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Pakistan Energy Subsidy Reform TA

Residential Electricity Subsidies in Pakistan: Targeting, Welfare Impacts, and Options for Reform

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Executive Summary

This report examines the system of residential electricity subsidies in Pakistan, and explores how it could be improved to better assist households within the existing political and budgetary constraints. The report is multi-disciplinary in nature, drawing on specially commissioned analysis of survey and administrative data on household electricity consumption, as well as a qualitative assessment of household and service provider attitudes and experiences. Based on the findings of this research, the report suggests various ways in which the Government of Pakistan could better target subsidies and manage the reform in a politically sensitive manner.

An extensive body of international evidence demonstrates that energy subsidies have been some of the most regressive and costly fiscal policies, particularly for the developing world (The World Bank, OECD & OPEC 2010). In 2015, global subsidies reached US\$5.3 trillion, 6.5 percent of global GDP (Coady et al. 2015a). Although subsidies were in many cases introduced with the intention of reducing poverty, redistributing wealth in resource-rich economies, protecting consumers against large price swings, or promoting access to energy, they are an inefficient tool for achieving these purposes. Energy subsidies put significant pressure on a country's fiscal balances, consuming public funds that could otherwise be used for more effective programs. These subsidies also tend to be regressive, disproportionately benefiting the better-off. They discourage investments in renewable energy and promote overconsumption of energy and investment in energy-intensive heavy industries. Recognizing this, many countries around the world are now rolling back or eliminating energy subsidies (Clements et al. 2013a).

The cost of residential electricity subsidies in Pakistan amounted to around 0.8 percent of GDP in 2014–2015, about the same as total public health expenditure (The World Bank, 2017). At times in the past decade, electricity subsidies have cost the Government of Pakistan more than 2 percent of GDP, adding to the national debt and weakening the country's external position. As one element of its reforms of the energy sector, the Government of Pakistan has reduced residential electricity subsidies to around 0.4 percent of GDP over the three years to 2016. This reduction has been achieved partly through cuts to subsidies on the highest-volume residential consumers (as well as commercial and industrial users), and partly by virtue of declining costs of energy worldwide. However, any future hikes in the cost of supply would need to be passed on to the consumer, or absorbed by the government as new debt.

Despite cuts to tariffs on heavy users, electricity subsidies continue to be poorly targeted. One of the objectives of the government's 2013 National Power Policy was to ensure fairness by protecting the poor and cross subsidizing their consumption and that another

was to create a culture of conservation and responsibility. The subsidy scheme continues to fall short of these objectives. Residential consumers in Pakistan are charged electricity tariffs based on monthly electricity consumption, with the most generous subsidies concentrated on households with low and moderate usage. This targeting mechanism relies on the premise that *measured* electricity use is closely related to household welfare. But the correlation between measured electricity consumption and household welfare in Pakistan is relatively weak, with the result that electricity subsidies continue to benefit the richest households disproportionately. Even though recent reforms have made subsidies slightly less regressive, the richest 20 percent of households still receive 40 percent more in subsidies than the poorest 20 percent of households. Moreover, there is a strong seasonality of electricity consumption, with rich and poor consuming more in the summer months. This pushes even the poorest households into higher-tariff slabs, increasing their bills substantially. Conversely, many richer households ‘drop’ into the more heavily subsidized and lifeline slabs during the winter months.

To better understand the experiences of electricity users in Pakistan, we conducted a qualitative study of households in three provinces: Punjab, Khyber Pakhtunkhwa (KPK) and Sindh. The study included 44 focus group discussions with low- and lower-middle income citizens, 40 in-depth interviews with individual household members, and 16 interviews with electricity company and social program officials. Electricity affordability remains a real challenge for many Pakistani households. Despite the subsidies, respondents reported struggling to afford their basic electricity needs. Some households reported being forced to reduce expenditure on food, health and childcare in order to pay their electricity bills. Low income households—in particular urban slum residents and beneficiaries of the Benazir Income Support Program (BISP)—mentioned resorting to illegal electricity connections because they could not afford to pay their bills. Aside from affordability, residential electricity users are most concerned about the reliability of supply and quality of customer service. Electricity is central to the lives of modern Pakistani households, and their lives have been disrupted by long hours of load shedding in recent years. The stress of coping with the high cost and low reliability of electricity is taking a toll on family life, health, education, and economic activities. The qualitative research revealed a general lack of trust in electricity service providers and a poor perception of governance in the sector. Many low income respondents expressed feeling disempowered to get help with service problems or trouble paying bills.

The case for further reform (ideally elimination) of electricity subsidies is clear. While declines in energy costs in recent years have helped contain the subsidy bill, the budget will come under renewed pressure if international energy costs rise or the rupee depreciates. Even if energy costs remain low, the targeting of subsidies is still biased towards the richest Pakistani households, while the poor continue to struggle to pay their bills. The removal of

electricity subsidies would arguably improve the sustainability of the sector and free up fiscal resources for more equitable social spending, but the consequent increases in electricity prices would have a significant negative welfare impact on poor households unless they are offset by other assistance.

The key message of this report is that assistance *can* be designed in a way that is less distortionary to prices and incentives, and more effectively targeted to the poor, than the existing price-based subsidies. In the National Socio-Economic Registry—a national proxy means test (PMT) database—Pakistan already has the available mechanisms and administrative capacity to target subsidies to households based on a good proxy for their welfare. Targeting subsidies would help ensure that assistance goes to those households that most need it, while excluding the richest consumers would save considerable resources. Providing bill credits in place of price-based subsidies would make billing simpler and provide equal assistance to all targeted households. In addition, innovative policies can help encourage consumers to use the formal electricity supply, cutting down on non-technical losses in the sector. The qualitative analysis, for instance, identified a need for more flexible payment options, and points to a waiver of late payment fees for the poorer households as a way of helping keep them connected. Measures such as connection fee waivers and amnesty on illegal connections could also help attract more consumers back into the formal system. The design of these policies could be informed by the growing literature on economics and psychology, making use of behavioral techniques to influence consumers' incentives. Whatever approach is adopted, it will be important to pilot and then gradually scale it up to ensure it is effective and that the policy transition is made smoothly.

Finally, we discuss ways in which the transition to more effective energy assistance can be managed in a politically sensitive way. In doing so, we draw on international experience and lessons from the qualitative study. Experience from subsidy reform episodes worldwide stresses the importance of developing an effective communication plan from the very beginning (Clements et al. 2013a). Our qualitative research findings reveal that many lower-income households are unaware that there are electricity subsidies, and do not understand the need for tariffs to increase. There is a perception that prices are already too high, and this encourages the use of illegal connections. Moreover, given that a large share of poorer households are not formally connected to the grid, subsidies are a highly inequitable means of providing energy assistance. To ensure subsidy reform is publicly accepted, it will be crucial to employ a communications strategy that increases public awareness about weaknesses of the existing system and the need for reform, and explains how the reforms will make electricity more affordable for those most in need. Consumers might be more willing to pay higher prices for electricity if there are credible expectations of improvement in the reliability of the electricity supply in the medium term. The government should also address known governance and accountability issues in order to

convince the public that the reform is worthwhile. For instance, grievance redress mechanisms related to connection and bill payment could be strengthened and better publicized. Finally, a more credible policy to promote access to energy would provide alternative sources of electricity (such as solar power) to those who are separated from the grid, and promote access to poorer households in connected areas.

The report is structured as follows. **Chapter I** describes the current system of electricity subsidies in Pakistan and the pricing mechanism, takes stock of international experience on energy subsidy reforms, and highlights the importance of considering subsidies as part of the broader social safety net. **Chapter II** examines the relationship between electricity consumption and welfare using household survey and electricity company microdata. **Chapter III** presents the findings of the qualitative study, illustrating how households use electricity, manage their bills, and cope with increasing electricity costs and service disruptions. It sheds light on consumer perceptions and attitudes towards reforms, as well as factors driving these perceptions and attitudes. Finally, **Chapter IV** summarizes the policy implications arising from the multi-disciplinary study, and presents recommendations on how to improve the affordability of electricity for households in need in a manner that is politically acceptable and sustainable.

Chapter I: Country Background and International Experience with Energy Subsidy Reforms

The energy sector is critical to Pakistan's economic growth. However, it faces significant challenges, including weak governance, a lack of transparency, poor financial viability and inadequate service delivery. Existing residential electricity subsidies are regressive and distortionary. In recent years, the Government of Pakistan has undertaken reforms to address these challenges. As part of the reforms, the government has reduced spending on electricity subsidies and increased consumer tariffs to better reflect the cost of power generation and distribution. This has partly improved the situation, but more can be done to improve targeting of subsidies and address affordability issues.

Pakistan's power sector faces significant challenges in terms of capacity, governance and financial sustainability. Residential and industrial electricity consumers have been profoundly affected by routine power outages, called 'load shedding', where the electricity supply is periodically cut off in certain areas to ration supply during peak periods. In recent years load shedding has at times averaged 8 to 10 hours a day, constraining production and employment (IMF 2013). The sector's challenges stem from a complex mix of factors related to sector structure, governance, financing and subsidy design (among others). To address these challenges, the Government of Pakistan has embarked on substantial reforms of the power sector. Pakistan's National Power Policy, approved in June 2013, envisages that "Pakistan will develop the most efficient and consumer centric power generation, transmission and distribution system that meets the needs of its population and boosts its economy in a sustainable and affordable manner" (Government of Pakistan 2013). As part of its energy sector reforms, in October 2013 the Government of Pakistan increased residential electricity tariffs and modified the tariff structure to limit heavy users' access to concessional rates. However, one of the objectives of the National Power Policy was to ensure fairness by protecting the poor and cross subsidizing their consumption and that another was to create a culture of conservation and responsibility. The subsidy scheme continues to fall short of these objectives, as we will now explain.

The Government of Pakistan provides several subsidies to electricity consumers, the largest being the Tariff Differential Subsidy (TDS), which comprised 96 percent of electricity subsidies in 2012-13 (FY13). The TDS is the difference between the electricity tariff (plus tariff rationalization surcharge) paid by consumers and the 'allowable costs' of electricity utilities determined by the regulator, NEPRA. The government pays this amount to utilities in order to maintain a uniform national tariff for each tariff category and provide additional subsidies to certain consumer groups. Residential electricity subsidies in Pakistan are based on the monthly electricity usage of each customer. The tariff structure is

based on ‘slabs’ of monthly household consumption, with the unit cost of electricity increasing from one slab to the next (see Table 1).¹ A highly concessional ‘lifeline’ tariff is provided to households that use less than 50 kWh per month.² The lifeline tariff is intended to protect the poor by allowing them to afford a minimum amount of electricity. However, the benefit of the lifeline tariff is curtailed by a minimum monthly charge of Rs 75, meaning the subsidized rate is effectively only paid by consumers with consumption between 38 and 50 kWh in a given month.

Table 1: Residential electricity tariff schedules

Monthly consumption (Kwh)	2012-13	2013-14	2014-15	2015-16
0-50 (lifeline)	1.87	2.00	2.00	2.00
51-100*	4.54	5.79	5.79	5.79
101-200	6.86	8.11	8.11	8.11
201-300		8.11	12.09	10.20
301-700	10.65	12.33	16.00	16.00
700+	13.29	15.07	18.00	18.00

Note: * Consumers in this slab pay this rate for the first 100 units.

In the October 2013 reform, the government increased tariffs for slabs above 200 kWh per month (thereby splitting the second slab in two) and changed the method of calculating bills. Whereas households previously paid for their first 100 units at the 1-100 kWh/month slab rate, the next 200 at the 101-300 kWh/month tariff, and so on, households now pay the unit rate for the slab immediately below their total monthly consumption for all electricity up to that slab’s upper bound, and the unit rate on the subsequent slab for the remainder. For example, a household consuming 350 kWh/month pays the 200-300 kWh slab tariff rate for the first 300 kWh used and the 301-700 kWh tariff for the remaining 50 kWh used. The top two slabs are no longer subsidized, but due to the 201-300 slab subsidy some households consuming over 300 kWh/month still get a small subsidy.

While the 2013 tariff adjustments were achieved successfully and reduced the immediate debt burden, future cost pressures could see subsidies rise again as a share of GDP. Electricity subsidies remain poorly targeted and provide limited support to vulnerable households. In a previous World Bank study, it was shown that electricity consumption is weakly related to overall welfare in Pakistan, and therefore richer households still benefit disproportionately from subsidies (Walker et. al. 2014). Meanwhile, poor households

¹ The description here relates to the standard tariff. There is also a ‘time of use’ tariff for the 1.4 percent of households with electronic meters (as of June 30, 2015). This tariff structure has flat peak and off-peak rates for all units consumed.

² In the FY16 notifications, yet to become effective, the lifeline is to be restricted to households based on sanctioned load and average consumption.

struggle to afford higher electricity costs and resort to coping mechanisms that negatively impact their overall well-being. Around one-third of households, the majority of which are poor or living in remote areas, remain unconnected to the grid and instead use more expensive or less efficient energy sources. Since energy subsidies are poorly targeted, it is natural to ask whether there might be more efficient and equitable means of making energy affordable. But even though the electricity consumption of the poor is relatively lower, any cuts to subsidies would have a proportionately greater impact on their welfare, through higher prices for electricity, alternative energy, and indirectly on other goods and services. This makes it essential that any further subsidy reduction (or elimination) is accompanied by targeted measures to protect vulnerable households and keep energy affordable.

International experience with energy subsidy reforms emphasizes the importance of compensation to protect poorer households against adverse impacts of subsidy reforms. The choice of compensation method depends on the country's economic and political circumstances. When undertaking such reforms, it is important to consider the availability of existing social programs, administrative capacity, fiscal soundness of the budgets, and the political context (Yemtsov et al., forthcoming). Such compensatory measures should be tailored to the likely impact of the reform on different groups, not necessarily just the poor.

Cash transfers are often introduced or augmented as a means of replacing or at least temporarily mitigating the adverse effects of subsidy reform. Cash transfer programs can be universal (provided to entire population) or targeted (provided to selected households, usually the less affluent). Targeted cash transfers, on the other hand, remain one of the most preferred safety net tools available for energy subsidy reform. The experience of Indonesia (see Box 1) illustrates that targeted cash transfers can reduce the population's opposition to subsidy reform, and help assist those most in need. In Pakistan, the largest cash transfer program is the Benazir Income Support Program (BISP), which provides monthly cash transfers and other support to married and widowed women in more than 5 million households. The monthly payment to BISP beneficiaries has been increased by

Box 1: Indonesia's subsidy reform experience

Indonesia is one of the flagship examples of successful subsidy reform. In 2005, the increase in international oil prices gave way to ambitious subsidy reforms, which proceeded in two stages (Clements et al., 2013). In March 2005, the government raised gasoline and diesel prices by 33 and 27 percent respectively. Kerosene, being the least regressive of the subsidized goods, was initially left unchanged. In the second round of reform later that year, all fuel prices were increased, and kerosene prices almost doubled as a result. Had there not been a proper compensation plan, it is estimated that these price hikes (particularly of kerosene) would have caused the poverty headcount index to rise by 5.6 percentage points (Yemtsov et al., forthcoming). To mitigate such drastic impacts on the poor and near-poor households, the government introduced a two-pronged compensation package, reallocating a significant share of the savings from the subsidy reform towards social protection. A temporary (two-year) unconditional cash transfer introduced in conjunction with the reforms, *Subsidi Langsung Tunai*, was provided to the poorest 35 percent of the population (well above the 16 percent poverty line), in order to protect the near-poor and minimize political unrest (Beaton and Lontoh, 2010). What was then the world's largest UCT program proved to be largely successful in reaching the poor; the poorest quintile received 21 percent of the benefits, while the second, third and fourth quintiles received a total of 40 percent. The compensation package also included education, health and rural infrastructure programs for the poor (which were introduced later).

50% since 2013, likely offsetting the bulk of the adverse impact of the 2013 subsidy reform on the poorest households (Walker et al., 2014).

Non-cash compensation measures have also been adopted in many countries. This includes measures such as vouchers, fee waivers, targeted distribution of LPG for poor households, school meals, public works, reductions in education and health user fees, and incentives to switch to alternative energy sources or save energy. The latter may be particularly important in Pakistan, where around one-third of poor households lack access to electricity. Such measures could include the use of solar power, for example, in much the same way as Indonesia distributed clean cookstove starter packs to encourage citizens to move away from the use of kerosene for cooking (see Box 9).

Cross-country evidence also points to the need to take a *staged approach to subsidy reform*. Ad-hoc cuts to subsidies without longer term commitment can lead to public opposition and rollback of reforms. A more gradual pace of reforms not only helps inform citizens and target groups of the policy changes, but also helps build ownership and trust in Government processes (Yemtsov et al., forthcoming). A gradual approach can also facilitate a smoother economic and social transition to higher prices, provided the reform is backed by sound compensation mechanisms (Clements et al., 2013b). Timing is another crucial factor. Reforms are usually precipitated by macroeconomic needs or energy inefficiencies. However, advantage can be taken from favorable conditions such as a low-price environment in order to minimize the adverse effect of the reform. Gradual sequencing can also distribute negative impacts over a longer time period and enable households to adjust,

Box 2: Sequencing subsidy reforms

Indonesia: In 1997, when the government first attempted to reform fuel subsidies, it announced drastic increases in fuel prices (kerosene by 25 percent, diesel by 60 percent, and gas by 71 percent). The protests that followed contributed to President Suharto's dismissal (Clements et al. 2013a). In 2005, the government put in place a clear plan for reform, with price increases occurring in two installments. After the first increase, the government ordered an assessment of the system's performance. The evaluation revealed high under-coverage of the poor. As a result, the Government reopened program applications and added 3.7 million households to the safety net program before the second price hike took place. Total coverage totaled 19.2 million households by 2006.

Armenia: An important phase in the electricity subsidy reform was the increase of electricity tariffs to almost cost-recovery level before the actual electricity privatization took place. This allowed time to build the public's trust in the government's intentions and commitment behind systematic energy reforms (Clements et al., 2013a).

Iran: The gradual adjustment of prices was crucial in the success of the reform. The plan was to increase prices over five years, to almost par with international oil prices (Clements et al., 2013a). The initial price hike was only introduced after the first installment of cash transfers was made, and was followed by accompanying measures including gasoline rationing and quotas, and multi-tier tariffs on utilities, which made the reform process seem even more gradual and spread out.

Nigeria: The government undertook ambitious measures to reform both electricity and fuel subsidies. The president notified the public of the reform process and established a Subsidy Reinvestment and Empowerment (SURE) Program in order to mitigate the impact of the reform through targeted safety net programs. Nevertheless, soon after SURE was put into place, the government increased fuel prices to cost-recovery levels in one step, a staggering 117 percent increase. Nationwide protests and strikes forced the government to scale back the price increase to roughly 50 percent (Whitley and van der Burg, 2015)

but it increases the risk that the reform may be abandoned due to changes in the political or budgetary situation. Some international case studies related to the sequencing of reforms are provided in Box 2.

In general, the best practice is to start by providing support to the affected groups before or concurrently with the price hike. The pace of reform should take into account the time needed for the population to adjust to the new prices and for compensation to come into effect (Sdravovich et al. 2014). Implementation capacity and development of delivery systems can be major bottlenecks, and often determine the scale of reform and compensation. Social, political and fiscal factors play a role as well. The IMF suggests that about five years are needed to gradually phase in price increases and ensure a successful reform (Clements et al. 2013a). The experiences of numerous countries has shown that reforms are most successful if citizens and other stakeholders are engaged prior to the reform, to help design and provide feedback on the planned changes, and that a clear communications program accompanies the reforms. We elaborate further on how this can be done in Chapter IV.

Chapter II: Distributional Incidence of Electricity Subsidies

This chapter examines electricity consumption and subsidies by income level based on electricity billing and consumption data of residential consumers. Data from the Household Integrated Economic Survey (HIES) were used to analyze electricity consumption and the distributional incidence of electricity subsidies at a national level based on self-reported electricity expenditure. As a cross-check, we compared this with monthly billing data from selected regions, merged with data on household welfare from the National Socio-Economic Registry (NSER). In both cases, we find that residential electricity subsidies disproportionately benefit non-poor households. The analysis also shows that the NSER database could be used to better target subsidies based on a proxy for household welfare.

In Chapter I, we discussed how electricity subsidies are provided to households based on monthly electricity consumption. Subsidies are concentrated on households with lower electricity consumption. This approach appears pro-poor on the assumption that richer households consume more electricity. While we find that this is true on average, the rich still receive more subsidies overall. First, the relationship between electricity consumption and overall welfare appears quite weak; hence many better-off households have low measured consumption. Second, although the per-unit subsidy decreases as overall electricity consumption rises, the *total* subsidy received by a household increases until its consumption passes 300kWh/month. This is illustrated in Figure 1, which shows the tariff per unit charged to the household along with per-unit cost. The vast majority of households consume less than 300kWh/month on average, and since the rich consume more than the poor on average, their total subsidy is greater.

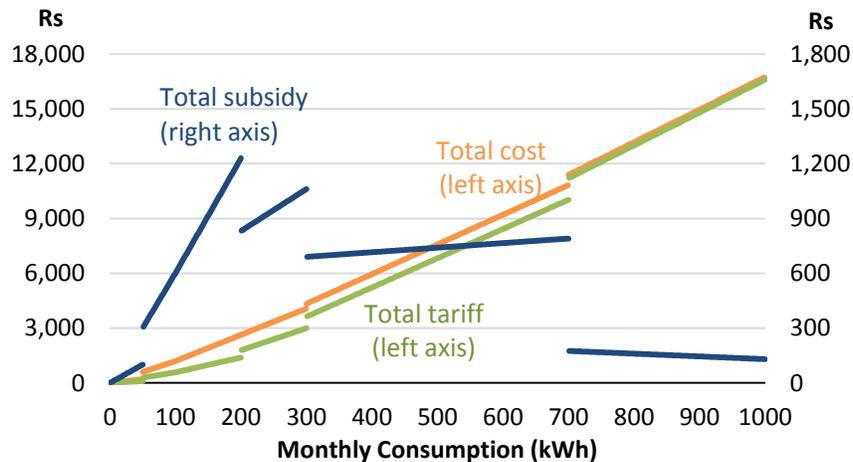
In this chapter we explore this result using two different data sources: the 2013-14 HIES, a nationally representative household survey conducted by the Pakistan Bureau of Statistics (PBS); and administrative data on almost half a million households collected from three electricity distribution companies (DISCOs), which were merged with a national database of poverty scores covering almost all households in Pakistan.

A. Analysis of Electricity Consumption Data

We first look at the 2013-14 HIES data. We construct total monthly household per capita expenditure (a measure of welfare) following the approach used by the PBS. Figure 2 shows the breakdown of monthly electricity consumption by slab for each quintile of total

household per capita expenditure.³ While there is some difference in electricity consumption across quintiles, the graph shows that the vast majority of households from all quintiles consume less than 300 kWh/month and therefore benefit from the highest subsidy rates.

Figure 1: Price and subsidy structure for residential subsidies, as of 2014

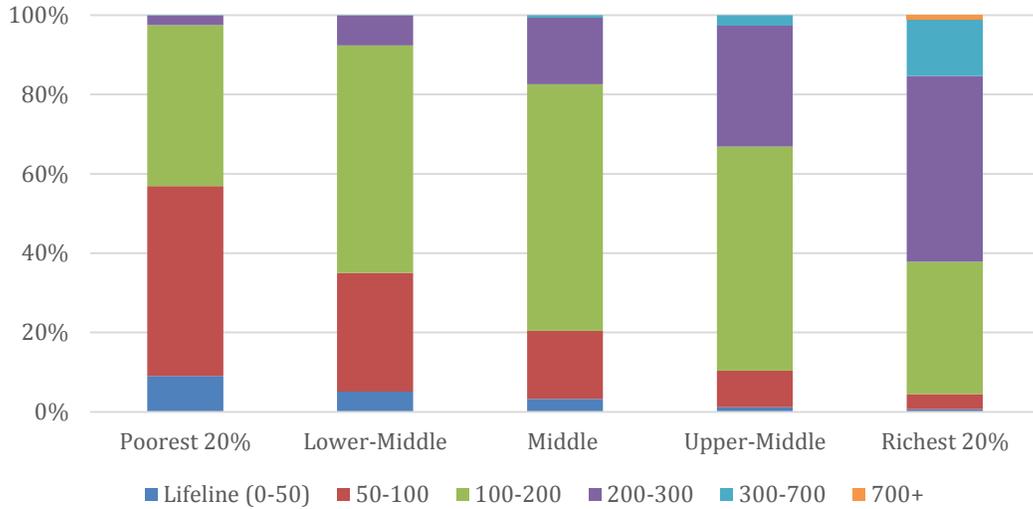


Note: Values are per household per month. Cost is the national average NEPRA-determined tariff for the slab.

When compared with the total subsidy per slab depicted in Figure 1, it is also clear that better-off households benefit more in absolute terms from electricity subsidies than do poorer households. This is also in line with findings from a detailed analysis of 2010-11 PSLM data (Walker et. al., 2014).

Figure 2: Residential electricity expenditure by quintiles (HIES 2013-14)

³ The poorest quintile is the 20 percent of households with the lowest monthly per capita expenditure, while the richest quintile is the 20 percent of households with the highest per capita expenditure.



One potential shortcoming of the analysis based on HIES data is that electricity consumption is self-reported by households, with a twelve-month recall period. Households may not be accurate in recalling past electricity expenditures, and it is possible that in reporting electricity expenditure they include expenditure on other energy sources such as batteries or uninterrupted power supply (UPS) devices. While the population-weighted total electricity consumption reported in the HIES data was found to align closely with the official production statistics from the Pakistan Energy Yearbook (2012), the above results might still be subject to some measurement error. In order to corroborate these findings, in the next section we repeat the analysis with actual billing data.

B. Analysis of Billing Data

I. Methodology

Data on monthly electricity consumption, along with other household details, were obtained for 325,926 households from three DISCOs: Gujranwala Electric Power Company (GEPCO), Faisalabad Electric Supply Company (FESCO) and Islamabad Electric Supply Company (IESCO).⁴ These DISCOs together serve almost 38 percent of Pakistan’s residential electricity consumers.⁵ The three DISCOs also cover a significant share of northern Pakistan, including a mix of rural and urban areas. For this analysis, IESCO, FESCO and GEPCO each provided a 10-15 percent random sample of household records for the

⁴ Other DISCOs were approached for inclusion in the analysis, but data could not be sourced with the right specifications in time for this study.

⁵ For a breakdown of billing data please see Annex 1.

period July 2013 to June 2014 (the same period during which the HIES data were collected).⁶

The DISCO databases include data on basic household characteristics as well as monthly electricity consumption, but they do not contain sufficient information to be able to rank households by welfare level. We therefore turned to the National Socio-Economic Registry (NSER), a near-census of almost 27 million households in Pakistan collected in 2011. The NSER is used for the targeting of more than 30 federal and provincial programs in Pakistan, most notably BISP. The NSER contains data on various measures of household socioeconomic status including occupation, household size, assets and characteristics of the household's dwelling. These variables were used to create a proxy means test (PMT) score for each household.⁷ The PMT score is a relatively good and easily verifiable proxy for household welfare, which can be used to identify subsets of the population for social programs. Because it is a census, the NSER could theoretically be used as a means of targeting subsidies; hence a secondary objective of this exercise was to test the feasibility of merging the NSER data to billing records.

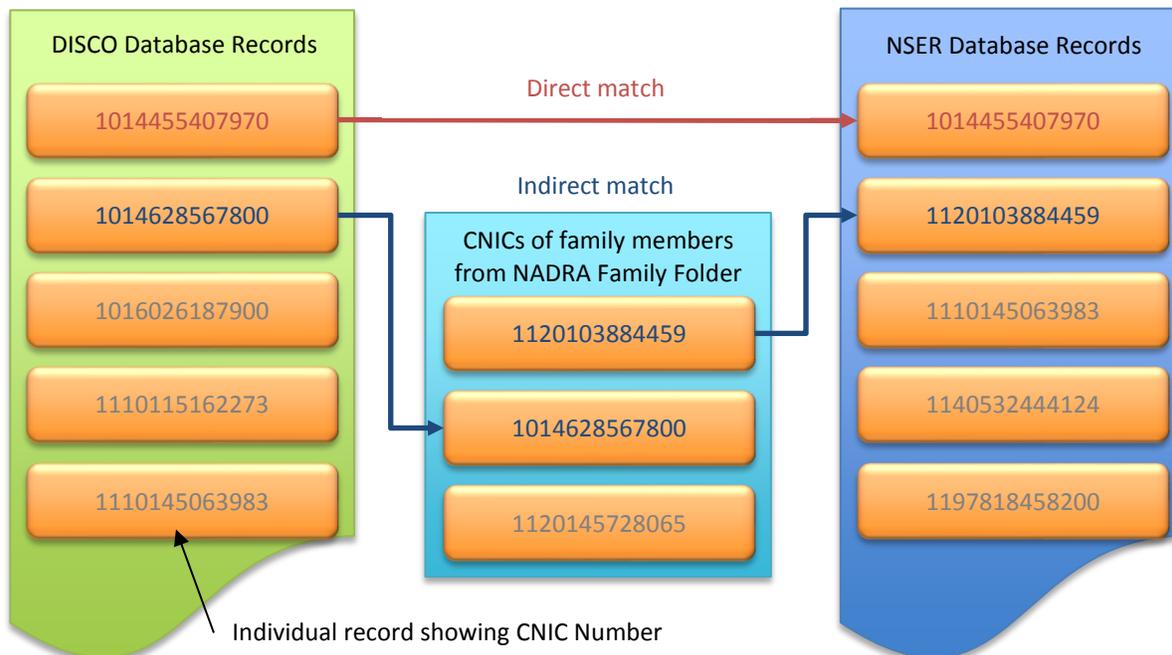
The National Database and Registration Authority (NADRA) generously agreed to merge the billing data with the NSER, using the Citizen's National Identity Card (CNIC) number as a common identifier.⁸ As well as looking for direct matches between CNICs in the two databases, NADRA also used its 'family folder' system to look for family links between CNICs in each database as illustrated in Figure 3. Around 45 percent of the 325,926 records in the DISCO database were successfully matched to the NSER data. This seems low, but is actually quite impressive considering the NSER database was put together in 2011, and many households that did not have a CNIC in 2011 have since obtained one. Another major reason why records did not match is that many CNICs in the billing data were missing or invalid. This indicates that, in order to be used for targeting, the billing company's CNIC records would need to be validated. Following the analysis below, we compare the matched and unmatched samples and show that they do not differ substantially; we are therefore relatively confident that the omission of these households does not skew the results of the analysis. Annex Table A2 summarizes the breakdown of matched and unmatched records.

Figure 3: Illustration of data matching process

⁶ The variables are CNIC of the bill holder, name and address, father/guardian name, kWh consumed per month for 2013-14 (FY14), connected load (kWh), phase and number of air conditioners.

⁷ The PMT score is designed to correlate closely with household per capita expenditure, enabling one to rank all households in the country roughly from poorest to richest. It is based on 23 variables related to household structure, dwelling characteristics, education, occupational status and assets.

⁸ The Citizen's National Identity Card (CNIC) number is a national unique identification number provided to adult citizens. Further details on the matching process are provided in Annex A.



II. Findings

Even though we have data on each month of the year July 2013 to June 2014, billing data are often estimated in certain months and balanced at the end of the year or when the meter is read. To avoid introducing this measurement error into the analysis, in this section we report *average* monthly consumption over the year.

Table 2 summarizes basic characteristics of the data. We use quintiles of the PMT score as the measure of welfare.⁹ It can be seen immediately that electricity consumption is relatively similar across the population and is weakly correlated with poverty.

Table 2: Summary of household characteristics and electricity consumption by PMT quintile

Quintile of proxy means test score distribution	Median household size	Median number of household members per room	Median electricity consumption (kWh/month)	Mean electricity consumption (kWh/month)
Poorest	7	6	81	92
Lower-Middle	6	4	94	101
Middle	5	3	102	110
Upper-Middle	4	2	100	109

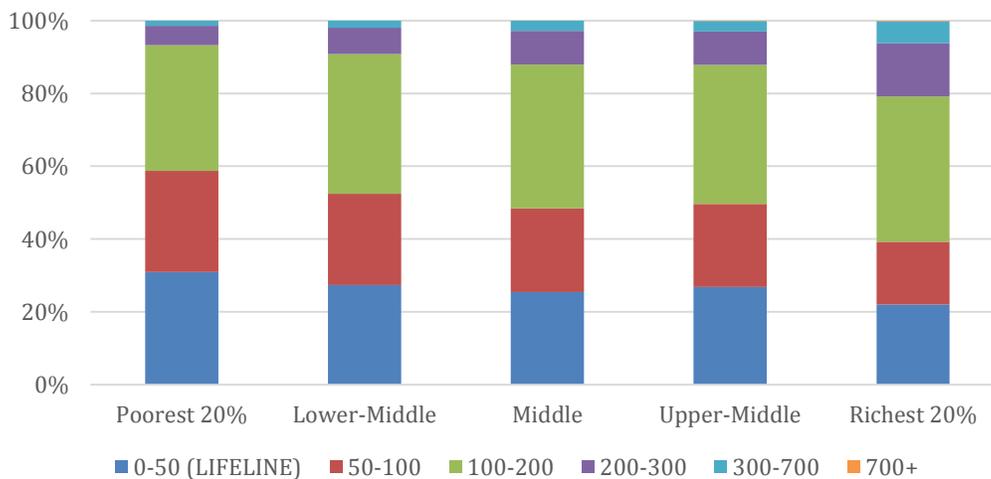
⁹ The cutoff PMT scores for each quintile are as follows: Poorest Quintile = 0 to 22, Lower-Middle Quintile = 22 to 29.7, Middle Quintile = 29.7 to 37.4, Upper-Middle Quintile = 37.4 to 46.4, Richest Quintile = 46.4 to 95.17.

Richest	5	2	118	133
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Figure 4 replicates the analysis done for the PSLM data. There are some key differences in the results. Around 30 percent of the poorest quintile consumed less than 50 kWh/month (the lifeline slab), compared with 22 percent of the richest quintile. Aside from the generally lower figures, however, the pattern is generally the same: electricity consumption rises gradually with welfare, and almost all households qualify for subsidized electricity. This graph also implies that the subsidy reductions in 2013 likely had a direct impact on only a small proportion of households, since the tariff increases were limited to slabs above 200 kWh/month.

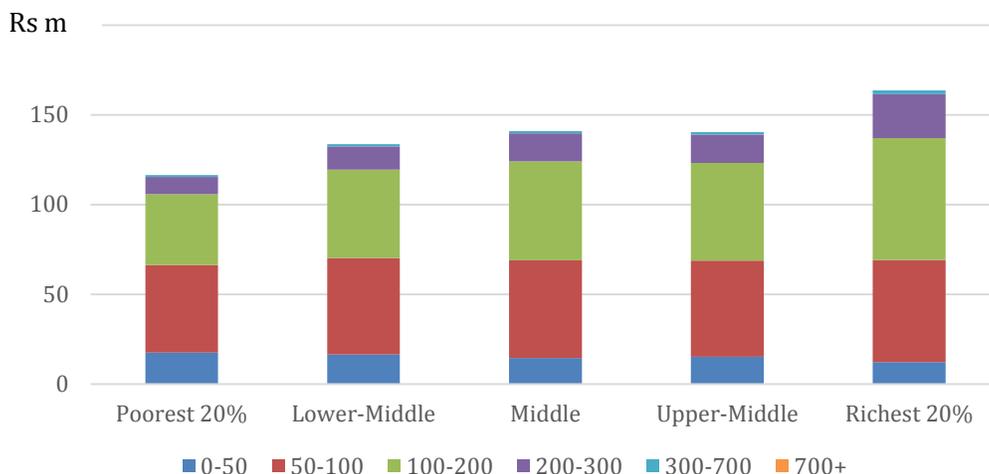
Figure 5 shows clearly that the distribution of subsidies is skewed disproportionately in favor of the richest households, with the top 20 percent of households receiving about 24 percent of the total subsidy. It can also be seen that the 50-100 and 100-200 kWh/month slabs account for the majority of subsidies: any substantial cuts to subsidies will need to be focused on these slabs, and this would adversely impact lower and middle income households.

Figure 4: Distribution of mean monthly consumption by poverty group and tariff block



Note: For billing database only.

Figure 5: Distribution of subsidies by PMT quintile and consumption, 2013-14

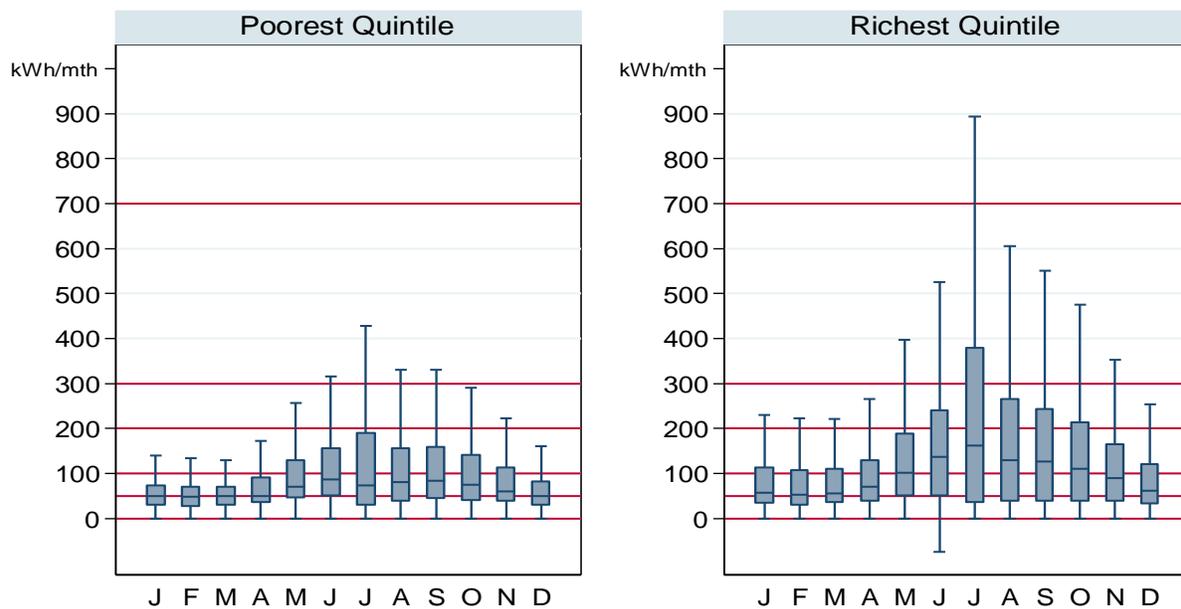


Note: For billing database only.

Seasonality of Electricity Consumption

Another weakness of the current subsidy system is that it does not take into account intra-year variation in electricity consumption. Given Pakistan’s warm summer climate and cool winters, electricity expenditure varies widely by season. This is shown in Figure 6, which plots the per-meter electricity consumption distributions by PMT quintile and month. While around half of poor households qualify for the lifeline in the winter, three-quarters jump above the lifeline cutoff in the summer months. Conversely, around 13 percent of rich households qualify for the lifeline subsidy in the winter. These findings indicate that the existing static subsidy scheme fails to provide adequate coverage to the poor in the summer, and provides an unnecessary benefit to richer households in the winter months, when electricity affordability is less of a concern.

Figure 6: Seasonal Variation in Electricity Consumption



Notes: Box ends are the 25th and 75th percentiles of monthly consumption in kWh for the given quintile. The consumption is the average for that month over the two-year observation period (Jul 2013-Jun 2015). The center bar shows median consumption. Red horizontal bars are the slab cutoffs. Note negative values in July are due to adjustments for previous estimates, which are all settled at the end of the fiscal year.

Source: Matched monthly consumption data from FESCO, GEPCO and IESCO, Jul 2013-Jun 2015. PMTs from NADRA.

I. Limitations and Robustness Checks

We now consider a number of possible limitations of the above analysis.

Low match rate

Our analysis is predicated on the assumption that the PMT scores matched to the billing data tell us about the patterns of electricity consumption and welfare at the national level. However, only 45 percent of DISCO records could be matched with the PMT score through the NSER.¹⁰ We analyzed the reasons for non-match in Table 2. A relatively small share of records could not be matched due to issues with the recorded CNICs in the DISCO database. This is a promising finding, suggesting that the data are generally of reasonable quality. The majority of the unmatched households could not be found in the 2010 NSER survey data. This is likely to be because those families did not have a CNIC at the time of the survey.

¹⁰ The unmatched 55% will have similar socioeconomic breakdown or might be skewed towards the better off households as records of the initial NSER survey shows that most refusals came from better off households. The K-density plot shows the variance in PMT across the matched sample (Annex E).

To check for biases in the matched sample, we calculate the average consumption (per month) for both the matched and unmatched sample and ran a *t*-test to determine whether the two samples are statistically significantly different. The *p*-value was 0.42, which implies no significant difference in consumption levels between the matched and unmatched samples. We then consider differences in welfare levels between the two samples. We first construct a synthetic PMT score for each household using our matched sample, and then predict the PMT distribution for the unmatched sample. Again the matched and unmatched samples appear quite similar, suggesting that the failure to match some observations does not bias the analysis.¹¹

Tenant households

It is common in Pakistan for the name on the electricity bill to be that of the owner of the house, even if the property is rented by another family. If this is the case, it is likely that the better-off landlord's PMT score is matched against the poorer tenant's actual electricity consumption, perhaps contributing to a result of low consumption by wealthy households.

To determine whether this is an issue for the results of the study, we look at the proportion of households renting in the study area. The PSLM 2013-14 data indicate that in rural areas, 93 percent of families own their house, while in urban households, ownership was around 72 percent. However, this is not a major concern for the analysis for the following reasons: first, the service areas of the three DISCOs are predominantly semi-urban and rural; and second, according to officials at GEPCO and FESCO, the mismatch between owner and tenant is less likely in rural and semi-urban areas. A district-wise representation of the billing data sample can also be found in Annex C.

Representativeness of the billing data

The PSLM data examined in Part I are nationally representative. The billing data sample is fully random, but comes from only three non-randomly selected DISCOs. How might the analysis differ if the other DISCOs were included? First, we note that the three DISCOs covered in this analysis comprise 38 percent of all households. Since these are relatively well-off districts, we would expect to see higher electricity consumption among this sample. This would imply that nationwide there would be proportionately less households above the 300 kWh/month level, reinforcing the above analysis.

Multiple connections

The final concern is households with multiple connections. Approximately 83 percent of the matched sample has a single meter connection (that is, the bill payer's CNIC appeared

¹¹ Results are available from the authors upon request.

only once in the database), 6 percent have 2 or 3 meters, and 11 percent have more than 3 meters (Annex A). For the analysis we removed all households with duplicate observations, since it is not clear whether this reflects an effort on the part of households to evade higher tariffs or is simply an error in the CNIC records.

II. Conclusion

This section has examined current household electricity consumption patterns in the context of the extant tariff and subsidy structure. The analysis confirms the findings of an earlier analysis of household survey data. Subsidies are poorly targeted to lower-income households due to the weak correlation between welfare and electricity consumption. Indeed, a disproportionate share of the subsidy outlay goes to the top two quintiles. We also find that the price-based subsidies are time-inconsistent, failing to protect even more poor households in the summer when electricity needs are greatest. The analysis shows that it is likely impossible to design a tariff structure with subsidies that effectively protect poorer households without significant leakage to the rich.

At the same time, further moves to bring residential electricity tariffs to cost-recovery levels would have a significant negative impact on a large share of poor households. Instead, we argue that the NSER could be used to target subsidies (or cash transfers in lieu) using the PMT scores for each household, as has been done for over 30 programs in Pakistan. An ongoing update to the NSER should address most of the issues we faced matching households due to missing CNICs, which have been distributed to a majority of households in recent years but were not recorded in the previous NSER census. Once the data are updated, and based on NADRA's extensive experience in using the NSER for registration and targeting of households, it will be relatively straightforward to register a subset of the population for subsidies based on their poverty scores. In Chapter IV we present some options for how this could be done.

Chapter III: Qualitative Assessment of Energy Subsidies and Reform

This chapter presents the findings of a qualitative assessment conducted in Pakistan to better understand the perspective of low and middle income households regarding electricity services. The findings emphasize the centrality of electricity to the lives of these households, and the day-to-day struggles they face due to increasing energy costs and irregular periods of load shedding. Electricity expenditures push vulnerable households to cut spending on essential needs such as food and education. Meanwhile, load shedding negatively impacts family life, employment activities, education and health. Qualitative research also points to the prevalence of mistrust among households towards electricity providers due to perceived governance and accountability issues in the sector.

A. Methodology

To better understand the situation of households regarding electricity subsidies, a qualitative study was commissioned by the World Bank and carried out by SoSec International, a Pakistani research company. The draft research guides/instruments for the qualitative study followed a methodology developed in a regional qualitative study conducted in eight countries in Europe and Central Asia (ECA) to understand poverty and social impacts of energy subsidy and tariff reforms (World Bank, 2015b). These draft research instruments were revised to reflect the country and sectorial context in Pakistan. They were piloted in Islamabad by the contracted research firm and revised further to reflect issues Pakistani consumers face such as energy service delivery issues (e.g. load shedding), prevalence of informal connections, and relations with and attitudes toward service providers. The study took place in six districts of three provinces of Pakistan in May and June, 2015. The firm selected 400 people to participate in focus group discussions (FGDs), stratified by income group, gender and location (urban and rural).¹² Separate FGDs were held with BISP beneficiaries and *katchi abadi* residents.¹³ All participants had an electricity connection. In all, 44 FGDs took place, each with 8-10 participants. The discussions covered a range of topics related to energy usage, affordability and service quality, as well as potential reforms and compensation. An individual participant from each FGD was randomly selected to participate in an ethnographic interview (EI) following the

¹² We defined two strata for income: low income, and lower middle income. Overall, the reported average monthly income of low income respondents was between Rs 13,050 and Rs 14,675, corresponding to the first and second income quintiles according to the PLSM 2011-12. The average monthly income of lower-middle income participants ranged between Rs 19,700 and Rs 22,000, corresponding to the third and fourth quintiles.

¹³ *Katchi abadi* is the term used for informal settlements in urban areas.

FGD, during which the same issues were discussed in more detail. Finally, the study included 12 interviews with BISP officers and energy company representatives, in order to get a government perspective on the issues raised.¹⁴

B. Research Findings

The findings of the qualitative assessment affirm that electricity is central to the lives of low income and lower middle income households, and that households struggle with electricity costs. To cope with rising costs, respondents reported having to reduce expenditure on food, health and child care. Low income households, especially *katchi abadi* residents and BISP beneficiaries, also reported using illegal connections (the *kunda* system¹⁵) as a way to cope. Long hours of scheduled load shedding and unplanned electricity outages have a negative impact on economic as well as social well-being of households. Women are the main electricity consumers at the household level, and therefore more directly affected by supply disruptions. The majority of respondents did not trust their bills, reporting that measured consumption exceeded their expectations based on usage. Few respondents were aware that the government provides electricity subsidies. This sentiment towards the electricity service appears to be the result of frustration with unreliable supply and perceptions of poor sector governance. Despite struggling to afford electricity, respondents expressed a willingness to pay higher prices provided service quality improves and governance problems are addressed. However, most respondents were skeptical that such improvements will take place. The following sections explore these findings in more detail.

I. Energy Use and Spending Patterns

Electricity is central to the lives of the households interviewed in the study. Nearly all households mentioned using electricity for lighting. While the types of electrical appliances used by households varied by income level and location, nearly all participants indicated that they use ceiling or pedestal fans in their homes. Most BISP beneficiaries and *katchi abadi* residents (the poorest group interviewed) reported using washing machines, fridges, irons, TVs and mobile phone chargers. Lower middle income households reported using a variety of electrical appliances, including personal computers, evaporative coolers, juicers, vacuum cleaners and sewing machines. More than half of

“Almost everyone takes a shower at least twice a day in our house during the summer months so the water motor is turned on at least three times a day... The iron is also used more because more clothes are washed and ironed because of the heat.”

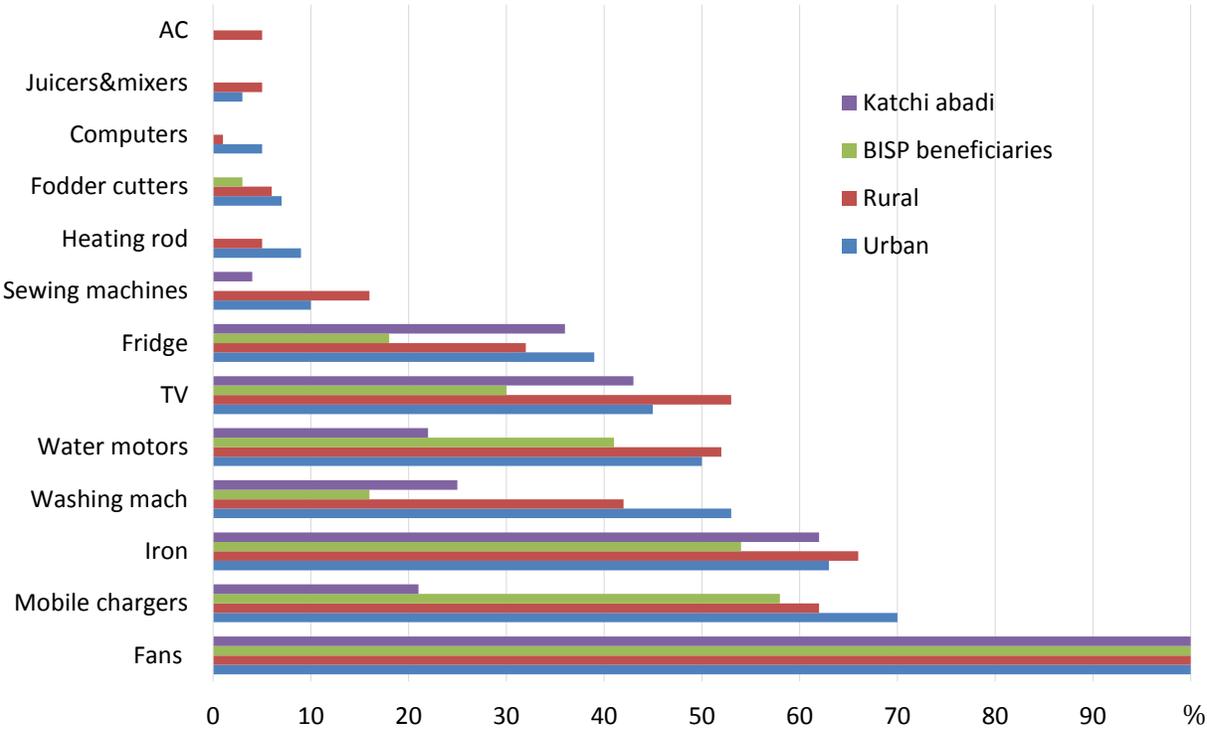
Lower middle-income female
Lodhran, Punjab

¹⁴ See Annex Table F1 for more details on the sample and methodology.

¹⁵ The *kunda* system involves making direct connections to power lines in order to bypass the meter.

the participants mentioned using electric pumps to fill household water tanks. Although these water pumps consume a limited amount of electricity, household water supply is interrupted if load shedding occurs when tanks are empty. Respondents engaged in farming also mentioned using electric pumps for tube well irrigation. While farmers had relatively higher electricity usage, households residing in rural areas reported using slightly less electricity compared to their urban counterparts due to lower rates of appliance use (Figure 7).¹⁶ This is not just due to lower living standards; during the summer months, rural families have the option to sleep outside in courtyards to save on electric cooling.

Figure 7: Appliance ownership among FGD participants



¹⁶ Qualitative research findings are not expected to be nationally or geographically representative and they should not be used to reach generalizations. However, to better understand energy use behaviors of Pakistani consumers, survey-like quantitative questions on appliance ownership were included in the focus group discussion guides. The data reflected in this table is tabulated by the contracted research firm based on an examination of focus group discussion summaries, in which a table with number of participants and their ownership of electric appliances was included. Since separate focus group discussions were conducted with urban, rural, katchi abadi and BISP beneficiaries, disaggregation of this quantitative data and tabulation was possible based on analysis of focus group discussion summaries. The World Bank task team also reviewed focus group discussion summaries on an ongoing basis during the implementation of qualitative research and analyzed this raw data to draft qualitative assessment findings.

Household electricity expenses fluctuate with the season: more electricity is used and costs are higher during the summer months. Low income and lower middle income households struggle more to pay higher electricity bills between the months of May to September. Peak consumption of electricity occurs during the summer months due to the need for electric appliances such as fans and coolers.

Due to higher summer temperatures, people take showers more frequently and need to wash and iron their clothes more often. This results in higher use of water pumps, washing machines and irons. Participants also mentioned using fridges more often during the summer. Ramadan also increased the consumption of electricity during the summer months in the period of the fieldwork. Households stated that they use energy-intensive food processors and juicers more during Ramadan to prepare for *sehri* and *iftar*.¹⁷ Another reason for higher electricity consumption in Ramadan is the short work and school days, which results in increased use of fans, lights and other electric appliances.

Consumption of energy is highest during the weekends and evenings, when most respondents do household chores. Male household members often come home at midday on Fridays to prepare for prayers. Consumption is higher during the weekends due to the presence of working adults and school children. On Sundays, women also use washing machines and iron more often.

Women and men have different electricity use behaviors. Women are the main consumers of electricity at the household level, being traditionally responsible for performing household chores and therefore the primary users of electric appliances such as washing machines, irons, refrigerators and food processors. The women interviewed were frequently involved in household budgeting, and appeared to be more aware than male respondents of the need to use energy efficiently.

Despite struggling with higher energy prices, most households interviewed prioritize paying their electricity bills on time to avoid surcharges. Poverty and unexpected shocks are the main reasons for nonpayment. In the discussions, participants expressed empathy towards those who are unable to pay their bills; however, the majority disapproved of illegal electricity use and believed that it was contributing to higher overall tariffs and poor electricity service.

II. Coping with Increasing Energy Costs

¹⁷ *Sehri* is an Islamic term referring to the meal consumed by Muslims before fasting during Ramadan. *Iftar* is one of the religious observances of Ramadan and is often done as a community, with people gathering to break their fast together.

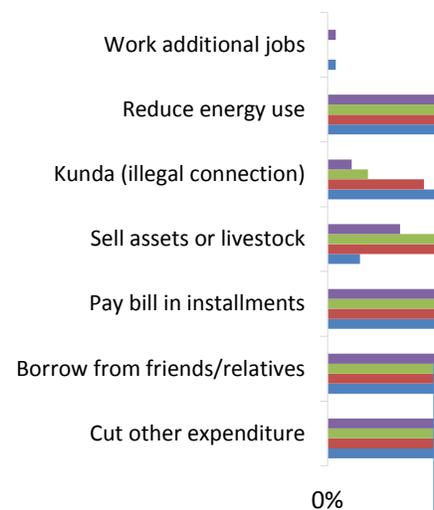
High energy costs diminish the economic and psychological well-being of households. Figure 8 summarizes the main coping methods by socioeconomic group. Both low income and lower middle income households reported reducing spending on food to pay electricity bills. *Katchi abadi* residents, BISP beneficiaries and low income households mentioned reducing the number of meals consumed and cutting out meat and other proteins. Lower middle income households, on the other hand, reported switching to lower-quality foods. Low income households also reported cutting spending on childcare and education (e.g. sending children to public schools, and economizing on school uniforms and equipment). This group of respondents also reported reducing health expenses by avoiding doctor visits and using self-treatment. Some rural households also reported selling livestock in order to pay their bills.

"I have stopped buying red meat or chicken. Previously we had it three or four times in a month but now we have it once a month. Electricity bills and other expenses are increasing and we have to change our living standards accordingly."

Female BISP beneficiary
Lodhran, Punjab

These results are consistent with the findings of a household budgeting study conducted by the Sustainable Development Policy Institute (SDPI, 2014), which found that 29 percent of respondents resorted to cutting their food budget, 8 percent reduced education expenses, and 6 percent cut health expenses to pay their electricity bills. Finally, social isolation is an indirect result of higher energy prices: some households reported having to stay away from social gatherings such as weddings due to an inability to afford the necessary clothing and gifts.

Figure 8: Coping mechanisms reported by FGD participants



"It is very stressful to take a loan from someone. My husband took a loan from my brother in law to pay off our electricity bill. I kept praying that we are able pay off this loan on time. Otherwise, my sister would have felt dishonored among her in-laws."

Low income female
Rural Mansehra, KPK

Households actively reduce their energy usage to

Residential Ele

"In order to cope with the utility bills, I cut down on food expenses. I mostly cook vegetables and avoid expensive food items. Our children study in government schools because we can't pay for private schools. We also try to cut down spending on their educational needs like shoes and uniforms."

Low income female
Urban Tando Muhammad Khan, Sindh

manage their electricity costs. Both low income and lower middle income respondents mentioned that they switch off lights in unused spaces, staying in one room with all family members to use fewer lights and fans, sleeping in courtyards in rural areas, washing clothes by hand, and using electrical appliances sparingly. Women are more affected by the increased use of manual tasks. Rather than run appliances, they perform household chores manually, which increases their workload and reduces time that can be spent on educational or income-generating activities. Investing in energy-saving appliances is another popular strategy: 68 percent of lower middle income households reported purchasing energy saver bulbs and more efficient appliances. Respondents engaged in farming emphasized the potential savings from switching to alternative energy sources such as solar power.

Paying bills in installments was another coping mechanism mentioned by research participants. Some respondents mentioned that they would prefer not to pay bills in installments as it creates additional stress on household members. These respondents stated that when they pay in installments, they constantly worry about whether they will be able to pay their installments on time. Respondents also saw this method as unattractive, reporting that it sometimes required bribery of officials. Borrowing money is also employed as a coping strategy by some respondents. Around a third of low income respondents mentioned borrowing money from their relatives to pay bills. Borrowing is viewed as a last-resort coping strategy, because it puts considerable stress on family relationships.

"We pay a bribe of PKR 500 every month to the lineman so he

Despite the sensitivity of the topic, a small share of households conceded that they resorted to illegal electricity (the *kunda*

Box 3: Ethnographic Interview I

General Information about the Household

The respondent lives in the village of Timargarh in Lower Dir, KPK, with his extended family of ten. For the last 35 years he has worked as a driver. His house is partially constructed and has four rooms. His wife takes care of all the household chores. Both of his children are deaf, and he pays their medical expenses out of his limited income. He has a separate *kunda* electricity connection in addition to a functioning legal connection.

Expenditures on Energy Sources

Electricity is mainly used in his home for lighting, and for appliances including fans, a fridge and an iron. The respondent stated that his electricity bills are usually delivered in the last week of the month at the local mosque. The amount varies from Rs. 200 to Rs. 1,000 per month.

Coping Mechanisms

The respondent supplements his driver's income with wages from agricultural work. In order to reduce electricity expenditures at the household level, his family makes an effort to turn off all extra lights and to minimize use of the fridge during the winter months.

system) because they could no longer cope with increasing electricity costs. Users of the *kunda* system pay a small amount to the linemen every month to prevent them from

cutting their illegal connection. Some respondents mentioned that they started using the *kunda* system after their electricity was disconnected due to nonpayment of bills. According to Faisal and Eatzaz (2014), per capita income and the consumer price of electricity are key determinants of electricity theft in Pakistan. A small number of lower middle income households also mentioned using the *kunda* system intermittently. These respondents had legal connections but reported using the *kunda* system for high electricity consuming appliances. Respondents also mentioned that they share meters with their neighbors, as they cannot afford to pay to connect a separate meter. Respondents who share meters lack control over the total electricity consumption and the bill amount, with a consequent disincentive to save electricity. Because their consumption is combined, households that share a meter are also less likely to qualify for subsidies.

III. Experiences with Service Quality and Energy Sector Officials

Load shedding

While load shedding has reduced significantly in recent years, respondents from all income groups still mentioned this as their most common concern. In a 2014 study, 32 percent of households stated that they had experienced load shedding lasting more than 13 hours in a day (SDPI, 2014). Long hours of load shedding and electricity outages have had adverse impacts on the economic, physical and social well-being of citizens.¹⁸ In our study, respondents from various occupation groups such as shop owners, factory workers and tailors mentioned that their income levels had fallen due to load shedding. Most respondents complained that due to load shedding they are unable to use water pumps to get water; due to lack of electric light their children cannot study in the evening; and a lack of fans and coolers means they cannot get regular sleep during the summer. The psychological well-being of participants is also negatively affected by load shedding: some reported that they cannot relax in their homes and that they feel angry due to the unavailability of electricity.

“When there is no electricity we can’t use water pumps and we can’t give our children water. Our children get sick and they are more likely to get diseases like malaria.”

Male BISP beneficiary
Rural Nawabshah,
Sindh

“My husband has become really grumpy – he gets angry with everyone especially during load shedding. His bad mood affects the whole family. But it is mostly because he can’t sleep properly at night due to load shedding.”

Low-middle income female
Urban Lodhran, Punjab

As the main consumers of electricity at the household level, women are more affected by load shedding and by the household’s efforts to manage electricity expenses. Nearly all

heatwave in the country killed more than 1,300 people, and 65,000 people hours of power outages were blamed (Imtiaz and ur-Rehman, 2015).

female FGD participants stated that due to long and unpredictable hours of load shedding, they couldn't use appliances such as washing machines, irons, vacuum cleaners, and electric cooking appliances. Female respondents also mentioned that income-generating opportunities such as stitching and embroidery and housekeeping were hampered by the unreliable electricity service. Female respondents are also adversely affected by the stress of sleep-deprived husbands and children in the summer months.

In the absence of electricity, respondents switch to alternative sources such as battery-powered lights and candles. Candles were the most common alternative lighting source, used by 65 percent of BISP beneficiaries and 44 percent of *katchi abadi* residents. Overall, 72 percent of respondents reported using battery-powered lights. These carry costs too: households spent Rs. 200 to Rs. 250 on average each month on candles, while a battery-powered light costs Rs. 250. A small number of lower middle income households mentioned using an Uninterrupted Power Supply (UPS) during load shedding hours. The price of a UPS ranges from Rs. 10,000 to Rs. 60,000 depending on its capacity.

"Stitching requires light and I can't just do it in the poor light of candles. I get very tired because of this and my other household chores get affected."

Female low income
FGD participant
Rural Lodhran, Punjab

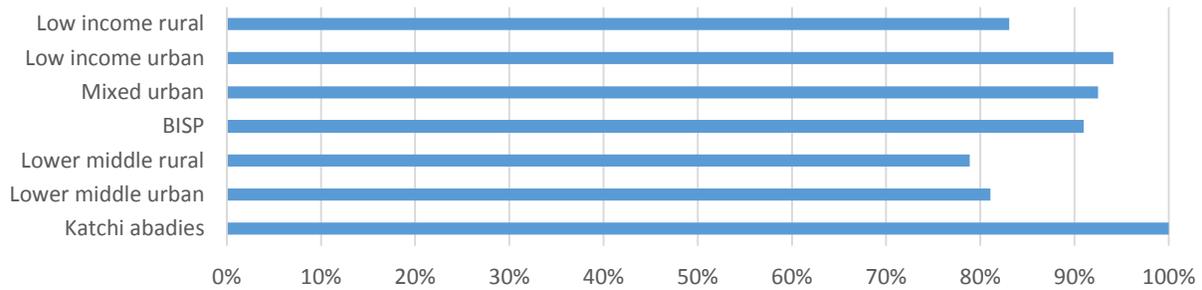
Billing system

The second most important problem reported by respondents was a pervasive lack of trust in the billing system, with 80 percent of respondents complaining that their electricity bill amounts do not reflect actual patterns of use (Figure 9). This appears to be due at least partly to the widespread practice of bill estimation: because of understaffing, meter readers do not visit every house monthly, but instead estimate usage and make an adjustment at a later date. This may be a source of confusion to consumers, and some respondents claimed that meter readers inflated their bills deliberately. Unreliable service also contributes to the perception of inflated bills. With fewer hours of electricity service, consumers expect lower bills. However, as load shedding has decreased, usage is likely to have gone up, and this has led some consumers to believe the utility company is cheating them. Electricity company representatives also emphasized the difficulties they face with meter reading due to staff shortages and difficulty in accessing some localities.

"With so much load shedding, why is the bill so high? They are not reading the meter properly."

Male BISP beneficiary
FGD participant
Nawabshah, Sindh

Figure 9: Percentage of respondents perceiving their bills as inaccurate



Governance

A majority of participants complained about the attitude of electricity company officials, perceiving them as rude and unresponsive. Around 81 percent of respondents stated that corruption was a significant problem in their interactions with service providers. Meter readers are the primary point of contact between the consumers and electricity providers; 44 percent of urban respondents and 29 percent of rural respondents perceived them as corrupt, while 32 percent of urban respondents and 37 percent of rural respondents complained about their attitude. Bribery of an official was reported by 65 percent of respondents, either to overcome issues related to overbilling, resolve technical problems, or in some cases to get an illegal electricity connection. The general perception among the participants was that without bribes no problem would be solved. There was also general dissatisfaction with the ineffective and untimely response of service providers to technical problems such as transformer breakdowns. All respondents were aware of the electricity company’s complaint offices, and many male respondents had visited them at least once. However, a substantial number of respondents reported having given up on their complaints after visiting the office. DISCO officials that were interviewed for the study agreed that their ability to provide good service and accurate billing was undermined by resource constraints, especially short-staffing.

“Once I had to go to the PESCO office because of a problem with my electricity meter. They kept referring me to different officers and they didn’t pay attention to my complaint. Finally I approached a lineman and offered him 1,000 rupees. Only then he was willing to address my problem. These people are actually forcing everyone to commit sins by paying bribes.”

Low income Male,
Rural Lower Dir, KPK

IV. Social Assistance

Energy affordability assistance is arguably part of the social safety net. If subsidies are not helping households to afford basic electricity needs without resorting to harmful coping mechanisms, improved assistance should be developed in the context of the country's broader safety net policy. We specifically interviewed BISP beneficiaries and non-beneficiaries about the program in order to understand what role it might play in any alternative energy affordability policy.

"I am fortunate that I was selected for BISP. Although the cash amount is not that big, it is very helpful. With BISP I pay small loans that I took from grocery shops and I also keep aside an amount for my electricity bills."

Female BISP beneficiary
Islamabad

Respondents demonstrated a high level of awareness of BISP.

Low income households in particular were aware of BISP's eligibility criteria and application requirements, and most had participated in the 2010 NSER survey. BISP beneficiaries consider the cash assistance an essential element of their income that helps them afford their utility bills. Around 70 percent of BISP beneficiaries interviewed perceived the BISP application procedure and the benefit amount as fair.

"I am poor. I don't have air conditioning in my house. I just use a fan but still the bill that my husband has to pay every month is barely affordable for us. I would like the government to charge me according to my economic status."

Low income Female
FGD participant
Rural Lodhran, Punjab

A considerable number of non-BISP beneficiaries in the low income group, on the other hand, felt that they should have been selected, and reported concerns about the clarity and fairness of BISP selection procedures. These respondents expressed their desire for additional support mechanisms

that could help them with their energy expenses.

Box 4: An In-Depth Interview with Service Providers

According to a meter reading supervisor at PESCO, in Lower Dir district of KPK, meter readers face challenges during meter reading and bill distribution due to a shortage of field workers and difficulty reaching remote areas. With a limited number of staff, the company could not deliver bills on time to such areas. This has consequences for the customers:

"Just two or three days have been given to us for the distribution of bills. Because of the limited time frame we cannot reach bills to all people, and thus some people get their bills after due day for bill payment. As a result, they have to pay extra surcharge and fines." (Meter reader supervisor, Lower Dir, KPK)

The respondent also emphasized that there is a tension between meter readers and communities. He said that there have been instances in which consumers threatened meter readers over higher bills.

A sub-division officer at PESCO observed that meter readers are often accused of unfair readings. He mentioned that the manual meter reading system needs to be replaced with a new system. According to sub-division officers in his area, there are more than 30,000 customers, but his staff checks only 6,000 to 7,000 meters a month. The remaining households receive estimated bills.

We asked respondents to choose their preferred energy affordability policy from three options: (i) increasing the BISP cash transfer; (ii) implementing targeted concessional pricing for the poor; and (iii) providing grants for energy saving measures. The most common response (with 87 percent support) was targeted concessional pricing for the poor. There was a prevailing perception among the research participants that well-off households get cheaper electricity, which should be addressed through credible and impartial targeting of assistance. Respondents agreed that adding an amount to BISP would help vulnerable households with their electricity expenses; however, there was a broad feeling that the benefit would not help many needy, low income households that had been unduly excluded from the scheme.

Box 5: Ethnographic Interview II

General Information about the household

There are eight members in the household. They live in a semi-structured house in a village. The respondent's husband works at a hotel, and the respondent manages household chores. They have six children, and all of them are school age. The household doesn't have a separate meter. The respondent's family shares the electricity connection equally with their relatives.

Expenditures on energy sources

The household spends Rs. 200 to 300 each month on alternative energy sources such as candles, and Rs. 300 to 700 per month on electricity. The family collects its electricity bills from the local village mosque, and the men pay the bills. The respondent tries her best to pay the bills on time. If there are any delays in bill payment, her relatives pressure her and this leads to tension.

Coping mechanisms

The respondent pays her bill on time and does not face many issues regarding bill payment. There was only one time when she had to take a Rs. 300 loan from her sister to pay her bill. However, the electricity bills affect her household budget. Her husband is sick, and even small bills are difficult to afford. It is not easy for her to send her children to school since they struggle to afford food.

Social Assistance

The respondent's family has received Rs. 1,500 per month from BISP for the last three years, and this has been very useful in helping her afford her electricity costs. Her household uses the BISP cash mainly for food and the children's education. She has also managed to put aside some money for emergencies.

Attitudes toward energy reforms

The respondent stated that she does not have sufficient knowledge regarding the reforms in the energy sector. In her opinion, the Government is responsible for making such decisions. However, she was aware that the price of electricity had been increasing.

V. Awareness and Acceptance of Energy Reforms

Finally, we asked participants about the planned reforms to subsidies, and under what terms they would accept price increases. In general, respondents were unaware that there

"If subsidized prices are so high, God knows what normal prices would be like."

Female katchi abadi
resident
Lodhran, Punjab

were electricity subsidies, especially given that electricity prices have increased in the last few years. Women were more aware of price increases than their male counterparts. However, women were less informed about the reasons for energy sector reforms. They expressed a belief that the increase in prices is associated with poor government policies and governance issues in the sector. Consumer attitudes towards reforms are also influenced by their trust in energy sector institutions and their interactions with electricity service providers.

Participants perceive future price increases as unjustified without improvements in service reliability and quality. Most of the respondents—in particular, BISP beneficiaries and *katchi abadi* residents—mentioned that they could not bear further increases in electricity tariffs. Upon further probing, interviewees agreed that price increases would be acceptable only if bills are made credible, load shedding is reduced and governance issues are addressed. However, the majority of households voiced their skepticism during the discussions that

Box 6: Ethnographic Interview III

General Information about the Household

There are eight members in the household. The respondent's husband is the main earner in the household and he works as a farmer. They live in a house in the countryside and have a separate meter. They mainly use electricity for lighting, running fans and electrical appliances such as fridge. They are not receiving any social assistance.

Expenditures on Energy Sources

The respondent stated that at times the electricity bill comes too high. She believes that high electricity bill is not acceptable given that there is excessive load shedding for several hours daily.

Coping Mechanisms

High electricity bills cause the household a great deal of stress. Due to inflation it is difficult to manage household expenses including food and the children's education. They try to reduce food and clothing related expenses to pay for their electricity bills. They also try to stay in one room to save energy and tend to sleep outside at night to avoid using fans. Despite using these measures they receive high electricity bills and are unable to pay them. The respondent also added that everyone had their own expenses and no one will lend them money.

Attitudes toward Energy Reforms

The respondent has general knowledge about reforms, which is limited to gradual increase in electricity tariffs over the last five years. She also said that she does not have any interaction with WAPDA and mostly her husband deals with such matters. The respondent also lacked information about the location of the electricity complaint office as well as the process of lodging complaints. She believes that the government is responsible

such improvements would ever happen.

Chapter IV: Policy Recommendations

Drawing on the above analysis, this chapter presents recommendations for improving electricity subsidies and ensuring the reform is successful and sustainable. Pakistan already has the capacity to better target subsidies to the poor and vulnerable using the National Socio-Economic Registry. Providing bill credits, rather than price-based subsidies, would simplify the billing system and guarantee vulnerable households a basic energy allowance. This approach would support lower-income households while excluding the richest consumers. Providing connection subsidies would further help encourage consumers to adopt and maintain legal connections. Based on international experience, we illustrate how the government can increase public support for the reform by: (i) conducting a communications campaign to improve citizens' awareness of subsidies and the rationale for reforms; (ii) addressing accountability and governance issues in the electricity sector; and (iii) strengthening grievance redress systems. Finally, we discuss the importance of improving governance, service quality and reliability of supply in medium to long term, in order to reduce the adverse impacts on households of load shedding and electricity outages.

A. Moving beyond general price subsidies

As we have demonstrated throughout this report, the existing price-based subsidy fails to protect low and middle income households from high electricity costs while disproportionately benefiting rich households. Price-based subsidies will only favor the poor if recorded electricity consumption is closely tied to overall welfare. This is evidently not true in the case of Pakistan—either because electricity usage patterns are similar across households, or because the current system of metering does not accurately capture consumption. Seasonal fluctuations further distort the functioning of subsidies, exposing poor households to higher per-unit costs for electricity in the summer, when their consumption is highest, and providing unnecessary discounts to rich households in the winter months.

Modifying the design of electricity subsidies will by definition require changes to electricity pricing, the governance of which is at the heart of the current electricity system. The system of price determination is bound up in broader issues of sector governance which we have not elaborated on in this report as they are well documented elsewhere. The sector's structure and governance are a major driver of the concerns about service delivery expressed by citizens in our qualitative analysis, and thus need to be addressed as part of any sustainable reform. Below we discuss alternative options for energy affordability and access, better service delivery and strategies for selling the reform, but one should keep in mind that these other reforms are also an important part of a long-run improvement in the fiscal sustainability and performance of the sector.

Improved targeting

First and foremost, we have argued that the existing subsidy structure is inequitable and inefficient. It is evident from the analysis in Chapter II that price-based subsidies are not an effective means of targeting assistance to those households that need it the most. Improving this targeting is a priority. **We recommend that the government use the NSER's database of poverty scores to determine eligibility for subsidies.** The NSER is already used to select beneficiaries for more than 30 programs in Pakistan. It allows the government to identify households based on their welfare level, meaning that assistance could be directed to any subgroup of the population. Previous research demonstrated how, given the regressive nature of subsidies, providing them to all but the richest 30 percent of households would reduce the cost of subsidies to below 0.4 percent of GDP (Walker et al., 2014). Alternatively, targeting a smaller percentage of the population (such as the poorest 40 percent) would enable the government to provide more generous assistance to the neediest households.

The matching exercise conducted in Chapter II was a first-pass test of this targeting mechanism. Using the CNIC records in the DISCO billing databases, NADRA was able to match poverty scores to almost half of the 350,000 households. A higher match rate would likely be achieved using the updated NSER data currently being collected. To be sure that records can be matched, in-person registration could be conducted. Households would be required to report in person to the DISCO office with their Citizens' National Identity Card (CNIC) and a recent electricity bill. They would identify themselves using the biometrics stored in the card, and the CNIC number would be used to look up their poverty score and make an instant determination of eligibility for assistance.¹⁹ For renters, a tenant would be entitled to claim a subsidy even if the bill is in the name of a landlord, but the subsidy would be limited to one per family, with families encouraged to re-register at their new address if they move. NADRA could provide the technical support to implement such a targeting system with customer access points at DISCO offices or another government post. To limit subsidies to one per family, a central database of beneficiaries would need to be developed. NADRA has the capacity and knowledge to do this type of registration and database development, having done so for various emergency programs in recent years (see, for example, Box 7).

A simpler alternative, which might work well if the objective is only to exclude the richest households from the subsidy, would be to **apply exclusion filters to determine eligibility.** For example, households with registered land, payers of income tax, holders of bank accounts, and so on, could be identified by CNIC and excluded from the benefit.

¹⁹ NADRA has the capacity to access the NSER database in real time using CNICs and biometric identification.

Further analysis would be needed to better understand which households would be excluded, and whether any deserving households would be unduly impacted by this approach.

With any targeting mechanism, **it is important to have a very clear process of application, review, appeal, and final eligibility determination.** This touches on two issues in particular: the need for a grievance redress mechanism; and the need for a carefully designed communications policy. Both issues are discussed in further detail below.

Affordability measures

The existing subsidy structure could be maintained for eligible households only; ineligible households could be charged the NEPRA-determined tariff or another cost-neutral pricing formula. However, such a system would not be fully equitable, and would not deal with the seasonality issue.

An alternative approach would be to **replace subsidies with a bill credit**, by charging all households a cost-recovery tariff and applying a monthly credit to the bills of eligible households. The credit could be set at an amount equivalent to basic electricity needs, with the household paying for usage above this level. The cost of the credit could vary with the tariff, or be fixed and reviewed periodically. The credit would serve as a more visible form of subsidy. To address the seasonality issue, the government could allow consumers to roll over unused bill credits to subsequent months (with some limitation, such as the current fiscal year), much the same way that cell phone companies allow users to roll over unused minutes. In this way, households not using all of their credit in the winter months could spend the remainder during the summer months (when consumption tends to be higher).

We also recommend that the government **consider more flexible options for payment of bills.** Our qualitative analysis found that poorer households are vulnerable to unexpected shocks, such as illness, that make it difficult to pay electricity bills on time. Some reported that they were disconnected as a result, and turned to the *kunda* system. Allowing flexible repayment would reduce pressures on customers to bribe officials or move to *kunda*. It would also help very poor households to smooth their consumption and avoid resorting to selling assets or going into debt. Households could be provided with a low-interest repayment option, or given a longer period of time to repay their bill. Penalties for late payment could also be waived for households in the target group. Such policies would need to be designed carefully to avoid moral hazard issues, but would help address the vulnerability of poorer households to rising energy costs.

One of the main limitations of the above forms of assistance is that they exclude households that are not formally customers of the DISCOs—a group that includes many of the poorest

and most physically isolated households in Pakistan. These ‘unconnected’ households can be broken into three groups: (i) households living outside the service area; and (ii) households living in service areas but not connected to the grid; and (iii) households using grid electricity illegally. For households outside the service area, there is no straightforward solution other than gradual expansion of coverage. In the meantime, the government may consider providing other forms of assistance to these households to help them cover their energy costs. Unconnected households inside the service area could be encouraged to connect to the grid by offering a **connection fee waiver or discount**. For those households that are connected illegally, an amnesty could be provided for a limited

Box 7: Successful Grievance Redress: The Pakistan Flood Emergency Cash Transfer Project

The cash transfer program for the Pakistan Flood Emergency project had a very successful grievance redress mechanism (GRM). The GRM included facilitation centers with grievance redress counters. It also included a public information campaign on the grievance redress process. Television, radio, print, and word-of-mouth was used as part of the communication strategy. In addition to facilitation centers, complaints could be registered by text messages, phone and calls. The project successfully mobilized different organizations to address different types of grievances, for example NADRA centers handled grievances related to incorrect personal details and local authorities dealt cases of eligibility/targeting grievances. Hotlines were created to handle cases of incorrect personal details. The local authorities checked whether the applicant is based in a flood-affected area and if they have already received the benefit. Another channel of communication was through local influential leaders who could verify the applicants’ status as flood affectees. The district authorities supervised the review process and the eligibility statuses were submitted to the Provincial Disaster Management Authority (PDMA). The final step involved NADRA entering the decisions into case management systems and clearing the households enrolled at the facilitation centers. For the payment grievances, the partner commercial banks operated through offices and dedicated hotlines. Grievances related to maladministration and unaddressed complaints were handled by the District Administration or NADRA. The GRM successfully handled grievances and has been cited as one of the most effective GRMs for emergency projects in Pakistan. The example shows that an effective GRM is one that is efficient on multiple fronts and where each organization effectively handles grievances both individually and as part of the collective effort.

Source: Rao, 2014.

time to entice these customers to resume an official account, while the bill credit and more flexible payment options proposed above would help them pay their bills and stay connected.

Whatever compensation and targeting schemes the government selects to replace subsidies, **it is advisable to pilot test, evaluate and refine them before scaling up nationwide**. This is quite feasible given the regional structure of electricity service delivery—the system could be reformed in phases by DISCO. As part of the pilot, it will be important to conduct further focus groups with beneficiaries to test their acceptance and understanding of the alternative compensation and targeting mechanisms. At that time, stakeholder and delivery chain mapping are two tools that can be used to anticipate

political economy and implementation issues. A better understanding of these issues will be crucial to the packaging of the reform, an issue to which we now turn.

B. Ensuring the success of the reform

International experience illustrates how countries that succeeded in reforming subsidies did so by addressing issues of concern to the public through a clear communications campaign, and through careful sequencing of the reform. We now review the findings of the qualitative study, and propose some ways to ensure Pakistan's reform is also successful.

Packaging the reform

The results of the qualitative analysis show that consumers are primarily concerned about affordability, reliability of supply, and issues related to transparency and accountability. To be politically acceptable, the reform should address each of these issues with a clear plan of action and timeline for results:

- Affordability can be addressed in the near term by **introducing more generous compensation mechanisms** as proposed above. It is important to emphasize that affordability is perceived as an issue for middle-income households too, so subsidies should extend beyond the poorest quintile but not go to the richest (and even perhaps second-richest) quintile.
- In the longer term, affordability and reliability of supply can be improved through **investment in infrastructure and better governance**.
- Concrete actions can also be taken to **improve transparency and accountability**, especially relating to the billing system and resolution of grievances.

Consumers do not trust the accuracy of their bills, which contributes to a reluctance to pay. **Investment in capacity to read meters and clearer presentation of the bills themselves** is a priority. The government has already taken steps to make subsidies clearer on electricity bills and to photograph meters when read to bolster transparency. Such efforts should be evaluated and successful approaches replicated across DISCOs. Households also report feeling unable to assert their rights as consumers. DISCOs in Pakistan have customer service mechanisms in place, including dedicated customer service centers, websites for lodging complaints, call centers and SMS services (Table 5). These **customer service mechanisms could be strengthened** to effectively and rapidly respond to queries and complaints. The Government could encourage DISCOs to experiment with these techniques by rewarding the best performers and publicizing their approaches.

The government could also **put in place or strengthen grievance redress mechanisms (GRMs)** and provide training to staff to address consumer concerns in a manner that builds trust. A GRM will be essential to manage the transition away from universal subsidies, and to deal with appeals to selection decisions under a new targeting method. Box 7 provides an example of how the GRM could be designed. Multiple implementation partners may need to play a role in redressing grievances: for example, identity verification grievances handled by NADRA, billing data grievances by DISCOs, and eligibility/targeting grievances by BISP.

Table 5: DISCO customer service mechanisms

DISCO	Customer service center	Complaints on website	Call center	Complaints via SMS/Phone	Online bill payments
IESCO	✓	✓	✓		✓
LESCO	✓	✓		✓	✓
GEPCO	✓				
FESCO	✓		✓		✓
PESCO	✓	✓			
HESCO	✓		✓	✓	✓
MEPCO	✓		✓		
SEPCO	✓	✓		✓	✓
K-Electric	✓	✓	✓	✓	✓

A ‘social compact’ approach could be considered as a means of further strengthening citizen engagement. This has been used in Turkey and the Dominican Republic to reduce non-technical losses (see Box 8). The social compact approach could be especially useful in Khyber Pakhtunkhwa and Balochistan, where illegal electricity use is common. A social compact is a formal arrangement in which the views of citizens are sought at regular forums at the local level, and actively incorporated in policy making. The social compact approach aims to increase mutual trust and accountability between service providers and consumers through stakeholder consultations and participatory monitoring. The social compact approach was implemented in two provinces in south-eastern Anatolia—the region of Turkey with the highest nonpayment rates. Stakeholder committees representing consumers and the electricity company were established. These committees developed a joint plan to address payment, service quality, and communication issues. The electricity company agreed to institutionalize this plan and improve its grievance redress mechanism. In return, citizens were expected to increase payment rates.

This approach may likewise be a good way of increasing trust and mutual accountability between service providers and consumers in Pakistan. Indeed, K-Electric has experimented with this type of approach, offering residential areas more reliable energy supply conditional on collection rates being maintained at a high level. This mutual accountability

Box 8: Dominican Republic—using social compacts and citizen feedback to align incentives

In the Dominican Republic, to solve the problem of lack of trust and transparency, Social Agreements (*Pactos Social*) were signed between three regional electricity distribution companies and the communities. These agreements aimed to build trust between the distribution companies and the communities, thereby increasing consumers' willingness to pay and improve the quality of electricity service. Under Social Agreements, consumers agreed to pay 90 percent of their bills and reduce illegal connections in exchange for 24 hours of service in rehabilitation areas. Strengthening service delivery was the necessary condition for building trust. Consumers were taught how to accept responsibility for payments and learned that payment is linked to an increase in service quality. An online geo-referenced consumer portal is developed as an independent controlling mechanism. The online platform was jointly managed by utilities and eight voluntary local civil society organizations. It enabled each citizen to send feedback on issues such as neighborhoods stealing electricity or complaints about rude technicians via phone, e-mail, social media, a mobile app, and also in person. Each report could then be viewed on a map at the <http://www.vozelectrica.org> website in real time and in full transparency. The participating electricity distribution companies could evaluate the reports and post their responses in public.

Social compact approach and the online platform *Vozelectrica* have proven to be successful. In the implemented areas, losses dropped from 36 percent to 27 percent and revenues increased by 12 percent in one year. The online platform provided extensive information to the utilities about how to reach consumers, what channels to use, the profile of participants, and equity of service provision. It transformed the 'noise' about the quality of the service into a systematically collected citizen feedback. Client relations with consumers were professionalized and workers became more client-focused. The utilities requested to mainstream the platform beyond the pilot areas and they aim to fully integrate it in their customer response system. The civil society organizations gained experience in the use of an ICT tool for social accountability and played an active role in monitoring the resources spent in the sector.

Source: World Bank. 2014. "Citizen Engagement Could Bring Dominicans Out of the Dark."

<http://intranet.worldbank.org/WBSITE/INTRANET/INTRANETHOME/0,,contentMDK:23537923~pagePK:6426483~piPK:6407841~theSitePK:8604800.html>

approach has promise, although it will be important to ensure it does not end up simply prioritizing supply to richer households based on their ability to pay. A careful evaluation of the pilot is therefore recommended before scaling up the approach.

Communication and Sequencing

Lack of awareness and misinformation can be one of the biggest barriers to subsidy reform. A study by the IMF indicated that in 22 cases of reform, lack of a communication plan was the biggest cause of failure (Clements et al. 2013b). Information campaigns have underpinned the success of reforms in a number of countries, including Armenia, Indonesia, Iran and Uganda (see Box 9).

In the case of Pakistan, **an information campaign should both make the case for the reform, and educate eligible households about how to apply for the new benefits.** The campaign could include public addresses by senior government officials, media campaigns, focused outreach activities, and inclusion of civil society and other stakeholders. The communication agenda should continue throughout the reform process, and should be launched before the reforms begin. The communication strategy should take into account the interests of various stakeholder groups (World Bank 2015d). Beyond the traditional media, interpersonal channels could be tapped, such as community influencers, mosques,

representatives of the local Union Councils, and community outreach. This may be more effective in reaching poorer households: a recent survey found that among BISP beneficiaries, 58 percent relied on mosque announcements for information, 47 percent relied on TV, and only 10 percent mentioned radio or newspaper (Mott MacDonald, 2014).

C. Link to broader social protection policy

Although energy subsidies are introduced as a form of social safety net and may appear to have anti-poverty objectives, they are among the most regressive social programs. Energy subsidies can impose significant negative externalities and distort domestic markets. Subsidies are often introduced in the name of helping the poor, but implemented in isolation from other social protection programs, mainly due to their technical complexity and embeddedness in energy sector policy. Going forward, **subsidies and their reforms should be part of the broader dialogue on social protection in Pakistan**, and considered as one of a set of antipoverty interventions.

When governments undertake subsidy reforms, they have two main levers to help households adapt to higher prices: compensating households for the price increase; and encouraging households to adjust their consumption patterns (Yemtsov et al., forthcoming). In this analysis we have focused on the former, and illustrated cases worldwide where social protection interventions have helped cushion the effect of increased prices on poor and economically vulnerable families, whether through universal or targeted compensation schemes. Cash transfers (or voucher-style alternatives like bill credits) are the most favored forms of compensation. Where this approach is not feasible, there may be reason to continue certain subsidies, albeit in a more targeted manner—either for merit goods (such as discounted solar panels or green fuels), or better targeting of existing subsidies for products that have a strong welfare justification (such as LPG or kerosene). Nevertheless, the type of social protection mechanism used in conjunction with energy subsidy reform depends on the country context. Such decisions need to be made holistically, with a careful assessment for potential distortions on resource allocations, unpredictability of budget planning, damage to the environment, smuggling, and so on. In the case of electricity subsidies in Pakistan, there is a strong environmental case to price according to cost, to avoid overuse of limited resources and contain carbon emissions.

Social protection can also act as a platform for cooperation across different ministries, making better use of the freed resources. This is especially the case in Pakistan, where the NSER provides the basis for a common approach to targeting and potentially registration. Similarly, **the additional fiscal space may be used for social spending that benefits households affected by the reform**. Many countries have done this successfully and in the process strengthened their safety net; for instance, Indonesia invested in better service

delivery, Iran invested in better public transport, and Jordan and Argentina both increased their minimum wage levels. As countries move away from subsidies, they often empower other social protection programs and, in the process, create more efficient systems. This can help build political support and enhance the social dialogue, helping to manage political

Box 9: Communication of electricity sector reforms

Armenia: As part of the electricity sector reforms and with a longer-term vision for improving operational efficiencies in the energy sector, the government undertook strong efforts to increase collection rates. There is strong evidence of the inverse association between the quality of energy service and the size of subsidies, making subsidies even more damaging through their adverse effect on investment. To offset these extra negative externalities of energy subsidies, the Government of Armenia initiated a strong public awareness campaign (including specific information on the low billing rates and follow-on fiscal deficits) to garner additional support for the subsidy reform vis-à-vis higher electricity collection rates. The campaign emphasized that by increasing collection rates, there will be a greater fiscal space and fewer power cuts (Clements et al., 2013b).

Indonesia: An attempt in 2003 to link domestic oil prices to the international price was unsuccessful given a lack of communication, which led to a lack of trust in the government's objectives. At the time of the attempted reform, there was general dissatisfaction with political corruption, and many of the intended mitigation and compensation measures never materialized. As a result, there was strong opposition from the public, and in turn, a roll back of the price increase (Sdravovich et al., 2014). The government learnt from this experience: in 2005 the kerosene subsidy reform was accompanied by an information campaign to sensitize the public on the use of LPG for household cooking (World Bank 2011) and to phase out the use of kerosene as much as possible. Public outreach by the President, buy-in from prominent Indonesians, as well as a dedicated website illustrating the reform process and disbursement of the transfers, helped keep the society informed. The government also included "starter packs" (stoves and gas cylinders), distributed freely, as incentives for switching from kerosene to LNG, which, along with the information campaign, led to significant reductions in kerosene usage (ibid).

Iran: Public ownership of fuel subsidy reform in Iran would have been impossible without a clear communication plan put in place before the reform. The campaign helped inform the population about the estimated price increases, and showed how the reform would target and benefit poor households that had not been benefiting from the subsidies. A crucial message of the information campaign was to reiterate that subsidies were not going to be eliminated entirely, but rather that there would be a shift of subsidies from products (by subsidizing fuels) to the people (helping those most in need) (Coady et al., 2015).

Uganda: The government effectively communicated the cost of the electricity subsidy and its incidence to the public. The Ugandan government argued that it lacked the resources to continue subsidizing electricity for the relatively rich elite. Because 88 percent of the population lacked any access to electricity, the protests in Kampala regarding rate increases were very limited and gained little sympathy. A large proportion of the

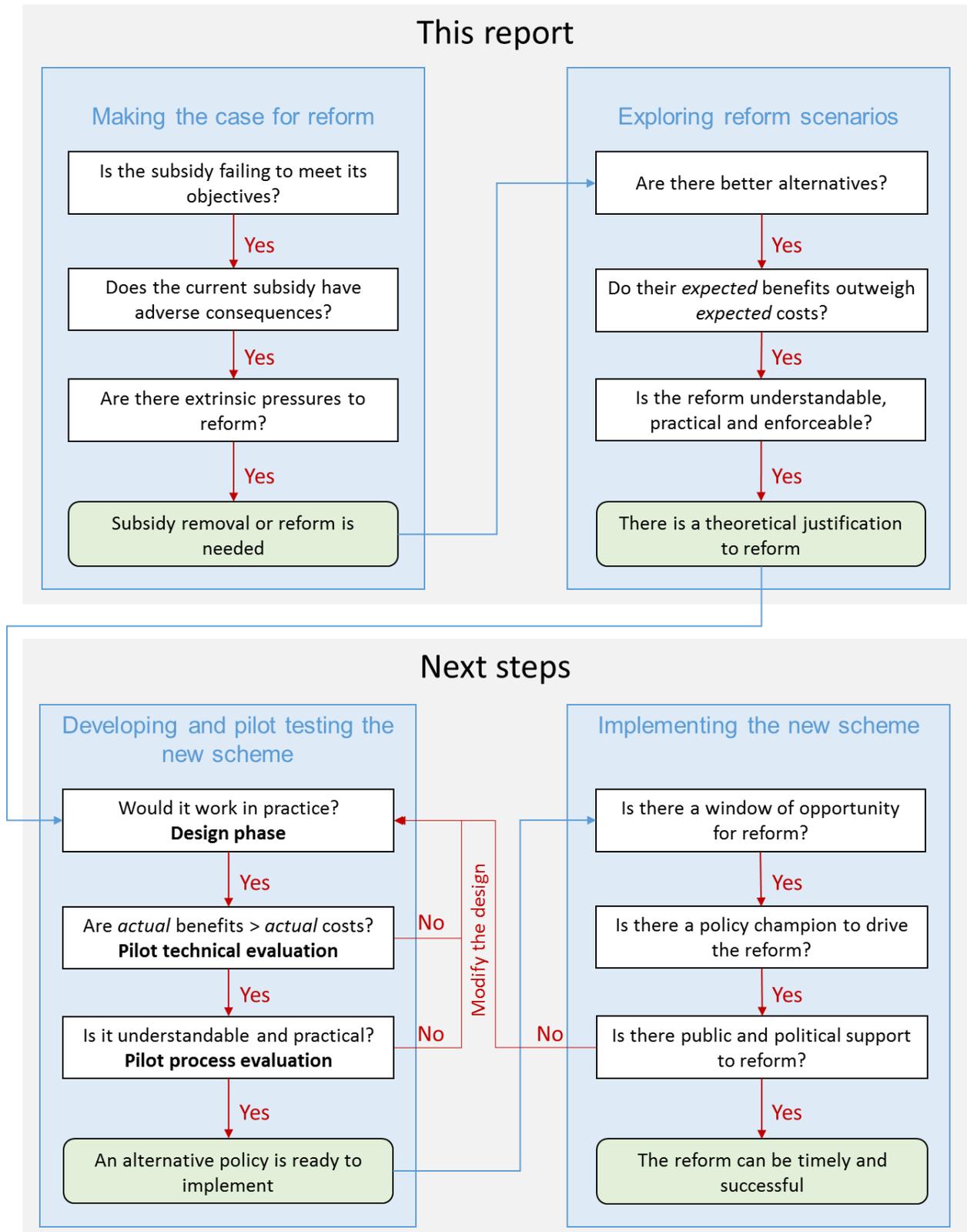
economy concerns related to the reform. Without alternative mechanisms in place to protect households, there is a greater chance of the reforms ultimately being reversed.

D. Next steps

Figure 10 lays out a stylized roadmap for the reform of electricity subsidies in Pakistan. The first step is to make the case that the status quo needs changing, and that there are

pressures to reform. This case needs to be impartial and clear to all stakeholders. In the current report, we have illustrated how the existing subsidies fail to meet their objectives: they are

Figure 10. Roadmap for reform



Source: Authors' adaptation based on Ten Brink (2012).

inequitable and inadequate to those who need them the most. We then explained how subsidies have adverse consequences, including promoting theft, overuse of electricity, and underinvestment in capacity. We showed that there are extrinsic pressures to reform – most importantly the unsustainable fiscal burden they create. This pressure has abated in recent years due to low energy prices, but will return if prices again rise. Second, the report presented a range of theoretically feasible alternative policies that can adequately compensate the poor and lower middle income households. We discussed how such policies could be implemented and made attractive to the various stakeholders based on a careful assessment of the available targeting and billing systems, and qualitative research on stakeholder needs and experiences. Hence this report has established the need for reform, and a set of policies that can in theory replace the status quo.

The next step in the reform process will be to design and pilot test an alternative scheme drawing from the suggestions made in this report. A stakeholder mapping can be a useful tool to guide the design of the scheme, in order to ensure the interests of all stakeholders are taken into account. The pilot need not extend to replacing price subsidies, but could for example test the use of the NSER to deliver a connection subsidy or bill credit to a targeted group based on poverty score. Improved billing practices could also be piloted. The pilot is best done well in advance of any planned reform, to provide enough time for evaluations to ensure it is cost efficient, acceptable to all stakeholders, and practically sound. If the evaluations suggest it is not, further modifications will be needed before the reform is implemented at scale. It should be noted that communications and outreach need to be developed and piloted at the same time.

If the pilot is successful, implementation can proceed once the preconditions for reform are met. First of all, it is important to have a suitable window of opportunity for the reform. Reforms are often precipitated by crises, but ideally Pakistan's electricity subsidy reform will not wait for a crisis but proceed as soon as political conditions permit, to allow the time needed to carefully sequence the pilot, evaluation, communications and roll-out of the new scheme. Most successful reforms are led by a strong government with a clear champion who can unite the sometimes disparate interests of stakeholders. Following these steps will provide the best chance that the reforms are acceptable politically and socially; if they are not, further refinements of the design may be needed before proceeding.

There is an overwhelming momentum now to remove energy subsidies worldwide, and many success stories demonstrating how this can be done in a politically sensitive and sustainable manner. In this report we have shown how Pakistan can make use of its strong existing social safety net to do the same for electricity subsidies.

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Annexes

A. Details of the matching process for billing data analysis

Table A1: Domestic consumers in each of the DISCOs

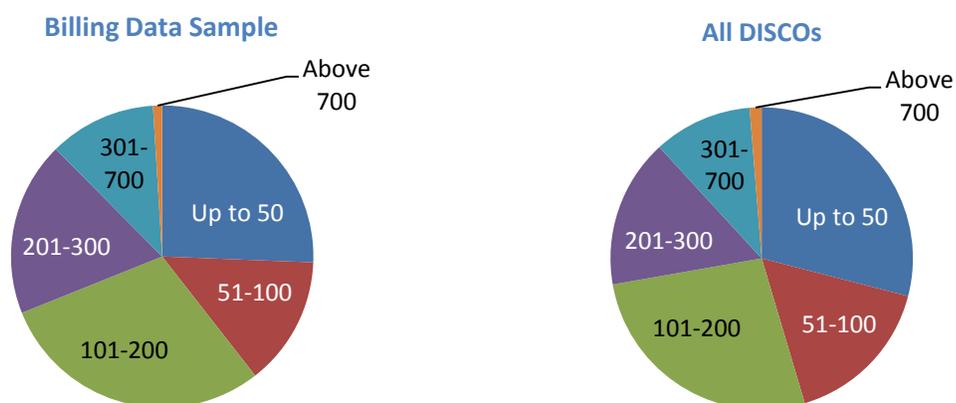
DISCO	Total customers	Share of national consumption
GEPCO	2,487,990	12.5
FESCO	3,004,486	15.1
IESCO	1,983,613	10.0
Total	7,476,089	37.6

Source: Ministry of Water and Power (June 2015)

Table A2: Success rate of matching consumption CNICs with poverty scores

DISCO	Records with CNICs	Matched to NSER	Not matched to NSER	Proportion matched (%)
GEPCO	132,388	60,653	71,735	45.8
IESCO	47,463	24,016	23,447	50.6
FESCO	146,075	61,410	84,665	42.0
All 3 DISCOs	325,926	146,061	179,865	44.8

Figure A1: Domestic electricity consumption (kWh/month), 2013-14



Description of Matching Process

A query of the NSER database was run to match the CNICs in the billing data with the CNICs in the NSER database. The two step matching process was designed to get the maximum number of CNICs from DISCOs matched with the NSER CNICs so that a poverty score is recorded for the analysis. The first step was to directly match the DISCO CNIC with the NSER database and the second step was to match the DISCO CNIC through a family member's '*alpha family*'²⁰ in the NSER. This second step was designed to achieve maximum results from the matching process. NADRA matched the records by CNIC number, a common variable in both datasets. Around 45% of the CNICs were successfully matched with the PMT scores. FESCO, GEPCO and IESCO have updated consumer CNIC records. Each of these DISCOs has a different timeframe for updating their CNIC records; IESCO updates its records each year while FESCO & GEPCO last updated their records 2-3 years ago.

The variables obtained from the NSER records were:

1. Poverty score
2. Household composition (number of children, number of adults in the family)
3. Gender of CNIC holder
4. Age bracket of CNIC holder
5. Disability status of the household head
6. Employment status of the household head
7. Education level of the household head
8. Number of rooms
9. Electric appliances owned²¹
10. Livestock owned²²

Table A3: Number of meters (households in DISCO dataset)

Meters in household	No. HH	%
1	317,140	83.0
2	17,630	4.6
3	4,842	1.3
More than 3	42,289	11.1
Total	381,901	100.0

²⁰ 'Alpha family' is a term used by NADRA. The alpha family is defined as the nuclear family plus parents.

²¹ Electric equipment: washing machine, refrigerator, AC, microwave, geyser, cooking stove, TV, air cooler and heater.

²² Livestock: Sheep, bull, cow, buffalo and goat

B. Distribution of Subsidies by Poverty Status

Table B1: Electricity subsidies by slab and quintile, 2013-14

Quintile	Number of households	Annual subsidy received by slab for all HH in PMT quintile, 2013-14 (Rs. m)						Total subsidy paid to quintile (Rs. m/year)	Avg. subsidy per HH (Rs./year)
		0-50	51-100	101-200	201-300	301-700	701+		
Poorest	29,214	17.5	48.8	39.4	9.7	1.0	-0.1	116.4	3,983
Second poorest	29,800	16.4	53.6	49.4	12.9	1.2	-0.1	133.4	4,477
Middle	28,641	14.5	54.3	55.1	15.7	1.3	-0.1	140.8	4,916
Second richest	29,196	15.2	53.6	54.5	15.7	1.3	-0.1	140.2	4,800
Richest	29,209	12.2	56.8	67.9	24.6	2.0	-0.2	163.3	5,591
Total	146,060	75.9	267.2	266.4	78.5	6.8	-0.7	694.0	4,752

Note: Calculations by authors based on matched billing data sample.

Table B2: Distribution of households by quintile and slab, 2013-14

Quintile	No. HH	Avg. monthly electricity consumption (kWh/month)													
		None		0-50		51-100		101-200		201-300		301-700		701+	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%
Poorest	29,214	566	1.9	8,854	30.3	7,980	27.3	9,873	33.8	1,540	5.3	386	1.3	15	0.1
Second	29,800	546	1.8	7,998	26.8	7,338	24.6	11,224	37.7	2,127	7.1	551	1.8	16	0.1
Middle	28,641	546	1.9	7,143	24.9	6,462	22.6	11,082	38.7	2,609	9.1	783	2.7	16	0.1
Fourth	29,196	562	1.9	7,672	26.3	6,533	22.4	10,939	37.5	2,624	9.0	844	2.9	22	0.1
Richest	29,209	508	1.7	6,323	21.6	4,935	16.9	11,468	39.3	4,176	14.3	1,741	6.0	58	0.2
All HH	146,060	2,728	1.9	37,990	26.0	33,248	22.8	54,586	37.4	13,076	9.0	4,305	2.9	127	0.1

Note: Calculations by authors based on matched billing data sample.

Table B3: Average TDS in FY14

	0-50 (Lifeline)	51-100	101-200	201-300	301-700	701+
NEPRA Determined Tariff	4.00	11.80	14.39	14.39	16.25	17.85
GOP Notified Tariff	2.00	5.79	8.11	12.09	16.00	18.00
Tariff Differential Subsidy	2.00	6.01	6.28	2.30	0.25	-0.15

Note: Calculations by authors based on matched billing data sample. TDS = GOP Notified Tariff – NEPRA Determined Tariff.

C. Sample Distribution by District

Table C1: District-wise representation in billing data sample

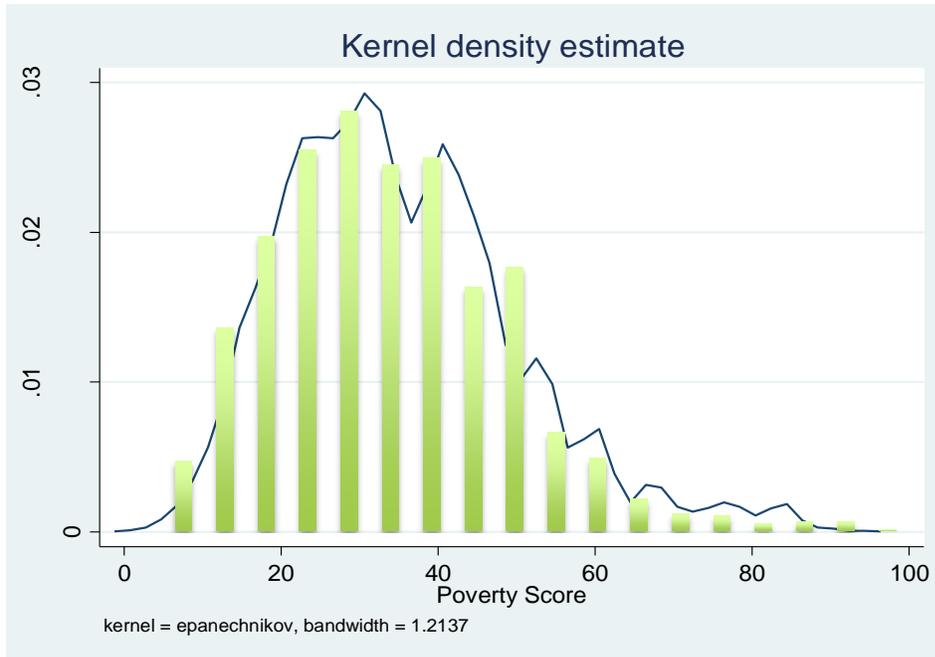
DISCO	District	Share of billing data sample (%)
IESCO	Attock	4
FESCO	Bhakkar	2
IESCO	Chakwal	1
FESCO	Faisalabad	14
GEPCO	Gujranwala	8
GEPCO	Gujrat	10
GEPCO	Hafizabad	2
IESCO	Islamabad	2
FESCO	Jhang	8
IESCO	Jhelum	1
FESCO	Khushab	2
GEPCO	Mandi Bahauddin	8
GEPCO	Narowal	4
IESCO	Rawalpindi	7
FESCO	Sargodha	5
GEPCO	Sialkot	7
FESCO	Toba Tek Singh	5
	Others	10
	Total	100

D. Home Ownership and Rental (PSLM 2013-14)

Owns home?	Rural	Urban	Total
Owner	92.5	72.0	84.7
Non-owner	7.5	28.0	15.3

E. PMT distribution in billing data sample

Table E1: Comparison of billing data PMT distribution with population distribution



The plot shows the distribution of the PMT score in the sample used for the analysis (line), with the PMT distribution in the full NSER dataset overlaid (columns). The NSER data was sourced from a BISP internal analysis presentation entitled "Presentation to the Cabinet Division, Government of Pakistan" (dated 22 March, 2012).

F. Further Details on the Qualitative Research

The qualitative research comprised 44 focus group discussions (FGDs), 16 follow-up ethnographic interviews (EIs) with a single participant from the focus group, and 12 in-depth interviews with key informants. The breakdown of FGD, EI, and IDI participants is described in Table F1.

Focus group discussions were conducted with 8-10 household heads or spouses, segregated by gender and stratified by socioeconomic status. The FGDs encouraged free discussion of the following topics:

1. Consumer behavior

- Electricity consumption patterns of households;
- The most stressful times with respect to electricity payments;
- The impact of electricity bills and tariff increases on household budgets;
- Methods households use to cope with tariff increases—for example, cutting back on other spending (and if so, what expenses are cut); and
- Gender-specific implications of an increase in electricity tariffs.

2. Perceptions of service quality

- Reliability and value for money of the electricity service;
- Consumer experiences interacting with electricity service providers; and
- Concerns relating to service providers (including clarity of tariff-setting processes, accountability, understanding of billing, and theft or nonpayment of bills).

3. Attitudes towards reform and compensation

- Awareness of, and attitudes towards, the government's electricity sector reform agenda;
- Conditions under which consumers would be willing to pay more for electricity and pay their bills on time;
- Elements that should be considered in communication efforts accompanying energy reforms; and
- Perceptions of the most effective measures to protect poor households against adverse impacts of energy tariff increases.

Ethnographic interviews focused on more specific information about households' energy costs and the ways in which they experience the impacts of tariff reforms.

In-depth interviews were conducted with key informants to gather their opinions on the same topics to validate, explain, and balance opinions expressed by consumers. Key informants interviewed included social assistance and energy company representatives.

Table F1: Qualitative Research Sample

Province	District	Locality	Village /Community Name	Gender	Socioeconomic Group	Ethnographic interview	Service provider in-depth interview (IDI)	
KPK	Lower Dir	Urban	Qurataro Mohallha, UC Timar Ghara	Male	Lower Middle Income		IDI with BISP Assistant Director	
			Rahimabad- UC/Tehsil- Samarh Bagh	Female	Lower Middle Income			
			Shah Mohalla Shakhans- UC- Timer Gahara	Female	Katchi abadi	✓	IDI with lineman	
		Rural	Rehmnabad, UC Noora Khal	Male	Lower Income	✓		
			Nageer Payeen	Female	Lower Income			
	Manshera	Urban	Chennai- UC 3	Male	Lower Income			
			Neighbourhood No Ghaz 1	Female	Lower Income			
			City No- Nogai Nori, UC- 2	Male	Katchi abadi	✓		
		Rural	Shamdara	Male	Lower Middle Income			
			Behali, UC Manshera	Female	Lower Middle Income		IDI	
			Behali, UC Manshera	Male	BISP	✓		
			Shamdara/Tehsil-Mansehra	Female	BISP	✓	IDI	
	Punjab	Lodhran	Urban	Mahmooda Abad, UC Gulab Pura	Male	Mixed Income	✓	
				Dunia Pur, UC Gulab Pura	Female	Mixed Income	✓	
Shah Muhammad Qabristan-Eid Gah Mohallah-Duyina Pur				Female	Lower Middle Income		IDI	
Mohala Nokhal Wala				Female	Katchi abadi			
Rural			Chak 231, Lodhran	Male	Lower Income			
			UC Gulab Pura Basti sal sadar	Female	Lower Income	✓		
			Chak No- 237/WB	Male	Lower Middle Income	✓	IDI	
			Sal Sadar	Male	BISP		IDI	
Chak No. 237		Female	BISP		IDI with BISP Assistant Director			
Muzafargarh		Urban	Ward No 10 Mohalla Mochi wala	Male	Lower Income	✓		
			Basti Dewan Wala	Female	Lower Income			
			Darkhan Wala, UC Khan Garh	Female	Lower Middle Income	✓		
			Tibba Kareem Wala	Male	Katchi abadi		IDI with lineman	
		Rural	Basti Kodaiwala, Tehsil Kot Uddo (UC Minha)	Male	Lower Middle Income			

Province	District	Locality	Village /Community Name	Gender	Socioeconomic Group	Ethnographic interview	Service provider in-depth interview (IDI)
Sindh			Village Ganga	Female	Lower Middle Income	✓	
			Basti Hayat Wala Moza Munha Sharif, Darkhan	Male	Lower Middle Income		
	Tando Muhammad Khan	Urban	Mizar Barani Mohalla, UC 3	Male	Mixed Income		
			Gulshan Faiz Colony, UC 1	Female	Mixed Income	✓	IDI
			Pattar Goth, UC 1	Male	Lower Middle Income		
			Pattar Kot UC 1	Female	Lower Middle Income		
			Gulshan Faiz Colony, Mohalla Somra, UC 1	Male	Katchi abadi		IDI with Bait-ul-mal officer
		Rural	UC Allah-Yar Turk Village, Mula Katiyar and Jamal Shoro	Male	Lower Middle Income	✓	
			UC Syed Pur Village - Takar Mohala Memon	Female	Lower Middle Income		IDI
			Kamis Pur	Male	Lower Middle Income		
			Kamis Pur, District -Tando Muhammad Khan, Sindh	Female	Lower Middle Income		
	Nawabshah (Benazirabad)	Urban	Sachal Colony –Benazira abad	Male	Lower Middle Income		
			Imamia, UC 3, Nawabshah district	Female	Lower Middle Income		
			Mohammad Saleh Deraj	Female	Katchi abadi		
		Rural	Khair Shah	Male	Low Income		
			Benazirabad, Obhayo Mangsi UC-Marhabpur	Female	Low Income		
			Haji Jarrar UC Mehrapur	Male	BISP	✓	
			Khair Shah Solangi Mohalla	Female	BISP	✓	
	Total					44	16