The transition from underpricing residential electricity in Bangladesh: fiscal and distributional impacts

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Policy Note

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Abbreviations

BERC	Bangladesh Energy Regulatory Commission
BIDS	Bangladesh Institute of Development Studies
BPL	below the poverty line
BPDP	Bangladesh Power Development Board
BUET	Bangladesh University of Engineering and Technology
CPI	Consumer Price Index
DESA	Dhaka Electricity Supply Authority
DESCO	Dhaka Electric Supply Co. Ltd
DISCO	Distribution Company
FY	fiscal year
GDP	gross domestic product
GOB	government of Bangladesh
HIES	Household Income and Expenditure Survey
IBT	incremental block tariff
IEA	International Energy Agency
IMF	International Monetary Fund
IPP	independent power producer
km	kilometer(s)
kWh	kilowatt hour(s)
MW	megawatt(s)
MoPEMR	Ministry of Power, Energy, and Mineral Resource
PGCB	Power Grid Company of Bangladesh
REB	Rural Electrification Board
REP	Rural Electrification Program
Tk	taka

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Contents

1 Executive Summary

The electricity sector in Bangladesh has been facing unprecedented challenges, with severe capacity constraints and sector subsidies that quadrupled from 0.2 percent to 0.8 percent of gross domestic product (GDP) between 2010 and 2012, driving the government's fiscal deficit deeper. Rising global energy prices and high-cost rental power plants have increased the fiscal burden of maintaining electricity subsidies that have been in place for decades. In response, the government of Bangladesh has been undertaking a series of difficult reforms for the sector.

This policy note examines the poverty and distribution impact of one such reform – residential electricity tariff increases - along with their fiscal implications. A challenge of such adjustments is how to minimize their impact on the poor and vulnerable. Using household survey data, this report studies the distributional and fiscal implications of the residential tariff adjustments between March 2010 and March 2012 on to inform policy dialogue on the provision and targeting of electricity subsidies.

An important determinant of how effective subsidies can be to protect the poor is the level of access to electricity among poor households. According to HIES 2010, just over half of the population in Bangladesh had access to electricity in 2010 (55 percent). Rural access to electricity remains very low (42 percent), and is even lower among households in the poorest quintile (21 percent). This means that using electricity subsidies as a social protection mechanism is automatically limited: very low levels of access among poor households mean changes in electricity tariffs and subsidies will not affect them.

Electricity subsidies are defined as the difference between the cost of supplying a unit of electricity and the tariff the end-user is charged for a given unit. Between 2010 and 2012, real cost of supply increased almost 20 percent. On the transition from underpricing to cost recovery tariffs, real tariffs more than doubled for high levels of consumption, while they actually fell for low levels of consumption. The combined impact of these changes meant that in both 2010 and 2012, almost all units of electricity consumed (80–90 percent) were subsidized to some extent, limiting the ability to offset the fiscal burden through cross-subsidies from high consumers to low consumers.

In 2010, the average unit of electricity was subsidized 25 percent, which remained constant in 2012. For low levels of consumption—where the majority of households consume—virtually stagnant real tariffs coupled with a soaring real cost of supply mean that the degree of subsidy provided on each unit of electricity has almost doubled in real terms. On the other hand, the cross-subsidy provided through high levels of consumption increased dramatically with the removal of slab benefits.

There was an unequal distribution of subsidy benefits in 2010. The significant leakage suggests the structure of tariffs and subsidies is not pro-poor. Households in the richest quintile receive subsidy benefits that are seven times more than households in the poorest quintile (42 percent versus 6 percent). Leakage of subsidies improved between 2010 and 2012, mainly driven by the removal of slab benefits for higher levels of consumption, meaning households in the richest quintile provided cross-subsidies to households in lower quintiles.

The fiscal deficit in Bangladesh is forecasted to increase from 3.1 percent of GDP in fiscal year (FY) 2010 to 4.4 percent of GDP in FY2012. Subsidies to the power sector are an important factor in this increase. The fiscal burden of electricity subsidies provided to residential customers increased by over 40 percent in real terms between 2010 and 2012.

This policy note focuses on just one part of a much broader and complex system of connected energy policies. The policy implications of this analysis should only be considered in light of this broader context. In particular, this note does not study in detail the complex issues of generation and operational efficiency (in transmission and distribution). The public debate on these topics is particularly strong, with a sizeable portion of voices arguing that the government should not make households pay for generation and operational inefficiencies.

Second, this note does not study the political economy of tariff and subsidy reform. Tariff increases have been a source of social unrest, and planned increases could generate additional unrest. It will be important for the government to consider the political economy of further reform carefully. In particular, care should be taken to communicate and educate the public on what changes are planned, the rationale for such changes, and what improvements households can expect as a result of these changes.

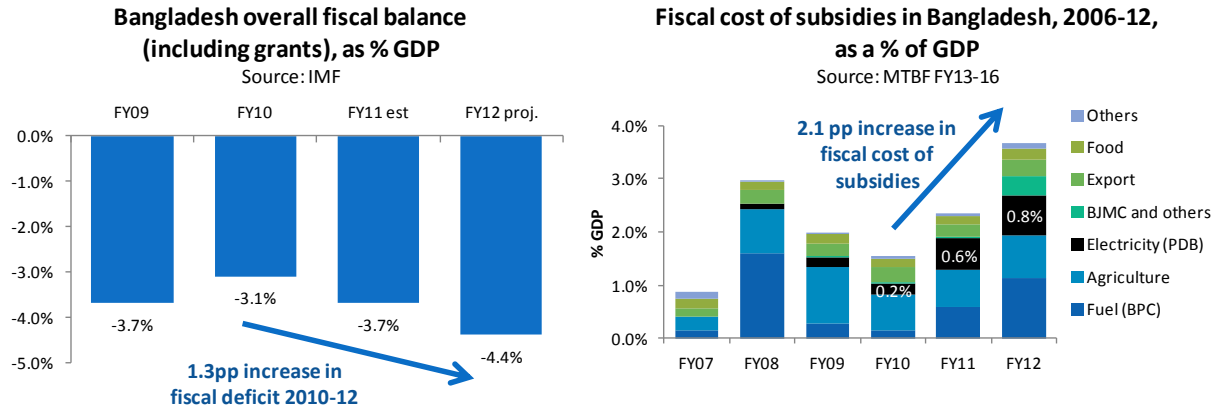
Moving forward, both of the new slab systems being discussed could relieve the fiscal burden of subsidies. In the medium term, generation and operational efficiency gains would help reduce leakage and fiscal burden. This analysis suggests that if the government could bring supply costs back down to 2010 levels, the fiscal burden would be reduced by more than 50 percent. In the long term, as Bangladesh moves toward universal access, it will be important for the government to offset the increased fiscal burden of having more households connected. Below poverty line tariffs, the seven and nine slab system, and reduced costs of supply could all help achieve the dual policy goal of well-targeted subsidies and low-to-zero fiscal burden. In the best-case scenario, the structure of tariffs and subsidies could actually generate a net fiscal contribution, creating resources for future investments in infrastructure.

2 Introduction

The electricity sector in Bangladesh has been facing unprecedented challenges. Despite aggressive efforts to increase generation capacity, demand continues to outstrip supply, leading to continued load shedding and blackouts. Soaring costs of electricity supply, driven by the high cost of quick-fix rental power plants, are forcing tariff increases and leading to increased social unrest. Yet tariff increases have not kept up with this cost of supply, leading to a ballooning in the fiscal burden of electricity subsidies, which has increased fivefold from Tk 12 billion in FY2010 to Tk 60 billion in FY2012 (and is forecasted to be Tk 56 billion in FY2013).

Electricity subsidies are a key element in the broader fiscal deficit. According to the International Monetary Fund (IMF) estimations for Bangladesh, the fiscal deficit will increase from 3.1 percent of GDP in FY2010 to 4.4 percent of GDP in FY2012[1]. A key driver of this increasing deficit is subsidies provided for various needs in the country. As illustrated in figure 1, the total cost of subsidies has more than doubled, from around 1.5 percent in FY2010 to more than 3.5 percent of GDP in FY2012. One of the most important subsidies that has increased is electricity, which between FY2010 and FY2012 increased from 0.2 percent of GDP to 0.8 percent of GDP.[2]

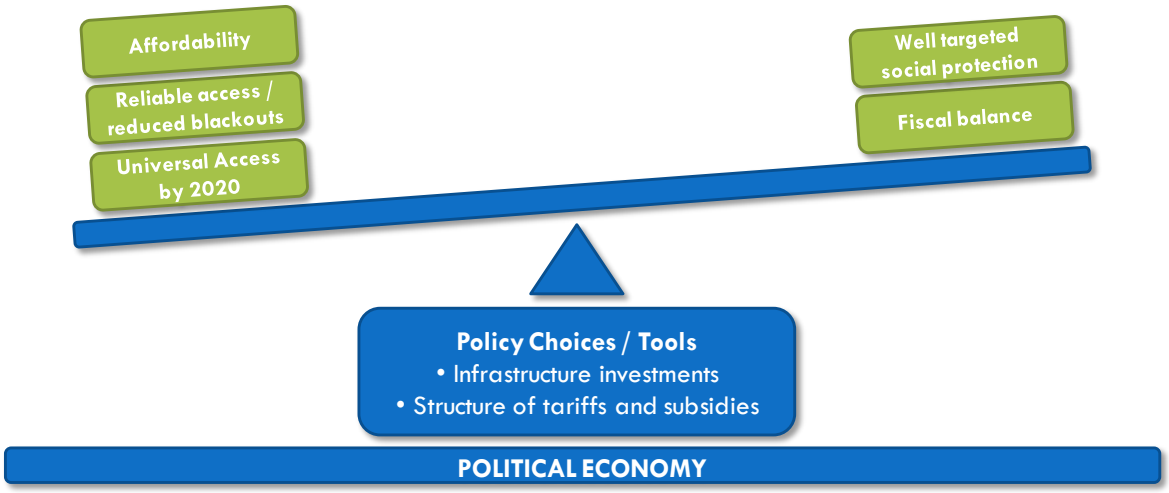
Figure 1: Fiscal balance and fiscal cost of subsidies



The question of electricity tariffs and subsidies is just one policy choice in a balancing act of interconnected—but sometimes competing—policy goals across multiple sectors (figure 2). On one hand, there are a range of policy goals including universal access, reliable electricity supply, and affordable electricity. On the other hand, there are the fiscal implications of achieving each of these goals and the desire to have well-targeted social protection with minimal leakage to rich households. To succeed in this balancing act, the government has a range of policy choices available, including, but not limited to, infrastructure investments and the structure of tariffs and subsidies. Underpinning these choices is the political economy of policy reform.

[1] IMF Article IV, November 2011
[2] MTBF, FY13 – FY17

Figure 2: Policy Framework



Source: Authors' illustration

In this challenging context, this policy note adds to the policy dialogue already underway in Bangladesh by providing evidence-based analysis that can inform decision making. This note uses household survey data (HIES 2010) combined with electricity data inputs such as tariff structures.[3] Specifically, the four objectives of this note are to:

i) estimate the distribution of electricity subsidies provided to residential customers;
ii) estimate how this distribution has changed between 2010 and 2012, during which time there have been significant changes in underlying tariffs and costs of supply;
iii) estimate how the fiscal burden of the subsidies provided to residential customers has changed between 2010 and 2012; and finally
iv) analyze the potential impact of various policy options.

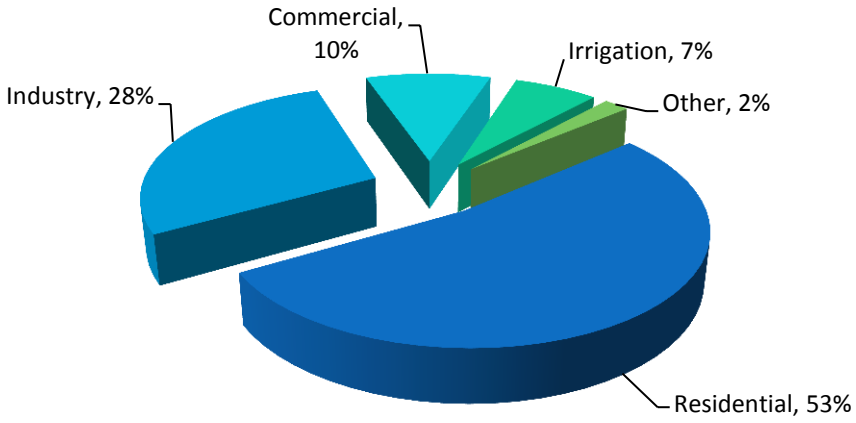
The primary audience for this poverty and social impact analysis is the regulator (BERC) with the responsibility for setting tariffs. The secondary audience includes the Ministry of Finance which pays for the many of the subsidies in the energy sector, and the Ministry of Power, Energy and Mineral Resources, and the Ministry of Social Welfare which oversees many of the social protection systems in Bangladesh.

This policy note focuses on residential electricity consumption, and does not include subsidies provided to other parts of the economy such as agriculture, and small businesses. As shown in figure 3, residential electricity consumption accounts for the majority of electricity consumption. Broader analysis of the energy sector is important (such as cost recovery in the electricity sector overall) but is beyond the scope of this analysis. Deep analysis of the political economy issues underlying policy choices and broader questions in the electricity sector, especially on issues such as efficiency in the generation, transmission and distribution of electricity, are also beyond the scope of this policy note.

[3] See annex 2 for methodology.

Figure 3: Electricity consumption by customer type, FY12

Source: Utility company reports (REB, DPDC, BPDB)



3 Electricity Subsidies and the Key Elements of the Electricity Sector

This section provides an overview of some of the key elements of the electricity sector in Bangladesh as they relate to the benefits-incidence analysis and fiscal burden of electricity subsidies.[4] This includes some of the important goals in the policy context; factors that affect the usefulness of subsidies as a social protection mechanism, including access and consumption profiles; and elements that determine subsidies, including cost of electricity supply and tariff levels.

To understand how effective electricity subsidies can be as a tool for providing protection to poor households in Bangladesh, it is important to understand patterns of electricity consumption. The subsections that follow illustrate two powerful points:

i) electricity subsidies have a limited role in providing protection when very few poor households have access to electricity; and

ii) the benefit of limiting the fiscal cost of subsidies through cross-subsidization from richer households (consuming in higher tariff slabs) is small—if not redundant—when consumption is so low that no households consume enough to provide a cross-subsidy.

3.1 Policy context

The objectives of the government of Bangladesh's (GOB, 2002) "Vision and Policy Statement" on power sector reforms are, among others, to:

i) bring the entire country under electricity service by the year 2020, with improved reliability and quality;
ii) increase the sector's efficiency and make the power sector financially viable; and
iii) make the sector commercial and increase private sector participation.

As a key element of (i) above, Bangladesh has a very active Rural Electrification Program (REP)[5]. This initiative aims to increase power generation and to reduce the country's power shortage significantly in coming years, with a goal of achieving universal electrification by 2020. The progress of rural electrification in villages has been significant, with 53,281 villages connected and a total of 266,460 kilometers (km) of line constructed.[6]

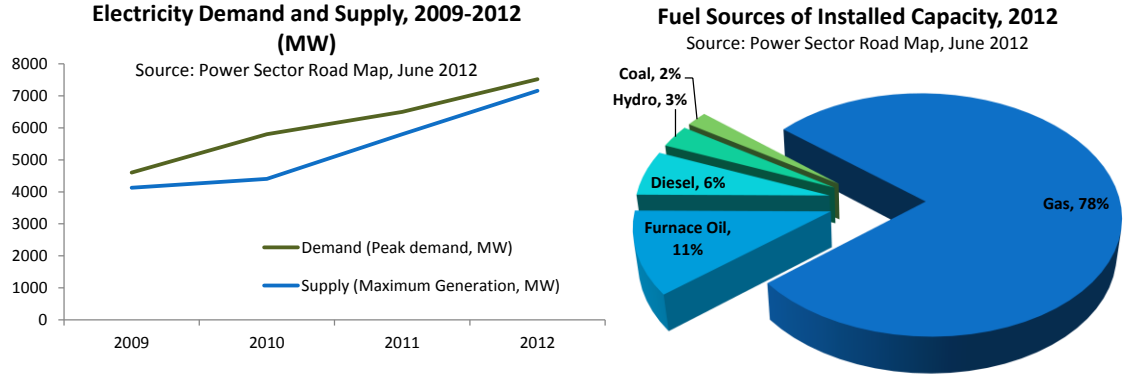
3.2 Installed capacity and sources of fuel

Along with the REP has been a parallel investment in generation capacity. The GOB has embarked upon an ambitious generation expansion plan that envisages doubling the supply capacity to the national grid

[4] Additional background information on the electricity sector can be found in the annexes.
[5] A program supported by the World Bank. For more information, see http://www.worldbank.org/projects/P071794/rural-electrification-renewable-energy-development?lang=en
[6] Ministry of Power, Energy and Mineral Resources, as of June 2011.

by 2016, from 7,000 megawatts (MW) in 2012 to 14,000 MW by 2016 (figure 4)[7]. Despite these investments and growth in supply, demand has continued to outstrip supply.

Figure 4: supply and demand, and current fuel sources

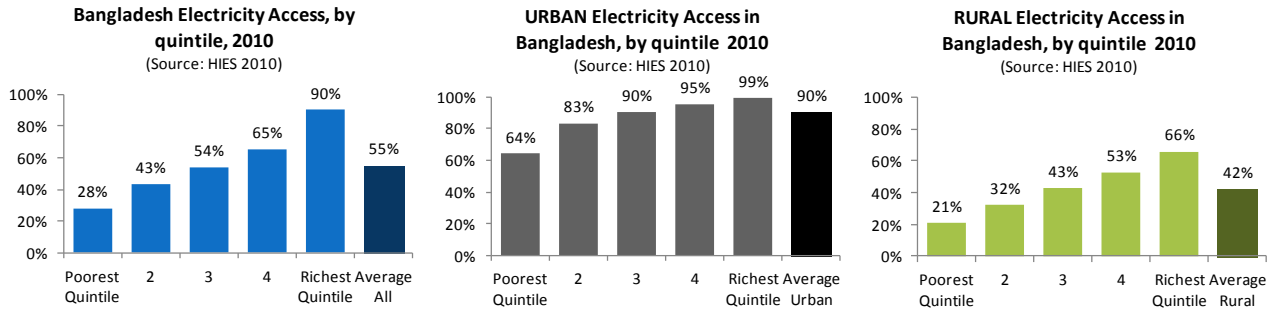


As part of that plan, a number of large gas-fired power plants have recently been awarded to the private sector; it will be a few more years before the plants are operational. Indeed, Bangladesh continues to rely on natural gas as its most important source of energy for electricity generation (figure 4). As an interim measure, the GOB has contracted rental plants with combined power of 2,500 MW, and by the end of 2011, these plants were supplying over 1,700 MW of power to help relieve power shortages.

3.3 Toward universal access to electricity

The GOB has a policy goal of universal access by 2020. According to the HIES (2010), 55 percent of households in Bangladesh report access to electricity.

Figure 5: Electricity access by quintile



Access, however, varies significantly by area and by quintile. Despite the REP, access rates remain much higher in urban areas compared to rural areas: 90 percent of urban households have electricity access compared to 43 percent of rural households (figure 5). Rural households in the poorest quintile have the

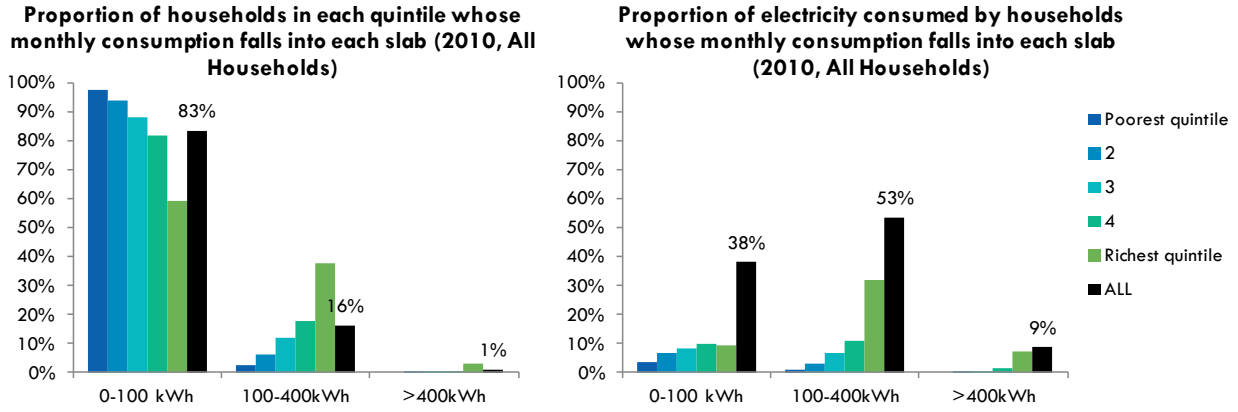
[7] For most up to date installed capacity data, see http://www.bpdb.gov.bd/bpdb/index.php?option=com_content&view=article&id=150&Itemid=16

lowest levels of access: only one in five rural households in the poorest quintile has access to electricity (85 percent of households in the poorest quintile are rural).

3.4 Electricity consumption profiles

Analysis of household survey data suggest that over 80 percent of households, rich and poor, consumed less than 100 kWh per month in 2010 (figure 6), and accounted for almost 40 percent of total electricity consumed. Almost all households in the poorest quintile consume less than 100 kWh per month. The only exception is households in the richest quintile, of which the majority consume 100–300 kWh per month. Less than 2 percent of households in Bangladesh consume more than 300 kWh per month, while accounting for almost 10 percent of total electricity consumption.[8]

Figure 6: Electricity consumption profiles by slab (Source: authors estimates based on HIES data)



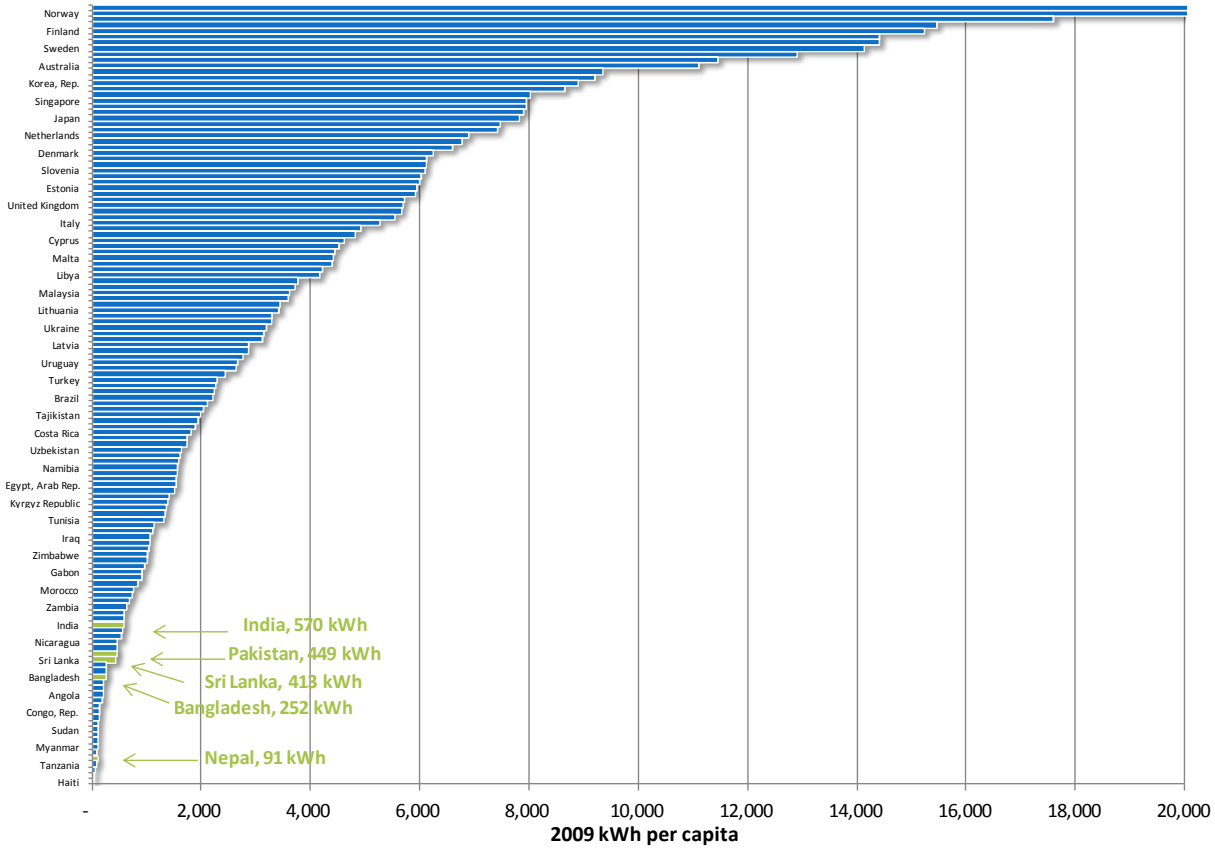
This means that using electricity subsidies as a social protection mechanism is limited: very low levels of access among poor households mean changes in electricity tariffs and subsidies will not affect them.

This pattern of low consumption and low levels of access results in low levels of per capita consumption, which is consistent with global data. Bangladesh has one of the lowest per capita electricity consumption levels in the world. For example, according to the International Energy Agency (IEA)[9], in 2009, electricity consumption was 252 kilowatt hours (kWh) per capita (figure 7), compared to an average double that level for both sub-Saharan Africa and South Asia (517 kWh per capita).

[8] See annex 3 for more detailed consumption analysis (split by rural/urban/urban Dhaka).
[9] See http://www.iea.org/stats/index.asp

Figure 7: Global electric power consumption

Source: International Energy Agency, Energy Statistics and Balances of Non-OECD



3.5 Brief overview of electricity tariffs in Bangladesh

Residential electricity tariffs are structured by an incremental block tariff (IBT), with one set of tariffs for urban households and another for each of the distribution companies serving rural households. Note there are three slabs for urban households and four for rural households, as illustrated in table 1[10]. Households only receive slab benefits for two slabs: the one where their final consumption falls, and the one previous. For example, an urban household consuming 450 kWh of electricity in March 2012, will be charged Tk 7.89 for the 50 units above 400, and Tk 4.29 for the first 400 units.

Table 1. Price by Block, Tk/kWh

	March 2010 (Tk)
Urban	
0–100 units	2.6
101– 400 units	3.3
> 400 units	5.65
Rural[a]	
0–100 units	2.53–2.90
101–300 units	2.57–2.95
301–500 units	3.89–4.15
> 500 units	4.99–5.95
Cost of supply	**3.8**

Source: Authors' compilation.

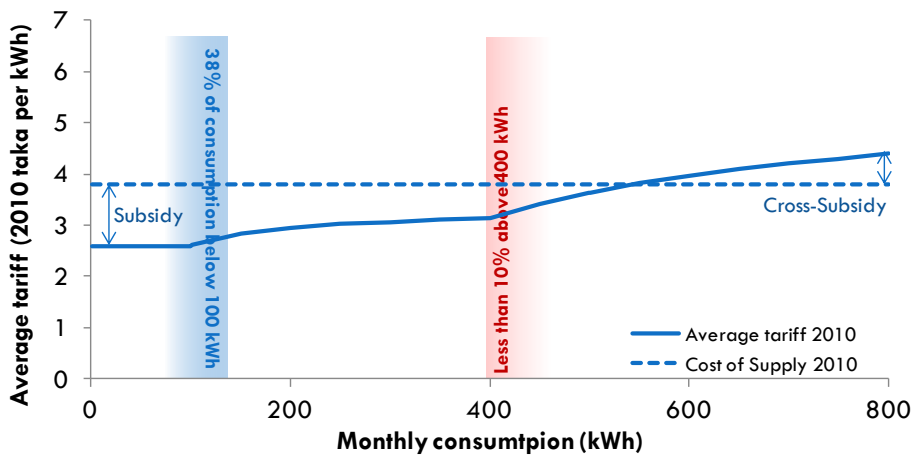
a. There are several utility companies supplying rural households, so tariff ranges provided.

3.6 Electricity subsidies in Bangladesh

In this report, the electricity subsidy provided on each unit of electricity consumed by a household is measured by the difference between the prices households face (the tariffs charged) and the cost of supplying that electricity.

Figure 8: Electricity Subsidies in Bangladesh 2010 (Urban)

[10] Note in the past a minimum charge of Tk 100 was in place. This is important since it strongly affects the average tariff paid by low consuming households. Based on input from a number of sources, this analysis assumes no minimum charge is in place, but this should be clarified for future analysis given conflicting reports on the existence of a minimum charge e.g. http://www.berc.org.bd/images/stories/pdf/existing_retail_tariff_w.e.f_01_september_2012.pdf



What is a subsidy?

- **Subsidy:** for units of electricity consumed where the tariff is below the cost of supply, households are receive a subsidy from the state
- **Cross-subsidy:** for units consumed where the tariff is above the cost of supply, households are paying a cross-subsidy

For varying levels of consumption, figure 8 illustrates the average tariff per kilowatt hour for urban households and the cost of supply. It shows that at low levels of consumption (below 100 kWh), the average tariff is Tk 2.6 against a cost of supply of Tk 3.8, meaning each unit under 100 kWh was subsidized Tk 1.2 (or 32 percent). Even at higher levels of consumption, electricity remains subsidized.

Note that although the marginal tariff is above cost for consumption above 400 kWh (table 1), the average tariff only increases above cost of supply when a household consumes more than 550 kWh. This is because of slab benefits that were in place in 2010: all households benefit from the prices of all slabs independently of how much electricity they consume.

Table 2. Regional Comparison of Electricity Costs

	For 100 kWh of electricity consumption for an urban household in 2010			
	Electricity bill (Tk)	**Supply cost (Tk)**	**Subsidy (Tk)**	**Subsidy as % cost**
Pakistan	322	752	429	57
India, Uttar Pradesh	366	544	178	33
Bangladesh	260	380	120	32

Source: Authors' compilation

Calculating the cost of 100 kWh of electricity for an urban household in March 2010 (table 2) in Bangladesh, Pakistan, and India (using the representative state of Uttar Pradesh) provides a regional comparison. This basic indicator shows that urban residential households pay relatively less than similar households in neighboring countries, perhaps because they are more heavily subsidized.

4 Distribution Analysis of Electricity Subsidies

One of the main arguments for providing subsidies is that they provide social protection for poor households. Given the high cost of providing these subsidies and the fiscal burden they place on the government, it is especially important to understand how the benefits are distributed among different income quintiles to assess the efficiency in targeting poor households.

Before analyzing the distribution of benefits, there are two important aspects to analyze that will affect the distribution of subsidies: the depth and width of subsidies, and the degree of cross-subsidization from high-consuming households to low-consuming households.

4.1 Width versus depth of subsidies

One of the key questions that emerge when consumption patterns are overlaid on the existing tariff structure (figure 8) is how wide and how deep electricity subsidies are.

Width: proportion of electricity units consumed that receive some level of subsidy

Depth: the degree to which the average connected household was subsidized

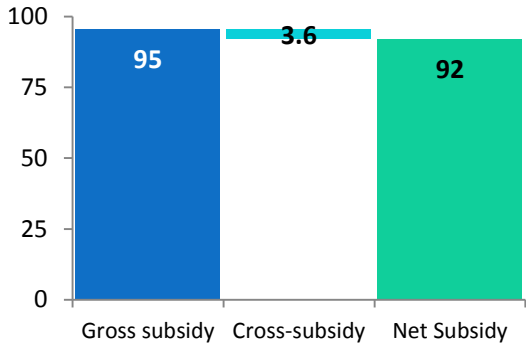
Figure 7 illustrated that 90 percent of electricity consumption is below 400 kWh, while it is only above 400 kWh that the marginal price is above cost (table 1). This means that 90 percent of electricity consumed by residential households was subsidized to some extent in 2010. Note this width of subsidies will limit the ability to offset the fiscal burden through cross-subsidies from high consumers to low consumers.

In terms of depth, the consumption of the average connected household was subsidized 25 percent in 2010. The average connected household spent Tk 281 consuming 149 kWh of electricity that cost Tk 373 to supply. This means the average connected household therefore received Tk 90 in subsidies (or 25 percent of the cost of supply).

4.2 From gross to net: the limited impact of cross-subsidies in Bangladesh

One of the design features in an IBT structure is that high-consuming households pay above the cost of supply for their high levels of consumption, providing a cross-subsidy and helping to offset some of the cost of providing subsidies. This is an important factor to consider in relation to the fiscal burden of subsidies.

Figure 9: Gross to net electricity subsidy for the average connected household (2010). Source: authors estimates based on HIES



As described above, approximately 90 percent of electricity units consumed in 2010 were subsidized to some extent. This limits the impact of cross-subsidies in Bangladesh which is illustrated on Figure 9.

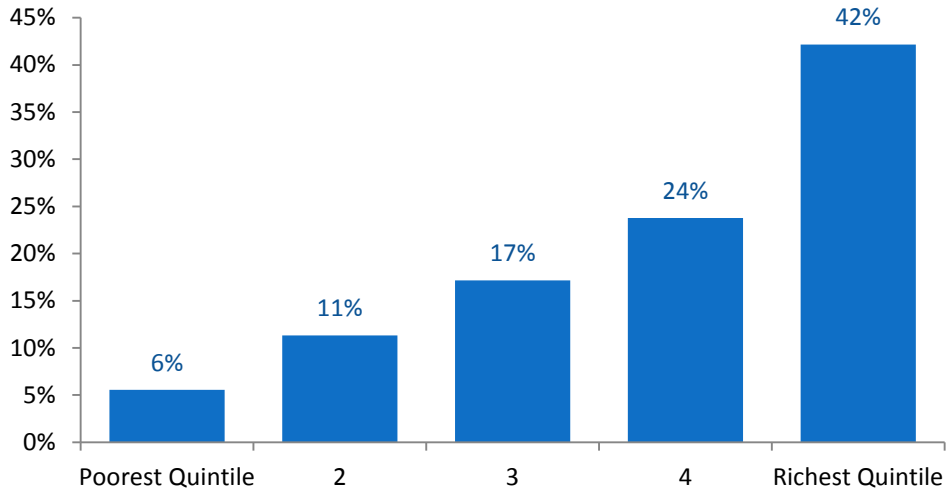
Cross-subsidies are the difference between the gross cost of subsidies (before cross-subsidies are taken into account) and the net cost (after cross-subsidies are taken into account).

On a gross basis, the average connected household received Tk 95 in March 2010, which reduces only marginally to Tk 92 on a net basis. Most of the cross-subsidies come from high consuming households which tend to be urban households in the richest quintile. The very limited consumption at high levels means cross-subsidies only reduced the fiscal burden of subsidies by 4 percent; this is important for the distributional analysis because it implies that rich households on net still receive significant subsidies.

4.3 Distributional analysis of electricity subsidies

A distributional analysis allows us to estimate how the benefits provided through subsidies are distributed among different quintiles in Bangladesh. The key objectives of this analysis are (i) to understand how well the subsidy is targeted to the intended beneficiaries and (ii) how much leakage there is from these intended beneficiaries to others.

Figure 10: Distributional Analysis of Electricity Subsidies in Bangladesh, 2010. Source: World Bank Analysis

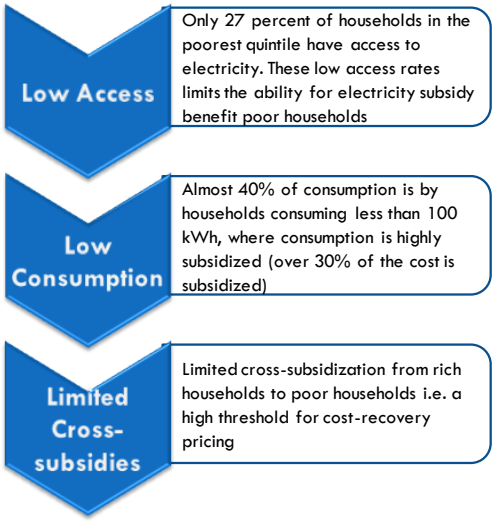


Rich households receive overwhelmingly more of the subsidy benefits than do households in the poorest quintile. Households in the richest quintile receive seven times more than households in the poorest quintile (42 percent versus 6 percent, figure 10). This means that not only are the subsidies not well targeted, but there is significant leakage to households that arguably have less need for subsidy support.

There are at least three important factors producing this result (figure 11). First, the very low electricity access rate among poor households limits the ability of subsidies to reach them. Only 27 percent of households in the poorest quintile had access to electricity in 2010. Second, as discussed above, consumption levels are low, meaning a significant proportion (almost 40 percent) of electricity is

consumed by households in the deeply subsidized slab (less than 100 kWh). Third, and related, because of this low consumption, cross-subsidies from rich households to poor households are limited. The typical international experience is that higher levels of consumption are priced above the threshold for cost-recovery pricing, meaning enough households consume above the threshold, helping to offset subsidies paid at low levels of consumption. In Bangladesh, as illustrated in figure 8, there is very limited cross-subsidization taking place because so few households consume above the threshold for cost-recovery pricing.

Figure 11: Key Factors contributing to unequal distribution of electricity subsidies. Source: authors illustration



4.4 The relative value of subsidies

An important final comment on the distribution of benefits is the degree to which subsidies represent an important source of value to households. In an abstract sense, a poor household may value Tk 100 in subsidies more highly than a rich household. While it is difficult to measure this sense of value, one proxy could be the scale of the subsidy provided in relation to total household spending.

For households consuming electricity in March 2010, the value of subsidies provided to households were worth almost 2 percent of total household spending for the average household in the poorest quintile, compared to only 1 percent for the richest quintile. Therefore while poor households receive much less of a subsidy, it represents a higher proportion of their overall spending, so it could be more important to them. This is an important consideration, particularly with respect to the political economy of subsidy reform.

5 Key Changes in the Electricity Sector in 2010–12

This section will briefly outline four key changes in the electricity sector relevant to the distribution of and fiscal burden of residential electricity subsidies:

- the increase in cost of electricity supply;
- the increase in tariffs;
- the removal of slab benefits; and
- the increase in electricity consumption.

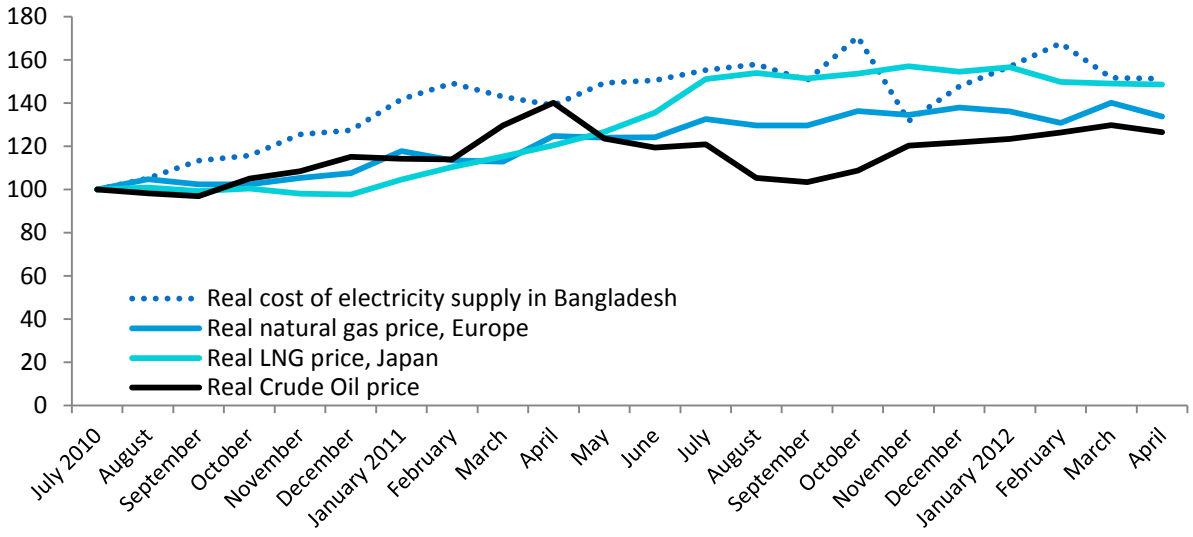
While these changes have different directional impacts on the distribution and fiscal burden of subsidies (for example, increase in the cost of supply will tend to increase the fiscal burden, while removal of slab benefits will tend to decrease the fiscal burden), the analysis will show that on net, subsidies have increased between 2010 and 2012 as a result of these changes.

5.1 Increase in cost of electricity supply

The cost of electricity supply is a critical component for determining the level of subsidization within each Distributing Company (DISCO). While tariffs increased substantially in nominal terms between 2010 and 2012, the cost of electricity supply increased over 80 percent between July 2010 and March 2012 (from Tk 2.96 to Tk 5.47 per kWh), or around 50 percent in real terms.

There are two main factors behind this increase; the first is increasing prices in global energy markets. Natural gas remains the primary fuel source for electricity generation, and while Bangladesh has significant domestic reserves, the GOB has increased gas prices along with global price increases[11]. Figure 12 illustrates that during July 2010–March 2012, cost of supply increased 50 percent in real terms, which is very comparable to increases in global energy prices over the same period.

Figure 12: Cost of Electricity Supply in Bangladesh vs Global Energy Prices (in July 2010 prices, indexed)



[11] Helping to avoid the introduction of another layer of untargeted subsidies

The second factor is the high cost of rental power plants. By the end of 2011, 27 rental and quick rental power plants had come online: 7 quick rental power plants with a generation capacity of 522 MW, and 20 rental plants with a production capacity of 1,173 MW. Most are diesel fired or furnace oil run, which increases the cost of supplying electricity. According to some reports, the Bangladesh Power Development Board (BPDB) has been purchasing electricity at Tk 13 to Tk 14 per unit from new diesel-fired rental and quick rental power plants, and at around Tk 7 per unit from new furnace oil–run power plants. The electricity purchase rate from gas-fired independent power producer (IPP) power plants is around Tk 2.[12]

5.2 Increase in tariff levels

Partly in response to this rising cost of supply, along with a drive toward cost recovery, the government of Bangladesh increased tariffs significantly between 2010 and 2012. The focus of tariff increases has been in high levels of consumption (40–60 percent increase at the higher levels of consumption, table 3), and further increases are expected as the government transitions from underpricing electricity towards cost recovery pricing.

Table 3. Price by Block, Tk/kWh (rates in current taka)

	2005	March 2010	February 2011	March 2012	Nominal increase (% 2010–12)
Urban					
0–100 units	2.5	2.6	2.6	3.05	*17*
101–400 units	3	3.3	3.47	4.29	*30*
> 400 units	5	5.65	5.93	7.89	*40*
Rural					
0–100 units		2.53–2.90	2.64–3.03	3.08–3.55	*23*
101–300 units		2.57–2.95	2.95–3.39	3.67–4.20	*42*
301–500 units		3.89–4.15	4.49–4.78	5.98–6.35	*53*
> 500 units		4.99–5.95	5.92–7.05	7.88–9.38	*58*
Cost of supply		**3.8**	**4.15**	**5.47**	***44***

Trend of increasing tariffs: nominal versus real

Tariffs have increased significantly in nominal terms between 2010 and 2012, by up to at least 15 percent for the lowest slabs and up to 60 percent in the higher consumption slabs. However, with high rates of inflation, tariff increases have not been so large in real terms. According to the Consumer Price Index (CPI), prices increased by more than 20 percent between March 2010 and March 2012. This means

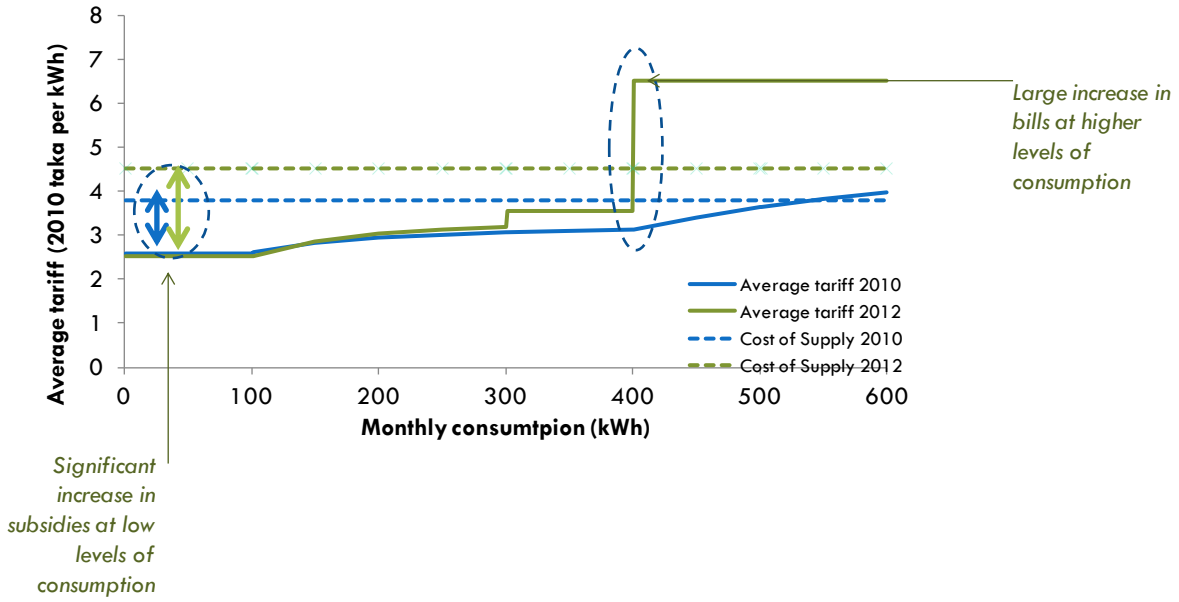
[12] See http://www.thefinancialexpress-bd.com/more.php?news_id=98188&date=2011-12-21.

that tariffs at the higher slabs increased less than 30 percent in real terms, and urban households consuming less than 100 kWh per month actually experienced a real decrease.

5.3 Removal of slab benefits

A second key change in pricing along in the transition from underpricing has been the removal of slab benefits. In 2010, all households benefited from all slabs. This meant that a household consuming 500 kWh benefited from the low tariffs at low levels of consumption, for example, at 100 kWh. From March 2010, slab benefits were removed for households consuming more than 300 kWh (urban and rural). This volume-based tariff applies a fixed rate to all levels of consumption. If this is applied to the figure used previously (based on average tariff), the new tariff system means there are significant "steps" at the slab boundaries, as illustrated in figure 13.

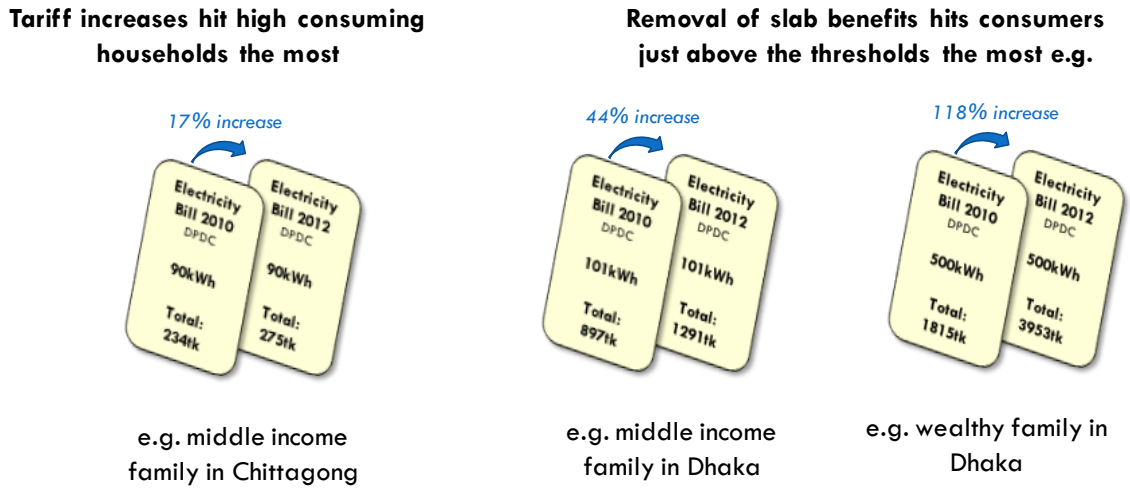
Figure 13: Electricity Subsidies in Bangladesh 2010-12 (Urban, 2010 taka per kWh). Source: authors compilation



The combination of higher tariffs and the removal of slab benefits resulted in significant increases in electricity bills. Most households have experienced at least a 17 percent increase in their bills during the two year period. However, wealthy households have been hardest hit by the increases, with some household bills more than doubling (figure 14). There has been strong public outcry in response to these sharp increases in electricity bills,[13] which adds to the political economy considerations the government must factor as it contemplates further tariff reform.

[13] For example, see http://www.thedailystar.net/newDesign/news-details.php?nid=238636.

Figure 14 Example Electricity Bills, 2010–12. Source: Authors' illustration



5.4 Increase in electricity consumption

At least two factors have contributed to the 20 percent increase in consumption reported in administrative records[14]:

- The Rural Electrification Program (REP): The ongoing REP is part of the government's strategy to achieve universal access. According to administrative records, there was an 8 percent increase in the number of rural households connected between 2010 and 2012.
- Increased generation capacity: figure 4 illustrates that electricity consumption is constrained by supply (hence the need for load shedding). In this context, any increase in generation capacity will translate into increased consumption.

The analysis that follows estimates 2012 consumption based on these trends observed in administrative data. It suggests that 14 percent of the electricity consumed in 2012 was by households consuming more than 400 kWh, compared to 9 percent in 2010.

To summarize, there are four key factors that will influence the subsidies analysis that follows. Between 2010 and 2012:

(i) cost of supply increased 20 percent in real terms;
(ii) tariffs increased (though decreased in real terms at low levels of consumption);
(iii) slab benefits were removed; and
(iv) consumption increased 20 percent.

[14] MIES data June 2012

6 2010 versus 2012: The Distribution and Fiscal Burden of Subsidy Benefits

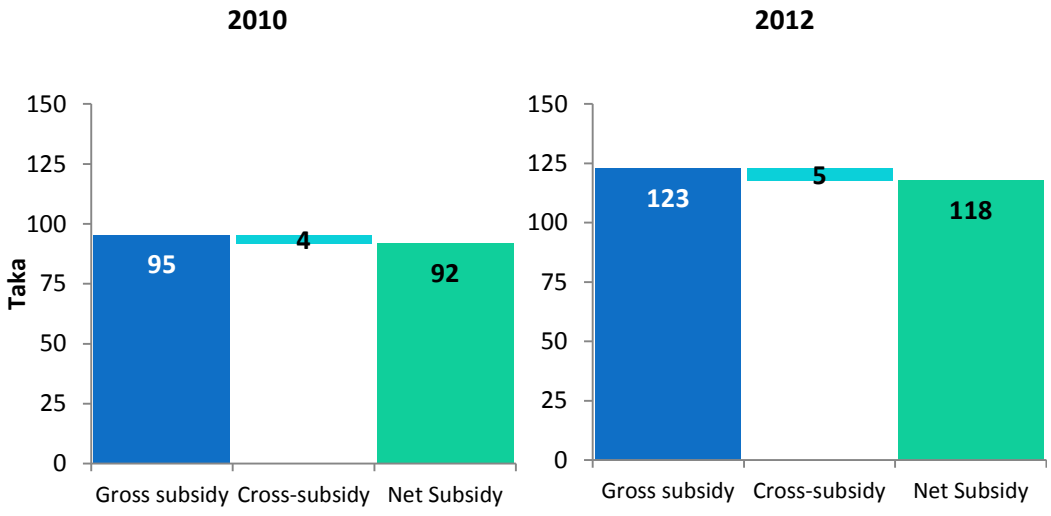
This section will discuss the impact of the changes described in section five. It will look at the impact on the distribution of benefits and on the fiscal burden. This section will also disaggregate the change in fiscal burden by each of the changes described in section five. Results show that the cost of supply was a key factor in the increase of the fiscal burden, although the removal of slab benefits helped to limit this increase.

6.1 More cross-subsidies, but higher net subsidies

Electricity was subsidized as deeply and almost as widely in 2012 as in 2010. In both years, almost all electricity units consumed (80–90 percent) were subsidized to some extent. Depth remained around 25 percent in 2012, although there was a change in the underlying pattern of subsidies. For low levels of consumption, virtually stagnant real tariffs coupled with a soaring real cost of supply (figure 13) meant that the degree of subsidy provided on each unit of electricity almost doubled in real terms. On the other hand, the cross-subsidy provided through high levels of consumption increased dramatically with the removal of slab benefits.

The net effect of these opposing forces was neutral in terms of average degree of subsidization. However, the amount of cross-subsidization did increase as a result of tariff and consumption increases, but not enough to offset the effects of the rising cost of supply and consumption at lower levels, so net subsidies increased. Figure 15 illustrates this for the average connected household. In 2010, this household received 95 taka in gross subsidies, paid 4 taka in cross subsidies, and so received 92 taka in net subsidies. In 2012, the cross-subsidy increased to 5 taka, but on a gross subsidy of 123 taka, meaning the net subsidy received was 118 taka (up from 92 taka in 2010).

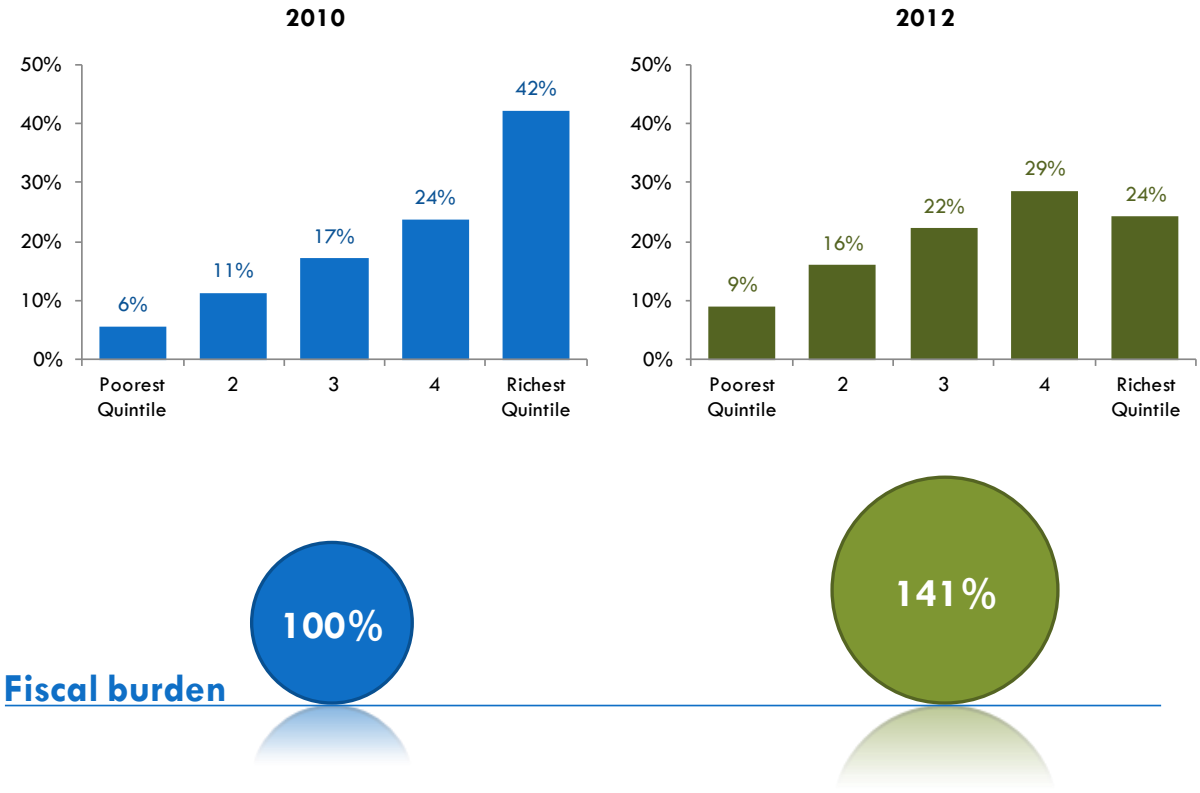
Figure 15: Gross to net electricity subsidy for the average connected household, 2010 vs 2012. Source: authors estimates based on HIES data



6.2 Distribution of subsidy benefits improving, though more expensive

Figure 16 illustrates that the distribution of benefits improved between 2010 and 2012. Overall, the distribution was more equal in 2012, with the increased cross-subsidies paid by rich household reducing the net subsidies they receive by almost half. While the share received by poor households also improved, they still only receive around one-third of the benefits of households in the top two quintiles. This suggests that there remains significant leakage.

Figure 16 Benefits Incidence of Electricity Subsidies in Bangladesh, Source: authors estimates based on HIES data



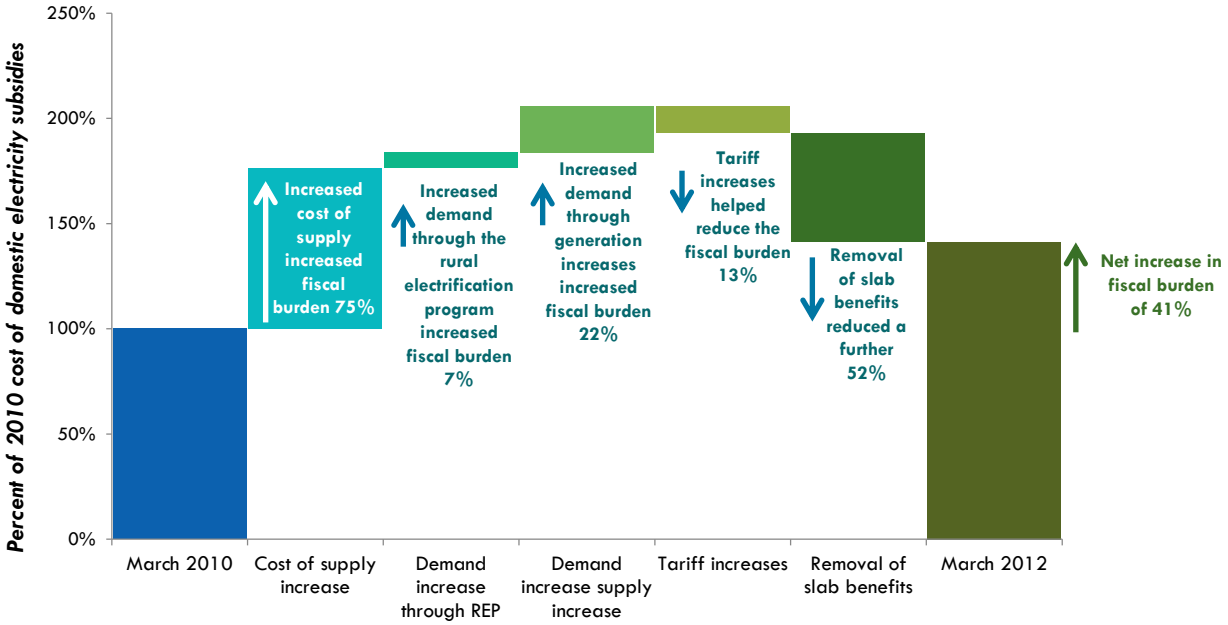
The second critical question to analyze is the fiscal burden of subsidies. This is particularly important in the context of a difficult and deteriorating overall fiscal position in Bangladesh. According to the most recent IMF estimations for Bangladesh, the fiscal deficit will increase from 3.1 percent of GDP in FY2010 to 4.4 percent of GDP in FY2012. A key driver of this increasing deficit is subsidies provided for various needs in the country.

Electricity subsidies include subsidies provided to households (residential subsidies) as well as to other sectors (for example, agricultural subsidies)—the focus here is on residential subsidies. According to this analysis, the real fiscal burden of residential subsidies increased by over 40 percent between 2010 and 2012.

6.3 Disaggregation of change in fiscal burden

The major contributing factor was the increased cost of electricity supply, which increased the fiscal burden by 75 percent (figure 17). Increased consumption increased the fiscal burden by a further 29 percent. These increases were offset to some extent by tariff increases between 2010 and 2012, which helped to reduce the fiscal burden by 12 percent, and the removal of slab benefits, which reduced the fiscal burden by a further 52 percent. On net, the fiscal burden increased by 41 percent.

Figure 17: Disaggregation of change in fiscal burden, 2010-2012



7 Moving Forward: Scenarios of Policy Options

This section briefly explores five policy-relevant scenarios using a partial equilibrium analysis that includes policies already being pursued by the GOB, for example, the trend toward cost-recovery pricing and the push toward achieving universal electrification. The results suggest that the move toward cost-recovery pricing will help reduce the leakage and inefficiency of subsidies, but subsidies will always have some degree of leakage and inefficiency.

7.1 Overview of scenarios

The scenario analysis looks at the impact of various policy choices available to the government in the short term (that is, next 12 months), as well as policy choices that could be implemented in the medium (3–5 years) and long term (5–10 years).

Table 4. Policy Option Summary. Source: Authors' compilation

		SHORT TERM					*MEDIUM TERM*	*LONG TERM*			
Policy Choices	**2012 Base**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 5**	**Scenario 6**	**Scenario 7**	**Scenario 8**	**Scenario 9**	**Scenario 10**
Urban Tariff Structure											
2012 structure	✓						✓		✓		
Proposed seven slab system		✓	✓								
Proposed nine slab system				✓	✓	✓				✓	✓
Social tariffs								✓			
Rural Tariff Structure											
2012 structure	✓	✓		✓			✓		✓		
Proposed seven slab system			✓								
Proposed nine slab system					✓						
20% lower than proposed nine slab system						✓				✓	✓
BPL tariffs								✓			
Cost of supply											
March 2010							✓				✓
March 2012	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Access											
2012	✓	✓	✓	✓	✓	✓	✓	✓			
Universal Access (2020 goal)									✓	✓	✓

Table 4 summarizes the changes modeled in each scenario. Further discussion of below the poverty line (BPL) tariffs can be found in annex 4, while the seven and nine slab systems being discussed at the time of this paper are captured in table 5. There are at least two new slab systems being considered; both would have limited or no slab benefits, but would help avoid the "jumps" in electricity bills experienced in the current slab structure when households move from one slab to the next (figure 13).

Table 5. Comparison of Seven and Nine Slab Systems

Seven slab system
No slab benefits

Slab	Proposed Tariff
0-75	3.66
75-200	5.32
0-300	5.53
0-400	5.75
0-600	9.39
0-800	9.78
>800	9.94

Nine slab system
Slab benefits only to 300 kWh

Slab	Proposed Tariff
0-75	4.56
76-200	5.16
201-300	5.45
0-400	7.63
0-500	7.66
0-600	7.98
0-700	8.76
0-800	9.35
>800	9.9

Source: BERC

7.2 Scenario results

Table 6 summarizes the scenario results, with detailed output provided in annex 5.

Table 6. Summary of Scenarios. Source: Authors' compilation

Scenario	Description	Proportion of benefits received by poorest quintile	Fiscal burden as % of 2012
	BASELINE	***9%***	***100%***
1	New slab system (seven) for urban only	14%	43%
2	New slab system (seven) for urban & rural	15%	22%
3	Nine slab schedule for urban only	14%	37%
4	Nine slab schedule for urban and rural	16%	-2%
5	Nine slabs with rural tariffs 20% lower	15%	10%
6	2010 cost of supply	13%	35%
7	BPL tariffs / at least cost recover for all other households	52%	-34%
8	Access 2020 (universal access) with current tariffs	15%	174%
9	Access 2020 - nine slab structure with rural 20% lower	25%	45%
10	Access 2020 scenario 9 with 2010 cost of supply	48%	-56%

All scenarios would improve the targeting efficiency of subsidies provided that households in the poorest quintile receive at least 10 percent of benefits. While these represent an improvement over 2012, most scenarios in the short run would still have significant leakage, although the fiscal burden could be reduced significantly.

In the medium term, perhaps the most effective policy measure would be to reduce the cost of supply to 2010 levels. While issues of generation cost and operational efficiency are outside the scope of this

policy note, it is important for the government to explore these issues in depth to understand the extent to which it can justify passing on cost of supply increases to households.

In the long term, scenario 8 (achieving universal access under the current tariff structure) illustrates the need for the GOB to take action. Under this scenario, the fiscal burden would almost double its current levels.

The only scenarios where leakage is significantly reduced are the long-term options of introducing a BPL tariff, or achieving universal access while also reducing cost of supply to 2010 levels and introducing the nine slab system currently being discussed. Both options (scenarios 7 and 9) would see the households in the poorest quintile receive around 50 percent of subsidies provided. Further, the fiscal burden in both scenarios would not only be cut completely, but a net fiscal gain would be generated through cross-subsidies, meaning that additional resources could be available for infrastructure improvements.

8 Conclusions and Policy Recommendations

The electricity sector in Bangladesh faces unprecedented challenges, with severe capacity constraints and sector subsidies, which quadrupled from 0.2 percent to 0.8 percent of GDP between 2010 and 2012, driving the government's fiscal deficit deeper. Subsidies provided to residential households are an important component of broader electricity subsidies, which also include subsidies to the agriculture sector.

There is significant leakage of residential electricity subsidies: households in the richest quintile received seven times as much in electricity subsidies as households in the poorest quintile (42 percent of subsidies versus 6 percent) in 2010. The three key factors contributing to this result are:

(i) access rates have remained low in Bangladesh (55 percent for all Bangladesh, only 20 percent for rural poor);
(ii) consumption patterns—in 2010 almost 40 percent of electricity consumed was by households consuming less than 100 kWh, where electricity was highly subsidized (over 30 percent of the cost of electricity was subsidized); and
(iii) the threshold for cost-recovery pricing—the level of consumption above which consumers pay at or above cost—is currently high in Bangladesh, only 1 percent of electricity consumption is above the threshold, that is, 99 percent of electricity units are subsidized.

Leakage of subsidies improved between 2010 and 2012, mainly due to the removal of slab benefits for higher levels of consumption, meaning households in the richest quintile provided cross-subsidies to households in lower quintiles.

Meanwhile, the fiscal burden of subsidies increased 41 percent in real terms, mainly because of a 20 percent increase in consumption—the result of increased generation capacity and the ongoing rural electrification program has increased access—and increases in the cost of supply, since the generation increase has mostly come from expensive furnace oil rental power plants.

In the short term, any of the new slab structures being considered will help reduce the fiscal burden significantly. In the medium term, reducing the cost of supply, by reducing generation costs through new power plants, and improving operational efficiency, will reduce fiscal burden and subsidy leakage.

In the long term, achieving universal access would increase the fiscal burden further. The new tariff structure, BPL tariffs like those found in many states in India, and reduced cost of supply are all policy options for the GOB to consider to mitigate fiscal burden and leakage.

Athought this policy report carried out analysis on the technical dimension of electricity pricing and subsidies, there remain several factors that are crucial for implementing the electricity subsidy reform. First, it has not discussed the financial aspect of the electricity sector, inlcuding sector losses and fiscal transfer mechanisms. These issues should be studied as part of a broader energy sector review, and public expenditure review.

Second, perhaps the most difficult aspect of electricity tariff and subsidy reform is the political economy of reform. Electricity tariffs affect a large proportion of the voting electorate, and often households with a stronger political voice. Recent public outcry at tariff increases illustrates the tension that exists, and is especially important when considering recent reports that the GOB is considering increasing tariffs a further 50 percent.

A number of other factors are also important to be examined as part of a boarder package on pricing and subsidy reform. First is the public communication dimension. Recent experiences of substantial subsidy reform such as those seen in Iran[15] provide a good example of placing a high emphasis on managing public expectations and engaging in a highly visible communication and education program. Second, the timing and sequencing of reforms is important. Recent tariff increases have been substantial n Bangladesh and over a short period of time. Experiences of tariff reform in other countries[16], for example Laos, provide an example of a slow and steady approach to tariff reform. In the case of Laos which chose to transition to cost recovery pricing in 2005, the government implemented the change over a period of five to six years[17]. Tariff increases can be more palatable politically when introduced steadily and gradually over time, and when households can see the benefits (for example, higher quality supply, more households connected etc.). These factors should be included in a political economy analysis of any further pricing and subsidy policy changes.

[15] See Guillaume 2011
[16] The case studies documented by the Global Subsidies Initiative may be useful in this regard. See http://www.iisd.org/gsi/fossil-fuel-subsidies
[17] See page 64, World Bank 2006

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Annexes

Annex 1 Structure of Power Sector

The power sector is organized under the Ministry of Power, Energy, and Mineral Resource (MoPEMR). The ministry manages the Bangladesh Power Development Board (BPDP), the Dhaka Electricity Supply Authority (DESA), and the Rural Electrification Board (REB). BPDP is by law responsible for generation and transmission of power while distribution has the responsibility of different government corporations. The government also allows private power generation. As part of the 1998 sector reforms, new public entities such as Power Grid Company of Bangladesh (PGCB), and Dhaka Electric Supply Co. Ltd (DESCO) as well as private sector IPPs have been constituted.

Key milestones

Figure A1

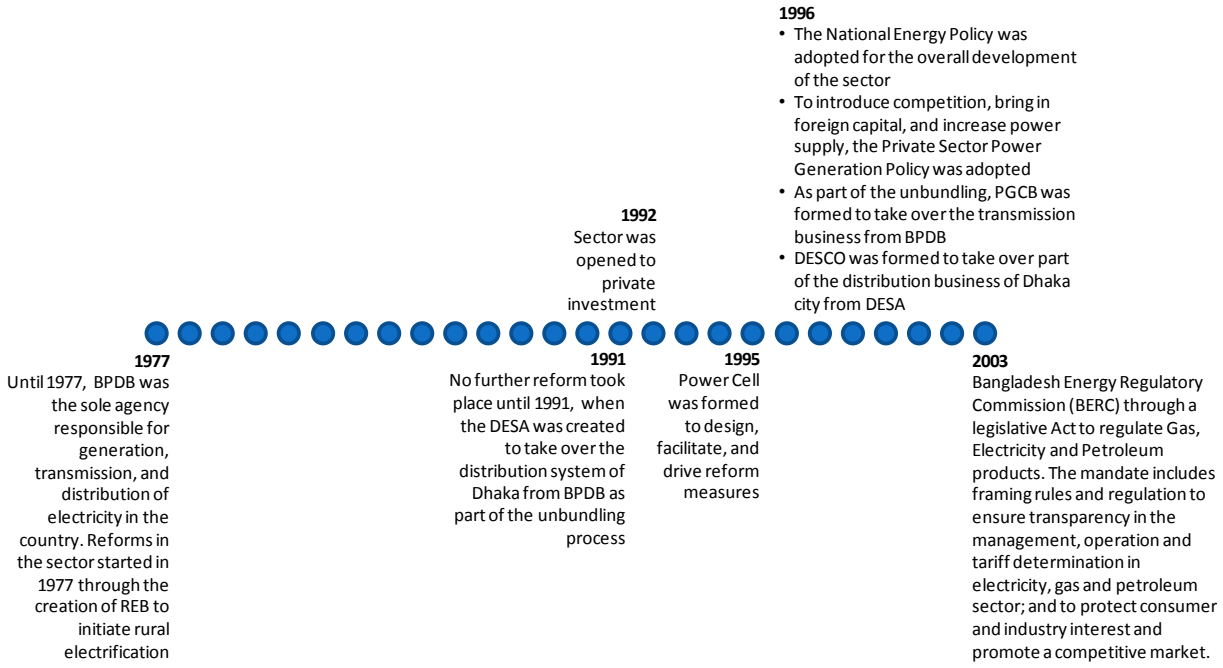
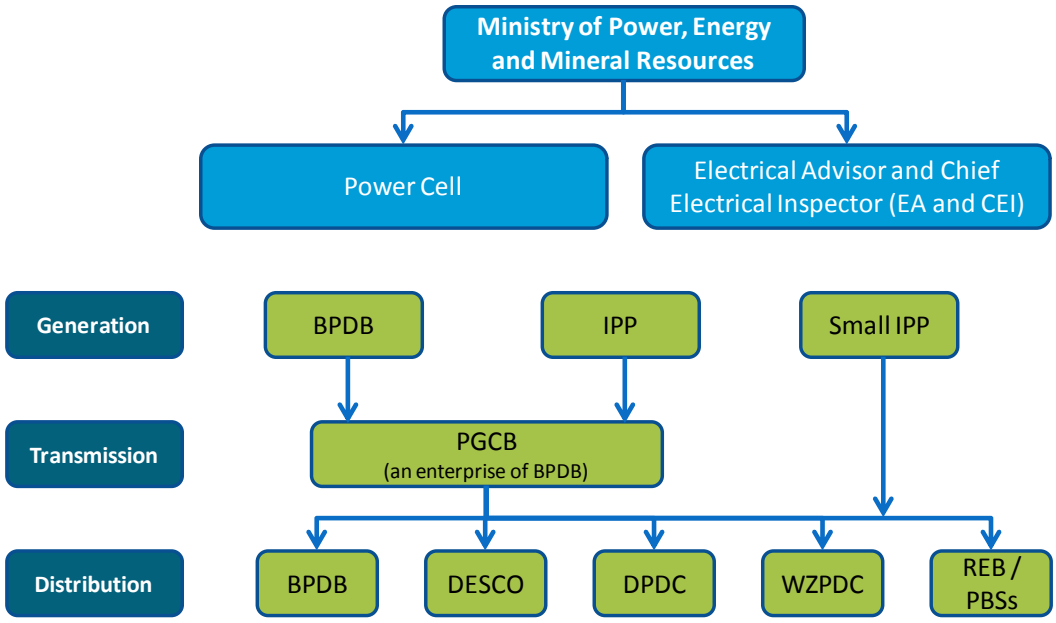


Figure A2



Power Distribution

Bangladesh Power Development Board (BPDB)

Responsible for distribution in urban areas except metropolitan area of Dhaka and its adjoining area. Dhaka is the commercial heart of Bangladesh with many large business corporations and large and small industries located here. There is a good mix of consumers like commercial, industrial and residential.

Dhaka Electricity Supply Authority (DESA)

Responsible for distribution in greater Dhaka area.

Dhaka Electric Supply Co. Ltd (DESCO)

Responsible for distribution in Mirpur area of Metro area of Dhaka in Greater Dhaka. It purchases power from DESA.

Dhaka Power Distribution Co. Ltd. (DPDC)

The largest power distribution company in the country, responsible for distribution in metropolitan areas.

Rural Electricity Board (REB)

Responsible for distribution in rural areas of Bangladesh through a system of cooperatives known as Palli Biddyut Samities (PBS). It purchases power from BPDB and DESA. Rural Bangladesh is primarily agricultural with some engaged in small scale industries thus, the consumer mix of REB is mostly agricultural in nature

West Zone Power Distribution Co. Ltd (WZPDCL)

Under BPDB, it is responsible for power distribution in Khulna and Barisal regions. Both Khulna and Barisal are predominantly agricultural areas with lot of jute and rice production in these areas. The demand for electricity is both for agriculture as well as for industrial especially in Khulna which has many large jute mills.

North West Zone Power Distribution Co. Ltd (NWZPDCL)

Under BPDB, it is responsible for power distribution in Rajshahi and Rangpur (formerly a part of Rajshahi) regions. Rajshahi has been regarded as the bread-basket of Bangladesh. With recent agricultural modernizations and agro-processing (which has an extremely bright future in this region of the country) there is a huge amount of agricultural demand for electricity here.

South Zone Power Distribution Company Ltd (SZPDCL)

Under BPDB, it is responsible for power distribution in Chittagong and Comilla regions. Around 40 percent of the heavy industrial activities of the country are located in Chittagong city and adjacent areas. Chittagong is the site of Bangladesh's busiest port which handles 80 percent of all Bangladeshi imports and exports. The strategic location of the port has allowed for interest by investors to help improve the city. Thus a major electricity demand comes from the industrial consumers.

Annex 2 Technical Notes on Benefits Analysis Methodology

We estimate the HH subsidy using electricity utility data (for example, tariff structure, cost of supply, and others) and electricity consumption data in the 2010 Household Income Expenditure Survey (HIES). This relies on making a number of assumptions, which are discussed in the following methodology.

First spatially adjusted quintiles are defined based on consumption levels. Second, the sample is cleaned. The HIES survey includes 12,600. We remove 460 observations (3.7 percent) whose reported electricity expenditure is not possible given the tariff structure. For example, with the minimum charge of 100 taka in effect in March 2010, households with a valid connection couldn't spend less than 100 taka. We assume these observations are due to either reporting error, or that they are illegal users (and so shouldn't be counted as part of a subsidy analysis).

Third, electricity consumption was estimated by applying the given tariff to the reported expenditure. We estimate electricity consumption from expenditure data (as consumption is not reported). The following procedure was carried out: First, from the tariff structures, we calculated ranges of electricity expenditures that should belong to each slab[18]. For example, if an urban HH's monthly electricity expenditure in 2010 is Tk 100, their electricity consumption belongs to the first slab and the marginal tariff is Tk 2.6 (table 1). Second, once we identify the slab that a HH belongs to, we apply the variable tariff for each segment of electricity consumption. For example, if an urban HH's monthly expenditure in 2010 is Tk 750, then this HH belongs to the second slab and the HH's consumption is thus estimated as (750–260)/3.3 + 100.

As a robustness check, consumption estimates were cross-checked against two sets of administrative data. At a high level, we compared monthly household consumption to per capita consumption reported by the International Energy Agency[19] (box A1). Our estimates were comparable to IEA estimated. At a more granular level, we compared our estimates to administrative records (table A1). The biggest issue of under-reporting was for Urban Dhaka households. For example, we estimated 6 percent of total electricity consumed by urban Dhaka households is by households consuming more than 400 kWh in 2010, while administrative data suggests this was 30 percent for 2010–11. This is likely due to under-reporting for urban households in Dhaka within HIES (common to have issues with representative samples in urban areas). We tested a number of different factors to apply to Dhaka households to make an adjustment for under-reporting. A factor of 1.75 brought results to be comparable with administrative data, which would imply an under-reporting of 57 percent. Applying this factor brings consumption for Dhaka households >400 up to 24 percent, in line with administrative data (30 percent).

Table A3 details all consumption estimates compared to administrative records after applying the adjustment factor. Better, the figure for the total consumption is much more consistent when taking this adjustment into account (all consumption brackets are within +/- 20 percent), and total consumption is in line with IEA estimates (of 250 kWh per capita per year).

[18] Note for rural consumers, we selected the mid-point of range of tariffs for rural households selected as the effective tariff for the purposes of the analysis.
[19] http://www.iea.org/stats/index.asp.

Figure A3[20]

ALL		
	HIES estimate (2010)	**Administrative data (2010-11**
0-100	38%	46%
100-400	53%	41%
>400	9%	12%

URBAN		
	HIES estimate (2010)	**Administrative data (2010-11**
	21%	26%
	66%	57%
	13%	17%

RURAL		
	HIES estimate (2009-10)	**Administrative data (2010-11**
0-100	65%	76%
100-300	30%	18%
300-500	4%	4%
>500	1%	1%

DHAKA	
HIES estimate (2010)	**Administrative data (2010-11**
1%	3%
75%	66%
24%	30%

Fourth, we estimated the subsidy by subtracting the cost of electricity supply.

$$S = C - E$$

$$C = U * Q$$

$$Q = E / F$$

S = subsidy

C = cost of supply

E = electricity expenditure

U = unit cost of supply

Q = quantity of electricity consumed

F = tariff

Box A1

Robustness check: are HIES estimates consistent with IEA figures?

- IEA is based on total power generated (that is, includes everything: residential, industry, and so forth) divided by total population. IEA report a figure of 250 kWh per capital for 2009 in Bangladesh.
- HIES suggests monthly consumption is 50 kWh per household (or 90 kWh per connected household).
- HIES 50 kWh is almost exactly in line with the 250 kWh per capita per year figure from IEA. Why?
- 50 kWh per month = 600 kWh per year. The average household size in Bangladesh is 4.5 persons, so 600 kWh per household = ~133 kWh per capita. Residential consumption represents around 50 percent of total energy consumption, so total energy consumed per capita is around twice 133 i.e. 266 kWh per capita in 2010; on par with the 250 kWh per capita in 2009 from IEA, that is, after considering growth in generation, access, and so forth.

[20] Notes

- HIES is 2010, while BERC data is 2010–11. Given growth in consumption, we expect HIES to be lower than administrative records
- Comparisons for sub-group indicative only:
  - For Dhaka analysis, District 26 & urban used to identify Dhaka households in HIES; DPDC administrative data used for comparison—will not match households exactly
  - For Rural household analysis, "rural" identifier used for HIES, and REB administrative

Table A1. **Domestic Consumption: 2010–11**

Utility	Slab	% Total consumption in each utility	% of slab consumption	
DESCO	0-100	1.50	3.10	49,256,329,452
	100-400	29.02	60.10	2,540,675,895
	>400	17.76	36.80	4,149,310,361
	Subtotal	48.28	100.00	**1,526,946,213**
DPDC	0-100	1.38	3.22	77,261,495
	100-400	28.46	66.64	1,598,977,025
	>400	12.87	30.14	723,186,788
	Subtotal	42.71	100.00	**2,399,425,308**
PDB	0-100	21.09	47.41	1,515,200,299
	100-400	22.18	49.85	1,593,181,500
	>400	1.22	2.74	87,569,053
	Subtotal	44.49	100.00	**3,195,950,852**
WZPDCL	0-100	22.38	48.00	396,392,331
	100-400	23.31	50.00	412,908,678
	>400	0.93	2.00	16,516,347
	Subtotal	46.62	100.00	**825,817,356**
REB	Min	2.10	4.08	219,474,071
	0-100	37.49	72.89	3,922,937,338
	101-300	9.36	18.19	979,199,149
	301-500	1.95	3.79	204,091,537
	Above 500	0.54	1.05	56,543,332
	Subtotal	51.44	100.00	**5,382,245,427**
All Utilities			46.35	6,178,597,504
			41.27	5,502,018,480
			12.38	1,649,769,170
				13,330,385,154

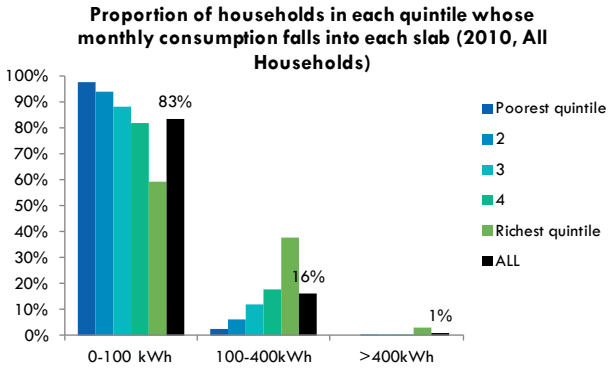
Source: BERC.

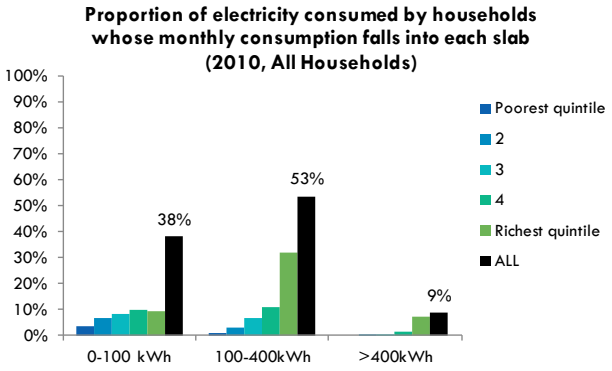
The 2012 simulations summarized in the main body of this note and in more detail below (Annex 5) include consumption forecasts for 2012. These are based on observed overall trends in the energy sector (20 percent increase in overall demand) and the rural electrification program. The following process was applied. First, we assumed a ten percent increase in the number of rural households receiving electricity (in line with administrative records). For each of the newly connected households, we applied the average electricity consumption for rural households in 2010 (77 kWh). This resulted in an overall increase in electricity consumption of 4 percent. To adjust for the 20 percent increase observed at a macro level, we applied a 16 percent increase to all connected households (including the newly connected rural households). Households were then re-categorized into their relevant consumption slabs, and the relevant 2012 tariffs were applied for each simulation.

Annex 3 Detailed Consumption Analyses

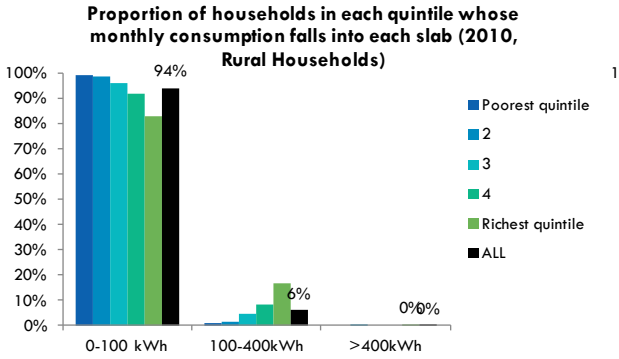
Figure A4

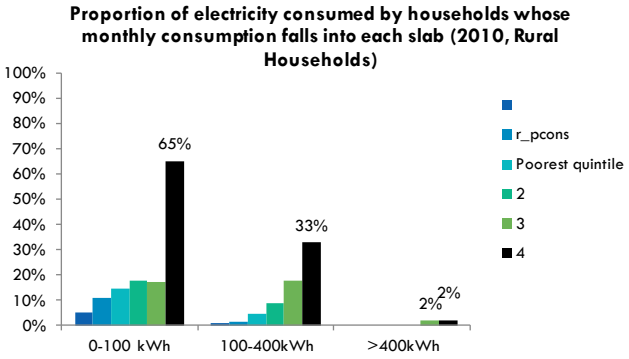
ALL HOUSEHOLDS



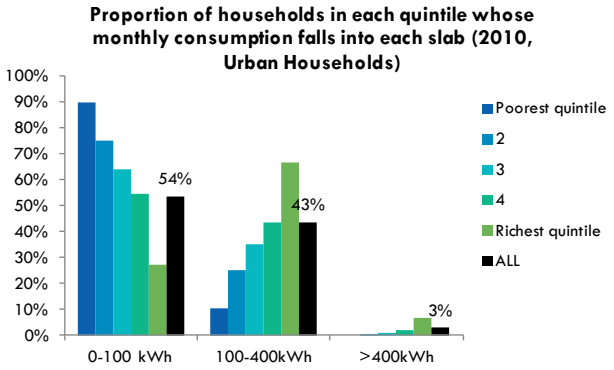


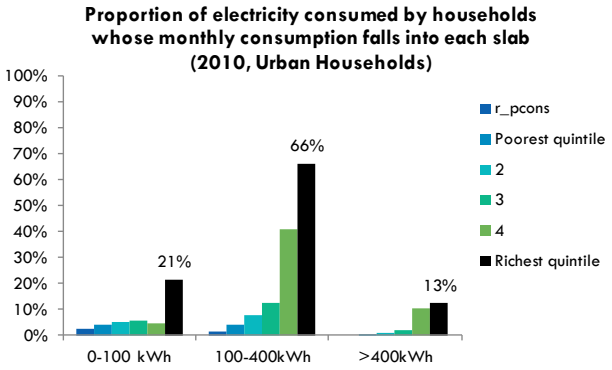
RURAL HOUSEHOLDS



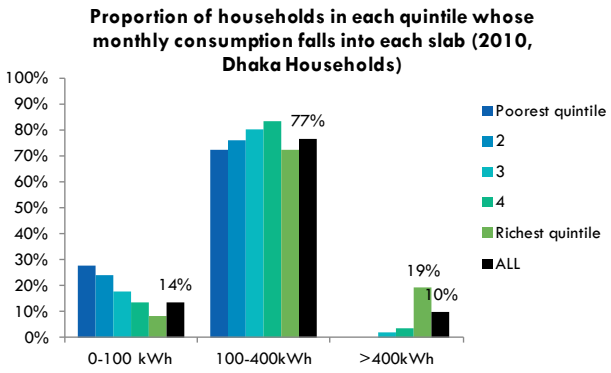


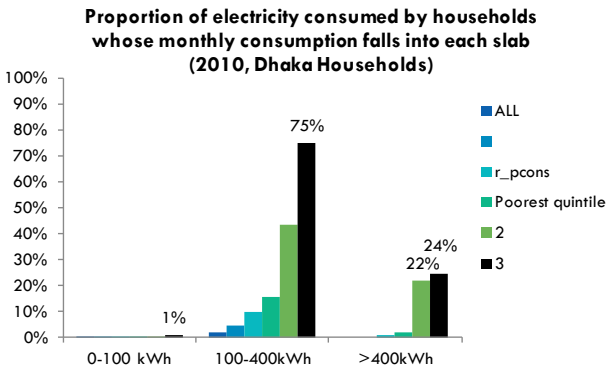
URBAN HOUSEHOLDS





URBAN HOUSEHOLDS IN DHAKA





Annex 4 BPL Tariffs in India

One option available to the Government of Bangladesh is below the poverty line (BPL) tariffs, which are widespread in neighboring India. BPL tariffs are typically highly subsidized tariffs that are only available to households below the poverty line. In India, implementation of BPL tariffs varies by state, but generally BPL households need to provide supporting documentation to qualify for the lower electricity tariffs. The lower tariff is also often contingent upon other household characteristics, such as total electricity consumption or number of electricity connections. These are funded through a combination of cross-subsidies from high consuming households, and transfers from the Ministry of Finance.

This annex provides a brief overview of BPL tariffs in India.

Prevalence of BPL tariffs

As of 2004–2005, 11 states of 19 surveyed[21] had a separate tariff schedule for BPL consumers. There were no "lifeline" tariffs (a special slab for any household with limited consumption). As of 2009–10, 17 states of 26 surveyed[22] had a separate tariff schedule for BPL consumers (13 of the 19 surveyed for2005). Two additional states (both included in the 2005 figure) had lifeline tariffs, and two states had both with BPL and lifeline tariffs.

History of BPL tariffs

The government of India does not have a central policy mandating subsidized tariffs for BPL consumers; however, it started encouraging such subsidies with the mid-2000s electricity reforms. The 2005 National Electricity Policy (NEP) encouraged cost recovery in tariffs yet allowed that BPL consumers may receive subsidized tariffs. It suggests this subsidized consumption should be limited, potentially at 30 units per month, but does not mandate such limitations, and limits the tariffs to no less than 50 percent of the average cost of supply.

In practice, the effective subsidization rate varies substantially, and most states have not chosen to follow the 50 percent subsidization limit: 14 of the 2010 BPL tariffs were subsidized between 51 and 100 percent. The limits also vary: 6 of the 2010 BPL schedules were unlimited for all BPL consumers; another 6 were limited at the suggested 30 kWh per month; and the remaining ranged from limits of 25 to 200 kWh per month.

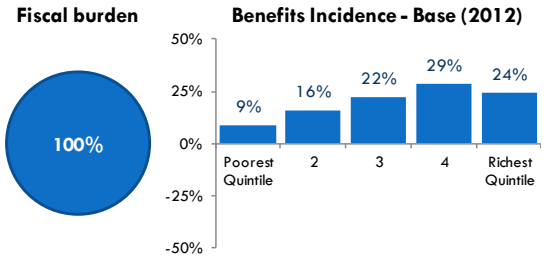
Prior to the NEP and other Acts, the Government of India does not appear to have had a stance on BPL tariffs. From 1989 to 2005, it had the "Kutir Jyoti Program", which provided single-point light connections to all BPL consumers and gave a 100 percent grant for connection charges, but it did not cover or appear to mention tariffs. Despite this, some states (for example, Karnataka) had BPL tariffs as early as 1979.

[21] Surveyed states are: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh, and West Bengal.

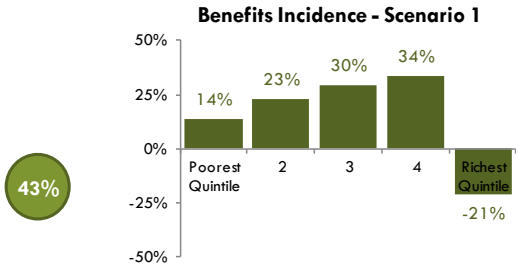
[22] Survey excluded Goa, Manipur, and Mizoram because their 2009–10 schedules were not available.

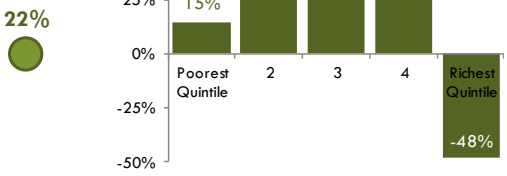
Annex 5 Detailed Scenario Results

Figure A5

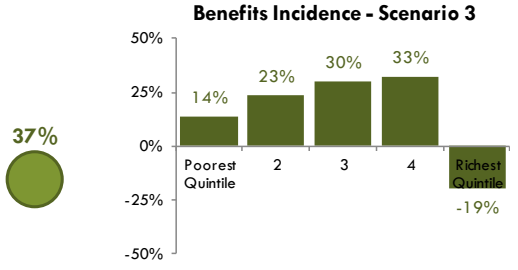


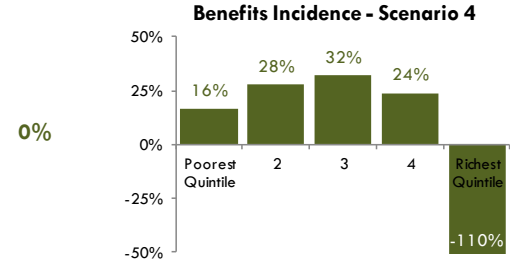
Policy Choices	2012 Base	SHORT TERM Scenario 1	Scenario 2
Urban Tariff Structure			
2012 structure	✓		
Proposed seven slab system		✓	✓
Proposed nine slab system			
Social tariffs			
Rural Tariff Structure			
2012 structure	✓	✓	
Proposed seven slab system			✓
Proposed nine slab system			
20% lower than proposed nine slab system			
BPL tariffs			
Cost of supply			
March 2010			
March 2012	✓	✓	✓
Access			
2012	✓	✓	✓
Universal Access (2020 goal)			

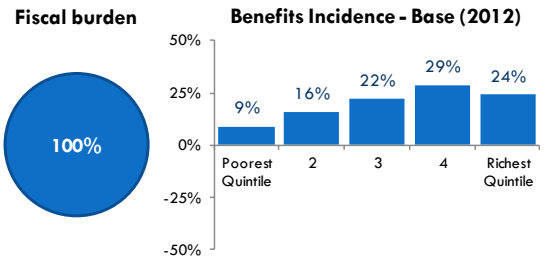




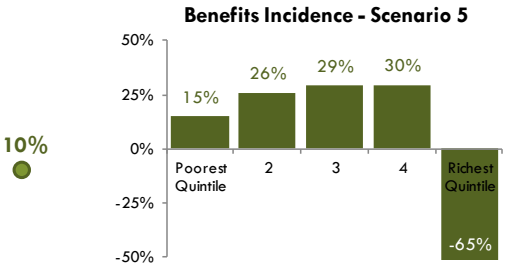
Policy Choices	2012 Base	SHORT TERM Scenario 3	Scenario 4
Urban Tariff Structure			
2012 structure	✓		
Proposed seven slab system			
Proposed nine slab system		✓	✓
Social tariffs			
Rural Tariff Structure			
2012 structure	✓	✓	
Proposed seven slab system			
Proposed nine slab system			✓
20% lower than proposed nine slab system			
BPL tariffs			
Cost of supply			
March 2010			
March 2012	✓	✓	✓
Access			
2012	✓	✓	✓
Universal Access (2020 goal)			



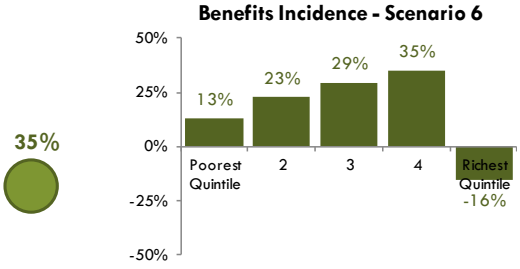


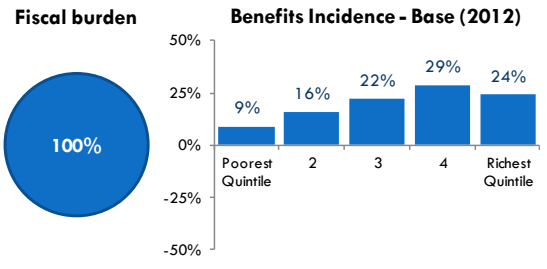


Policy Choices	2012 Base	*SHORT TERM* Scenario 5
Urban Tariff Structure		
2012 structure	✓	
Proposed seven slab system		
Proposed nine slab system		✓
Social tariffs		
Rural Tariff Structure		
2012 structure	✓	
Proposed seven slab system		
Proposed nine slab system		
20% lower than proposed nine slab system		✓
BPL tariffs		
Cost of supply		
March 2010		
March 2012	✓	✓
Access		
2012	✓	✓
Universal Access (2020 goal)		

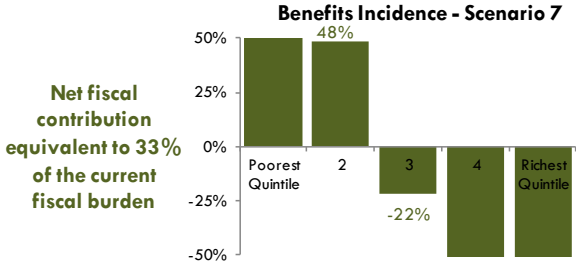


Policy Choices	2012 Base	*MEDIUM TERM* Scenario 6
Urban Tariff Structure		
2012 structure	✓	✓
Proposed seven slab system		
Proposed nine slab system		
Social tariffs		
Rural Tariff Structure		
2012 structure	✓	✓
Proposed seven slab system		
Proposed nine slab system		
20% lower than proposed nine slab system		
BPL tariffs		
Cost of supply		
March 2010		✓
March 2012	✓	
Access		
2012	✓	✓
Universal Access (2020 goal)		

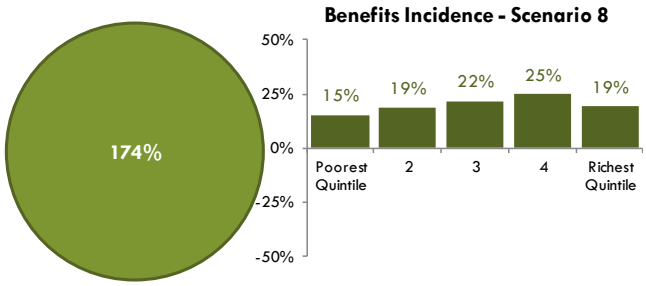




Policy Choices	2012 Base	LONG TERM Scenario 7
Urban Tariff Structure		
2012 structure	✓	
Proposed seven slab system		
Proposed nine slab system		
Social tariffs		✓
Rural Tariff Structure		
2012 structure	✓	
Proposed seven slab system		
Proposed nine slab system		
20% lower than proposed nine slab system		
BPL tariffs		✓
Cost of supply		
March 2010		
March 2012	✓	✓
Access		
2012	✓	✓
Universal Access (2020 goal)		



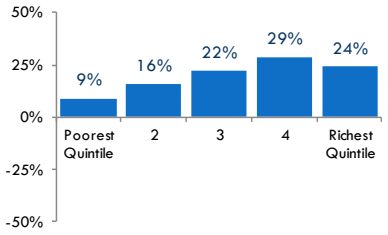
Policy Choices	2012 Base	LONG TERM Scenario 8
Urban Tariff Structure		
2012 structure	✓	✓
Proposed seven slab system		
Proposed nine slab system		
Social tariffs		
Rural Tariff Structure		
2012 structure	✓	✓
Proposed seven slab system		
Proposed nine slab system		
20% lower than proposed nine slab system		
BPL tariffs		
Cost of supply		
March 2010		
March 2012	✓	✓
Access		
2012	✓	
Universal Access (2020 goal)		✓



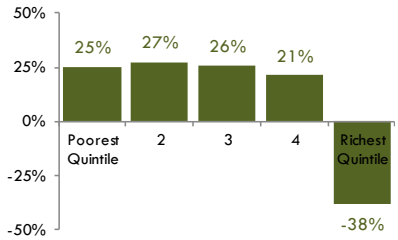
Policy Choices	2012 Base	LONG TERM Scenario 9	LONG TERM Scenario 10
Urban Tariff Structure			
2012 structure	✓		
Proposed seven slab system			
Proposed nine slab system		✓	✓
Social tariffs			
Rural Tariff Structure			
2012 structure	✓		
Proposed seven slab system			
Proposed nine slab system			
20% lower than proposed nine slab system		✓	✓
BPL tariffs			
Cost of supply			
March 2010			✓
March 2012	✓	✓	
Access			
2012	✓		
Universal Access (2020 goal)		✓	✓

Fiscal burden

Benefits Incidence - Base (2012)



Benefits Incidence - Scenario 9



Net fiscal contribution equivalent to 55% of the current fiscal burden

Benefits Incidence - Scenario 10