Political Economy of Power Sector Subsidies:
A Review with Reference to Sub-Saharan Africa

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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>DBT</td>
<td>decreasing block tariff</td>
</tr>
<tr>
<td>ESMAP</td>
<td>Energy Sector Management Assistance Program</td>
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<td>GDP</td>
<td>gross domestic product</td>
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<td>IBT</td>
<td>increasing block tariff</td>
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<tr>
<td>kWh</td>
<td>kilowatt-hours</td>
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<tr>
<td>NGO</td>
<td>non-governmental organization</td>
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<tr>
<td>O&amp;M</td>
<td>operation and maintenance</td>
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<tr>
<td>PSIA</td>
<td>poverty and social impact analysis</td>
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<td>TEMS</td>
<td>Transitional Electricity Market Stage</td>
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<td>VDT</td>
<td>volume differentiated tariff</td>
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Executive Summary

Power sector subsidies in Sub-Saharan Africa are substantial and highly regressive. While subsidies can be quick, easy, and politically expedient to implement, they are equally quick to take root and challenging to remove. Optimal policies that are technically sound and welfare-enhancing over the long run have nevertheless been found difficult to launch and even more challenging to sustain. Of the barriers to reform, those associated with political economy are among the most powerful, yet their analysis is often lacking due consideration in the reform design process.

This paper reviews the literature on power subsidies and their reform with emphasis on the political economy of such reform. It examines pricing principles in the power sector and different types of subsides; drivers for subsidies, benefits and costs of subsidy reform, and their distribution; and approaches to political economy analysis, tools available, and methodological issues. The paper draws examples from Sub-Saharan Africa and elsewhere, and presents case studies from the literature.

Subsidies can be reformed by reducing costs as well as increasing revenues. In both cases, stakeholder analysis and distributional analysis are important for designing suitable reform programs. Technical and nontechnical losses can contribute significantly to avoidable costs. While much is made of numerous small consumers stealing electricity by various means, in financial terms, a handful of very large consumers often account disproportionately for nontechnical losses, usually through collusion with utility staff. The interests of these large consumers and utility staff are often inter-twined, introducing an important dimension of political economy, but addressing these losses should receive high priority because eliminating such losses affects few, albeit potentially powerful, people.

Increasing revenues through tariff adjustments has been the subject of many studies. Because many individuals play multiple roles in the economy, there can be considerable uncertainty about the outcome at the individual level, and subsidy reform that may be supported ex post may be opposed ex ante. Government credibility, which is influenced by the perceived level of corruption and delivery of services, strongly influences the public’s acceptance of price increases. The public is more inclined than not to believe that there is scope for cutting costs, thereby minimizing the need to raise tariffs. Given this tendency, being seen to be making concerted efforts to reduce costs would be important, as would be making efforts to improve the quality of service. Over time, in a number of Sub-Saharan countries, the latter could even offset tariff increases, if the need for backup diesel power generation can be largely eliminated.

Institutions matter and reforms can be path-dependent. The literature on new institutional economics dealing with the power sector is still relatively new and weak. This is a promising area for future investigation.
It is worth noting that a power market with large subsidies is likely to have a host of other distortions and challenges. As a result, subsidy reform rarely occurs in a vacuum, and is likely to be part of a broader sector reform agenda.
1. Introduction

Sub-Saharan Africa lags behind all other regions of the world in installed capacity of power generation, household access to electricity, per capita power consumption, and connectivity across systems, leading to high reliance on expensive oil products for power generation, leased emergency power, and back-up captive-power generation. Despite their relatively high levels, tariffs in many countries often do not even cover operating costs.

Power sector subsidies in Sub-Saharan Africa are substantial. According to a recent estimation by the International Monetary Fund, the quasi-fiscal deficits of state-owned electricity companies—the difference between the revenue collected and that required to fully recover the capital and operating costs—in the region amounted to 1.8 percent of gross domestic product (GDP) in 2009–10 (IMF 2013). In addition, fuel subsidies benefit electricity generation in some countries. These subsidies impair the financial health of the energy suppliers, deter investments in the energy sector, and impose large fiscal costs where they are provided by governments.

Power sector subsidies in Sub-Saharan Africa are highly regressive: because the vast majority of the poor in the region—many residing in rural areas or informal urban settlements—are not connected to electricity, the subsidies to residential services are captured largely by better-off urban households, and in some countries industries and commercial establishments capable of paying much more are charged subsidized prices.

The barriers to power subsidy reform are significant. Price subsidies can be quick, easy, and politically expedient to implement; they are equally quick to take root and challenging to remove. Electricity is essential to modern economy, and provision of subsidies creates many vested interest groups. In the extreme, the survival of an entire industry may be put at risk if subsidies are eliminated. In Sub-Saharan Africa, households and businesses that are connected to electricity generally have greater voice and political influence than those who are not.

Among the barriers to the reform, those associated with political economy are arguably the most powerful. Pritchett (2005) proposes a framework of policy design with three elements: technically sound, administratively feasible, and politically supportable. Even when adequate attention is paid to the elements of technical soundness and administrative feasibility in designing policy, the political supportability aspect is often inadequately addressed. If reform policy makes little economic or technical sense, it cannot expect to enjoy widespread support. But if the reform policy is sound, the opposite ought to be true—after all, the current policy is infeasible in the long run, and its costs may be mounting to the detriment of the economy. Yet that support is often lacking.

Political economy analysis seeks to understand why it is difficult to launch and sustain optimal policies. The costs of maintaining the status quo are evident in many countries: financially insolvent power utilities with poor planning and weak management; growing contingent liabilities for the government, an increasing budgetary burden, or both; unreliable and inadequate
power supplies; expensive backup or emergency power generation and loss of competitiveness as a result; and lesser human capital accumulation on account of shortages of electricity for education, health, and clean water supply. Yet policies to address these widely acknowledged problems are frequently resisted by many. Of various types of subsidies, those that create a fiscal burden for the government or make utilities insolvent are especially of policy interest. Subsidies may have grown so large as to become unsustainable, but the necessary adjustments are often delayed, even in the face of growing government debt. A political economy analysis of subsidy reform explores the politico-economic determinants of such delays, and overlaps with the literature on fiscal adjustment programs (Alesina and Drazen 1991).

There is a large literature on power sector reform in developing countries (Bacon and Besant-Jones 2002; Besant-Jones 2006; Vagliasindi and Besant-Jones 2013), some of which introduces an explicit political economy dimension (Sulistiyanto and Xun 2004; Victor and Heller 2007; Erdogdu 2013). There is an equally extensive literature on the political economy of economic reform in general (Haggard and Webb 1993; Krueger 1993; Williamson 1994; Lora and Olivera 2004; World Bank 2007 and 2008a; Fritz, Kaiser, and Levy 2009; Corduneanu-HucI, Hamilton, and Ferrer 2013; Fritz, Levy, and Ort 2014), with some focusing on subsidy or pricing reforms (Dinar 2000; OECD 2007; Chen, Liverani, and Krauss 2014).

A number of recent case studies have looked in some detail at problems that have arisen in attempts to remove energy subsidies in developing countries (UNEP 2003; Bacon, Ley, and Kojima 2010; IEA, OPEC, OECD, and the World Bank 2010; Commander 2012; IISD 2012). The great majority of studies of power subsidy reform have been carried out ex post to identify various factors contributing to the success or failure of the policy reform. Examples include discussions of subsidy reform in Argentina, Armenia, Azerbaijan, Chile, the Dominican Republic, Egypt, Ghana, India, the Islamic Republic of Iran, Jordan, Malaysia, Mexico, Moldavia, Morocco, Nigeria, Pakistan, Peru, Turkey, and the Republic of Yemen (Vagliasindi 2013); Armenia, Brazil, Kenya, the Philippines, Turkey, and Uganda (Clements et al. 2013); Armenia (Sargsyan, Balabanyan, and Hankinson 2006); Ghana (Keener and Banerjee 2006); Pakistan (Trimble, Yoshida, and Saqib 2011); and the countries of Eastern Europe and Central Asia (Laderchi, Olivier, and Trimble 2013). Some studies have been carried out ex ante to help design a reform policy, including Bangladesh (Ahmed, Trimble, and Yoshida 2013), Mexico (Komives et al. 2009), Rwanda (Angel-Urdinola, Cosgrove-Davies, and Wodon 2006), the Kyrgyz Republic (Gassman 2012), and the Republic of Yemen (ESMAP 2005).

The foregoing large body of literature is helpful in understanding subsidy reform in the power sector. But while there are a fair number of papers chronicling subsidy reform episodes and drawing lessons or analyzing the distributional effects of power subsidy reform, there are fewer papers explicitly addressing the political economy of subsidy reform.

This paper reviews the literature on the political economy of economic reform that is relevant to power sector subsidies, as well as studies touching upon the political economy of subsidy reform.
episodes in the power sector; discusses some of the factors to consider in reforming subsidies in the light of specific characteristics of electricity supply and tariff structures; and considers application to, and examples from, Sub-Saharan Africa to the extent possible. This is the first in a series of background papers intended to inform a larger study examining subsidies in the power sector in Sub-Saharan Africa. The overall study surveys tariff structures and household expenditures on electricity, quantifies the nature and magnitude of subsidies in the countries in the region, and carries out several case studies; if sufficient data can be found to do so, political economy analysis as outlined in this paper can be carried out in one or more case studies.

The paper begins with examination of the various factors that lead to costs exceeding revenues and forcing provision of subsidies, and the associated political economy dimensions. Section 2 is followed by a description of approaches to political economy analysis and methodological issues. The paper draws upon examples of experience in the power sector in developing countries and the findings from other studies. It concludes with implications for Sub-Saharan Africa.

2. Cost Recovery and Related Political Economy

Power sector subsidies may be broadly defined as forms of financial or in-kind support provided by governments to electricity suppliers or consumers. Subsidies in the power sector arise in part because tariffs are regulated—absent price control, consumers are charged whatever suppliers can afford to charge without losing business, broadly ensuring that revenues cover costs and realize acceptable returns—and, in some markets, because state-owned utilities operate. Because of the existence of natural monopolies in some segments of the supply chain, economic regulation is inevitable. But government participation—through economic regulation and ownership of some utilities—politicizes tariff-setting and makes it more difficult to implement subsidy reform.

Subsidies can be provided to the power sector through a number of channels. Consumer subsidies, which reduce the revenues earned from users, can be financed directly by the government making a compensating payment to the utility, or indirectly by the utility incurring a loss and eroding its capital base. Producer subsidies may be financed by the government or consumers. Examples include subsidized inputs, notably subsidized fuels; price support, such as some feed-in tariffs; reduced rates of tax and tax credits; government assumption of occupational health, environmental, accident, and socioeconomic liabilities; credit and loan guarantees and subsidized interest rates; under-pricing of government goods and services, such as access to land; and higher tariffs paid by consumers on account of supply inefficiencies and avoidable losses.

Consumer subsidies in the power sector depend on the type of tariff structure in place as well as technical and nontechnical losses. Briceño-Garmendia and Shkaratan (2011) provide a detailed description of the different power charges to users for a large number of countries in Sub-Saharan Africa. Technical losses occur naturally from power dissipation in the supply chain.
Nontechnical losses are caused by actions external to the power system and consist primarily of various forms of electricity theft, non-payment by customers, and errors in accounting and record-keeping. These three categories of losses are respectively referred to as commercial, non-payment, and administrative losses, although their definitions vary in the literature (Antmann 2009). Commercial losses can arise from deliberate tampering of meter readings, consumption without meters, and illegal connections including theft. Where the utility’s customer database is not regularly updated, some customers may not be in the database, as a result of which they are not metered and billed on a regular basis.

In all cases, consumers pay less than the value of their consumption according to the official tariff schedule, if they pay at all. But there is an important difference. If consumption is not metered and billed accurately, the utilities cannot recover the losses, which become permanent. In contrast, under-collection of bills can be managed by the utility using debt recovery mechanisms applicable to any commercial activity, combined with service disconnection.

Reducing subsidies calls for higher aggregate revenues, lower costs, or both. While tariff increases receive much media coverage, revenues can be increased by other means—through anti-theft measures, more accurate metering and billing, and better payment collection. Raising tariffs may reduce subsidies significantly if consumption is not metered, as in some power markets. Even where consumption is metered, poor payment discipline together with the inability to disconnect non-paying consumers (such as government agencies) may decouple tariff levels from revenues collected. Costs can be reduced by improving efficiency, such as through long-term, least-cost power planning—including power mix optimization—and investment optimization; commercialization of power supply; and incentive regulation promoting cost reduction, such as CPI – X (consumer price index minus efficiency savings) regulation.

Avoidable costs created by inefficiencies and malpractice have been estimated for a group of African countries (Briceño-Garmendia, Smits, and Foster 2008; Briceño-Garmendia and Shkaratan 2011). These costs are associated with transmission and distribution losses, under-billing or under-collection of bills, and over-staffing. Depending on the energy mix, generation costs could dominate all other costs combined. This means reducing losses should receive high priority. Costs related to overstaffing, in contrast, are generally low compared to those associated with generation and losses. This general observation is supported by the study by Briceño-Garmendia and Shkaratan (2011), which indicated that, in about half the countries of Sub-Saharan Africa, the effects of under-billing, technical transmission and distribution losses, and over-staffing together were larger than that of underpricing, and transmission and distribution losses were generally the largest.

Technical losses are not incurred as a deliberate act of policy and can be reduced through technical solutions requiring upfront investment. Even though such investment may enjoy a high rate of return, it may not be undertaken—because system-wide optimization has not yet been carried out (to indicate whether technical loss reduction will more cost-effectively increase
supply than construction of new power generation capacity), the utility is short of cash as a result of the subsidies, or more likely the combination of both. Provided that loss reduction is cost-effective, the political economy of technical loss reduction is largely favorable to its implementation: users benefit from lower prices and utilities benefit from lower costs than otherwise.

A particular problem with bill collection occurs in countries where meter readers actually collect the revenues or are not subject to supervisory checks. The interest of the individual employee is opposed to that of the utility as a whole, and there is an incentive to collude in under-reporting consumption, with a kickback received in return for under-reporting. Further, as subsidies are reduced and tariffs are increased, the financial incentive to under-report consumption increases. A World Bank study (2009) found that businesses in 72 countries expected to give gifts or informal payments for a new electricity connection, and there were many ways in which side payments for under-billing, tampering with the accounting system, or failing to enforce collection could occur. In financial terms, large consumers of electricity account for a disproportionately high share of commercial losses. At the same time, there have been instances where a large number of small consumers stealing electricity have become violent and posed physical threats to meter inspectors. A recent example is a report of beating and stoning by residents of meter inspectors looking for tampered meters in a village near New Delhi in May 2014 (Bloomberg 2014).

Subsidy reduction and tariff reform are sometimes used interchangeably, but, as the foregoing paragraphs show, reducing subsidies may entail measures other than adjusting tariffs, such as improving technical and commercial performance or changing the power mix. Therefore, there is not necessarily a sharp boundary between subsidy reform and other reform steps, or sector planning, in the power sector. This paper considers subsidy reduction measures that have the effect of increasing payments for electricity consumption—tariff reform resulting in average tariff increases—as well as a program of measures (as opposed to routine measures adopted by the utilities) to reduce nontechnical losses. Other steps that improve regulatory, commercial, or market governance and efficiency, including privatization, are outside the scope of this paper, even if their net impact is to reduce subsidies.

**Cost recovery**

The question of which costs should be recovered through revenue collection influences tariff setting and the extent of subsidy reform. Broadly, there are two measures of cost recovery and financial sustainability: “cash needs” and full cost recovery.

- The cash-needs approach looks at the short-term financial sustainability of a utility and covers all projected cash payments to be made by the utility: the costs of operation and maintenance (O&M); debt obligations, such as principal and interest payments for past capital projects; taxes; insurance; and cash payments for relatively minor capital
expenditures from internal funding or equity sources. This approach does not capture input subsidies, subsidized interests (as in concessional financing), and other types of subsidies to cover the expenses the utilities are not expected to pay.

- Full cost recovery covers all cash needs as well as all capital costs—with depreciation and the rate of return on invested capital forming the basis for calculating capital costs—and decommissioning costs where applicable. If all costs are fully recovered from payments by consumers, the utilities are financially sustainable over the long run. However, input subsidies and other types of subsidies for expenditures for which utilities are not presented with a bill may not be captured. The main difference with the cash-needs approach is coverage of future investment projects for significant replacement or upgrading of existing capacity as well as capacity expansion. The need for capacity expansion is obvious especially in countries with low rates of electrification, but these are also the countries that arguably struggle the most to achieve full cost recovery. While future demand for electricity may not increase appreciably in North America, Europe, and high-income Asia, the shift in the energy mix from thermal power to renewable energy requires installation of new generation capacity and substantial expansion of transmission lines.

Subsidy accounting would include input subsidies and other support measures—such as concessional financing provided by donors—that may not be captured by either of the above measures of cost recovery.

International experience shows that the degree of cost recovery from consumer payments depends largely on the level of development of the power sector. In most higher-middle-income countries in Latin America and elsewhere, the power sector is mature, with near-universal access to electricity, high ability to pay among most consumers, and low or moderate rates of demand growth. In these markets, consumers pay cost-reflective tariffs that recover the O&M and all capital expenditures. Those facing affordability constraints are protected through social safety nets or assisted by cross-subsidies.

The power sector in low-income and many lower-middle-income countries, including nearly all in Sub-Saharan Africa, is far from mature—the rate of electrification, consumption per capita, and the ability to pay on the part of a large segment of consumers are all relatively low, and current tariffs are generally below the cost of service delivery. The medium- to long-term target for these countries is to reach tariff levels that fully cover all reasonably and prudently incurred costs. But where tariffs are not even covering operating costs, the immediate priority is to meet all cash obligations. The cash-needs approach reduces the short-term impact of capital expenditure on tariffs, but requires the country to seek concessional financing (grants, low-interest loans, long grace periods, partial risk guarantees) for major capital expenditures. Transmission and distribution in particular may require concessional financing, because private sector participation is unlikely. There is insufficient concessional financing to meet all future
demand for electricity, but future economic growth should increase the ability of consumers to pay and eventually enable full cost recovery.

Another avenue for subsidizing the power sector is through subsidized input prices. One common channel is price subsidy for natural gas, coal, fuel oil, or diesel. Fuel subsidy reform typically falls outside the power sector, with the power sector as a consumer of fuel often opposing fuel price subsidy reform. Fuel price subsidies are more prevalent in fuel-producing countries, and especially among major oil exporters. Once the reform is implemented, unless the fuel price increases are passed on to consumers through higher power tariffs, fuel subsidy reduction immediately creates additional subsidies in the power sector. The political economy of fuel subsidy reform has much in common with that of subsidy reform in the power sector.

**Pricing principles**

In a perfectly competitive market with free market entry and exit, marginal cost pricing delivers the most efficient outcome. Efficient electricity tariffs under such conditions require the complete accounting of the costs of power supply and depend, to a large degree, on the capital requirements of future expansion. Defining and calculating marginal costs and applying them to the tariff-setting policy present challenges. The difficulties include how to estimate technologies and costs in a least-cost or any other expansion plan optimizing the future welfare, how to address potentially high revenue variability, and how to deal with a revenue deficit arising from lower marginal than average costs due to increasing returns to scale. Two-part tariffs—in which a price less than the average cost is charged per kilowatt-hour (kWh), referred to as the energy charge, and the balance of the total cost is recovered by levying a fixed fee independent of consumption—are often used to deal with the last problem. The question for the efficient two-part tariff is how much less than the average cost the energy charge should be; equating it with the marginal cost may make the fixed charges too high and make electricity unaffordable for some, with adverse equity and even business consequences.

The concern about a trade-off between efficiency and equity is particularly strong in developing countries, where many poor households may not be able to afford even prices set at marginal costs. The need to enable the poor to use electricity has led to much lower tariffs for consumption or connection patterns characteristic of the poor at the expense of economic efficiency. A special type of subsidy in this regard is cross-subsidization. In high-income economies, power tariffs are highest for residential consumers, followed by commercial, and finally by industrial consumers, reflecting costs of supply to these consumer categories. For example, in 2013, the energy charges averaged US$0.121/kWh for residential consumers, US$0.103 for commercial, and US$0.0682 for industrial consumers in the United States (U.S. EIA 2014). In contrast, in Guinea, residential consumers are charged a fraction of what larger consumers pay. In 2007, residential consumers paid, inclusive of fixed charges, less than one fifth of what medium-voltage consumers paid, corresponding to US$0.052/kWh and US$0.293/kWh, respectively (IDEA Consult 2009); these tariffs have not been adjusted since. A
question that arises is when cross-subsidies imposing excessive burdens on large consumers become unsustainable, causing serious harm to businesses and ultimately to the economy.

A customer may be considered to be cross-subsidized if delivering electricity to that consumer at the prices charged leads to prices for other consumers becoming higher than otherwise (Faulhaber 1975). Depending on how cross-subsidies are structured, they may not necessarily incur net losses and claim budgetary support. How much to cross-subsidize is a choice policy makers make, depending on the importance attached to their understanding of trade-offs between equity, efficiency, and competitiveness. Throughout the world, rural electricity users, who are more expensive to serve, are cross-subsidized by urban users, or else some rural households may have to pay exorbitant prices. Two approaches are adopted worldwide to set electricity tariffs. One is to set nationally uniform tariffs for all consumers in a given tariff category (residential, commercial, industrial). The other is to set uniform tariffs for all users in a tariff category served by a given distribution company, with tariffs varying from company to company. Most distribution companies have urban customers and hence cross-subsidize rural consumers by charging urban consumers more and rural ones less than the costs of supply would suggest. Options for setting tariffs for different consumer categories are described below.

**Charging residential consumers for electricity consumption**

For residential consumers, equity and other considerations have led governments to adopt multi-tier pricing as a function of kWh consumed or of the connected load (amperage, kilovolt-amps, or kilowatts). Fixed monthly charges may also be a function of kWh or connected load.

*Energy charges that change with consumption*

Nonlinear pricing can be an increasing or decreasing function of kWh consumed. Increasing block tariffs (IBTs) have long been seen as a way of ensuring that even poor households can pay for a basic quantity of electricity, while higher tariffs at higher consumption would encourage conservation and help make up for some of the revenue shortfalls. Where the tariff for the first block for residential consumers is heavily discounted, it is called a lifeline rate.

IBTs are considered appropriate particularly in countries with large income inequality, many poor consumers of electricity, or both. IBTs, however, have several drawbacks:

- Political pressures make it difficult to limit the size of the first block. It is not uncommon to see the first block start off small but gradually grow over time.
- All residential consumers, rich and poor, benefit from the large subsidy offered by the first block (or two or more bottom blocks), when the rich can well afford to pay much more.
- IBTs make it difficult to recover costs without significantly departing from marginal cost pricing, and can seriously distort economic incentives.
• Where a meter is connected to multiple households, which may be common especially in low-income areas, IBTs cannot provide the intended protection to the poor.

• Consumers find it difficult to respond efficiently to complex nonlinear pricing. A recent study has examined IBTs with five blocks faced by some residents in California, United States, and found that consumers respond to average, not marginal, prices. The study concludes that multi-tier IBTs are inefficient electricity conservation (Ito 2014).

For these and other reasons, Georgia abandoned IBTs in 1999 in favor of a single uniform tariff and compensated the poorest households for the elimination of the lifeline rate with a direct cash payment through social protection (Lampietti et al. 2001).

A variation on IBTs is volume-differentiated tariffs (VDTs), under which each consumer is charged a single unit rate, but that rate is a function of total kWh consumed. This avoids the problem of high-income households benefiting from the subsidies offered by lower blocks in IBTs. However, the financial cost of overshooting the consumption limit on any given block, and especially the first one intended for the poor, can be punishing for low-income households, depending on the magnitude of the difference in the rate between two successive blocks.

Most Sub-Saharan African countries have more than one block for residential consumers, and as many as seven in Ethiopia and Gabon. Some markets in other parts of the world, such as Europe, have opted for decreasing block tariffs (DBTs) on the grounds that higher levels of consumption are less costly at the margin to serve. In Sub-Saharan Africa, DBTs, if adopted, are applied to medium- and high-voltage consumers, and not to residential consumers.

Energy charges that depend on the connected load

Another approach is to have a single unit energy charge for each consumer category but set up multiple categories as a function of connected load, on the assumption that the richer the household, the larger the electricity load. Mauritania, Mauritius, Namibia, Nigeria, and South Africa are among the countries in Sub-Saharan Africa that have adopted this approach, including eight different kilovolt-amp categories in Mauritania. This approach may be combined with nonlinear pricing within each category. Burkina Faso has three increasing tariff blocks each for 12 different residential consumer categories that vary with load and other supply characteristics. The 12 categories also have different fixed monthly charges.

Fixed monthly charges

Fixed charges are not related to consumption and correspond in part to such fixed costs as those for metering and billing, and help make up for revenue deficits. Examples of Sub-Saharan African countries that levy fixed monthly charges to residential consumers include Burkina Faso, Burundi, Ghana, Kenya, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Nigeria, South Africa, Togo, and Zambia. Fixed charges are regressive, being relatively more onerous for low-income households. For this reason, many Sub-Saharan African countries have one or more
categories of residential consumers—always associated with low consumption or low connected load—who are not levied fixed charges. For example, in Burundi, fixed charges are levied only on households consuming more than 300 kWh a month. There are no fixed charges on prepaid electricity—a payment system which is used particularly by the poor—in Malawi, Mozambique, Namibia, South Africa, and Zambia. Because there are no fixed charges, energy charges are not necessarily lower for prepaid than postpaid electricity.

**Subsidizing connection for residential consumers**

An important goal for many Sub-Saharan African countries is to increase the connection rate and eventually achieve universal access. Globally, initial connections by households have been subsidized to varying degrees in every country. Some key features were common in the electrification strategies implemented by many countries achieving high rates of access during the second half of the 20th century (Crousillat, Hamilton, and Antmann 2010). A government agency or state-owned utilities carried out systematic planning to identify all investments needed to connect new users (distribution network infrastructure, individual users’ connections, and generation assets in the case of isolated grids and home systems). In parallel, special-purpose electrification funds were created to finance the identified investments, using a mix of resources provided by development aid agencies, the national budget, and earmarked tariff charges paid by existing better-off consumers (defined by tariff category or monthly consumption). Assets built using funds provided by others (such as aide agencies and government budget) were excluded in the computation of allowed revenues to be captured in the tariffs for capital expenditure based on the annuity of the replacement costs, because the utility should not be entitled to remuneration on the investments it had not financed. New electricity consumers were exempted from connection charges or paid a fee based on affordability, and the revenues collected by the utility from those payments were transferred to the electrification fund. Assets built under the electrification program were operated by the utility responsible for service provision and incorporated into its asset base. Revenues required for efficient operation of those assets are included in the computation of the overall revenues the utility was allowed to collect through tariffs. Once the number of better-off consumers reached a critical mass, this approach became financially self-sustaining through tariff charges collected by the utility from those customers, as in Brazil, Colombia, and Peru.

Charging fully cost-reflective connection charges to all consumers would substantially slow down progress toward universal access. Komives et al. (2005) provide a framework to evaluate a change in connection charges in terms of its effects on households at different income levels (see section 3). Two advantages of connection subsidies are their relative ease of targeting—it is simpler to ascertain whether a household is connected than to determine whether it is poor—and their limited nature—once all households are connected, no further subsidies are needed.

The tariff systems applied by most countries also include specific charges for service disconnection/reconnection following non-payment of bills. These costs are charged only to
those who fail to pay, and hence are likely to fall on cash-strapped households, because these are the most likely to have to default on occasion.

**Commercial and industrial consumers**

For commercial and industrial users, and especially those connected to medium- and high-voltage lines, demand charges corresponding to subscribed peak demand are common. Energy charges can be a function of the time of day with two or three time periods. Cameroun has DBTs within the off-peak period for medium-voltage consumers.

The government may decide to subsidize certain businesses for a variety of reasons: curbing inflation, helping individual businesses, and promoting new business:

- *The impact on the costs of production, prices, and inflation* is often cited for not passing through increased costs of generating and distributing power, even when there are regulatory rules mandating tariff adjustments. This puts the immediate benefits of reducing inflation to the whole population above other considerations, which include not only the longer-run costs to taxpayers and power users of financing the subsidies so created, but possibly the immediate possibility of continuing power outages.

- *The impact on individual businesses* of higher power costs will depend in part on the degree of competition. Strong competition from imports can make it difficult to pass on a domestic cost increase and a reduction in power subsidies would lead to lower profits, lower sales, or both. Where businesses are well organized through trade associations, an effective campaign against the increases may be mounted. The threat of job losses as businesses lose sales may ally organized labor with the employers to protest against the proposed policy. Another reason for avoiding subsidy reduction may be fear of loss of support in election campaigns from businesses enjoying subsidized electricity.

- *The effect on potential businesses and employment generation* will also concern the government. Raising costs of production would discourage new firms and might slow down business growth and job creation. Some governments may offer subsidized power tariffs to attract investments and kick-start an industry. Examples include mining companies and manufacturing plants consuming large quantities of electricity. The economics of making a decision to support such industries by providing power subsidies are complex—mining companies may "shop around" between countries looking for the best deal, and the employment and income they generate may be perceived to compensate for the fiscal cost of the subsidies that the government would have to offer to secure their investment. Removing such a subsidy may be seen as risking the viability of the new industrial structure. Subsidized connection charges for businesses have similar drivers: helping business development, creating jobs, and gaining political support from businesses and workers.
Ironically, while businesses may support subsidies in the power sector, these very subsidies may have become expensive in practice: subsidies can decapitalize the power sector to the point of leaving the power infrastructure in disrepair, causing frequent power outages and forcing firms to resort to expensive backup power generation. Unreliable electricity is cited as one of the most significant barriers to business development in Sub-Saharan Africa (Dethier, Hirn, and Straub 2008). In such circumstances, steps to restore the financial health of the electricity suppliers and make reliable power available 24/7 year around—which include subsidy removal—may not encounter strong or even much opposition, provided the proposal to raise tariffs and improve the quality of service carries credibility.

**Perceived drivers of financial gaps**

Subsidies become necessary when costs persistently exceed revenues. The public’s perception of why this is happening significantly influences the degree of acceptance of the need for subsidy reform.

- **Mismanagement.** If utilities are widely viewed as being corrupt, inept, or mismanaged, their financial plight may be considered of their own making. Consumers may very well ask why they should be asked to pay more under such circumstances. Mismanagement of the sector may even lead the public to believe that corruption is what makes subsidies unaffordable, and that subsidies can be made affordable by rooting out corruption and making subsidy delivery more efficient.

- **Sub-optimal planning and project execution.** Costs may be unnecessarily high because the power sector is not run optimally. A lack of systematic integrated planning that minimizes long-term costs, and implementation of projects through unsolicited proposals rather than through transparent competitive bidding, are two examples of causes of high generation costs in some Sub-Saharan African countries. Where there is ample scope for cost reduction, the first priority is to reduce costs rather than focus primarily on tariff increases. But the fact that there are enormous opportunities for cost reduction in Sub-Saharan Africa—the potential for hydropower, which is low in cost per kWh generated, is largely unexploited, while reliance on oil, the most expensive form of power generation, can be slashed—has sometimes led to “postponement” of serious subsidy reform, on the grounds that costs need to be cut first. In addition, softening of the budget constraint for state-owned utilities tends to reduce incentives for efficiency improvement and increase costs.

- **External shocks.** The public is less likely to question the need to deal with cost increases outside of utilities’ control, such as droughts in markets dependent on hydropower. A sharp increase in the cost of generation as a result of the failure of Nigeria to deliver natural gas by the West Africa Gas Pipeline was one of the contributing factors to the suspension in Ghana of automatic tariff adjustments between 2011 and 2013, as was currency depreciation combined with higher world oil prices.
However, opinions may differ on how much tariffs will need to be increased, if any. The perception of the likely duration of higher costs—droughts could last only one season, and oil prices might fall again—affects the willingness to accept higher tariffs. If higher costs are expected to be short-lived, consumers may expect the utilities to accept short-term financial losses, recovering them over time and obviating the need to raise tariffs. Further, external shocks are likely to have other adverse economic effects, such as job losses and higher inflation, thereby reducing consumers’ ability to cope with higher electricity bills and making them less willing to accept tariff increases.

- **Nontechnical losses.** Where these losses are large, it would be rare for the opponents of subsidy reform to openly defend theft, non-payment, meter tampering, and other forms of malpractice or the utilities’ administrative inefficiency. Those not engaged in incurring the losses are likely to support their reduction. However, financial gains reaped by those profiting from commercial losses can be very large, especially for large consumers who could exercise considerable political influence. The beneficiaries include not only electricity consumers but also utility employees colluding with customers. In some cases, powerful groups in the government—such as the military or the ministry regulating the utilities—may be guilty of under-metered consumption, under- or non-payments, or both.

The regulatory question concerns what would be acceptable losses of this nature, initially and over time (they should eventually decline to zero), and the answer will determine how the cost of these losses will be shared among the utilities (through financial losses), consumers (through higher tariffs), and government (through the budget). Historically, nontechnical losses have been as high as 30–40 percent in some developing countries and contributed significantly to the inability of state-owned utilities in many developing countries to achieve financial sustainability (Bakovic, Tenenbaum, and Woolf 2003).

The public’s tolerance for paying more to make up for these avoidable losses would be low, and any perceived failure to address these losses could undermine the credibility of the subsidy reform. As an illustration, Faiz (2013) argues that a credible reform package in Pakistan, where a large part of the total cost of persistent power subsidies is due to these losses, would require a massive effort to reduce theft and corruption in order to avoid a public backlash against raising prices in a sector known to be corrupt and inefficient.

Another political economy consideration is the importance of going after large consumers first. Not only do they account for a large share of the total commercial losses, if a utility tackles small consumers while leaving fraudulent commercial large consumers alone, the public’s perception will be that the rich and the powerful are allowed to carry on business as usual, while the poor and the less powerful are unfairly
targeted as scapegoats. Such a perception could stiffen the public’s opposition to commercial loss reduction.

Finally, a related but distinctly different aspect is legally allowed unmetered consumption. There may be one meter for an entire village covering all consumers, with utilities basing bills on “estimated” consumption. This inevitably means that consumers in the same category are charged different amounts per kWh. Installing prepaid meters addresses multiple problems: payments that reflect actual consumption, no payment for non-consumption such as through fixed charges, and no need for the utility to bill and risk late or non-payments.

- **Government ownership of utilities.** The public may have different expectations about state-owned utilities, regarding them more as providers of social services than commercial operators making acceptable returns on investments. The utilities may be expected to make minimal profits or even losses in the name of public interest. It is also easier for governments to burden public utilities with social objectives, such as over-staffing for job creation or providing social services outside of their core business, to which the public may feel entitled.

- **Tariffs being too low.** If the main reason for the utilities’ financial losses is that tariffs have historically been too low even after eliminating avoidable losses, it would be more difficult to argue on technical grounds that tariffs should not be raised, although opposition to tariff reform is often not based on technical merits. If tariffs are not low in the absolute sense—for example, if electricity is generated largely from oil in an island economy with few other choices—it would be more difficult to persuade the public that they are paying too little for electricity.

**Costs and benefits of subsidy reform**

The benefits of technically sound subsidy reforms should outweigh costs, but there are aspects that militate against reform acceptance: when benefits are reaped and how costs and benefits are distributed.

*Timing of benefits versus costs*

If there is a long delay before visible benefits emerge, there may not be enough early wins to sustain the reform politically. Would-be reformers might worry that “short-term pain, long-term gain” could lead to election defeats. One problem is the perception of the counterfactual by the general public: instead of taking as the counterfactual what the situation today would have been without the reform, they compare the situation with reform to the situation before the reform when consumers were enjoying lower electricity prices, not recognizing that continuing subsidies might have made the power sector increasingly dysfunctional. If politicians believe that benefits will come too late for their purpose (such as maximizing their re-election chances), they may not launch the reform, and if winners from the reform emerge too late for politicians to benefit from
the reform gains, the reform may not be sustained. The opposite is observed on occasion: because consumers experience the benefits of price subsidies immediately, subsidies may be expanded just before elections.

The effect of the electoral cycle on reform and other observations on participatory reform processes earlier led some to postulate that autocratic regimes can implement reform measures more successfully than democratic ones, or even that public participation in the reform process may be counter-productive. Haggard and Webb (1993) point out, for example, that numerous studies in the 1980s compared the success of economic policy reform (not specific to energy) carried out by authoritarian and democratic governments, with several suggesting that authoritarian regimes might be more successful. Williamson (1994) reviewed major economic reforms in 13 countries starting from adverse conditions, and concluded that authoritarian regimes were no better at carrying out reform and that there were many counter-examples. Today, consulting affected stakeholders and mounting information campaigns to fully inform the public using different media is considered essential for designing and implementing reforms. Further, authoritarian regimes may feel the need to earn the social license to govern, as it were, and some attempt to please the public by giving out generous subsidies.

As regards the electoral cycle, there is often reluctance to raise tariffs just before elections, but a new government winning elections with a strong mandate may enjoy a honeymoon period and be in a position to implement subsidy reform soon after taking office. The opposite may also occur—a party campaigning on the promise of not raising power tariffs, as in Kenya in 2013, may be reluctant to start a new term with tariff price adjustments.

One potential example of delayed benefits is raising tariffs to finance infrastructure repair and capacity addition to improve supply reliability. Because back-up electricity generation typically relies on expensive diesel fuel and cannot take advantage of economies of scale that utilities can exploit, even unsubsidized electricity is most likely to be cheaper than captive power generation. Businesses would therefore prefer electricity provided by utilities to their own power generation even if subsidies were eliminated. The burden of power outages and high voltage fluctuations is unevenly shared and affects small businesses disproportionately:

- One study using a large cross-country sample of enterprises from the World Bank Enterprise Survey database found that electricity-intensive sectors in high-outage countries were characterized by a significantly lower share of small firms (Alby, Dethier, and Straub 2012). Such a trend may have particularly deleterious effects on poverty reduction in Sub-Saharan Africa, where many depend on small businesses for work.

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2 In April 2013, a new government, which campaigned promising to reduce electricity costs, assumed office and initially resisted and postponed the proposed tariff increases. However, following discussions on the rationale for the increases, the new government did not prevent the regulatory tariff review process taking its course, and the Energy Regulatory Commission approved a new three-year tariff schedule in November 2013. The power tariffs had been last reviewed in 2008.
Another study on power supply to agriculture in two states in India found that the costs of unreliable quality and supply were regressive and had larger adverse effects on small and marginal farmers (Monari 2002). Conversely, increasing tariffs while aggressively improving supply quality benefited small farmers far more than large farmers.

The willingness to accept subsidy reform hinges on improving the quality of service. Ideally tangible improvement precedes or occurs at the same time as tariff increases. If not, the assurances of supply reliability have to be considered credible, but that credibility is often lacking, especially if the utilities have the reputation of being incompetent, poorly managed, or corrupt. The end result is that consumers do not know whether they will pay more now but see benefits only years from now, and prefer the status quo.

There are steps utilities can take to improve service quality even in the short run. One possible quick win is establishment of a call center operating 24 hours a day to which customers can report supply disruptions, and acting quickly to restore electricity. El Salvador, Peru, and Uruguay are among the countries that have demonstrated service quality improvement in this way (Antmann 2009), where consumers saw, early on, reductions in the duration—but not necessarily frequency, which takes longer to address—of power outages.

**Distribution of costs and benefits**

It is not possible for everyone to gain from subsidy reform, or else there would be little opposition to it. In the extreme, decades of low tariffs may have led to creation of grossly inefficient industries that have little chance of surviving in a deregulated market with cost-reflective power tariffs. Such industries would be clear losers. Businesses in competition with the power sector, such as sellers of back-up generators, would gain if tariffs are increased and power supplies remain unreliable, but would lose if the supply reliability is improved to the point of eliminating the need for back-up generation or if diesel fuel price subsidies are reduced. Those profiting from commercial losses and under-payments would lose as these losses are cut. Another group of potential losers is those who are offered no compensation. As consumers they lose, although they may gain as income earners if supply reliability improves.

Delays in subsidy reform arise often due to a political stalemate over the distribution of costs, and, often, the more uneven the expected distribution of costs, the longer the delay (Alesina and Drazen 1991). If the government has a good distributional track record and the wealth distribution is not sharply unequal, the public is more inclined to believe that the burden of the subsidy reform would not be one-sided.

A related point is uncertainty about the outcome at the individual level. It is inevitable that not all winners and losers of reform can be identified beforehand, and this uncertainty can lead to a bias toward the status quo. How the effects of the subsidy reform on different sectors of the economy will interact is not easy to assess. Further, many individuals play multiple roles in the economy— as electricity consumers, workers, business owners, policymakers, meter readers engaged in
under-billing, sellers of back-up generators—and this further complicates estimation of the net impact at the level of the individual. Fernandez and Rodrik (1991) show how it is possible for the majority of society to benefit from subsidy reform, and yet for the majority to also believe that they will lose from the proposed reform because of this uncertainty. As a result, ex ante hostility to reform and ex post support can be consistent, and reforms that would receive adequate political support after adoption could still be opposed beforehand.

**Context**

What is happening elsewhere in the power sector, in the rest of the economy, and in society at large affects the public’s and policymakers’ willingness to deal with subsidy reform.

Within the power sector, if there is broader reform being implemented, it may be difficult to disentangle the effects of tariff reform from those of other reform measures. For example, if vertically integrated state-owned utilities are being unbundled and generation companies are being privatized, the public may attribute tariff reform to the transfer of ownership to private companies and believe that tariff increases are largely feeding higher profits demanded by private investors rather than making insolvent utilities financially viable. Such perceptions may result in opposition to both privatization and tariff increases.

The public may have become disillusioned with the failure of the power ministry and agencies to carry out their mandates, and treat their pronouncements—about improving the quality of electricity supply, a national plan for extending access, and even pronouncements about pricing reforms—with skepticism. The credibility of a reform program would be low in such circumstances.

If government departments and institutions pay little for electricity because the utilities do not or cannot disconnect them for partial or non-payments and their arrears are allowed to grow without bound, the credibility of the reform program will be questioned. The public’s perception of the government’s commitment to reform in general—whether the government will withstand the pressure to abandon or roll back reform policies—will also influence the credibility of the subsidy reform in the power sector. And if government policies are not consistent—if, for example, agricultural subsidies are growing while the government is stressing the need to reduce power sector subsidies for fiscal sustainability—again the credibility of the government, and by association reform steps that it proposes, will be questioned.

Related to the question of government credibility is the ability of the government to use the savings from subsidy reduction for more broadly beneficial activities. Victor (2009) argues that subsidies persist in large part because of weak government capacity. Delivering essential social services efficiently, protecting the poor and the vulnerable effectively, encouraging citizen participation in decision making, and responding to legitimate demands from citizens all require strong institutions, good governance, and capacity to deliver. Facing elections, political instability, or both, governments without such capacity use broad-spectrum subsidies—which are
blunt instruments but are popular—especially when governments have few other administrative tools in their arsenal. Serious reforms require not only the reduction of the demand for subsidies, but also increasing the ability to supply alternative policies that would be more effective and less costly. Commander (2012) also discusses institutional weakness as a driver of energy subsidies, and associates the weakness with the presence of authoritarian forms of government.

A striking illustration of the impact of trust in the government on reception to reform is given by the attempts in Indonesia to reduce fuel price subsidies in 2003 and 2005. The price increase of January 2003 was met with such fierce opposition that, within less than a month, the government rolled back the diesel price increase by more than two thirds. Analysts described the fuel demonstrations as being symbolic of a wider public dissatisfaction with the government, and with the corruption and inefficiency that was perceived to permeate political and bureaucratic life. The public viewed and judged subsidy reductions against the background of other government decisions that appeared to favor powerful interests, including debt forgiveness of five of the country’s largest debtors in November 2002. Although the government, after a public outcry, reversed course, the incident reinforced the view that wealthy, influential figures continued to receive special treatment, while average Indonesians faced price increases they could ill afford (Economist Intelligence Unit 2003). In contrast, much larger price increases in March and October 2005 were carried out without popular opposition, thanks to the credibility of the new government voted in following largely peaceful elections with high levels of voter participation. A survey conducted in December 2005 showed that President Susilo Bambang Yudhoyono’s popularity had remained high, with more than half of the population approving of his job performance. The President won respect across the country for his integrity, as well as performance in the areas of legal, security, and social welfare (Jakarta Post 2005).

What is happening in the rest of the economy may amplify or moderate the effects of subsidy reform. If the economy is booming and income is rising rapidly, higher electricity prices from subsidy elimination would be easier to manage than in times of financial crisis and high unemployment. Consumers would find it more difficult to bear the cost of higher power tariffs if food prices are soaring at the same time, as in 2008. If farmers are used to unmetered electricity, the decision to start metering to reduce losses—which would be unpopular in the best of times—would encounter even greater opposition if import tariff protection of domestic agricultural products is being reduced at the same time as part of trade liberalization.

The role of crisis in spurring reform has received attention. Financial crises will exacerbate the difficulties faced by consumers if they are asked to pay more for electricity consumption—through reductions in nontechnical losses and higher tariffs—and hence consumers could oppose such a move all the more. At the same time, a crisis may become so deep as to make adherence to the status quo too costly for the government, leading it to conclude that it has no choice but to act (Krueger 1993). That crisis may be economy-wide, as in the case of the Islamic Republic of Iran which undertook large-scale subsidy reform in the energy and other sectors in December 2010 (Hassanzadeh 2012), or in the power sector, as with widespread load shedding hitherto
unexperienced in South Africa in 2008. This line of argument, however, has been criticized for being irrefutable, in that the absence of reform can always be explained away—the crisis has not yet become serious enough to force the government’s hands.

3. Approach and Methodological Issues

For a ministry or regulator wishing to reform subsidies in the power sector, political economy analysis entails examining factors that are largely outside the control of the sector as well as those that are within the sector’s control. While there may be little that the ministry can do about those outside of its control, they may influence the design, timing, and manner of implementation of the reform.

Tools

*Tools for Institutional, Political, and Social Analysis of Policy Reform* provides a useful survey of the various techniques available for the analysis of different types of policy reform at the macro, meso, and micro levels (World Bank 2007). A modified version tailored to power subsidy reform is suggested below:

- The macro-level analysis examines the historical, international, political, socio-economic, cultural, administrative, and any other relevant characteristics of the country and broader context for the reform. These factors cannot be readily altered, are unlikely to respond to policy initiatives in the power sector, and limit what is feasible. The credibility of the government, its historical performance in delivering social and other services, the perceived level of corruption in the government and its efficiency, the degree of economic polarization and social stability, and the likely effects and outcomes of the electoral cycle are some examples that may influence the course and pace of reform. An example of a study identifying such factors is an econometric analysis of the factors driving the growth of power subsidies for farmers in 14 states in India from 1992 to 2001 (Fukumi 2012). The study found that the more polarized the electoral votes, the larger the subsidy. At the same time, these factors should not be viewed merely as constraints on policy options. Understanding the context enables identification of opportunities for change and building a coalition for reform.

- At the meso level, the sector context—the sector may be dominated by an inefficient state-owned monopolist utility known for poor service quality, or consumers may have experienced high tariffs in recent years following privatization of generation companies—is examined to understand the public’s perception and identify what other steps may be needed to formulate an acceptable reform plan. These are under the control of the ministry in charge, at least in theory. An example of the impact of consumers’ perception of sector performance on the acceptance of reform is a survey of 300 farm households in the Punjab, India, by Jain (2006), showing that the willingness to pay for
electricity was almost nil if the utility was to continue under state intervention, because of the belief that political lobbying would ensure delivery at negligible prices while the reliability and availability of electricity would continue to be unsatisfactory. Conversely, if the utility, promising adequate and reliable electricity, could operate independently of state intervention, most households surveyed would be willing to pay reasonable user charges on the belief that the quality of service would improve.

Stakeholder analysis is also undertaken to identify significant actors, the factors that are likely to shape their response to the reform, the nature and degree of their influence on the decision-making process and reform implementation, and their awareness about the implications of the policy change. The stakeholders include not only major consumers and producers of electricity, but also bureaucrats, politicians, trade unions and associations, producers of competing industries, non-governmental organizations (NGOs), the media, and even those illegally profiting from subsidy delivery. The purpose is to devise means to strengthen support for, and overcome resistance to, the reform.

Force-field analysis, used in an ex post study of the 2003 tariff reform in Ghana (Keener and Banerjee 2006) presented as the first case study in the annex, is one type of stakeholder analysis. Force-field analysis provides a framework to examine factors or pressures that support the status quo (restraining forces) and those that support particular reforms (driving forces).

- At the micro level, the distributional impacts of the reform on key stakeholders are analyzed to identify likely winners and losers and consider how to mitigate adverse effects where appropriate. Estimating indirect effects could pose a significant challenge. Participatory methods—such as interviews, focus group discussions, and workshops—may also be used for qualitative and interpretative information. To advise the government of the Republic of Yemen on potential reform measures for energy including the subsidies in the power sector, ESMAP (2005) used participatory assessment to inform the design of the household survey and complement the quantitative analysis. Among its recommendations, the study pointed to the need to consider the prices of connection and supply simultaneously in reforms. More details on this study, as well as an ex post study that also combined participatory assessment with quantitative analysis using household survey and utility data in Europe and Central Asia (Lampietti and Junge 2006), are given in the annex.

Related to the macro-level analysis is examination of institutional weakness as a driver of subsidies by Victor (2009) and Commander (2012). On the demand side, Victor argues that it is politically costly to organize to demand a subsidy, but once the subsidy is in place, it is even more costly to organize for a change. Large and small consumers organize their businesses around the subsidy, locking in a certain economic structure, as with the agricultural sector in India, which has become accustomed to consumption of unmetered electricity. Where Victor’s
observations hold, detailed analysis of the objectives of the subsidy policy and its intended beneficiaries may be more academic than informative for policy formulation.

Stakeholder analysis is essential for political economy analysis. There can be opposing interests within a particular grouping or even within a single institution or agency. For example, the ministry of finance may wish to reduce subsidies because of their impact on government finances, but not wish to see power prices rise because of their impact on inflation. The ministry of energy may be most concerned about reducing subsidies in order to facilitate financing for further investment in the utility. At the same time the government (drawn from one or more political parties) may be most concerned about the electoral cycle and the impact of higher prices on key political supporters. Awareness of these differing interests and relative importance can help design policies that form a workable compromise among the groups involved.

An important aspect related to stakeholder analysis is awareness about the existence and size of subsidies and delivery mechanism. It is not unusual for the public to be largely unaware of subsidies offered, especially if subsidies have a long history. A study of energy subsidy in Morocco (Chen, Liverani, and Krauss 2014) interviewed 1,375 households in 12 cities to gauge, amongst others, the public’s perceptions. Many could not accurately name the consumption goods subsidized, and some confused items no longer subsidized with those that continue to be subsidized. Most could not guess the size of the unit subsidy, under-estimating the market prices of subsidized goods. With so little awareness, a subsidy reform program would come as a shock and struggle to find acceptance. These findings highlight the critical importance of early and wide communication campaigns.

As part of macro- and meso-level analysis, institutional economics—which brings together theoretical and empirical research in economics and political science on the role of institutions in economic growth—can help assess how institutions in the country may promote or deter subsidy reform. New institutional economics removes the assumption that all parties have perfect information and are entirely rational, and that transactions are costless. It acknowledges that, in practice, available information is rarely complete and is asymmetrically held by various parties, it takes time to obtain accurate or complete information (such as costs of delivering electricity), and individuals in the sector often do not behave “rationally,” or at least not with the objective of maximizing long-term general welfare or efficiency—doing so may not necessarily be consistent with their personal interests or even the interests of the organizations to which they belong. Institutions matter when transactions are costly, and they are formed to reduce the transaction costs and increase the feasibility of engaging in an economic activity.

An important concept in new institutional economics is path dependence: stakeholders in an institution have inherent interest in preserving the system, and institutional change is often incremental and path-dependent. Therefore, once a sector embarks on a sub-optimal or inefficient path, inefficiency and performance could persist for a long time. This makes establishing the “right” institutions all the more important.
To date, the literature relying on new institutional economics to examine power sector reform has been thin and relatively weak. It seems to suffer from shortcomings in theory, data, and/or methodology. Papers by Erdogdu (2013 and 2014) and Brown and Mobarak (2009) investigate the influence of such institutional parameters as democracy, corruption, civil liberties, political rights, government stability, the professional and educational background of decision-makers (head of state, regulator, energy minister), economic policy orientation of the ruling party, and the number of years in office. But the way the degree of reform is quantified by Erdogdu is such that the Canadian power market is categorized as being among the least reformed in the world, and in one paper the power sectors in India and Pakistan are more “reformed” those in Canada and the United States. In Brown and Mobarak, power tariffs are assumed to be a function only of the consumer category (agriculture, industry, residential, and other) multiplying a democracy index, which is a 1/0 dummy, and industrial tariffs being lower than residential tariffs is taken as a sign of cross-subsidy. On the contrary, in all mature, well-functioning power markets industrial tariffs are lower than residential tariffs on account of economies of scale in delivering electricity and accounting for consumption. The examination of power consumption patterns fails to account for captive power generation in less mature power markets with frequent power outages. These papers also enter groups of explanatory variables one at a time, without retaining significant variables but replacing them in each successive step. As a result, the coefficients are biased due to omitted variables, and their statistical significance may also be altered.

There is strong evidence that institutions do matter, and reforms may very well be path-dependent. New institutional economics reflecting a stronger understanding of the power sector could be helpful in deepening the understanding of the political economy of power sector reforms, including subsidy reform.

At the micro-level, an important tool is poverty and social impact analysis (PSIA). PSIA examines the distributional impacts of government policies, with a special focus on the poor and vulnerable. PSIA includes ex-ante analysis, analysis during reform implementation, and ex-post analysis of completed reforms (World Bank 2013). Social analysis is understood to include not only the relationships that govern interaction at different organizational levels but also institutional (rules, both formal and informal, that govern behavior) and political (the structure of power relations and interests) factors, and can be used to complement economic analysis by clarifying the costs and benefits of policy reform accruing to different groups.

**Poverty impact analysis**

Subsidies may be characterized as progressive (larger benefits to the poor) or regressive (larger benefits to the better-off), and in a relative or absolute sense. It is possible for a given subsidy to be progressive but the subsidy structure as a whole to be regressive—for example, the residential subsidy per unit could be largest for low-income households (progressive), but the existence of large users who do not pay and yet are not disconnected implies a regressive subsidy structure overall. This means that the progressivity of subsidy per kWh may be distinct from that of the
total subsidy received. Komives et al. (2005) suggest a number of summary statistics to describe such effects for utility subsidies and apply them to power sector subsidies.

1. *A progressive residential tariff subsidy* is one where the average subsidy per kWh is greater for households purchasing smaller amounts. Because poorer households tend to purchase less than richer households, quantity is a proxy for income. An alternative is a tariff schedule whereby unit subsidy decreases with increasing subscribed load. Households that are not connected are excluded in both cases.

2. *Materiality of a subsidy*, alternatively referred to as *generosity* or *dependency*, relates the total value of subsidy received by a household to its total expenditure on all goods. This measure combines the progressivity of the subsidy with the degree to which purchases of electricity increase with income (total expenditure). This measure also ignores households not connected to electricity.

3. *Benefit incidence of a subsidy* is measured as an aggregate across all households. It is the share of the total subsidy given to all households received by poor households relative to the share of poor households in the total population. Where these two shares are equal this benefit-targeting performance indicator would be equal to unity. This value would be achieved by a fixed subsidy giving equal benefits to all households. A value greater than unity is said to be progressive because the poor receive a greater share of total benefits than their proportion of the population. However, this indicator can be high when the majority of subsidies go to poor households, but many poor households do not receive any benefit because they are unconnected. Also, benefit incidence can be regressive with the better-off receiving the greater part of the total subsidy, even if the subsidy structure is progressive.

4. *Beneficiary incidence* measures the extent to which poor households receive some benefit from the subsidy. The error of exclusion is simply the percentage of poor households that receive no benefit from the subsidy.

Considering these measures simultaneously can point to different policy conclusions. For example, benefit incidence may indicate that the bulk of the subsidies are going to better-off households, suggesting that a subsidy reduction would be pro-poor in aggregate, but materiality may indicate that lower-income households connected to electricity are highly dependent on the subsidies. A detailed analysis of the tariff structure in Mexico (Komives et al. 2009) provides a concrete example of such a situation. Subsidy reduction or removal would have a larger adverse effect in percentage terms on such households. One challenge would be to find a new tariff structure that did not make a large change to materiality for lower-income groups, while reducing the regressivity of the benefit incidence and reducing the overall costs of the subsidy. Komives et al. found that replacing IBTs with DBTs with three flat volume-differentiated tariffs, depending on the total consumption, would be a significant improvement.
Where recent national household expenditure survey data are available, they are used for distributional analysis. However, there could be circumstances that complicate the analysis of such data to assess the impact of the subsidy structure and tariff schedule on the poor:

- Where multiple connections are prevalent (as in West Africa), there may be little correlation between the tariff schedule and what consumers pay. Fine-tuning the tariff schedule for social protection may not do much to help the poor under these circumstances, while giving a false sense of security to policy makers, who may believe, based on modeling, that the poor are being adequately protected.

- Payment arrears may be common, but few household surveys probe this point. The 2012 National Survey of Household Income and Expenditures in Mexico asked a series of questions to understand arrears, including when the last payment for electricity had been made, while the 2005 Integrated Sample Household Budget and Labor Survey in the Kyrgyz Republic asks for kWh of electricity consumed, the amount billed, and the amount paid for three successive months as well as the amount of subsidy received. Among the recent household surveys in Sub-Saharan Africa, those in Ethiopia, the Gambia, and Mauritania asked about expenditures on electricity in the last 12 months, and that in São Tomé and Príncipe in the last six months. Such longer recall periods may increase measurement errors due to the inability of the respondent to recall and calculate up to 12 payments accurately, but should smooth out expenditure fluctuations due to skipped payments and arrears clearance. Most household surveys, however, simply ask how much the household spent last month on electricity. This could under- or over-estimate monthly expenditures and corresponding electricity consumption.

Cross-checking household survey data against utility data could indicate the magnitude of these problems and ways of adjusting data for a more accurate picture. One study found large discrepancies in the data on spending on electricity between the household budget survey and utility reporting in Georgia (Lampietti, Banerjee, and Branczik 2007), underscoring the importance of such comparison in some circumstances. Lampietti and Junge (2006), discussed in the annex, combined billing and payment records from the utility and merged them with household survey data to address recall errors, under- and over-reporting, and the presence of arrears, which enabled more accurate estimation of current and historical electricity consumption as a function of household income and other characteristics.

Simulation of the effects of different tariff options on households would ideally use price elasticities of demand. Komives et al. (2009) in its study of Mexico used a short-run elasticity of -0.4. Laderchi, Olivier, and Trimble (2013) used a price elasticity of -0.25, but noted that a detailed study of data in Turkey suggested that the short-run elasticity varied from -0.2 for poor households to -0.6 for the rich. Studies that do not allow for price elasticity are likely to overstate post-reform consumption, particularly for high-income groups, and hence tend to underestimate the extent to which the subsidy burden is made more equitable by the new tariff scheme. In
conducting meta-analysis of price- and income-elasticities of residential demand for electricity found in 36 studies, Espey and Espey (2004)\(^3\) observed that elasticities depend on the geographical area, data years utilized in the estimation, and the tariff structure, and cautioned against extrapolation of results from one place or time period to another.

Indirect and economy-wide effects are more resource-intensive and intellectually demanding to estimate, but may be more important than direct effects. At one end of the spectrum, effects would be entirely indirect for those not connected to electricity. It is even possible for tariffs to increase and for net benefits without compensation to also increase in parallel. The paper on agriculture in India cited earlier is one such example, largely on account of improved supply quality (Monari 2002). Another example, although not in the power sector, is a study by Renzetti (1992) of water prices in Vancouver, Canada. It found that moving to marginal cost pricing implied increasing residential tariffs and decreasing non-residential tariffs. Without any change in service quality, this was nevertheless found to yield a positive net benefit, as long as commercial consumers of electricity were assumed to pass on the cost savings associated with lowered water prices in the form of lowered output prices to households.

Input-output analysis is sometimes used to estimate economy-wide effects and indirect effects on households. It models an economy as an interconnected system of industries that affect one another directly and indirectly. But input-output tables assume fixed coefficients and a change has proportionate effects throughout the economy with no substitutions among inputs and products. As a result, input-output analysis is likely to significantly overstate the effects of higher electricity tariffs.

Computable general equilibrium modeling allows demand and supply to respond to price increases, permitting the relative use of different factors of production to change, and is less likely to overstate the effects than input-output analysis. The modeling is designed to estimate the new equilibrium after the price increases have been absorbed by the economy. These models can become extremely complex. While such complexity enables the models to be tailored to every need, this flexibility advantage can also become its weakness. The models yield very different results depending on the assumptions made, and the modeler may even be said to be primarily working out the implications of these assumptions.

What is assumed about subsidy savings influences the impact on the economy. To the extent that subsidies financed by the government budget become available to the government for other purposes, they remain part of government expenditures, which can be spent on compensation, education, health, and other areas. If they leave the economy—for example, if most of the savings are used to pay back debts to foreign banks—then working out the effects would be more

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\(^3\) In the data used in this study, short-run price elasticity estimates ranged from -2.01 to -0.004 with a mean of -0.35 and median of -0.28, long-run elasticities from -2.25 to -0.04 with a mean of -0.85 and median of -0.81, short-run income elasticity estimates from 0.04 to 3.48 with a mean of 0.28 and median of 0.15, and long-run income elasticities ranged from 0.02 to 5.74 with a mean of 0.97 and median of 0.92.
challenging. Possibilities include avoidance of a financial melt-down in the sector at a future date, lower interest rates as a result of a higher credit rating, more future investments in the sector, and other developments that are more difficult to model.

Much of the literature examining the impact of tariff increases on lower-income households looks at alternative methods of support to such households, particularly through some form of cash transfer. The targeting performance of such schemes is an important factor in the decision on how to proceed. A detailed analysis of how energy subsidies can be cut while protecting affordability is given for the countries in Eastern Europe and Central Asia by Laderchi, Olivier, and Trimble (2013).

A framework for developing countries

Reviewing major policy changes effected to encourage and sustain economic growth and social welfare through the 1980s, Grindle and Thomas (1991) proposed a framework to analyze the political economy of policy reform. The framework has similarities as well as differences with the tools covered in the foregoing section and presents an alternative that can enrich the understanding of the factors that can account for how, why, and when policy changes occur.

The framework identifies three junctions in a reform process, and explores a series of questions at each junction. It highlights the role of policymakers in shaping policy agendas, considering available options, and managing the political and bureaucratic challenges of implementation. The authors argue that the perceptions, activities, motivations, and impact of public officials deserve more systematic analytic attention than they have been given. Partly because the authors were particularly interested in the major policy and institutional reforms of the 1980s, the presence or absence of a crisis is considered an important determinant of the type of issues considered by policymakers and how agendas for policy reform are set. Policy characteristics influence the distribution of costs and benefits of the policy changes and under what conditions and timing the affected parties are likely to react to the consequences of reform. These in turn determine whether the response to the reform will occur primarily in a public or a bureaucratic arena, and the resources required to pursue the reform successfully.

One essential element of the framework, summarized in figure 1, is the recognition that a policy reform initiative may be altered or reversed at any stage. Policy reform is an interactive process, not a linear one with a beginning and an end, and hence after the third and last juncture in the framework, the process may continue and start all over in a new cycle. Viewed this way, effective reform leadership is one that finds room to maneuver astutely within the given context, circumstances, available options, policy characteristics, and available resources, but also sometimes expands the boundaries of policy space, mobilizes missing resources, and, on rare occasions, even alters the environment and circumstances in which reform measures are to be implemented and sustained.
Figure 1: A framework to analyze the political economy of policy reform

1. Environmental context

| Individual characteristics of policy-makers | Ideological predispositions, professional expertise and training, memories of similar policy situations, position and power resources, political and institutional commitments/loyalties, personal attributes and goals |
| Context of policy choice | Societal pressure, historical context, economic conditions, international context, administrative capacity, other policies |

2. Agenda-setting circumstances

| Crisis situation | Strong pressure to reform and take action immediately, high stakes, high-level decision-makers, “innovative” change |
| Politics as usual | Chosen problem, flexibility in timing, low stakes, middle-level decision-makers, incremental change |
| Policy decision-making tends to be dominated by concern about macro-political relationships | Policy decision-making tends to be dominated by concern about micro-political and bureaucratic relationships |

3. Policy characteristics

| Arenas of conflict | Public | Direct impact on large sectors, highly and immediately visible to public |
| Can call into question regime legitimacy | Can negatively affect regime stability, reform sustainability, and capacity to pursue other reforms |
| Bureaucratic | No direct impact on large sectors, not readily visible to the public |
| Bureaucratic compliance can be withheld, bureaucratic capacity may not be available, can negatively affect reform sustainability, and clientelistic accommodation can erode reform |

| Resources for implementation and sustainability | Level of political support | If strong, broad-based support, unlikely to be threatened |
| Organization | If high, ability to counter bureaucratic resistance |
| Consensus building | If consensus is possible, ability to change values |
| Existence of behavioral incentives | Greater control over bureaucrats if incentives exist |
| Administrative capacity | Ability to assume new tasks if high |

4. Environmental context ...

Source: Adapted from figure 8.1 in Grindle and Thomas 1991.

Questions to help think through political economy issues

Given the divergent set of circumstances and drivers for supporting or opposing subsidy reduction, there is no single approach to analyzing the political economy of power sector subsidy reform. But a series of questions can help understand the context and identify critical points (table 1).
Table 1: Considerations for reforming power sector subsidies

<table>
<thead>
<tr>
<th>Question</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How do the current tariffs compare to those in the neighboring countries and elsewhere?</td>
<td>Tariff levels are influenced largely by the power mix: oil-based power generation is the most expensive and hydropower may be the least. But excessive losses could also raise costs and hence tariffs. If consumers are already paying high prices—as an extreme example, about US$0.50/kWh in Liberia—then consumers would be less open to the argument that prices are too low. High prices would signal the critical importance of reducing costs through cutting avoidable losses (next question), long-term sector planning (for optimizing power mix and investment plans), and competitive procurement.</td>
</tr>
<tr>
<td>2. How large are the avoidable losses?</td>
<td>Where technical and nontechnical losses are large, a policy of raising tariffs to cover these avoidable losses without taking aggressive steps to reduce and eliminate them is likely to encounter popular opposition.</td>
</tr>
<tr>
<td>3. What is the extent of under-pricing, with and without avoidable losses?</td>
<td>Quantification of subsidies is necessary to assess the relative importance of the pricing decision and cost-reduction measures, and medium- to long-term goals for tariff levels.</td>
</tr>
<tr>
<td>4. What were the objectives of the current subsidy and who has historically benefitted from it?</td>
<td>There may not even have been policy discussions culminating in a decision to introduce subsidies—subsidies may simply be a result of failure to adjust tariffs against the backdrop of general inflation, wage increases, oil price shock, weaker exchange rates, and other cost inflation. There are official and unofficial drivers of subsidies. If the primary factor triggering the introduction of subsidies was that the government lacked administrative capacity to deliver services through other means and a tariff subsidy was the most readily available instrument, and if the government continues to lack administrative capacity, subsidy elimination may prove to be difficult. Who has actually benefitted from the subsidy depends on the subsidy delivery mechanism (see 6 below).</td>
</tr>
<tr>
<td>5. What are the objectives of the proposed subsidy reform and how do they rank in importance?</td>
<td>The objectives of the current government policy need to be understood from the beginning of the analysis to ensure that initial policy design takes account of primary and secondary considerations. For example, if the objective is to reduce the fiscal burden of the tariff subsidies, but at the same time the government wishes to minimize the impact on inflation and continue to support infant industries, the policies suggested need to evaluate the impact on all three fronts. A particular issue is the possibility that different actors in the government have different interests, with varying degrees of influence based on the power structure within the government.</td>
</tr>
<tr>
<td>6. What is the subsidy delivery mechanism?</td>
<td>The delivery mechanism, both official and unofficial, defines not only the officially intended beneficiaries and the likelihood of their actually receiving the subsidies, but also unofficial beneficiaries, whose benefits may even exceed those of official beneficiaries. For example, large subsidies may be provided to state-owned utilities owned by relatives of powerful politicians, with pervasive rumors about questionable procurement practices leading to routine leakages of the order of 20 percent per procurement package, or subsidies may take the form of large commercial losses arising from collusion between utility employees and large industrial consumers through under-billing. These situations would be fundamentally different from, for example, private operators facing CPI – X regulation in a well-governed sector where governments have kept electricity prices artificially low in the belief that budgetary transfers to subsidize low-cost electricity will more than pay for themselves by boosting economic growth.</td>
</tr>
<tr>
<td>7. Which policy changes could be considered for possible implementation, and which could not?</td>
<td>Because there are several possible policies to consider, such as changing the magnitude of tariffs, changing the tariff structure, or introducing means-tested cash benefits, it is important to establish whether any of these might be ruled out on technical, administrative, or political grounds. For example, if there is no register of households that would allow means testing, which is the case in most...</td>
</tr>
<tr>
<td>Question</td>
<td>Considerations</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8. Who determines the tariffs and what is the mechanism for implementing a subsidy-reducing policy?</td>
<td>Unlike fuel price subsidy reform in a number of countries, power tariff increases are usually not cabinet decisions, making decision-making less politicized. Many countries have a regulator, often independent at least on paper and charged with determining and approving tariff increases. In practice, the independence of the regulator may be compromised if tariff increases encounter widespread popular opposition. Where subsidy reform also entails cost reduction that requires upgrading infrastructure (such as installing new meters or reducing technical losses), the sources of financing for the investments required need to be identified.</td>
</tr>
<tr>
<td>9. How would different groups be affected by the proposed reform policies, and what would be the magnitude of these effects?</td>
<td>This question lies at the heart of a political economy analysis. Different groups need to be identified and how they will be affected needs to be considered. Where possible, the magnitude of the impact should be quantified using recent household surveys, and partial or general equilibrium models. Indirect effects are important but more resource-intensive to calculate. Benefits captured through illegal means are seldom, if ever, quantified for lack of reliable data, but qualitative analysis would be useful and identification of such beneficiaries would be important.</td>
</tr>
<tr>
<td>10. How important are the various affected groups in their ability and willingness to influence the decisions on the proposed policy changes?</td>
<td>A force-field approach, as discussed in the annex country case study on Ghana, can be used to assess the power of the various groups to influence the policy makers to support or oppose the proposed changes. This step requires detailed analysis of society, the government’s popularity and vulnerability to election change, the degree of organization of the groups, and their awareness and understanding of the proposed policy change. A program of information and consultation may be able to change the attitude to the policy so that opposition may be reduced or “bought off” by offering compensation by various means.</td>
</tr>
</tbody>
</table>

Source: Authors.

4. Conclusions

Many Sub-Saharan African countries have the characteristics cited in this review that pose serious challenges to the design and implementation of subsidy reform—weak institutions, poor quality of electricity service delivery typified by frequent outages, and weak social protection systems. Weak administrative capacity frustrates governments’ efforts to build credibility, and social protection systems in infancy make it difficult to replace tariff subsidies with more targeted and efficient compensation mechanisms for the vulnerable. In countries with low electrification rates where the vast majority of the poor lack access to electricity, the argument that subsidy reform would be especially punishing for the poor might not hold, but conversely those who are connected and will bear the cost of subsidy reform wield political power and influence.

All countries fund safety net programs, but not all are well designed and demonstratively effective. Having a functional mechanism in place greatly strengthens the government hand in
implementing tariff reforms, and helps exploit economies of scale by addressing a host of related and unrelated problems occurring in parallel, such as food crisis, financial crisis, and high unemployment. To replace tariff subsidies, targeted cash transfers of adequate coverage, generosity, and quality are the best option. Increasing the benefits of social insurance programs not linked to earnings—such as social pensions, survivorship pensions, disability pensions, and unemployment benefits—can be helpful if they cover the poor. Near-cash instruments such as food stamps or vouchers for transport have slightly higher administrative costs than cash but can be politically popular. Fee waivers or vouchers for health and education help households maintain access to services even if households become poorer (World Bank 2008b). Importantly, a good social protection mechanism enables the government to move away from sectoral subsidies, which are inefficient, costly, and suboptimal. Social protection schemes in Sub-Saharan African countries are still generally weak. An inventory of programs can be found in “The State of Social Safety Nets 2014” (World Bank 2014). Virtually every country has a school feeding scheme. Very few have cash transfer programs.

While development of safety net programs should not necessarily be tied to power tariff increases—in the worst case, the absence of social protection programs can be used to justify retention of tariff subsidies and safety net programs may be drawn into a highly politicized debate over tariff increases, diminishing the chances of program development—the need to protect the vulnerable provides an additional incentive to build up such programs. Good safety net programs require efficient and cost-effective systems for enrolling beneficiaries, making payments and delivering other forms of compensation, and monitoring. Setting up a sound safety net program from scratch takes at least four to six months, with a longer period for refinement. In the immediate term, the question is which existing programs can be scaled up while avoiding actions that will work against the medium- to long-run development of a sound social protection system. For example, if medium- or long-term plans envisage consolidating or closing specific programs, scaling these up as part of a short-run response will work against long-term reforms.

In some Sub-Saharan African countries, large subsidies exist side by side with relatively high power tariffs, making it difficult to persuade consumers that they are not paying enough for electricity. Under these circumstances, cost reduction, which should be explored under all circumstances, takes on even greater importance in the region, where there is considerable scope for cutting costs. From the point of view of political economy, any perception that the rich and the powerful are unfairly benefitting—through larger price subsidies offered to “strategic” industries or, worse, exploiting informal discretionary power of corrupt utility employees or executives who collude with large customers—should be addressed as a matter of urgency. More generally, one political economy lesson may be to sequence and prioritize reform steps according to political risk. Of the menu of technically sound and administratively feasible options available to reduce subsidies, some bear more political risk than others. Steps that do not require large tariff increases are likely to be less politically sensitive, and giving them high priority is likely to enhance the utilities’ credibility and trust.
And as this paper shows, reducing subsidies will entail measures other than adjusting tariffs, such as improving technical and commercial performance or changing the power mix. These are all core, fundamental questions of the power sector. And a power market with large subsidies is likely to suffer from a host of other problems—large technical and nontechnical losses; financially insolvent utilities characterized by operational inefficiencies; weak corporate, market, and regulatory governance; little private participation; and little or no competition. Businesses may accept high tariffs for reliable electricity, or low tariffs with poor quality, but not high tariffs for unreliable electricity. Yet a weak power market is not well equipped to increase system reliability fast enough in the early stages of tariff reform.

The foregoing suggests that subsidy reform rarely occurs in a vacuum but is likely to be intrinsically linked to a larger sector reform agenda, and sometimes even to reforms in other sectors. Nigeria illustrates how broader reforms in the energy sector can affect electricity subsidy reform. By December 2013, the country had achieved all the milestones contained in the very bold and ambitious Nigeria Power Sector Reform Roadmap launched in August 2010, with two exceptions: (i) the declaration of the Transitional Electricity Market Stage (TEMS), which would initiate a fully contracted and rules-governed electricity market, and (ii) development of a market-based gas sector delivering natural gas for power generation. The failure to declare the TEMS has meant suspension of all industry agreements and contracts and the absence of an enforceable and fully risk-allocated contractual basis for industry participants to extract performance from each other, resulting in poor service reliability and mounting market debts (PTFP 2014). Because non-payments by the power sector for natural gas have historically been one of the two main reasons for the delay in the development of a viable domestic gas market, the failure to declare the TEMS is prolonging the vicious cycle of natural gas outages causing power shortages, with not only domestic but regional repercussions through outages in the West Africa Gas Pipeline.

Despite the difficulties, regular tariff reviews are increasingly being implemented in Sub-Saharan Africa. As one recent example, Uganda’s Electricity Regulatory Authority published “Tariff Quarterly Adjustment Methodology” in January 2014 (ERA 2014). The methodology adjusts tariffs in response to changes in fuel prices, the exchange rate, and inflation. For these countries, the main political economy question is how to consolidate tariff reform and avoid policy reversal.

Because electricity is used throughout the economy, large tariff increases will have macroeconomic effects and are highly and immediately visible to the public. The first step is to agree on the objectives of the reform—different reform pathways may be considered depending on whether the primary goal is to reduce the fiscal burden but in a way that keeps the rate of inflation below a threshold level, or make utilities financially viable to enable their corporatization and attract private investment, or address serious power outages damaging the economy—and determine the extent of under-pricing and the size of avoidable losses that can be eliminated.
Sustaining reform has presented considerable challenges in a large number of countries. The failure to sustain reform typically takes the form of failing to adjust tariffs adequately when costs rise. There is increasing recognition that subsidy reform often does not have a clear end and should instead be viewed as a continuous process of adjustment and search for mechanisms that take into account the country’s institutions and political system, and the power sector’s market structure, infrastructure, and history.

While tariff increases may not call the legitimacy of the regime into question, they can negatively affect not only the sustainability of the subsidy reform itself but also the capacity of the government to pursue other policies. Whether coalitions of support can be formed and to what extent consensus building is possible depends on who will win and who will lose from subsidy reform, by how much, and the sphere of influence of each group so identified—and hence the critical importance of stakeholder analysis and PSIA. The case studies in the annex provide informative illustrations in this regard. Bringing together the answers to these questions should enable the policy-makers to choose a strategy that will help achieve the government’s objectives, while minimizing the likelihood of effective opposition to the policy changes.
Annex: Case Studies

This annex presents three case studies to illustrate a diversity of approaches and starting conditions. The first concerns detailed force-field analysis in Ghana, the second sequential mixed-method approach in the Republic of Yemen, and the third a combined use of a variety of qualitative and quantitative approaches in Europe and Central Asia. The second case study is ex ante, and the remaining two are ex post analyses.

Force-field analysis in Ghana

Keener and Banerjee (2006) carried out an ex post analysis of a past tariff reform in Ghana that was likely to continue to raise concern. The study used force-field analysis to identify those supporting or resisting the subsidy reform and to indicate their strength of support or resistance. In the absence of extensive household survey data that would have allowed a detailed assessment of the impact of the revised tariffs on low-income households, the study conducted a survey to focus on how such households had coped with the tariff increases. Both of these techniques are of particular interest to possible future studies of tariff reform in Sub-Saharan Africa.

By 2002 the deficits of the three Ghanaian power utility companies had reached about 4 percent of GDP and were projected to reach 6 percent by 2003. These deficits were leading to a lack of investment and power shortages. There had been a long history of tariff increases in the country. Between 1994 and 1997 the government tried to reflect costs in tariff increases, but a 300-percent increase in May 1997 provoked nationwide opposition, with the Association of Ghanaian Industries, the Trades Union Congress, and the Civil Servants Association at the fore. This increase did go through and a Public Utility Regulatory Commission was established. The regulator subsequently authorized tariff adjustments at irregular intervals until 2003, when a formula for automatic exchange rate and inflation effects was introduced. A combined tariff increase of 72 percent for all end-users in August 2002 and March 2003, and the subsequent enactment of the automatically adjusting formula, raised public concerns. Following stakeholder consultation in 2003, the PSIA decided to focus on two questions: (i) whether the lifeline tariff for up to 50 kWh a month was an effective tool to protect the poor, and (ii) how consumers were coping with the higher tariffs. At the start of the PSIA tariff increases had brought the average end-user tariff to where it covered regulator-defined economic costs, but not inefficiencies, estimated at $0.02/kWh.

The PSIA focused on informing policy discussion and involving stakeholders as well as technical analysis. A multi-stakeholder steering committee was created to guide the process, while research was led by national consultants. The steering committee included the minister of energy (chair), minister of state and economic planning, chief executives of the National Development Planning Commission, the regulator, and the Volta River Authority (major generation company). A technical committee added representatives of other companies, the World Bank, and two NGOs representing consumer interests.
The PSIA faced two major challenges. First, there was limited time for the work because of need to adjust electricity policy in the upcoming Poverty Reduction Strategy Credit, and second there was a lack of up-to-date primary data. For quantitative analysis the available household survey did not identify lifeline customers as such and it was difficult to impute the level of use because the arrears section of an electricity bill was commonly taken as the bill for current usage. Hence the PSIA complemented the national household survey data with a small-scale survey.

Qualitative analysis started with interviews with key groups including disconnected consumers, commercial consumers, bonded cashiers (agents contracted by the distribution company to collect debts from users), district technical officers of this company, loss control units, and non-connected consumers using solar power, liquefied petroleum gas, and other forms of alternative energy. This stakeholder analysis revealed incentives and diverse perspectives of different institutions within and outside the sector. A list of crucial actors was constructed, based on interviews and the guidance of the steering committee. The coverage of this list was much broader than that found in studies not using a formal approach to political economy analysis of the sector and is reported below in table A.1. The PSIA also assessed the likely degree of influence each group would have had over the tariff reform process and the degree of support or opposition. For each of the groups identified, the strength of influence was plotted against the degree of agreement or opposition to the changes. The relative strengths on these two dimensions were based on a qualitative ranking emerging from document review and stakeholder interviews. Data for the importance/influence matrix fell into one of four quadrants, depending on the stakeholders’ ability to influence decision making (high or low) and whether they are likely to support or oppose tariff increases. The table indicates into which quadrant each of the groups was assigned.

Table A.1: Groups and sub-groups of stakeholders assessed in Ghana PSIA

<table>
<thead>
<tr>
<th>Actor</th>
<th>Influence</th>
<th>Support or oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National government</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Ministry of Finance</td>
<td>High</td>
<td>Support</td>
</tr>
<tr>
<td>Ministry of Energy</td>
<td>High</td>
<td>Neutral</td>
</tr>
<tr>
<td>National Development Planning Commission</td>
<td>High</td>
<td>Oppose slightly</td>
</tr>
<tr>
<td>Ghana Water Company</td>
<td>Low</td>
<td>Oppose slightly</td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volta River Authority</td>
<td>High</td>
<td>Support</td>
</tr>
<tr>
<td>Electricity Company of Ghana</td>
<td>High</td>
<td>Support</td>
</tr>
<tr>
<td>Takoradi International Company</td>
<td>Medium</td>
<td>Neutral</td>
</tr>
<tr>
<td>Regulators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Utility Regulatory Commission</td>
<td>High</td>
<td>Support slightly</td>
</tr>
<tr>
<td>Energy Commission</td>
<td>Low</td>
<td>Support slightly</td>
</tr>
<tr>
<td>National Unions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actor</td>
<td>Influence</td>
<td>Support or oppose</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-----------</td>
<td>------------------</td>
</tr>
<tr>
<td>Trade Union Congress</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Civil Servants Association</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Ghana Bar Association</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Interest Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association of Ghana Industries</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Ghana Chamber of Mines</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Political parties</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Patriotic Party</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>National Democratic Congress</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Convention Peoples Party</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Peoples National Convention</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Others</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>End-users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential consumers</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Non-residential consumers</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Special load tariff customers</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Volta aluminum Company</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Irrigation farmers(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil society organizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumers Association of Ghana</td>
<td>Low</td>
<td>Oppose</td>
</tr>
<tr>
<td>Ghana National Association of Consumers</td>
<td>Low</td>
<td>Oppose</td>
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<tr>
<td>Integrated Social Development Center</td>
<td>High</td>
<td>Oppose</td>
</tr>
<tr>
<td>Energy Foundation</td>
<td>Low</td>
<td>Support</td>
</tr>
<tr>
<td>Media</td>
<td>High</td>
<td>Oppose</td>
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<td>Development partners</td>
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<tr>
<td>World Bank</td>
<td>High</td>
<td>Support</td>
</tr>
<tr>
<td>International Monetary Fund</td>
<td>High</td>
<td>Support</td>
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<td>Department for International Development</td>
<td>High</td>
<td>Support</td>
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<tr>
<td>Danish International Development Agency</td>
<td>High</td>
<td>Support</td>
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</tbody>
</table>

Source: Keener and Banerjee 2006.

\(^a\) Irrigation farmers were interviewed as a stakeholder group but are missing from figure 8.3 on page 269 of the publication, but would be expected to oppose tariff increases.

This ex post force-field analysis of the political economy context related to the tariff increases reflected the assessed impact of the various groups on the final decision. The study indicated some of the reasons for assigning the relative political influence and degree of support or opposition to the tariff changes. For example, high-consumption industrial consumers had more direct influence than other consumers because they generated a significant fraction of utilities’ revenues, and could occasionally make direct bargains for favorable terms.
The Volta River Authority (VRA), a power generator, had historically been arguably the most influential stakeholder in tariff reform. The VRA proposed initial tariffs that formed the basis for negotiations, and was able to bypass the energy ministry and report directly to the president. The VRA generated substantial foreign exchange from sales to the Volta Aluminum Company, a major aluminum company that took about one third of electricity and had enjoyed low tariff rates because of a long-term contract. This contract was at the time in dispute, causing the aluminum company to cease operations. The resulting fall in revenues also led to a fall in personal salaries to VRA staff, and hence they were pushing for tariff increases. Dispersed consumers (such as residential) had less direct influence between elections, but their power prior to elections had led the government to move away from tariff increases at such times, or to pressurize the regulator to delay them.

The perceptions of the less well-organized groups were highly influenced by the media—there were more than 70 FM stations at that time. Consumer organizations had small staff and limited funding and hence limited power, but did represent consumers at the public hearings of the regulator. The Public Utility Regulatory Commission has the mandate to oversee tariff setting; its final decisions, in principle, are not subject to executive or legislative consent or concurrence. In practice, it was dependent on the government for the bulk of its operating budget and could be influenced by the government.

Opposition parties, unions, and associations have often strongly opposed tariff increases in Ghana. Groups with influence over public decision-making process included the Civil Servants Association, which had branches in all regional capitals; the Association of Ghana Industries, including large industrial users; and the Trades Union Congress, with a membership of 600,000.

The second aspect of the PSIA concerned the impact of the new tariffs on the poor, and in particular whether the lifeline tariff was providing adequate support to this group. It also explored the ways in which households were coping with the higher costs. It started by quantifying access to electricity, confirming that in rural areas, where most of the poor are concentrated, very few had access at that time. This was despite the existence of a subsidized connections program. A key assumption in the debate had been that those falling into the lifeline band of consumption also fell below the poverty line. The PSIA data suggested that about half the lifeline subsidy was leaking to households that did not fall below the poverty line. Further analysis indicated that lifeline customers were no more vulnerable, in terms of missing meals and selling assets, than other customers. It was concluded that the lifeline tariff represented an imperfect mechanism for targeting poor electricity users.

In the absence of household expenditure data covering both before and after the tariff increase, the study carried out a small survey into how households were coping with the price change. Responses varied from being unaware of the price increase to conserving energy (turning lights out), accumulating arrears, or switching to other energy sources, particularly kerosene. Of those households that were aware of the increase in tariffs, many did nothing in response. Where
households had gone into arrears, the tariff change was the most important factor, but other changes in the financial situation and seasonality of income were also important. Significantly, the practice of cycling in and out of connection was widespread—almost half the households interviewed reported that they had been disconnected at some time, with higher rates in slum areas. A little more than half of these households had been disconnected for two weeks or less, suggesting that the costs of disconnection and reconnection were small and possibly subsidized by the utility. The analysis of the impact of the lifeline tariffs showed that the total costs to the utility were relatively small and that many poorer rural consumers were unaware of how the lifeline rate worked, so that they did not avail themselves of its protection. This pointed to a better public education program before increasing tariffs in the future. The use of a small-scale survey to highlight how households have coped with actual tariff increases is a valuable tool for ex post analysis when traditional household expenditure surveys are absent or inadequate.

There were general lessons of this study that also focused on other aspects of sector reform:

- Collaboration among stakeholders is crucial for ensuring that there was sufficient internal discussion of the PSIA findings. To do so, sufficient time needs to be set aside.
- Local organizations play a key role in collecting the data and also in its analysis. This may require substantial capacity building and training.
- Where a policy involves a diverse set of stakeholders, the process of analysis and policy formulation begins after the PSIA has been completed.
- The dissemination process requires ample time in order to be effective.

**Sequential mixed-method approach in Yemen**

ESMAP (2005) carried out a detailed household survey of energy use and a participatory appraisal to examine what energy policy changes would, if implemented, contribute to poverty reduction in the Republic of Yemen. The study was initiated with a workshop of experts drawn from key ministries, women’s groups and academia. The workshop endorsed the study and the proposed analytical approach, and this was followed by field work for the household survey. After the fieldwork was completed, the work program and framework for economic and financial analysis were presented to a meeting attended by representatives from ministries, local government, and energy companies. Draft findings were discussed at a later stage with this group. The findings were also presented in multiple meetings, including a stakeholder analysis meeting with the government and civil society to discuss the distributional effects of energy subsidies. The final study was presented at several meetings in order to derive concrete policy recommendations.

The PSIA in fact used a sequential mixed-method approach—participatory assessment informed the design of the household survey and complemented the quantitative analysis. The quantitative analysis of energy use by the poor and middle-income groups provided an understanding of how the poor obtained their energy and their strategies for coping with shifting conditions. A number
of important findings emerged, several of which related to charges for electricity. The connections fees were widely regarded by poor households as a significant barrier to access, and some households admitted that they were connecting illegally to a neighbor’s line or to a power line. At 200 kWh a month, the lifeline block of the tariff structure was well above the amount needed to meet basic household needs, estimated to be about 30 kWh, thus creating a large leakage of the subsidies to better-off households. Related policy recommendations were that connection charges should be payable over a twelve-month period, and that the size of the first block should be substantially reduced.

Yemen shares characteristics found in many Sub-Saharan African countries, including low income and low access to electricity. The use of stakeholder engagement to understand how households used energy and their attitude to paying for electricity connection provided an important backdrop to the quantitative household expenditure analysis. This information permitted a more meaningful discussion with the government on how the household tariff structure might be reformed.

**Qualitative and quantitative analysis in Europe and Central Asia**

Lampietti and Junge (2006) explained how PSIA was used to assess the reasons for the success of power sector reforms experienced in the early 2000s in a number of countries in Europe and Central Asia. This largely ex-post approach combined both qualitative and quantitative components. The qualitative research typically included focus group discussions and in-depth interviews from different utilities, government, the private sector, the regulator, and households. The quantitative analysis used household surveys to collect data on energy consumption and expenditures. An important innovation in this step was the merging of data from payment and billing records of the utilities with the self-reporting data from traditional household surveys. The latter include recall error, under-reporting, and over-reporting, and do not separately identify the presence of arrears in payments. Combining these two data sources permits a more reliable picture of current and historical consumption of electricity to be identified.

The study presented Moldova as an example of the qualitative approach. There was a generally positive picture of changing behavior among the poor exemplified by rising electricity consumption and a decreasing share of electricity in the household budget. The return of 24-hour availability benefited the rich and the poor alike. However, the very poorest were experiencing severe hardships—they were coping by unplugging appliances and substituting low-wattage bulbs. This group increased electricity consumption only slightly over a three-year period, and few perceived this as improvement. In Georgia focus groups were used to explore why the use of electricity relative to other forms of energy was decreasing—natural gas was becoming more widely available, it was cheaper than electricity for cooking and heating, and households preferred it to electricity.
Quantitative analysis was able to link consumption of electricity to changes in prices. For example, mean household consumption in Georgia remained constant at about 125 kWh per month over a three-year period despite the increase in tariffs. This trend emphasized the low level of consumption at that time and the inelasticity of demand.

Ex post PSIAs were used to help with policy design in certain countries. A working group of government, civil society, and nongovernment stakeholders was brought in at the policy concept stage to discuss the design of the reform process. In Azerbaijan, a series of in-depth interviews were conducted with representatives from the presidential administration, the cabinet of ministers, various ministers, parliament, energy sector enterprises, the media, and NGOs. The objective of the interviews was to identify key elements of the reform package that were not supported by stakeholders and why. There was general agreement on the following key elements:

1. There was a need for tariff reform.
2. Mitigation policies should be in place to cushion adverse social effects of the reform.
3. Metering and collection rates must be improved first before implementing the reforms.
4. Higher tariffs and collection rates should be accompanied by improved service.
5. Private sector participation in the sector was necessary.

The conclusion from this stakeholder analysis was that more transparency on the reform measures was required because only a limited number of key players were fully aware of the range of policies being considered. Stakeholders who were less well informed felt excluded from the process.

The experience of sector and tariff reform in Europe and Central Asia, where connection was almost universal, was that welfare gains came from improvement in service, and this aspect became particularly important in designing the reform program. The low price elasticities of demand identified indicated that tariff increases would produce large welfare losses, and this made the performance of the safety net systems important.

The PSIAs carried out in the region pointed to several lessons for policy design. First, there should be an explicit linking of tariff increases to improvements in service quality. Second, tariffs should not be increased too rapidly unless it is possible to protect those worst affected by the increase. Third, reform programs should focus on raising collections (and reducing losses) before increasing tariffs.

The PSIAs in a group of countries with a wide range of conditions pointed to the following on the design of subsidy reform:

1. The PSIA should be adapted to the specific issues of the country involved.
2. Sufficient time and resources should be made available in order to produce results that will be valuable for policy discussions.
3. A broad range of stakeholders should be involved in the PSIA in order to facilitate a helpful discussion and increase the degree of buy-in from those affected by the reform.

4. Rigorous analysis is important when controversial issues are being debated.

5. Both ex ante and ex post analysis can be valuable.

Although the electrification rate was nearly universal, the countries studied at the time and those in Sub-Saharan Africa today share some common problems, beginning with regular power blackouts. As such, this study offers some useful lessons relating to political economy. For households facing tariff increases following subsidy reduction, the quality of electricity supply was very important. Without substantial improvement in quality ahead of subsidy reform, there may very well be little support for the resulting tariff increases.
References


