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THE BOTTOM LINE

Better management, sustainable pricing, and selective, context-specific reforms could free up enough investment resources to enable power utilities to meet growing demand for electricity in the Middle East and North Africa, according to this analysis of a new dataset covering 14 MENA economies and 67 electricity utilities.

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Shedding Light on Electricity Utilities in the Middle East and North Africa: Insights from a Performance Diagnostic

What is the main insight from the performance diagnostic?

The immediate solution to freeing up sufficient financial resources to meet annual investments needs resides in utility performance and efficiency

The electricity sector in the Middle East and North Africa (MENA) is in the grip of an apparent paradox. Although the region is home to 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 able to cater to the future electricity needs of its fast-growing population and their business activities. Primary energy demand 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 is 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 economies will continue to cut financing for the sector as they adjust to their fiscal situation. 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.

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 that are needed to meet demand—and to do so more efficiently.

This brief summarizes a new study from the World Bank (Camos and others 2018) that assembles and analyzes indicators for a large sample of electricity utilities in the region. The study is based on collection and analysis of primary data on 36 performance indicators in the newly generated MENA 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.[1]

What else can the new database teach us?

Analysis of the new MENA Electricity Database suggests solutions that will be useful to a wide and influential audience

The essence of the solution is not surprising: it involves cutting costs and improving revenue. Efficiency improvements could generate on average more financing (4 percent of the region's GDP) than the sector's investment needs (3 percent of the region's GDP). That said,

[1] Not included are Libya, the Syrian Arab Republic, and the Islamic Republic of Iran. The sample of operators in the MENA region 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 for 2013 validated across 14 MENA economies and 3,832 entries for the period 2009–13.

The essence of the solution is not surprising: it involves cutting costs and improving revenue.

the optimal mix of cost-cutting and revenue-enhancing solutions is economy- and even utility-specific, because cost and revenue-efficiency margins vary substantially across the region.

The report estimates the quasi-fiscal deficit (QFD) of the power sector in the economies of the region and determines the proportion that can be attributed to four factors: underpricing (setting tariffs below costs), collection losses (failure to bill or collect revenues owed to the utility), transmission and distribution losses (made of technical and non-technical losses such as electricity theft), and overstaffing (employing more labor than a comparable efficient utility would do). It then assesses the utilities' relative performance on a wide variety of technical, financial, and commercial indicators, explores the scope for improvements and estimates 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.

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, since it highlights directions in which the sector may want to evolve, and at the macroeconomic level, since 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 identifies significant information gaps. Without data, poor management and poor policy decisions are unlikely to be addressed, imposing a significant cost on users and taxpayers.

It should be remembered that the baseline year of the study is 2013 and that the power sector has changed since then—in some economies more than others. Several economies are addressing deep fiscal deficits linked to a long history of high energy subsidies that have endured since the Arab Spring. An appropriate response to this limitation of the study is to expand and extend the analysis and data collection begun here.

Where will the region's utilities find the investment funds they so badly need?

Cutting hidden costs in the power sector is the key

Explicit and implicit subsidies of the region's power sector impose a very heavy burden on taxpayers and electricity users. The burden can be measured in terms of the utilities' hidden costs, or QFDs, which express the cost of not operating as efficiently as a well-run utility. The QFD encompasses four types of inefficiency: underpricing, collection losses, transmission and distribution losses, and overstaffing. Underpricing is almost always linked to explicit subsidies of the sector. Implicit subsidies, such as commercial losses, collection failures, and overstaffing, are generally linked to poor management.[2]

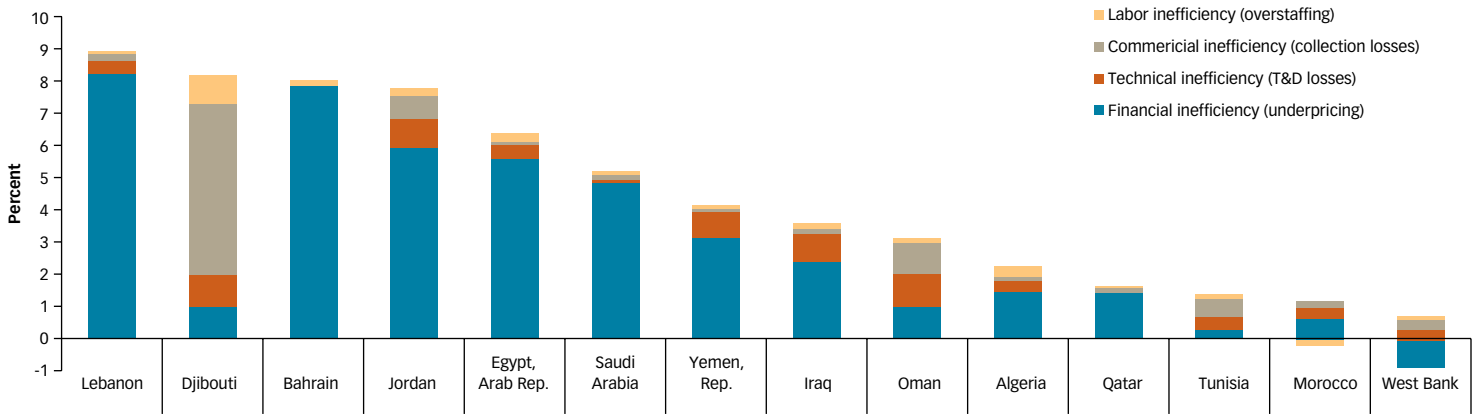
In half of the 14 Middle Eastern and North African economies studied, the QFD of the power sector exceeds 4 percent of the entire economy's GDP. In most economies, the deficit is greater than the immediate investment needed in the electricity sector. The QFD share of GDP is relatively small in Maghreb economies and large in some Mashreq and Gulf Cooperation Council (GCC) economies.

Estimates of the QFD range between –0.1 percent of GDP for the West Bank to 8.9 percent in Lebanon (figure 1). To put this in context, consider that in Sub-Saharan Africa, where social concerns are at least as large as in MENA, the sector's QFD ranges from –0.3 percent to 6 percent. At the utility level, performance also varies widely. When measured as a share of utilities' revenue, QFDs range from 25 percent for a West Bank distribution utility to almost 1,300 percent for the vertically integrated Iraqi power ministry. The QFD of at least 13 utilities exceeds their revenue. In other words, these utilities would double their revenue if they were to maximize their efficiency. These figures reveal the extent to which utility-specific inefficiencies common in the region may be preventing self-financing. Absolute QFD values by economy, including the cost of the component of inefficiencies, are provided in table A.2 at the end of the brief.

[2] 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).

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

Figure 1. Contribution of inefficiency category to the quasi-fiscal deficit of the power sector as a percentage of GDP in 14 MENA economies, 2013



Source: World Bank calculations.

Note: GDP = gross domestic product; MENA = Middle East and North Africa; T&D = transmission and distribution.

Do the hidden costs show a pattern?

Underpricing is the major source of inefficiencies; others are economy and utility specific

About two-thirds of the QFDs we detected can be traced to tariffs being set below cost-recovery levels in most economies (figure 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 largely due to electricity production costs that reflect the preponderant role of diesel and fuel oil in generation.

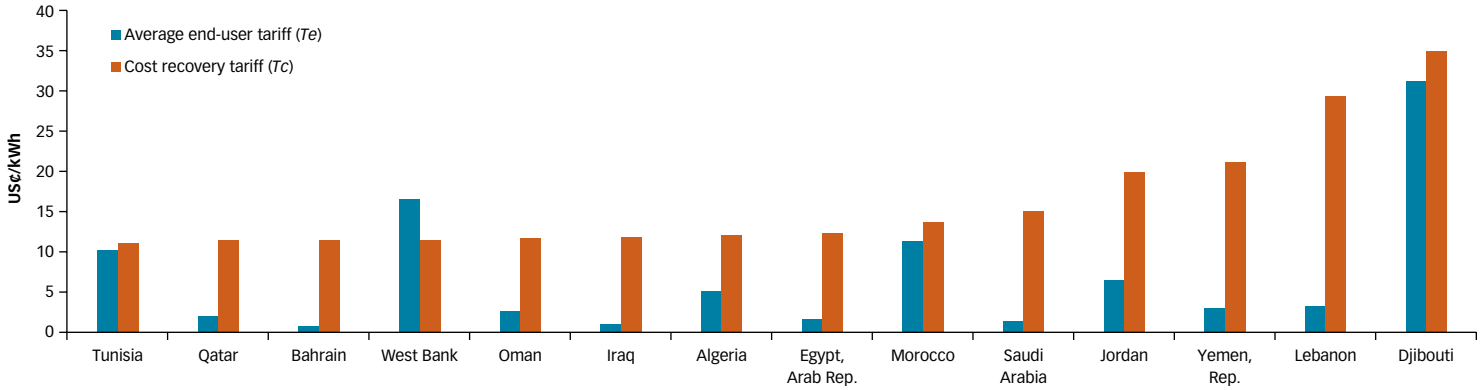
The remaining third is explained by technical losses, collection failures, and overstaffing, which are all mostly management decisions, though overstaffing may sometimes represent a political decision if it is an issue for all utilities in a given economy. These sources of inefficiencies should not be 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 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 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 of 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, 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 increase the creditworthiness of utilities, thus facilitating access to commercial financing.

The quasi-fiscal deficit 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.

Figure 2. Comparison of average end-user and cost-recovery tariffs in the MENA region, 2013



Source: World Bank calculations.

Note: MENA = Middle East and North Africa; kWh = kilowatt-hour

What about management?

In general, commercial and financial management do not match technical performance

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 region. 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 1).

On the technical and operational side, international comparisons and trend analysis 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.

With regard to 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, despite return-on-assets and return-on-equity values that are somewhat better than those of peer economies outside the region, MENA's power sectors appear 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 in this study. Connections per employee are considerably lower in MENA than in other regions, suggesting that hiring practices in the region may need to be reviewed in some cases. 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).

What can be done to improve sector performance?

Well-targeted institutional and economic reforms are desirable—and feasible!

Utilities are central to all organizational models found in the region, yet these models show substantial differences, some of which have been credited with—or blamed for—differences in utilities' performance.

Table 1. Comparing the median performance of selected MENA and non-MENA utilities

	MENA median	Non-MENA median	All utilities	Distribution utilities	Vertically integrated utilities
Technical and operational indicators					
OPEX/connection ($)	DU: 346 VIU: 1,237	DU: 129 VIU: 594	—	MENA higher	MENA higher
OPEX/kWh sold ($)	DU: 0.10 VIU: 0.07	DU: 0.14 VIU:0.18	—	MENA lower	Samples too small
Residential connections/employee	DU: 252 VIU: 90	DU: 367 VIU: 157	—	MENA lower	MENA lower
Distribution losses	11	12	Equivalent	—	—
Commercial indicators					
Energy sold (kWh)/connection	4,223	3,405	MENA higher	—	—
Total billing/connection	299	292	MENA somewhat higher	—	—
Collection rate	92	94	MENA somewhat lower	—	—
Financial indicators					
Sales/OPEX (%)	DU: 93 VIU: 92	DU: 98 VIU: 87	—	MENA somewhat lower	MENA somewhat higher
Sales/total costs (%)	DU: 88 VIU: 56	DU: 97 VIU: 67	—	MENA higher (depending on subsidies)	MENA lower (depending on subsidies)
Accounts receivable/sales (days)	148	52	MENA much higher	—	—
Debt/equity	357	91	MENA much higher and essentially unsustainable	—	—
Current assets/current liabilities	84	88	Equivalent but not ideal	—	—
Return on assets (%)	3	1	MENA somewhat higher but not high enough to stimulate financing	—	—
Return on equity (%)	6	0	MENA higher but not commensurate with risk	—	—

Source: World Bank calculations.

Note: DU = distribution utility; kWh = kilowatt-hours; MENA = Middle East and North Africa; OPEX = operating expenses; VIU = vertically integrated utility; — = 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.

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.

The correlations between various institutional and contextual characteristics (utility type, size, ownership, presence of a separate regulatory agency, and national income level) and performance indicators, despite limitations (notably the use of cross-sectional rather than time-series data), suggest how and where reform policies may be most effective. Of the 36 performance indicators used for this analysis, 25 showed a statistically significant effect associated with one of the characteristics; in 14 cases, more than one characteristic (or "driver") was statistically significant. (A detailed table of some of the 36 performance indicators found in the book appears at the end of the brief as table A.1.)

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.

The case for change in the region's monitoring practices is thus strong—and change is possible. But without the checks and balances provided by an effective monitoring system, progress in addressing challenges cannot be tracked adequately.

Table 2. Categories of indicators where drivers of performance show significant results for a substantial proportion of the indicators in the category

Driver of performance	Indicator categories showing significant results for that driver						
	Losses efficiency	Labor efficiency	Cost efficiency	Balance sheet	Profitability	Consumption and billing	Metering
Type of utility	✓				✓	✓	
Size			✓	✓		✓	
Ownership		✓	✓				
Regulation		✓	✓				
Income			✓			✓	✓

Source: World Bank calculations.

Utility type and size are two of three 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 an independent 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 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 labor efficiency, cost efficiency, 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.

Anything else?

Yes. More systematic monitoring of sector performance is needed

The MENA Electricity Database and the study summarized here offer the region a comparable dataset for a statistically significant sample of economies within the MENA region, as well as 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 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 in different economies of the region.

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.

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 utilities, 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. The case for change in the region's monitoring practices is thus strong—and change is possible. But without the checks and balances provided by an effective monitoring system, progress in addressing challenges cannot be tracked adequately.

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.

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Table A.1. Key performance indicators by utility

Economy	Utility type	Utility	OPEX/connection	OPEX/kWh	Residential connections/employee	Distribution losses	Energy volume sold/connection	Total billing/connection	Collection rate	Sales/OPEX	Sales/total costs	Accounts receivable/sales	Debt/equity	Current assets/current liabilities	Return on assets	Return on equity
			$/con	$/kWh	con/emp	%	kWh/con	$/con	%	%	%	days	%	%	%	%
Algeria	VIU	SONELGAZ	—	304	—	19	5,814	—	—	92	56	—	428	146	–1.74	–7
Bahrain	VIU	EWA	—	0.08	—	—	—	—	97	37	—	205	67	84	0.88	1
Djibouti	VIU	EDD	1,612	0.43	44	—	3,713	—	37	152	110	192	222	274	—	—
Egypt, Arab Rep.	DU	AEDC	134	0.04	155	11	3,658	111	99	83	—	81	—	77	0.18	0.26
	GU	CEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	5	0	1
	DU	CEDC	230	0.04	178	6	5,862	197	94	89	83	—	685	66	2	8
	GU	EDEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3,484	37	0.05	0.3
	TU	EETC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	53	—	—
	DU	EEDC	157	0.04	188	10	4,392	132	95	90	80	175	527	103	0.04	0.12
	GU	MDEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2,509	68	0.03	0.41
	DU	MEEDC	115	0.03	296	11	3,746	96	92	86	77	115	501	85	0.06	0.14
	DU	NCEDC	157	0.04	252	10	4,340	138	93	91	87	183	850	71	0.19	0.61
	DU	NDEDC	101	0.03	315	9	3,133	97	84	—	90	—	677	97	0.30	0.83
	DU	SCEDC	169	0.04	233	8	4,584	148	86	93	87	276	1,282	81	2.6	8.77
	DU	SDEDC	75	0.03	319	10	2,438	68	93	—	—	—	523	103	0.23	0.46
	DU	UEEDC	119	0.03	287	8	3,570	101	88	87	75	178	571	113	0.06	0.17
	GU	UEEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,270	56	0.35	3.02
	GU	WDEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3,074	67	0.01	0.11
Iraq	VIU	MOE	820	0.07	—	37	—	182	—	—	—	—	—	—	—	—
Jordan	GU	AES Levant	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	—	—	—
	GU	AAEPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	290	123	—	—
	GU	AES PSC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	333	287	—	36
	GU	CEGCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	354	95	12	21
	DU	EDCO	—	—	126	12	6,429	—	—	97	—	117	1,476	99	5	16
	DU	IDECO	547	0.10	310	11	5,591	586	—	107	99	120	981	84	6	20
	DU	JEPCO	—	0.14	364	14	7,437	—	97	93	—	122	576	80	25	12
	TU	NEPCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	126	—	—	—
	GU	QEPCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	621	488	5	25
	GU	SEPCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	876	113	4	17
Lebanon	VIU	EdL	1,575	0.29	—	33	5,386	529	—	27	27	—	—	15	–150	—
Morocco	DU	AMENDIS Tanger	508	0.12	—	10	4,312	473	—	—	—	—	—	—	3	3
	DU	AMENDIS Tetouan	346	0.15	—	11	2,292	299	—	—	—	—	—	—	–1	–2
	DU	LYDEC	836	0.20	—	7	4,223	520	—	100	89	76	279	72	—	18
	VIU	ONEE	510	0.09	—	15	5,634	190	—	118	87	159	3,327	63	–4	–127
	DU	RADEEL	361	0.12	—	8	2,953	—	—	86	—	—	—	—	6	7
	DU	REDAL	644	0.17	969	8	3,759	442	—	103	92	121	—	92	2	10
	DU	RAK	412	0.12	—	8	3,532	306	—	94	—	—	—	—	—	—
	DU	RADEEMA	410	0.10	—	5	4,047	466	—	130	—	205	41	—	—	—

(continued)

Economy	Utility type	Utility	OPEX/connection	OPEX/kWh	Residential connections/employee	Distribution losses	Energy volume sold/connection	Total billing/connection	Collection rate	Sales/OPEX	Sales/total costs	Accounts receivable/sales	Debt/equity	Current assets/current liabilities	Return on assets	Return on equity
			$/con	$/kWh	con/emp	%	kWh/con	$/con	%	%	%	days	%	%	%	%
Morocco	DU	RADEM	309	0.11	—	7	2,750	301	—	97	—	—	—	—	21	22
	DU	RADEEJ	396	0.10	403	4	4,048	436	—	136	119	106	66	64	—	—
	DU	RADEEF	318	0.11	—	—	2,814	312	—	98	—	—	—	—	—	—
	DU	RADEES	339	0.13	—	3	2,621	302	—	89	—	—	—	—	14	16
Oman	GU	APBS	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	249	121	8	24
	GU	ABPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	n.a.	n.a.	n.a.	303	54	—	—
	GU	ASPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	n.a.	n.a.	n.a.	294	53	—	—
	GU	GPDCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	n.a.	n.a.	n.a.	—	443	1	0.2
	GU	AKPP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	n.a.	n.a.	n.a.	94	79	9	15
	GU	ARPP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	n.a.	n.a.	n.a.	—	156	—	—
	GU	BPDP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,857	42	3	—
	VIU	DPC	1,438	0.05	92	15	27,586	—	—	81	72	263	315	46	—	—
	DU	MJEC	—	0.05	92	13	—	—	—	69	—	119	109	43	8	14
	DU	MZEC	1,150	—	115	11	—	—	—	61	—	110	148	18	6	14
	DU	MEDC	1,698	—	399	9	—	—	—	80	—	122	147	46	8	16
	TU	OETC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	192	—	7	20
	GU	PPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	—	0.1	—
	VIU	RAECO	4,917	0.21	13	11	23,011	925	71	—	—	365	316	128	3	11
	GU	SSPWC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	357	179	3	13
	GU	SPP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,399	118	3	—
	GU	UPC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	72	38	5	7
	GU	WAJPCO	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	—	504	8	2
Qatar	VIU	KAHRAMAA	1,519	—	—	—	—	—	—	97	—	138	74	2145	—	—
Saudi Arabia	VIU	SEC	1,237	0.03	179	5	35,937	—	—	99	39	205	392	86	2	5
Tunisia	VIU	STEG	948	—	—	14	3,749	377	—	55	47	99	596	89	–4	–22
West Bank	DU	JEDCO	—	0.19	—	26	5,988	97	—	—	—	—	260	126	–20	–19
	DU	NEDCO	684	0.16	147	13	4,307	—	90	108	103	166	86	275	3	4
	DU	TUBAS	759	0.10	73	16	7,330	—	62	—	—	276	—	—	7	—
Yemen, Rep.	VIU	PEC	158	0.06	90	36	2,631	178	—	—	—	—	—	75	—	—

Source: World Bank calculations.

Note: con = connection; DU = distribution utility; emp = employee; TU = transmission utility; VIU = vertically integrated utility; kWh = kilowatt-hour; n.a. = not applicable; OPEX = operating expenses; T&D = transmission and distribution; - = not available; SONELGAZ = Société Nationale de l'Électricité et du Gaz; EWA = Electricity and Water Authority; EDD = Électricité de Djibouti; AEDC = Alexandria Electricity Distribution Company; CEPC = Cairo Electricity Production Company; CEDC = Canal Electricity Distribution Company; EDEPC = East Delta Electricity Production Company; EETC = Egyptian Electricity Transmission Company; EEDC = El-Behera Electricity Distribution Company; MDEPC = Middle Delta Electricity Production Company; MEEDC = Middle Egypt Electricity Distribution Company; NCEDC = North Cairo Electricity Distribution Company; NDEDC = North Delta Electricity Distribution Company; SCEDC = South Cairo Electricity Distribution Company; SDEDC = South Delta Electricity Distribution Company; UEEDC = Upper Egypt Electricity Distribution Company; UEEPC = Upper Egypt Electricity Production Company; WDEPC = West Delta Electricity Production Company; MOE = Ministry of Electricity; AES Levant = AES Levant Holding BV Jordan PSC; AES PSC = Amman East Power Plant; AAEPC = Amman-Asia Electric Generating Company; CEGCO = Central Electricity Generating Company; EDCO = Electricity Distribution Company; IDECO = Irbid District Electricity Company; JEPCO = Jordan Electric Power Company; NEPCO = National Electric Power Company; QEPCO = Qatrana Electric Power Company; SEPCO = Samra Electric Power Generating Company; EdL = Électricité du Liban; AMENDIS Tanger = AMENDIS Tanger; AMENDIS Tetouan= AMENDIS Tetouan; LYDEC = Lyonnaise des Eaux de Casablanca; ONEE = Office National de l'Électricité et de l'Eau Potable; RADEEL = RADEEL; REDAL = REDAL Rabat; RAK = Régie Autonome de Distribution d'Eau d'Électricité et d'Assainissement liquide de la Province de Kenitra; RADEEMA = Régie Autonome de Distribution d'Eau et d'Électricité de Marrakech; RADEM = Régie Autonome de Distribution d'Eau et d'Électricité de Meknès; RADEEJ = Régie Autonome de Distribution d'Eau, d'Électricité et d'Assainissement liquide des Provinces d'El Jadida et de Sidi Bennour; RADEES = Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Safi; RADEEF = Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Fès; APBS = ACWA Power Barka; ABPC = Al Batinah Power Company; ASPC = Al Suwadi Power Company; GPDCO = Al-Ghubra Power and Desalination Company; AKPP = Al-Kamil Power Plant; ARPP = Al-Rusail Power Plant; BPDP = Barka Power and Desalination Plant; DPC = Dhofar Power Company; MJEC = Majan Electricity Company; MZEC = Mazoon Electricity Distribution Company; MEDC = Muscat Electricity Distribution Company; OETC = Oman Electricity Transmission Company; PPC = Phoenix Power Company; RAECO = Rural Areas Electricity Company; SSPWC = Sembcorp Salalah Power and Water Company; SPP = Sohar Power Plant; UPC = United Power Company; WAJPCO = Wadi Al-Jizzi Power Company; KAHRAMAA = Qatar General Electricity and Water Corporation; SEC = Saudi Electricity Company; STEG = Société Tunisienne de l'Électricité et du Gaz; JDECO = Jerusalem District Electricity Company; NEDCO = Northern Electricity Distribution Company; TUBAS = Tubas District Electricity Company; PEC = Public Electricity Corporation.

Table A.2. Absolute QFD values by economy, including the cost of each component of inefficiency

	Cost of the sources of inefficiencies expressed in absolute value ($ million)				Absolute QFD value ($ million)	QFD as share of GDP (%)
	Financial inefficiency (underpricing)	Technical inefficiency (T&D losses)	Commercial inefficiency (collection losses)	Labor inefficiency (overstaffing)		
Lebanon	3,554	179	91	12	3,826	8.9
Djibouti	12	13	65	11	101	8.2
Bahrain	2,587	6	5	41	2,640	8.0
Jordan	2,003	283	252	70	2,608	7.8
Egypt, Arab Rep.	16,041	1,207	167	803	18,219	6.4
Saudi Arabia	35,806	848	1,264	549	38,467	5.2
Yemen, Rep.	1,137	291	27	38	1,494	4.2
Iraq	5,317	1,816	291	464	7,888	3.6
Oman	2,108	170	140	79	2,496	3.2
Algeria	3,063	766	213	678	4,720	2.3
Qatar	2,965	48	193	18	3,224	1.6
Tunisia	156	179	251	69	655	1.4
Morocco	639	321	197	-209	948	1.0
West Bank	-95	34	34	15	-13	-0.1

Source: World Bank calculations.

Note: GDP = gross domestic product; T&D = transmission and distribution; QFD = quasi-fiscal-deficit.

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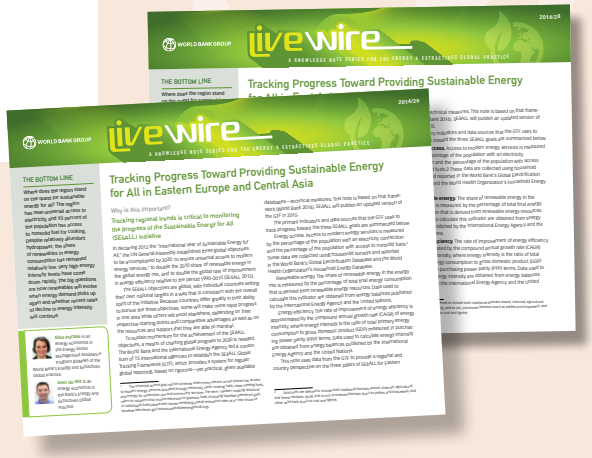

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