

Overview

Shedding Light on Electricity Utilities in the Middle East and North Africa

Insights from a Performance Diagnostic

Daniel Camos, Robert Bacon, Antonio Estache, and Mohamad M. Hamid

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Key Findings

1. *Cutting hidden costs in the power sector is key to financing sorely needed investment.*

In half of the 14 Middle Eastern and North African economies studied, a quasi-fiscal deficit (QFD) exists that exceeds 4 percent of the entire economy's gross domestic product (GDP). This QFD represents more than the average investment urgently needed in the region's electricity sector, estimated at 3 percent of GDP. In other words, the sector's investment gap could be filled simply by halving the current level of inefficiency.

2. *Underpricing is the major source of inefficiencies; other inefficiencies are economy and electricity utility specific.*

About two-thirds of the QFDs detected can be traced to tariffs set below cost-recovery levels. The remaining third is explained by commercial losses, collection failures, and overstaffing. Taking advantage of readily available opportunities to reduce inefficiencies will also make the sector more sustainable and increase the creditworthiness of utilities, thus facilitating access to commercial financing.

3. *The power sector in the Middle East and North Africa must match the region's technical success with improvements in commercial and financial management.*

For commercial management, the indicators reveal (a) a high dependence on subsidies to recover costs and (b) a high tolerance for nonpayment. On financial dimensions, one finds (a) a low ratio of current assets to current liabilities and (b) an exceptionally high debt-to-equity ratio, thus leaving utilities highly exposed to external shocks. Connections per employee are considerably lower in the Middle East and North Africa than in other regions, suggesting that hiring practices in the region may need to be reviewed. Even if overstaffing simply cannot be addressed, it may be useful to quantify the costs of not addressing the issue, thus clarifying the implications for subsidy levels.

4. *Well-targeted institutional and economic reforms would boost the region's power sector.*

Our assessment of the correlations between institutional and contextual characteristics (utility type, size, ownership, presence of a separate regulatory agency, and national income) and performance indicators suggests how and where reform policies may be most effective. Of the 36 performance indicators used for this analysis, 25 had an effect for one of the characteristics; in 14 cases, more than one characteristic was statistically significant. Utility type and size are the policy-related drivers found most often to be significant (each for 30 percent of the indicators tested), whereas ownership type (public or private) and presence of a separate regulator are significant for about 20 percent of the indicators tested. National income level was significant in 35 percent of the tests, indicating that this variable should be considered in any comparison across economies.

5. *More systematic monitoring of power sector performance is needed.*

The gaps in the data needed for good policy and management are real but not unsurmountable. To help fill them, authorities in the region may wish to impose on regulated industries information-sharing requirements that are derived from modern regulatory practice. For unregulated companies, standard accounting reports and annual balance sheets can go a long way toward supplying the raw data needed to improve monitoring of the region's electricity sector, provided that the will to use that information is present.

The electricity sector in the Middle East and North Africa is in the grip of an apparent paradox. Although the region holds the world's largest oil and gas reserves and has been able to maintain electricity access rates of close to 100 percent in most of its economies, it may not be in a position to cater to the future electricity needs of its fast-growing population and its business activities. Primary energy demand in the region is expected to rise at an annual rate of 1.9 percent through 2035, requiring a significant increase in generating capacity. Investments have not been rising fast enough to meet that requirement.

The annual investments needed to keep up with demand have been estimated at about 3 percent of the region's projected gross domestic product (GDP) (Ianchovichina and others 2012). But in most economies of the region, the ability to make those investments has been limited by fiscal constraints. The region's 2015 fiscal deficits averaged 9.3 percent of GDP, and the economies with the largest deficits were those that most heavily subsidized electricity. It thus seems unavoidable that, as economies adjust to their fiscal situation, they will continue to cut financing for the sector. To bridge the widening financing gap, the electricity sector must find its own financing sources, and it must do so quickly to keep pace with demand.

This book demonstrates that the solution is readily available. By improving the management and performance of the region's utilities, more than enough resources could be freed up to make the investments needed to meet demand and operate at a lower cost.

A New Database to Improve Efficiency and Generate Resources for Investment

Shedding Light on Electricity Utilities in the Middle East and North Africa builds on the following data and analysis:

- A detailed snapshot of technical, operational, commercial, and financial indicators for a large sample of electricity utilities in the region, based on a major effort to collect original data for the region
- An estimation of the quasi-fiscal deficit (QFD) of the power sector in the economies of the region that determines the proportions of the deficit that can be attributed to underpricing (setting tariffs below costs), collection losses (failure to bill or collect revenues owed to the utility), transmission and distribution losses, and overstaffing (employing more labor than an efficient utility of the same size and characteristics would do)
- An assessment of the utilities' relative performance on a wide variety of indicators in the Middle East and North Africa and in other regions and an assessment of the scope for improvements of utilities in the region, at both the utility level and the economy level
- An assessment of the relevance of key factors on operators' performance—that is, the degree to which performance is affected by (a) vertical integration,

- (b) utility size, (c) utility ownership, (d) the presence or absence of a regulator, and (e) the level of development of a given economy
- Four country case studies that distill useful lessons for the region to improve the performance of electricity utilities.

The strength of this study lies in a newly generated dataset covering 67 electricity utilities in 14 economies of the region.¹ Before this survey, information on the region's power sector was very uneven. The Middle East and North Africa Electricity Database (box O.1) thus forms a valuable public resource for policy makers as they reconcile the multiple dimensions of utility management performance with key policy concerns at the sector level.

The target audiences for the study are managers of electricity utilities, regulators, policy makers, and other stakeholders (including members of civil society) concerned with the performance of specific utilities. The analysis is likely to be useful both at the sector level, because it highlights directions in which the sector may want to evolve in the region and in specific economies, and at the macro-economic level, because it highlights the main drivers of the fiscal costs of the sector. At the utility level, the data (where they are detailed enough) allow managers and regulators to evaluate performance features, which can then help them weigh the trade-offs involved in making utilities more cost-effective and client-oriented. For regulators and other stakeholders concerned with the need to improve governance of the sector, the overall analysis highlights significant

Box O.1 The Middle East and North Africa Electricity Database

This study is based on collection and analysis of primary data on 36 performance indicators in the Middle East and North Africa Electricity Database. It covers 67 electricity utilities in 14 economies of the region: Algeria, the Arab Republic of Egypt, Bahrain, Djibouti, Iraq, Jordan, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, the West Bank, and the Republic of Yemen.^a It also relies on a sample of comparable economies from other regions.

The data were collected by means of a standardized survey completed by utilities and regulatory agencies, thereby covering indicators of technical, commercial, and financial performance. In some economies, the data were collected with support from local consultants or the public authorities. For the economies from other regions, the data were collected from publicly available international databases. The sample of Middle Eastern and North African operators comprises 12 vertically integrated utilities, 29 distribution utilities, 23 generation utilities, and 3 transmission utilities. Data were collected from 2009 to 2013, with 2013 as the base year. Although the database contains much partial information, it also contains 945 base-year entries validated across 14 Middle Eastern and North African economies and 3,832 entries for the period 2009–13.

Source: World Bank compilation.

a. Not included in the study are Libya, the Syrian Arab Republic, and the Islamic Republic of Iran. The utilities analyzed in this study are listed in appendix B of the full report.

information gaps. Without data, poor management and poor policy decisions are unlikely to be addressed, imposing a significant cost on users and taxpayers.

The potential management and financing payoffs that emanate from analysis of the new Middle East and North Africa Electricity Database are hard to ignore. Because the database covers most power utilities in the region, it is broad enough to produce robust insights into the sector's achievements and challenges. The essence of the solution is not surprising: it involves cutting costs and improving revenue. The report provides detailed evidence on how this solution can be accomplished and on the size of the potential gain. In short, efficiency improvements could generate on average more financing (4 percent of GDP) than the sector's investment needs (3 percent of GDP). That said, the optimal mix of cost-cutting and revenue-enhancing solutions is economy specific, because cost and revenue-efficiency margins vary substantially across the region. For that reason, wherever several utilities share the responsibility to produce, transmit, and distribute electricity within a given economy, the analysis and the evidence identify the major cost drivers and the sources of revenue losses at the utility level.

Data analysis is essential to performance diagnostics at the utility and sector levels. It should be remembered that the baseline year of the study is 2013 and that the power sector has evolved since then—in some economies more than others. An appropriate response, of course, is to expand and extend the analysis and data collection begun here. And this is what we hope each country will decide to do while working with its utilities.

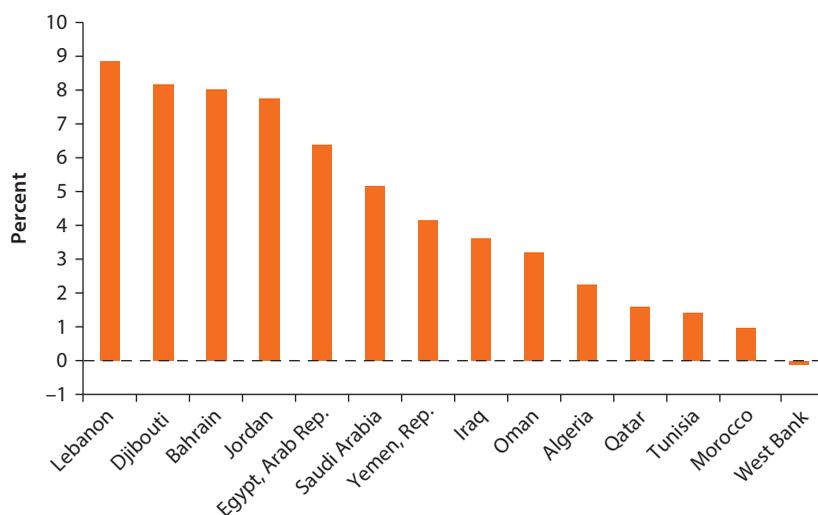
Cutting Hidden Costs in the Power Sector to Finance Sorely Needed Investment

Explicit and implicit subsidies of the region's power sector impose a very heavy burden on taxpayers and power users. The burden can be measured in terms of the utilities' hidden costs, or QFDs, which express the cost of not operating in the manner of a well-run utility. The QFD encompasses four types of inefficiencies: collection losses, transmission and distribution losses, underpricing, and overstaffing.²

Estimates of the power sector's QFD range between -0.1 percent of GDP for the West Bank to 8.9 percent in Lebanon (figure O.1). To put this in context, consider that in Sub-Saharan Africa, where social concerns are at least as large as in the Middle East and North Africa, the sector's QFD ranges from -0.3 percent to 6 percent.

Half of the 14 economies studied have a QFD in excess of 4 percent of the entire economy's GDP. The QFD share of GDP is relatively small in Maghreb economies and large in some Mashreq and Gulf Cooperation Council (GCC) economies. The median value of about 4 percent of GDP is higher than the average investment needed in the region's electricity sector, estimated at about 3 percent of GDP. In other words, the sector's investment gap could be filled simply by halving the current level of inefficiency.

Figure O.1 The Quasi-Fiscal Deficit of the Power Sector as a Percentage of GDP in 14 Middle Eastern and North African Economies, 2013



Source: World Bank calculations.

Note: GDP = gross domestic product.

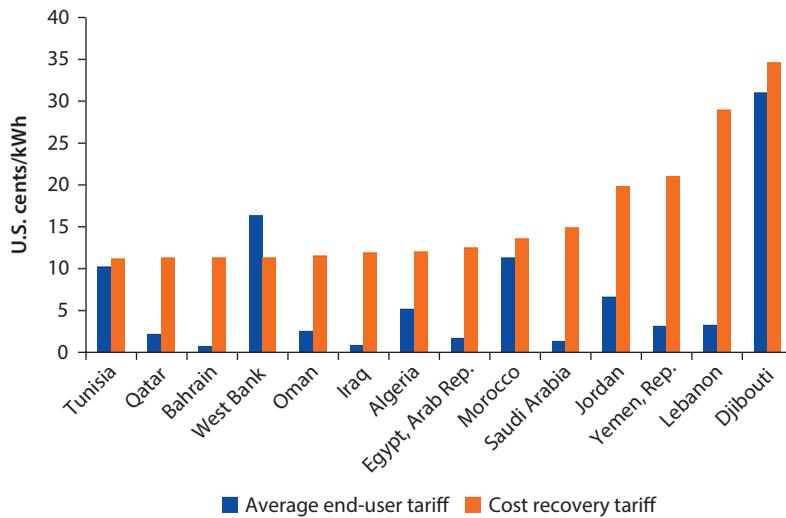
At the utility level, performance varies widely. When measured as a share of utilities' revenue, QFDs range from 25 percent for a West Bank distribution utility (Northern Electric Distribution Company, or NEDCO) to almost 1,300 percent for the vertically integrated Iraqi power ministry. The QFD of at least 13 utilities exceeds their revenue. These figures reveal the extent to which utility-specific inefficiencies common in the region may be preventing self-financing.

Underpricing: The Major Source of Inefficiencies

The inefficiencies reflected in the QFD are linked to both policy and management decisions. The sources of inefficiencies—and hence the nature of the solutions—vary across economies. About two-thirds of the QFDs we detected can be traced to tariffs being set below cost-recovery levels in most economies (figure O.2), which nearly always reflects a political decision intended to protect current users. Even under such circumstances, however, managing costs can go far to enhance revenues. For example, Jordan's high levels of cost inefficiency are due largely to electricity production costs that reflect the preponderant role of diesel and fuel oil in generation.

The remaining third is explained by commercial losses, collection failures, and overstaffing, which are all mostly management decisions, although overstaffing may sometimes represent a political decision if it is an issue for all utilities in a given country. These sources of inefficiencies should not be underestimated, as they represent half of the resources needed for the sector's investment needs. Overstaffing is of particular concern in only a few utilities, almost all of them

Figure O.2 Comparison of Average End-User and Cost-Recovery Tariffs in the Middle East and North Africa



Sources: World Bank calculations and Arab Union of Electricity (2014).

Note: kWh = kilowatt-hour. Data are for 2013 or most recent year available, 2009–12.

distribution utilities in the Arab Republic of Egypt. Collecting bills seems to be a significant challenge for distribution utilities in Djibouti, Jordan, and the West Bank. Technical losses are significant for two of the West Bank operators (Jerusalem District Electricity Company and NEDCO) and for the Republic of Yemen's vertically integrated utility.

Low tariffs and overstaffing often reflect good intentions, but they are not the most effective ways to ensure that the poor can afford electricity or to boost employment. Moreover, given their present macroeconomic prospects, many Middle East and North Africa (MENA) economies cannot afford to continue to lavish, on average, 2 percent of GDP on poorly targeted electricity subsidies (IMF 2013). Improving the sector's performance will allow economies to increase the social returns on fiscal resources by allocating savings where they will do the most good, whether within the sector or outside it.

Identifying and unbundling hidden cost drivers and inefficiencies at the utility level can pinpoint areas for improvement—whether financial, technical, commercial, or labor related—and, from a regulatory perspective, can improve the accountability of key actors. From the perspective of sector policy, quantification of the QFD provides a rough order of magnitude of the improvements for which governments might aim. Taking advantage of readily available opportunities to reduce cost inefficiencies in the generation and distribution of electricity will also make the sector more sustainable and will increase the creditworthiness of utilities, thus facilitating access to commercial financing.

Matching Technical Success with Improvements in Commercial and Financial Management

For more than half of the indicators selected—most of them technical—the region’s economies tend to perform better than the sample of economies outside the Middle East and North Africa. Unfortunately, there does not seem to be a clear correlation between good technical performance and sustainable financial performance, and unless the sector can increase its revenue or better manage its costs, the current technical level is unlikely to be sustainable (table O.1).

On the technical and operational side, the international comparison and the trend analysis presented in chapter 3 point to a significant increase in operating expenses during the period covered. This finding is consistent with the increase in oil prices from 2009 to 2013. On commercial management, the indicators reveal (a) a high dependence on subsidies to recover costs and (b) a high tolerance for nonpayment (with a ratio of accounts receivable to sales that is almost three times that of economies from other regions). On financial dimensions,

Table O.1 Comparing Median Utility Performance in the Middle East and North Africa and Elsewhere

	<i>All utilities</i>	<i>Distribution utilities</i>	<i>Vertically integrated utilities</i>
Technical and operational indicators			
OPEX/connection (\$)	—	MENA higher	MENA higher
OPEX/kWh sold (\$)	—	MENA lower	Samples too small
Residential connections/employee	—	MENA lower	MENA lower
Distribution losses	Equivalent	—	—
Commercial indicators			
Energy sold (kWh)/connection	MENA higher	—	—
Total billing/connection	MENA somewhat higher	—	—
Collection rate	MENA somewhat lower	—	—
Financial Indicators			
Sales/OPEX (%)	—	MENA somewhat lower	MENA somewhat higher
Sales/total costs (%)	—	MENA higher (depending on subsidies)	MENA lower (depending on subsidies)
Accounts receivable/sales (days)	MENA much higher	—	—
Debt/equity	MENA much higher and essentially unsustainable	—	—
Current assets/current liabilities	Equivalent but not ideal	—	—
Return on assets (%)	MENA somewhat higher but not high enough to stimulate financing	—	—
Return on equity (%)	MENA higher but not commensurate with risk	—	—

Source: World Bank calculations.

Note: kWh = kilowatt-hours; MENA = Middle East and North Africa; OPEX = operating expenses; — = not applicable. Comparisons are only made for all utilities together when the indicator has the same meaning for different type of utilities. Otherwise comparisons are made separately for distribution utilities and vertically integrated utilities.

despite return-on-assets and return-on-equity values that are somewhat better than those of peer economies outside the region, the Middle East and North Africa appears to be relying on a risky strategy as indicated by (a) a low ratio of current assets to current liabilities (lower than 100 percent) and (b) an exceptionally high debt-to-equity ratio (almost four times the median outside the region), leaving utilities highly exposed to external shocks.

The importance of labor costs highlighted by the QFD analysis is likely to be a particularly sensitive topic in any policy discussion of the data reported here. Connections per employee are considerably lower in the Middle East and North Africa than in other regions, suggesting that hiring practices in the region may need to be reviewed in some cases. In a region where underemployment is a major problem, it is impossible not to recognize the political sensitivity of efforts to improve labor indicators. Where the matter is so sensitive that overstaffing simply cannot be broached, it may nevertheless be useful to quantify the costs of not addressing the issue, thereby clarifying the implications for subsidy levels (if revenues cannot be increased).

Because partial indicators of utility performance can lead to heterogeneous rankings of utilities, we applied an “average rank score” methodology to help utilities assess their performance against other utilities across a set of relevant indicators. The average rank score makes it possible to identify the better-performing utilities within a group that share a common set of data and for which reliance on a single indicator could be misleading. The main takeaways from this diagnostic across utility types are as follows: (a) for generation utilities, the best-performing utility is QEPCO (Jordan), followed by AKPP (Oman) and APBS (Oman); (b) for distribution utilities, EDCO (Jordan) is the best-performing utility in the group, followed by LYDEC (Morocco) and JEPCO (Jordan); and (c) for vertically integrated utilities, the best performance is by SEC (Saudi Arabia), followed by SONELGAZ (Algeria).

Boosting the Power Sector with Well-Targeted Institutional and Economic Reforms

The variety of organizational structures found in the electricity sector around the world is quite striking.³ This study reveals that the Middle East and North Africa is no exception. Utilities are central to all organizational models encountered in the region, but otherwise these models show substantial institutional and contextual differences, some of which have been credited with—or blamed for—differences in utilities’ performance.

Our assessment of the correlations between various institutional and contextual characteristics (utility type, size, ownership, presence of a separate regulatory agency, and national income) and performance indicators, despite limitations (notably the use of cross-sectional rather than time-series data), suggests how and where reform policies may be most effective. Of the 36 performance indicators used for this analysis, 25 showed an effect for one of the characteristics; in 14 cases, more than one characteristic (or “driver”) was statistically significant.

Table O.2 Categories of Indicators Where Drivers of Performance Show Significant Results for a Substantial Proportion of the Indicators in the Category

<i>Driver of performance</i>	<i>Indicator categories showing significant results for that driver</i>
Type of utility	Losses efficiency, profitability, consumption and billing
Size	Cost efficiency, balance sheet, consumption and billing
Ownership	Cost efficiency, labor efficiency
Regulation	Cost efficiency, labor efficiency
Income	Cost efficiency, consumption and billing, metering

Source: World Bank calculations.

The results support the hypothesis that performance differences between utilities are likely to be correlated with institutional and economic policy variables, although a more thorough analysis is needed to be able to establish causality.

Utility type and size are the policy-related drivers that were most often significant (each for 30 percent of the indicators tested), whereas ownership type (public or private) and presence of a separate regulator are significant for about 20 percent of the indicators tested. National income level was significant in 35 percent of the tests, indicating that this variable should be considered in any comparison across economies.

The effects of reform would not be felt across all indicators but are likely to be concentrated on certain aspects of performance. Table O.2 shows that the significant results for each driver are concentrated within two or three categories of indicators. For example, utility type has a substantial proportion of significant links to the indicator categories of losses efficiency, profitability, and consumption and billing, and it has no links at all to the categories of systems and operational efficiency, cost structure, cost recovery, balance sheet, and metering. Ownership and regulation are linked to cost efficiency and labor efficiency. This finding suggests that improvements in cost efficiency and labor efficiency are particularly open to reform efforts, because ownership and regulation are relatively easy factors to adjust. Other categories of indicators may be influenced by other drivers or by a complex combination of factors that simple testing of one characteristic at a specific point in time was unable to duplicate.

Valuable Insights from the Case Studies

The four case studies (from Egypt, Jordan, Morocco, and Oman) represent the diverse challenges faced by economies in the region, as well as different paths toward electricity reform, informed by actions and trends over the past 10 to 15 years. The four countries are characterized by quite different economic and political environments, which affect the degree of ease or difficulty involved in implementing reforms. In a region where the sector is mostly publicly owned and centralized under vertically integrated utilities, Egypt, Jordan, Morocco, and Oman each have a story to tell, whether in relation to their dependence on fossil fuel imports, their population size and geographic spread, or the initial and organizational structure of their electricity sector.

Egypt has not enjoyed the political stability often needed when undertaking significant reforms. Its experience indicates that demand shocks linked to political tensions may have a much stronger impact on the sector's commercial and financial performance than on its technical and operational performance.

Jordan has had to address both a demand shock and a supply shock. On the supply side, it has been affected by the need to drastically change its sources of energy owing to a break in gas supply from its main supplier in 2012. On the demand side, it has had to deal with unexpected increases resulting from a large inflow of refugees. The case study illustrates the effect of efforts to significantly scale up the role of the private sector in absorbing these shocks.

Morocco illustrates how electricity reforms can be implemented in a hybrid market in which regional utilities cover electricity as well as water and sanitation. This peculiarity makes it difficult to differentiate the allocation of resources across the two activities but does allow for the introduction of cross-subsidies.

Finally, Oman is a relatively small economy where policy reforms have eased access to private financing in the sector. It now has long experience with an unbundled electricity sector. Private generation utilities are also involved in the desalination efforts that ensure the sultanate's water supply.

A Need for Systematic Monitoring of Power Sector Performance

The Middle East and North Africa Electricity Database can be applied not only to produce a snapshot of the region's power sector but also to clarify the managerial, technical, and policy steps that might be required to meet fast-growing demand from all economic actors, including residential users. Just as importantly, and perhaps more subtly, the database provides a baseline against which future progress can be tracked and measured. To be effective and to ensure accountability of policy makers and managers, progress needs to be measured from baseline to target, which is how comparisons can become an input for policy. Targets are best set at the firm level for most operational matters, but sector-level targets are needed as well if governments are to address the fiscal and social concerns and constraints raised in the analysis.

The new database produced for this report offers the region access to a comparable dataset for a statistically significant sample of economies both within and outside the region. The comparable components of the dataset cover indicators in three broad performance categories: (a) technical and operational, (b) financial, and (c) commercial. But the dataset also exposes the monitoring weaknesses of the region. Very little comparable information exists for generation utilities, for example. On many performance indicators, comparability is not possible, either for lack of data or because the indicators have different meanings for different types of utilities.

The gaps in the data that are needed for good policy and management are real but not unsurmountable. To help fill them, authorities in the region may wish to impose on regulated industries guidelines and other information-sharing

requirements derived from modern regulatory practice. For unregulated companies, standard accounting reports and annual balance sheets can go a long way toward supplying the raw data needed to improve monitoring of the region's electricity sector, provided the will to use that information is present.

Without a political commitment to improve the dataset and to use it to monitor progress and fine-tune policy, it will be difficult for the sector's decision makers to track efforts to cut the sector's financing deficits and close its service gaps. The analysis provided here has shown how much room there is to cut specific costs and to enhance revenue. It has also shown, for many economies in the region, the unsustainability of a business-as-usual approach. Without the checks and balances provided by an effective monitoring system, progress in addressing challenges cannot be tracked adequately. The case for change in the region's monitoring practices is thus strong—and change is possible. Many policy makers are already moving in the right direction by making important institutional changes. How fast and how intensively they move is likely to determine how quickly the financing and service needs of the sector are met.

Notes

1. A limitation of the analysis is that the database's baseline is 2013, and the power sectors of some economies in the region have changed considerably since then.
2. Implicit subsidies, such as commercial losses, collection failures, and overstaffing, are generally linked to poor management. The methodology used in the report for the QFD of utilities was largely inspired by Trimble and others (2016). Another example of the use of the concept is Eberhard and others (2008).
3. See Jamasb, Nepal, and Timilsina (2015) for a broader review and Vagliasindi and Besant-Jones (2013) for a detailed analysis of organizational structures in the power sectors of low-income countries.

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