the brackets with $b = (1, 2, 3, 4, 5, 6)$, r_i the maximum kWh consumption within each bracket and cc_i the upper expenditure threshold for each bracket. Then, consumption of electricity in kWh for each household belonging to each bracket can be calculated as follows:

$$kWh_{hb} = \begin{cases} \dfrac{E_{hb}}{p_b} & for \quad b = 1 \\ \displaystyle\sum_{j=1}^{b} r_j + \dfrac{E_{hb} - cc_{b-1}}{p_b} & for \quad b = 2, \ldots, 6 \end{cases}$$

The table below shows the actual values of the parameters in Jordan calculated from information provided by NEPCO.

Table 3 – Parameters for the calculation of household electricity consumption in Jordan

Bracket (i)	kWh	Tariffs by bracket in JD (p)	kWh range within bracket	Tot cost by bracket in JD (r)	Cumulated cost by bracket in JD (cc)
1	1 - 160	0.033	160	5.28	5.28
2	161 - 300	0.072	140	10.08	15.36
3	301 - 500	0.086	200	17.2	32.56
4	501 - 750	0.114	250	28.5	61.06
5	751 - 1000	0.135	250	33.75	94.81
6	> 1000	0.174	100000	100000	100000

Source: Author's calculations based on NEPCO information. (*) 100,000 is an unrealistically high upper bound used to make sure that the maximum consumption is captured.

Based on the formula and parameters illustrated above, we calculated household consumption of electricity in kWh. These results are shown in Table 4. The great majority of households (85.3%) consumes in between 161 and 500 kWh per month with the relative majority (45.1%) consuming in between 301 and 500 kWh. Only 2 percent of households have a consumption of electricity below 160 kWh and pay only the minimum tariff (33 fils/kWh). All other households pay increasingly higher tariffs based on increased consumption. It is also noteworthy that only 0.4% of households consume above the maximum tariff threshold of 1,000 kWh/month. Mean expenditure on electricity for all households is 20.5 JD/month.

[6] The 2010 Jordan HIES covered 13,866 households but collected information on expenditure for only 11,223 households. For all estimations that use expenditure figures, the Department of Statistics (DOS) has calculated a specific weight so as to be able to extrapolate figures for the full population. All calculations in this paper use the specific expenditure weight provided by DOS.

[7] Note that the HIES does not report quantities of electricity consumed.

Table 4 – Tariff structure and household consumption of electricity

Consumption tariffs 2010 (kWh/month)	Class of consumption (JD)	Mean consumption (JD)	No. of HH	% of HH
1-160	0-5.28	4.5	22,018	2.0
161-300	5.29-15.36	11.0	453,408	40.2
301-500	15.37-32.56	21.8	508,827	45.1
501-750	32.57-61.06	41.8	122,351	10.8
751-1000	61.07-94.81	73.2	17,605	1.6
1000 <	> 94.81	128.0	4,308	0.4
Total		**20.5**	**1,128,517**	**100**

Source: HIES 2010 and NEPCO

Distribution of consumption and household welfare

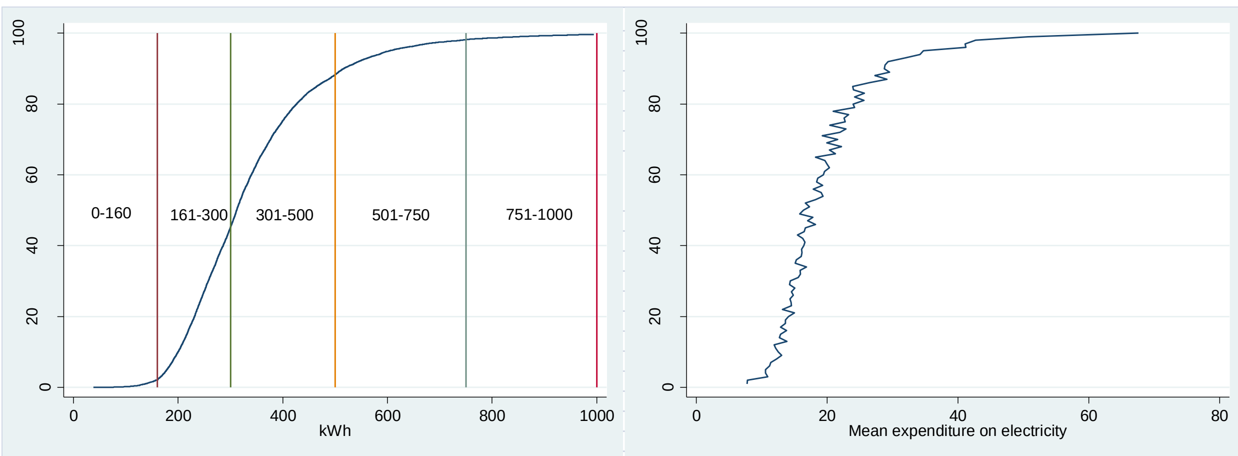
Electricity consumption is evidently related to household welfare and any reform of tariffs will have an impact on households. Before we make simulations of changes in tariffs, it is therefore important to understand how electricity consumption relates to household welfare.

Figure 4 (left panel) depicts the distribution of households (%) according to electricity consumption (kWh). On the *y-axis* we plotted the distribution of households in increasing order of electricity consumption while on the *x-axis* we plotted levels of electricity consumption in kWh. The vertical lines represent the thresholds between tariffs. It is evident how the distribution is very 'shallow' for the low consumers and for the high consumers. For the great majority of households, tariffs on the second and third consumption brackets are what make a real difference in the monthly bill.

The current structure of tariffs is not particularly equitable from a distributional perspective and is not particularly helpful when it comes to increasing tariffs and cost recovery. The tariff structure was originally designed to cater first for the consumption of poorer households. The first consumption bracket from 1 to 160 kWh/month was expected to cover the average electricity consumption of a household living in an apartment of 80 sqm, with 5 light points, a fridge and other essential electrical devices. The tariff on this consumption bracket was expected to be subsidized by larger consumers. The second and third brackets were designed to cater for the middle-class while a fifth bracket was designed for the richer consumers.

Therefore, the principles used to set tariffs were originally based on consumption patterns assuming a direct relation between household welfare and electricity consumption. Indeed, the relation between household expenditure and expenditure on electricity is positive and significant as one would expect with a coefficient of 24.0. For every 24 JD increase in household expenditure, expenditure on electricity increases by 1 JD. In Figure 4 (right panel) we plotted total household expenditure in percentiles against mean expenditure on electricity by percentile. Expenditure on electricity increases with household total expenditure and the relation between the two variables is clearly positive. The breakdown into percentiles shows that the relation is not perfectly linear or monotonic but for practical purposes it is relatively safe to take expenditure on electricity as a proxy of household welfare. This is useful because the electricity companies do not observe total household expenditure but observe household consumption and household expenditure as reported in the monthly bill.[8]

Figure 4 – Distribution of households by tariff bracket (left panel) and relation between expenditure on electricity and total electricity (right panel)



Source: HIES 2010

Richer consumers spend more on electricity than poorer consumers. In 2010 households were spending on electricity a monthly average of 23.1 m. JD (Table 5).[9] Total expenditure (by per capita expenditure decile) ranged from 1.3 m. JD for the lowest decile to 4.8 m. JD for the upper decile. Therefore, the richest households spent about four times on electricity than the poorest households.

However, poorer consumers spend a larger share of their total expenditure on electricity. On average, household expenditure on electricity represents 2.6% of total household expenditure. This share decreases with the increase in total household expenditure from 4.6% for the poorest decile to 2.0% for the richest decile. These shares are also not low by international standards. For example, the share of electricity expenditure of Italian households in 2008 was 1.7% of total household expenditure (calculated from IT-SILC, 2008). Electricity is a modern good that may be relatively more expensive than other consumption items in developing countries as compared to developed countries. However, electricity is not an irrelevant item in the consumption bundle of Jordanians, especially for the poor.

[8] According to NEPCO, all households connected to the electricity system have a meter.

[9] If we compare the HIES estimate of 23. 1 m. JD for total monthly expenditure in 2010 with the total expected revenues of 24.4 m. JD reported by the electricity commission for 2011, we should conclude that the HIES estimates are very accurate and provide a very good base for the simulations that will follow.

Table 5 – Per capita expenditure by decile (JD)

Decile (pc exp)	Tot. Exp. Elec.	Mean Exp. Tot.	Mean Exp. Elec.	% of Elec. Exp.
1	1,312,652	252	11.7	4.6
2	1,555,071	378	13.8	3.7
3	1,715,347	461	15.2	3.3
4	1,768,248	535	16.4	3.1
5	1,815,001	610	16.9	2.8
6	2,038,675	696	18.8	2.7
7	2,382,350	803	20.7	2.6
8	2,686,075	954	23.0	2.4
9	3,087,926	1188	26.5	2.2
10	4,784,487	2022	39.9	2.0
Total	**23,145,832**	**802**	**20.5**	**2.6**

Source: HIES 2010

Simulations of policy reforms

As described in previous sections and according to the HIES, in 2010 households were spending about 23.1 m. JD per month on electricity while in 2011 the monthly deficit of NEPCO was estimated at 100 m. JD per month. We also learned that households were responsible for about 33% of total electricity consumption in 2010. Consequently, we could argue that households are directly responsible for about 33 m. JD of subsidies per month. As a basic rule of thumb, if households were to pay for this additional amount every month, tariffs should increase on average by about 143% (23.1*1.43=33 m. JD).[10]

However, if other agents such as private or public enterprises benefit from subsidies, we should expect these subsidies to ultimately benefit households via lower-than-market consumer prices. Vice-versa, if tariffs are increased to cost recovery levels these increases will ultimately reach the final consumers through indirect increases of retail prices affected by the increase in electricity tariffs. For example, if the cost of electricity for water pumping increases we should expect the cost of fruit and vegetables to increase and this increase will eventually be borne by households. While the cost of subsidies can in principle be spread over the different types of consumers, the final beneficiaries of these subsidies are usually expected to be households. Therefore, households are expected to bear anything in between 33% and 100% of the increase in electricity tariffs across all types of consumers.

The question we want to address here is what share of NEPCO's monthly deficit household should be expected to pay under different scenarios of tariffs increases. If households would be called to pay for their share of subsidies, tariffs should increase by 143%. If households alone were to pay for the total monthly deficit of NEPCO, total household expenditure should increase by about 500%. It is evidently unlikely that households could withstand such increases in tariffs. This would imply major reductions in

[10] Note that NEPCO's monthly current deficit of 100 m. JD is net of household payments of 23.2 m. JD.

expenditure on other items and/or a reduction in the consumption of electricity. It is also unlikely that the government of Jordan will be prepared to introduce such changes given the current political volatility of the region. Therefore, our simulations will be necessarily more conservative and focus on only two average increases in tariffs of 30% and 60%.

When simulating increases in tariffs (cuts in electricity subsidies) we need to make assumptions about inflation, cross-substitution of products and household price/demand elasticity. Depending on these different assumptions results can be very different.

Inflation. When prices for electricity (tariffs) increase, these will have a *direct effect* on household welfare through the electricity bill and an *indirect effect* through the increase in prices of other consumption items. Both effects are important for estimating the demand of electricity and both effects should be taken into account when deflating electricity expenditure following increases in tariffs. The *direct effects* on the demand of electricity can be taken into account by simply deflating the demand of electricity by the changes in electricity tariffs.

The estimation of *indirect effects* is more complex. We can think of at least two different approaches to the problem, an input-output approach and a CPI approach. The input-output approach implies the use of input-output tables and the simulation of changes in production prices subject to changes in electricity prices. Following this approach, we found that a 30% increase in electricity tariffs leads to an average increase in production prices of 0.62%. Higher increases in tariffs result in proportional increases in production prices so that a 60% increase in tariffs results in a 1.24% increase in average production prices. These values are small and they are also an upper bound of the actual increase in market prices given that producers may transfer only a part of the increase in production costs to consumers.

The CPI approach implies a direct adjustment of the CPI using the weight of electricity prices in the overall CPI. Consumer Price Index (CPI) in Jordan is calculated with hundreds of food and non-food consumption items including electricity. Each item is weighted according to information gathered with the HIES and the current weights used by the Department of Statistics (DOS) are derived from the 2006 HIES based on the share of household expenditure for each item. The weight used for electricity consumption is currently 2.635%, a number calculated through a weighted average of electricity consumption by quintile. This is perfectly in line with our 2.6% estimate of the average share of electricity consumption on total household in Jordan for 2010 (Table 5). Thus, if average electricity tariffs increase by 30%, we should derive that the total effect on the CPI is 30% of 2.6% or +0.87%, which is a small effect, although greater than what estimated with the input-output tables.

We should also distinguish between *short-run* and *long-run*-effects. In the *short-run*, households will be affected by only direct effects and even these direct effects may not be immediately evident to households. Between the time of reception of the new electricity bill and the time of adjustment in expenditure due to changes in purchasing power some time may elapse. Therefore, it is not unreasonable to assume no inflation effects in the very short-run. In the *long-run*, both the direct and indirect effects will be evident. All these factors being considered, our simulations will include the full direct effects but exclude the indirect effects which we estimated to be very small according to both the input-output tables and the CPI methodologies.

Cross-substitution effects. It is possible that households facing an increase in electricity tariffs will react by cross-substituting electricity consumption with other products. These effects are generally small and also very difficult to assess. Electricity is not easily substituted for cheaper sources of energy. For example, household appliances and light bulbs only function with electricity and households would need fuel generators to substitute electricity from the network but the cost of producing electricity with fuel generators is typically higher than any increase in tariffs. Substituting electricity with candles or torches substitutes for light bulbs but cannot aliment household appliances and is not necessarily less costly than the increase in tariffs. This is the reason why the literature on electricity demand often assumes zero cross-substitution effects. However, in Jordan, households occasionally substitute electric heaters for gas heaters and we may expect some substitution between these two items given that the price of gas cylinders is fixed and subsidized. We will take this effect into account when estimating the price/demand elasticity.

Price/demand elasticity for electricity. In order to estimate price/demand elasticity in the electricity sector, researchers usually define a demand model and apply this model to household consumption data, macro electricity data or input-output tables over a period of time (see Taylor, 1975 for a review of these models). Studies on demand elasticities in the electric sector tend to find price/demand elasticities in the range of -0.21 to -0.9 in the short-term and in the range of -1 and -2 in the long-term (Taylor, 1975). Recent estimations of demand elasticity in the US found values of around -0.2 in the short-term and around -0.3 in the long-term (Bernstein and Griffin, 2005). In India, recent estimations find demand elasticities in the short-term around -0.3 and -0.4 (Filippini and Pachauri, 2002).

In this paper we do not estimate demand elasticity for electricity consumption over time because changes in tariffs during the period considered (2008-2010) have been too small to provide any valuable indication. The only increase that occurred in tariffs during the period is of 1 fil increase across the board in January 2010. However, we can estimate price/demand elasticities using the 2010 HIES survey. This is the exception rather that the rule but it is possible to use one cross-section survey to estimate price-demand elasticities for consumption products (see for example Deaton, 1997). Here we follow a model proposed by Taylor (1975) specifically designed for cross-section estimations of price elasticity in electricity sectors characterized by multi-tariffs price structures. We also adjust the model controlling for gas expenditure so as to capture the possible substitution effect between gas and electricity. The econometric specification can be described as follows:

$$lnQ_i = \alpha + \beta lnI_{i+} \gamma lnMP_i + \delta lnE_i + \theta lnGE_i$$

With: *Q*=Electricity demand in kWh; *I*=Income; *MP*=Marginal Price (of the last consumption bracket); *E*=Expenditure on electricity up to the last bracket; *GE*=Expenditure on gas cylinders and *i* is the subscript for households. In such model, γ is the price/demand elasticity. The estimation of the model on the 2010 HIES data provides a result of -0.55 (Table 6), which is higher than short-term elasticities elsewhere and below long-term elasticities as estimated with longitudinal models. [11]

Table 6 – Price/Demand elasticity estimation

Dep. Var.: ln kWh	Coef.	Std. Err.	t	P>t	95% Conf.	
ln income	0.006	0.001	4.0	0.000	0.003	0.024
ln marginal price	-0.550	0.005	-100.2	0.000	-0.561	-0.643
ln electricity expenditure	0.846	0.002	397.4	0.000	0.842	0.904
ln gas expenditure	0.098	0.002	44.4	0.000	0.094	1.359
Constant	1.641	0.016	103.2	0.000	1.609	1.609

Source: Estimated from HIES 2010

We should also expect demand elasticities to be larger the poorer is a country given that poorer people will have a higher budget constraint. Moreover, different households may have different elasticities depending on welfare with richer households showing a smaller elasticity than poorer households. We may therefore simulate a range of elasticities that would capture most types of households. In essence and all factors considered, we will make estimations considering two different values for price-demand elasticity, -0.3 and -0.6.

Irrespective of the exact elasticities simulated, it is important to clarify the implications for welfare and poverty of the upper and lower 0/-1 bounds. If the elasticity of electricity demand to changes in tariffs is zero ($\varepsilon = 0$) and we ignore inflation, an increase in tariffs does not change the household demand for electricity so that households will continue to purchase the same quantity of electricity with the new price. This implies that household expenditure in real terms will increase making households to appear richer. If, instead, we adjust for the direct short-term effects of inflation, household consumption of electricity in kWh and household expenditure on electricity in JD will decline.

If the elasticity of demand for electricity to changes in tariffs is unitary and negative ($\varepsilon = -1$) and we don't adjust for inflation, then the decrease in quantity consumed offsets the increase in prices leaving expenditure on electricity unchanged. In this case poverty would not change. Adjusting for direct effects of prices in the short-term will instead result in a decrease in expenditure on electricity and an increase in poverty.

Any simulation with elasticity between zero and minus one ($-1 < \varepsilon < 0$) and no inflation adjustments will result in increased expenditure. If instead, we adjust for the direct short-term effect of inflation, the impact on expenditure will always be negative. To firm ideas on these concepts, below we describe the estimation formula we use for expenditure on electricity (E_2) when prices increase:

With no inflation adjustment

$$E_2 = (P_1 + \Delta P)(Q_1 + \Delta Q)$$

[11] Note that estimations with household income or expenditure provide almost identical results.

$$E_2 = P_1\left(1+\frac{\Delta P}{P}\right)Q_1\left(1+\frac{\Delta Q}{Q}\right)$$

$$E_2 = P_1\left(1+\frac{\Delta P}{P}\right)Q_1\left[1+\left(\frac{\Delta P}{P}\frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}}\right)\right]$$

$$E_2 = P_1(1+p)Q_1(1+p\varepsilon)$$

With: $P = price; Q = quantity;\ p = \frac{\Delta P}{P};\ \varepsilon = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}}$; and *time=(1,2).*

With inflation adjustment (direct effects):

$$E_2 = [P_1(1+p)Q_1(1+p\varepsilon)]\frac{1}{1+p}$$

$$E_2 = P_1Q_1(1+p\varepsilon)$$

In what follows we will first simulate increases in tariffs with the basic assumptions of elasticity=0 and no inflation. This is what we could consider as the best possible scenario from the perspective of revenues of the electricity system. We will then introduce direct inflation effects and elasticities using the last formula described above and measure effects on poverty and revenues. Last we will revert to the basic scenario of zero elasticity and no inflation and simulate a change in the tariffs structure. This is an alternative path to reforms that is expected to provide a more equitable and efficient tariffs system.

Increases in tariffs with zero elasticity and no inflation

In this section, we simulate increases in tariffs of 30% and 60% for all tariffs brackets except the lowest (from 0 to 160 kWh/month). The lowest bracket was designed to protect the poor and increases in tariffs rarely concern this consumption bracket. However, it should be noted that by keeping tariffs for the lowest bracket unchanged we are also favoring richer consumers given that all consumers will benefit from low tariffs on the first 160 kWh consumed. We also assume no inflation and elasticity=0. All these assumptions and simulations are unrealistic. Inflation reduces purchasing power, households normally respond to increases in prices by reducing consumption and 30% and 60% increases in prices are very large increases that have never occurred in the past. They are also increases that the GoJ is unlikely to introduce given the volatile political situation in the region. These assumptions are made to see what is the upper bound in terms of revenues for the electricity system that we should expect from increases in tariffs.

The results of the simulations are shown in Table 7 below. With a 30% increase in tariffs, the expenditure for electricity of the poorest 10% of households would increase by 17.5% while it would increase by 23.5% for the richer 10% of households. On average a 30% increase in tariffs increases per capita electricity expenditure by 21.9%. Higher percentage increases in tariffs simply increase the cost for households proportionally. A 60% increase in all tariffs (except the tariff for the lowest consumption bracket) would increase the expenditure per capita on electricity of the first decile by 34.9% and by 46.9% for the highest decile. On average, a 60% increase in tariffs increases per capita electricity expenditure by almost 40%.

The table below also shows the increase in electricity revenues under these scenarios. With a 30% increase in tariffs, revenues would increase by 5.2 m. JD which is equivalent to about 5.2% of NEPCO's monthly deficit. With a 60% increase in tariffs, revenues would increase by 10.4 m. JD, about 10.4% of NEPCO's current deficit. Therefore, under the most optimistic assumptions from the perspective of revenues (no inflation, zero elasticity and high tariffs increases), households would be able to cover no more than 10% of the current deficit of NEPCO. Even if we assume that households would be called to cover NEPCO's deficit only in proportion of their share of electricity consumption (33%), a 60% increase in tariffs would only cover a third of this share. In essence, sharp increases in tariffs are unlikely to solve NEPCO's deficit problem.

Table 7 – Simulations of increases in tariffs

	+30% tariffs		+60% tariffs	
deciles	HH cost (% increase)	Tot. Reven.	HH cost (% increase)	Tot. Reven.
1	17.5	293,304	34.9	586,608
2	18.3	331,784	36.7	663,567
3	18.7	359,775	37.3	719,550
4	19.0	412,364	38.0	824,729
5	19.5	444,155	39.0	888,310
6	19.6	476,007	39.2	952,014
7	20.4	539,947	40.8	1,079,894
8	20.8	585,179	41.6	1,170,357
9	21.7	689,695	43.3	1,379,389
10	23.5	1,058,846	46.9	2,117,692
Total	19.9	5,191,055	39.9	10,400,000

Source: HIES 2010

Increases in tariffs with varying elasticity and inflation

In this section, we introduce inflation and demand elasticities simulations using the formula already discussed in previous sections: $E_2 = P_1 Q_1 (1 + p\varepsilon)$. Simulations are carried out as if increasing tariffs across the board of the same amount, including increases for the first tariffs brackets. As before, we simulate only two increases in tariffs, +30% and +60% while we assume two different elasticities, -0.3 and -0.6.

With the current tariff structure, elasticity=-0.3 and a 30% increase in tariffs, expenditure on electricity would increase by about 4.8 m. JD and by 4.3 m. JD with an increase in tariffs of 60% (Table 8). Here we see how the combination of elasticity and increases in tariffs interact. With negative elasticity, households respond to increases in tariffs by reducing consumption of electricity and the combination of higher prices and lower quantity results in smaller additional revenues for the electricity system as compared with the previous assumption of zero elasticity. A 60% increases in tariffs amplifies this effect and the additional revenues for the electricity system further decline. Increasing the negative elasticity has a similar effect by reducing further additional revenues. With an elasticity of -0.6 and a tariffs increase of 60%, the additional revenues to the system are only 3.3 m. JD.

On the positive side, reductions in household electricity consumption will reduce the demand for electricity in the system but this effect is small and is easily calculated with the formula above. With a 30% increase in tariffs and an elasticity of -0.3, the effect on quantity consumed is of 0.3*-0.3=0.09. Therefore, under such assumptions, household consumption of electricity would decline by about 9% and the impact on total consumption of electricity would be a third of this amount, about 3% (given that households consume a third of total electricity in Jordan). Therefore, the decrease in household electricity consumption due to increases in prices will not have a major effect on total electricity consumption while the gains in revenues are small.

The effects on poverty of these simulated changes would also be small. We considered a poverty line 762 JD/person/year, which is the official poverty line used for 2010 in Jordan. With increases in tariffs of 30%, the increase in the poverty rate is practically zero for the lowest quintile and increasing to 8.5% for the upper quintile but with a total increase in the poverty rate of only 0.32% with *e*=-0.3 and of 1.45% with *e*=-0.6. The overall increase in the poverty rate for a 60% increase in tariffs is about 4% with *e*=-0.6. Increases in poverty rates are higher for upper quintiles given the current tariff structure but the overall effect on poverty is small considering that these are percentage changes and not absolute changes.

The only effect that we did not simulate and that could have an effect on poverty is the increase in prices of other goods due to increases in electricity tariffs but when we estimated these effects in the previous sections we found these effects to be very small, which is the reason why we did not adjust for indirect effects of inflation.

Table 8 – Electricity Expenditure and Poverty under Different Behavioral Assumptions

		Poverty headcount increase (%)		**Revenues Increase**	
	Quintiles	**+30% tariffs**	**+60% tariffs**	**+30% tariffs**	**+60% tariffs**
e=-0.3	1	0.00	0.00	430,838	388,228
	2	0.08	0.27	575,581	518,655
	3	0.80	2.34	778,808	701,783
	4	0.86	2.71	1,025,069	923,689
	5	0.00	8.47	1,954,052	1,760,794
	Total	**0.32**	**1.45**	**4,764,348**	**4,293,149**
e=-0.6	1	0.00	0.97	388,228	303,007
	2	0.27	2.18	518,655	404,804
	3	2.34	5.67	701,783	547,733
	4	2.71	8.28	923,689	720,928
	5	8.47	12.17	1,760,794	1,374,278
	Total	**1.45**	**4.02**	**4,293,149**	**3,350,751**

Reform of the tariff structure

According to economic theory, consumers usually enjoy a “surplus” determined by the difference between what they pay on the market for a certain good and what they would be willing to pay. Economic theory would also argue that is beneficial for the economy to reduce the consumer surplus so that all consumers would pay for a good what they are really willing to pay. Ideally, reducing the consumer surplus means tailoring prices to each individual consumer. Because each consumer is different in taste and capacity to pay, the willingness to pay is also different for each consumer. Therefore reducing to a minimum the consumer surplus would mean, in theory, to have different prices for each consumer. In practice, this is not generally possible because goods are traded in markets and sellers cannot know the willingness to pay of each consumer for each good. This is why prices tend to vary across markets but they are usually very similar within markets.

Electricity is a particular good in that there are one or few markets and one or few sellers. Consumption is also precisely measured with meters installed in each household. This makes it easier to establish different prices according to different types of consumers and it the reason why different electricity prices are usually set for different types of consumers, lower prices for low consumers and higher prices for high consumers on the assumption that there is a direct positive relation between electricity consumption and welfare.

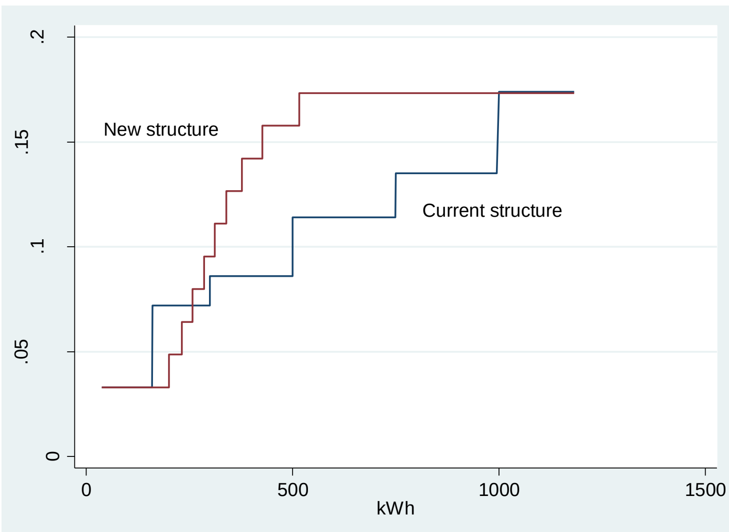
At present, Jordan has six consumption brackets but we know from economic theory that increasing the number of brackets would reduce the consumer surplus and would increase revenues for the system. It is also possible to change the way that prices are set across brackets so as to make prices closer to consumers’ willingness to pay and make the tariffs structure more equitable from a welfare perspective. For these reasons, in this section we simulate a change in the tariff structure by increasing the number of brackets and by changing the price increases across brackets.

For this simulation, we keep the minimum (0.033 JD/kWh) and maximum (0.174 JD/kWh) tariffs constant but we change the tariff structure in between these two bounds. Instead of six tariffs brackets we use ten brackets and instead of defining the brackets arbitrarily we define the ten brackets in terms of deciles of electricity consumption. In this way, we will have an equal number of households belonging to each tariff bracket and we will have households ranked according to electricity consumption in kWh.

We impose constant tariffs increases between tariffs brackets. By keeping the minimum and maximum tariffs constants and by imposing equal increases between brackets the tariff increase between brackets is easily estimated at 0.0156 JD/kWh [(0.174-0.033)/9]. We also keep the same assumptions introduced in the first simulation with no inflation and zero demand elasticity with the associated caveats already discussed. As for the simulations of the previous section, these are very unrealistic assumption made to test the upper bounds of household capacity to contribute to cover NEPCO’s current deficit. The only important difference in this respect is that by changing the tariffs structure we are also affecting the lowest consumption bracket.

The new tariffs structure is shown in Figure 5 below. It is evident that the gradient of tariff increases is much steeper and for most consumers this means an increase in the marginal and average costs. However, for the lowest consumers, the new tariff structure is below the current one indicating that the first decile of consumers will pay less than what they are actually paying now. This is by no means an optimal type of tariffs structure reform but illustrates how there is much more than a government can do than simply increasing tariffs.

Figure 5 – Current tariff structure and example of reformed structure



Source: Plotted from HIES 2010

The results of the simulation with the new structure are shown in Table 9 below. As expected, the brackets thresholds are now much more regular with each new threshold implying an increase in the cost per kWh of 0.0156 JD. More importantly, by changing the tariff structure and the tariffs within each bracket, household expenditure on electricity more than doubles, from 23.2 m. JD to 48.1 m. JD. This is explained by the fact that the marginal and average tariff of electricity have changed and have become higher for most consumers. In gross terms, restructuring tariffs as simulated here would imply increasing the average electricity bill by more than twice the current amount.

However, and differently from the previous sections, these increases in tariffs would be much more equitable than simply increasing tariffs with the current tariffs structure. Changes affect different deciles by different proportions. The decile of low consumers will spend less in total while the upper decile will spend more than twice the current amount. Therefore, the changes in tariffs simulated are more progressive and more equitable than the existing system and also more efficient than previous simulations in terms of revenues for the system.

Table 9 – Electricity Expenditure with a Reformed Tariffs Structure

	kWh	kWh	Current Tariff Structure	Reformed Tariff Structure	
Decile (kWh)	Brackets Thresholds	Tot. Elec. Cons.	Tot. Elec. Exp.	Tot. Elec. Exp.	Revenues increase
1	200	17,600,000	651,389	580,950	-70,440
2	231	22,500,000	973,487	1,095,897	122,410
3	258	24,800,000	1,151,561	1,591,071	439,510
4	286	29,600,000	1,450,082	2,359,649	909,567
5	312	34,200,000	1,754,373	3,263,522	1,509,149
6	340	36,900,000	1,988,510	4,092,542	2,104,032
7	377	42,600,000	2,418,612	5,392,826	2,974,214
8	426	48,200,000	2,886,144	6,852,862	3,966,718
9	517	57,100,000	3,641,021	9,010,123	5,369,102
10	Max	80,000,000	6,230,652	13,900,000	7,669,348
Total		394,000,000	23,100,000	48,100,000	25,000,000

Source: HIES 2010

A total of 25 m. in additional revenues for the electricity system would not be able to cover the share of NEPCO's debt directly attributable to households. The simulations we made here are also rather unrealistic given that we considered no inflation, demand elasticity equal to zero and very sharp increases in prices while the proposed new tariff structure is not necessarily an optimal choice. However, these last simulations show that it is more equitable and efficient to change the tariff structure while increasing tariffs rather than simply increasing tariffs. This is an important consideration to make in the light of the current budget crisis.

Conclusion and policy options

This paper has focused on the distributional implications and cost recovery potential of electricity tariffs reforms in Jordan. The electricity system of Jordan is going through a very difficult period of sharp increases in the cost of electricity production due to the continuous disruptions of gas supply from Egypt. The public NEPCO, (which is the only public company in the system and also the only company to bear all the costs of the increase in the cost of electricity production) is running a monthly deficit of 100 m. JD and is expected to accumulate a debt of over 1.2 bn. JD by the end of 2011. The question we addressed in this paper is whether residential consumers can pay for these increased costs.

We found that the tariffs in Jordan are not much lower than in the EU and that the share of electricity expenditure of Jordanian households on total household expenditure is not low by international standards. We also found that the current monthly deficit of NEPCO amounts to approximately four times the current monthly expenditure of households on electricity. Therefore, in transferring the increased cost of electricity production onto households the government faces the question of affordability, an issue widely debated in the literature on electricity utilities (see for example Foster and Yepes, 2006 and Komives et al. 2006).

The question of affordability will depend on several factors: a) the tariffs structure; b) the assumptions made about household behavioral reactions to changes in tariffs (elasticity); c) assumptions about inflation and d) assumptions about cross-substitution of products.

By simply changing the tariffs structure, it is possible to reduce the consumer's surplus (the difference between what the consumers pay and what the consumers would be willing to pay) and increase revenues to the electricity system. Therefore changing the structure of tariffs can be a good first approach to the problem. We estimated that with elasticity=0 and no inflation, household expenditure on electricity could potentially increase by more than two-fold by changing the tariff structure within the existing upper and lower bounds. However, the assumption of elasticity=0 is rather unrealistic and such reform implies a sharp increase in the marginal tariff of electricity.

Increases in tariffs with the current tariffs structure are much less promising irrespective of the assumptions made. With zero elasticity and no inflation, increases in tariffs of up to 60% would bring in no more than 10.m JD in additional revenues, which is less than a third of the household share in electricity consumption in Jordan. With more realistic assumptions about elasticities and inflation, we find that increases in tariffs of 30% and 60% can increase revenues by in between 3 m. and 5 m. JD, less than 5% of the total NEPCO's monthly deficit.

Given the findings above, the government will have to find a multi-tier approach to debt reduction. We can think of three different sets of measures:

- The first set of measures relates to tariffs restructuring and tariffs increases as discussed in this paper. In this respect, we have learned that the most sensible approach is to start by restructuring tariffs so as to make them more equitable from a welfare perspective and more efficient from a cost recovery perspective. Restructuring the tariff system is also an opportunity to increase the average tariff. Naturally, increases in tariffs in the current political scenario are difficult but nevertheless necessary to reduce the rapid debt accumulation process that NEPCO is experiencing.
- A second set of measures will require reconsidering the electricity sector as a whole. In the short-term measures such as the protection of the gas pipeline from Egypt and the negotiation for lower oil prices with neighboring countries such as Iraq may prove effective in reducing quickly the cost of electricity production. In the medium and long-term, Jordan will need to diversify sources of energy so as to reduce the risk associated with shortages of one supply. Importing gas from countries other than Egypt, increase the use of renewable resources, seek cheaper sources of oil supply and investing in nuclear energy may be some of the options. The discussion of these options is evidently beyond the scope of this paper and a matter for energy experts.
- A third set of measures will require looking at the debt problem as a national financial issue rather than an issue related to the electricity system only. This is legitimate given that the

electricity burden covers 18% of government expenditure as we write and is expected to increase to 35% by the end of 2012 if gas continues to be in short supply. This third set of measures could look into the question of whether would be more equitable to spread the electricity debt over tax payers rather than consumers. It may consider raising other taxes such as consumption taxes or eliminating tax breaks such as the existing tax breaks on consumption products. The discussion of these issues is also beyond the scope of this paper but something that the GoJ will have to seriously consider in the months to come.

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Development of Electricity Tariff In Hashimate Kingdome Of Jordan												
		From 15/6/1993 UP TO 30/4/1996	From 1/5/1996 UP TO 15/6/2002	From 16/6/2002 UP TO 31/12/2003	From 1/1/2004 UP TO 2/4/2004	From 3/4/2004 UP TO 8/7/2005	From 9/7/2005 UP TO 13/3/2008	From 14/3/2008 Up to 31/12/2008	From 01/01/2009 Up to 15/01/2010	From16/01/2010 Up to 30/04/2011	From 01/05/2011 Up to 30/06/2011	From 01/07/2011 Up to Now
First : Bulk Supply												
a) JEPCO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	34.30	45.81	45.81	46.67	46.67	55.19
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	24.25	35.76	35.76	36.62	36.62	45.14
b) EDCO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	33.56	37.35	36.15	35.86	38.58	48.92
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	23.51	27.30	26.10	25.81	28.53	38.87
c) IDECO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	31.66	38.16	38.16	39.09	41.89	49.10
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	21.61	28.11	28.11	29.04	31.84	39.05
d) Large Industries												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	45.00	47.00	48.00	48.00	48.00	48.00	65.00	65.00	66.00	66.00	82.00
Night Energy	(Fils/kWh)	23.00	32.00	33.50	33.50	33.50	33.50	49.00	49.00	50.00	50.00	66.00

Development of Electricity Tariff In the Hashimate Kingdom Of Jordan

		From 15/6/1993 UP TO 30/4/1996	From 1/5/1996 UP TO 15/6/2002	From 16/6/2002 UP TO 31/12/2003	From 1/1/2004 UP TO 2/4/2004	From 3/4/2004 UP TO 8/7/2005	From 9/7/2005 UP TO 13/3/2008	From 14/3/2008 Up to 31/12/2008	From 01/01/2009 Up to 15/01/2010	From 16/01/2010 Up to 30/04/2011	From 01/05/2011 Up to 30/06/2011	From 01/07/2011 Up to Now
First : Bulk Supply												
a) JEPCO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	34.30	45.81	45.81	46.67	46.67	55.19
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	24.25	35.76	35.76	36.62	36.62	45.14
b) EDCO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	33.56	37.35	36.15	35.86	38.58	48.92
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	23.51	27.30	26.10	25.81	28.53	38.87
c) IDECO												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	23.50	29.00	31.40	31.25	31.74	31.66	38.16	38.16	39.09	41.89	49.10
Night Energy	(Fils/kWh)	14.50	19.00	21.40	21.20	21.69	21.61	28.11	28.11	29.04	31.84	39.05
d) Large Industries												
Peak Demand	(JD/kW/Month)	2.40	2.40	2.40	2.40	2.40	2.40	2.98	2.98	2.98	2.98	2.98
Day Energy	(Fils/kWh)	45.00	47.00	48.00	48.00	48.00	48.00	65.00	65.00	66.00	66.00	82.00
Night Energy	(Fils/kWh)	23.00	32.00	33.50	33.50	33.50	33.50	49.00	49.00	50.00	50.00	66.00
Second : Retail Tariff												
a) Domestic												
From 1 - 160 kWh/Month	(Fils/kWh)	28.00	30.00	31.00	31.00	31.00	31.00	32.00	32.00	33.00	33.00	33.00
From 161 - 300 kWh/Month	(Fils/kWh)	52.00	52.00	55.00	55.00	57.00	59.00	71.00	71.00	72.00	72.00	72.00
From 301 - 500 kWh/Month	(Fils/kWh)	55.00	60.00	64.00	64.00	65.00	67.00	85.00	85.00	86.00	86.00	86.00
From 501 - 750 kWh/Month	(Fils/kWh)	70.00	75.00	80.00	80.00	80.00	82.00	113.00	113.00	114.00	114.00	114.00
From 751 - 1000 kWh/Month	(Fils/kWh)	70.00	75.00	80.00	80.00	80.00	82.00	113.00	113.00	114.00	114.00	135.00
More Than 1000 kWh/Month	(Fils/kWh)	70.00	75.00	80.00	80.00	80.00	82.00	113.00	113.00	114.00	114.00	174.00
b) Flat Tariff For T.V and Broadcasting Stations	(Fils/kWh)	45.00	60.00	60.00	60.00	60.00	61.00	86.00	86.00	87.00	87.00	98.00
c) Commercial												
From 1 - 2000 kWh/Month	(Fils/kWh)	50.00	60.00	62.00	62.00	62.00	63.00	86.00	86.00	87.00	87.00	91.00
More Than 2000 kWh/Month	(Fils/kWh)	50.00	60.00	62.00	62.00	62.00	63.00	86.00	86.00	87.00	87.00	106.00
d) Small Industries	(Fils/kWh)	30.00	36.00	38.00	38.00	39.00	41.00	49.00	49.00	50.00	50.00	57.00
e) Medium Industries												
Peak Demand	(JD/kW/Month)	3.05	3.05	3.05	3.05	3.05	3.05	3.79	3.79	3.79	3.79	3.79
Day Energy	(Fils/kWh)	25.00	33.00	35.00	35.00	36.00	38.00	46.00	46.00	47.00	47.00	60.00
Night Energy	(Fils/kWh)	20.00	21.00	25.00	25.00	27.00	28.00	36.00	36.00	37.00	37.00	50.00
f) Agriculture Flat Tariff **	(Fils/kWh)	21.00	23.00	26.00	26.00	28.00	31.00	47.00	47.00	48.00	48.00	60.00
g) Three parts AgricultureTariff												
Peak Demand	(JD/kW/Month)	0.00	0.00	0.00	0.00	0.00	3.05	3.79	3.79	3.79	3.79	3.79
Day Energy	(Fils/kWh)	0.00	0.00	0.00	0.00	0.00	30.00	46.00	46.00	47.00	47.00	59.00
Night Energy	(Fils/kWh)	0.00	0.00	0.00	0.00	0.00	20.00	36.00	36.00	37.00	37.00	49.00
h) Water Pumping	(Fils/kWh)	30.00	34.00	38.00	38.00	38.00	40.00	41.00	41.00	42.00	42.00	54.00
i) Flat Tariff Hotel	(Fils/kWh)	50.00	60.00	60.00	60.00	59.00	60.00	86.00	86.00	87.00	87.00	98.00
j) Three parts Tariff Hotel **												
Peak Demand	(JD/kW/Month)	0.00	0.00	0.00	0.00	3.05	3.05	3.79	3.79	3.79	3.79	3.79
Day Energy	(Fils/kWh)	0.00	0.00	0.00	0.00	56.00	56.00	81.00	81.00	82.00	82.00	93.00
Night Energy	(Fils/kWh)	0.00	0.00	0.00	0.00	45.00	45.00	70.00	70.00	71.00	71.00	82.00
k) Street Lighting ***	(Fils/kWh)	13.00	20.00	25.00	25.00	27.00	30.00	51.00	51.00	52.00	52.00	64.00
l) Armed Forces	(Fils/kWh)	0.00	0.00	0.00	67.00	67.00	67.00	81.00	81.00	82.00	82.00	94.00
m) Port Corporation	(Fils/kWh)	0.00	0.00	0.00	0.00	44.60	46.60	58.00	58.00	59.00	59.00	91.00
n) Mixed Tariff (Commercial / Agriculture	(Fils/kWh)	40	48	50	50	51	52	73	73	74	74	81