

Learning from Power Sector Reform

The Case of the Arab Republic of Egypt

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Abstract

The challenge of power sector reform in the Arab Republic of Egypt has long been dominated by extremely high subsidies, with prices set well below the costs of supply. These subsidies have taken a variety of forms: explicit subsidies in the government budget, implicit subsidies in the underpricing of fuel supply (particularly natural gas) to the power sector, accumulation of arrears from the sector, poorly-maintained physical capital, and cross-subsidies across customer classes. Egypt's social contract was linked to expanding energy access with good quality supply based on public financing and huge subsidies. Egypt has been able

to achieve universal access with more or less reliable power over the entire period, except when chronic underinvestment in the sector caused blackouts in 2011–14 at time of severe political uncertainty. The social compact came under pressure in 2014 when energy subsidies reached 6.8 percent of gross domestic product. Since then, the reform process has been revived based on new electricity, gas, and renewable energy laws; price and subsidy adjustments; structural reforms with a deliberately long time frame; and greater emphasis on the role of the private sector.

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Learning from Power Sector Reform: The Case of the Arab Republic of Egypt

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Keywords: power sector reform, electric utility, power generation, energy access, state-owned enterprise, regulation, electricity pricing.

JEL Codes: L9; Q4

¹ This case study draws on contribution of colleagues and consultants including, among others, Jonathan Walters, Hafez el Salmawy, Marwa Mostafa Khalil and Macroconsulting S.A (Argentina).

Foreword

“Rethinking Power Sector Reform” is a multiyear global initiative of the World Bank’s Energy & Extractives Global Practice that provides an updated assessment of power sector reform experiences across the developing world. The initiative aims to revisit and refresh thinking on power sector reform approaches, in the light of accumulated evidence about the performance of countries undertaking different types of reforms. The goal is to reignite the policy debate around reform approaches by articulating a new vision that incorporates lessons learned over the past 25 years. It also reflects on how recent technological trends and business models that are disrupting the sector may call for a new thinking on reform strategies.

Since the 1990s, a standard set of policy prescriptions for power sector reform has been widely used. These include vertical and horizontal unbundling of power utilities; private sector participation; creation of an independent regulator; achievement of cost recovery pricing; and the introduction of competition in power generation. While this package of reforms was, at least partially, adopted by several developing countries, momentum and uptake slowed considerably in the 2000s. There is a need to revise approaches in the light of 25 years of experience, evidence, and technological disruptions to provide practitioners with a flexible frame of reference that can help identify the types of reforms needed to improve the power sector in different country contexts.

Supported by the World Bank’s [Energy Sector Management Assistance Program](#) (ESMAP) and the [Public – Private Infrastructure Advisory Facility](#) (PPIAF), the initiative works with different partners and experts across the World Bank Group (WBG) and beyond to generate evidence, analysis and insights on key themes of interest to power sector reform practitioners and decision makers globally: cost recovery, utility governance and restructuring, power markets, regulation, and political economy. Findings and recommendations on each of these themes will be included in a forthcoming Flagship Report.

The initiative is strongly evidence-based, grounding its research in an in-depth exploration of the 25-year power sector reform journey of 15 World Bank Group client countries that represent a wide diversity of geographies, income levels, and approaches to reform. The selected countries are Colombia, the Dominican Republic, the Arab Republic of Egypt, India, Kenya, Morocco, Pakistan, Peru, the Philippines, Senegal, Tajikistan, Tanzania, Uganda, Ukraine, and Vietnam.

An important output of the project is a series of case studies – of which this is one – that provide a narrative of the reform dynamics in each country and evaluate the impact of reforms on key dimensions of sector performance including security of supply, operational efficiency, cost recovery and energy access. For a subset of countries that pursued deeper reforms – Colombia, India, Peru and the Philippines – the project also includes a series of free-standing case studies that evaluate the experience with wholesale power markets. The purpose of the case studies is to reflect upon the experiences of individual countries with a view to extracting lessons of broader interest to the global community. It is not the role of these papers to recommend any particular way forward for the countries in question.

These case studies, which constitute companions to the synthesis of the Flagship Report, are being published in the Policy Research Working Paper series of the World Bank. As such, the case studies represent the views of the authors alone and should not be attributed to the World Bank or to any other person or institution.

Introduction

The Egyptian power sector has been entirely under government control since the nationalization in 1962 with only a handful of IPPs developed later. For much of the period since nationalization, the sector has received both explicit and implicit subsidies, creating very little incentive for efficiency improvement in the sector. Reforms have been announced frequently but implemented only very partially and in short bursts (with long periods of relatively little reform between the bursts). This has not been very different from the pace of economic reform in the rest of the Egyptian economy.

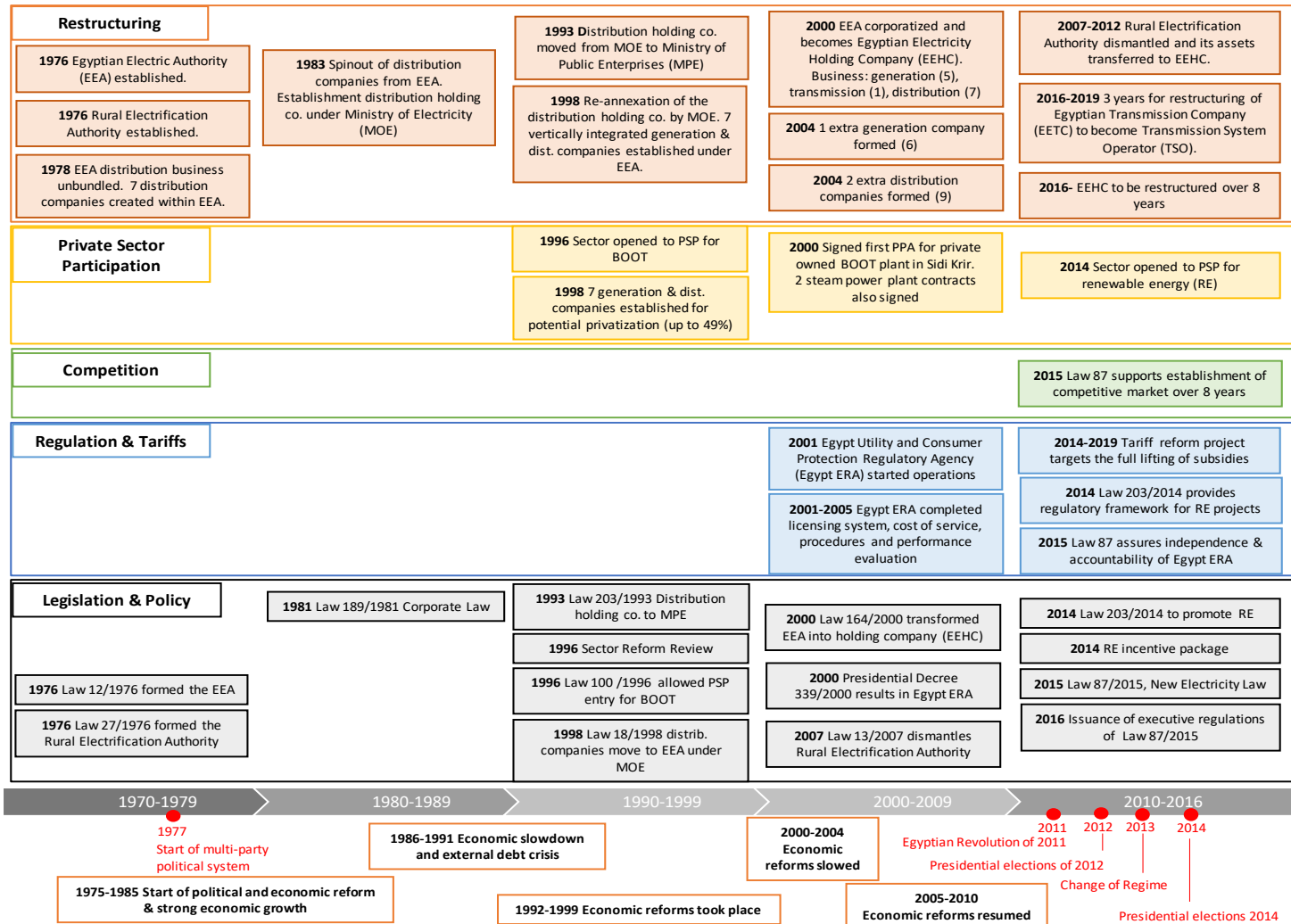
Figure 1 presents the main reform events in the power sector since the 1970s grouped in the various elements of reforms- restructuring, regulation, private sector participation and competition. Overall, we see until very recent years the achievement of only a marginal role for private sector participation, a restructuring that has been more nominal than real (figure 2), some competition *for* the market but none *in* the market, a regulator that has developed considerable capacity to advise and monitor but with no independence over the critical issue of cost recovery, and cost recovery itself which has been a long way from full (even in financial terms, let alone in economic terms when the large implicit subsidies in natural gas prices as fuel to the power sector are accounted for).²

The actual reform agenda today remains quite large (even though the implementation of reform has accelerated somewhat since 2014, particularly in catching up on cost recovery). It is also important to recognize that data for this study range from 1990-2015, to align with other countries as part of the study, and hence they do not capture the detailed impact of reforms undertaken since 2015. Wherever possible, the reform steps after 2015 have been mentioned to give an idea of the kinds of changes the sector is going through, but this study is primarily an attempt to understand the experience of power sector reforms in Egypt and draw lessons for the larger global community.

This paper sets out to cover the Egyptian power sector reform story since the 1990s focusing on sector outcomes such as security of supply, access and affordability, utility performance, and sector regulation and tariff setting. The paper begins with a chronological account of the power sector reforms and the associated political economy. Then the paper considers the impact of the reform steps taken in the Egyptian power sector, by highlighting the sector performance over the years. Finally, the paper concludes by reflecting on the lessons learned from Egypt's two decade long reform experience that can be relevant to policy makers globally.

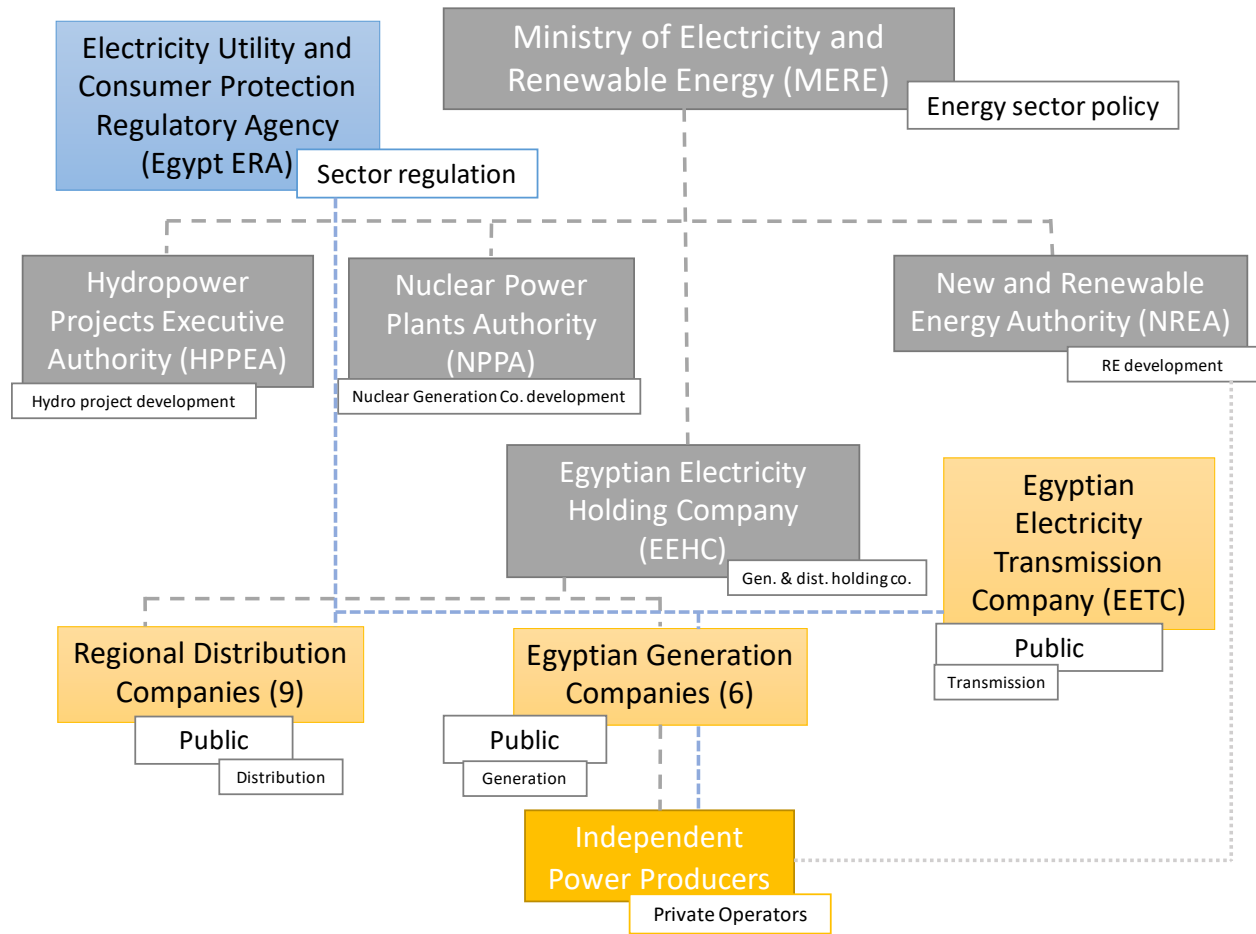
² Natural gas in Egypt has generally been priced to the power sector well below its opportunity cost.

Figure 1: Egypt Power Sector Reform Timeline³



³ In 2019, the Egyptian Constitution was amended to extend presidential terms (including of the current President, former Field Marshal Abdel Fattah Al-Sisi), give greater presidential control over the judiciary, and more deeply enshrine the role of the military in politics.

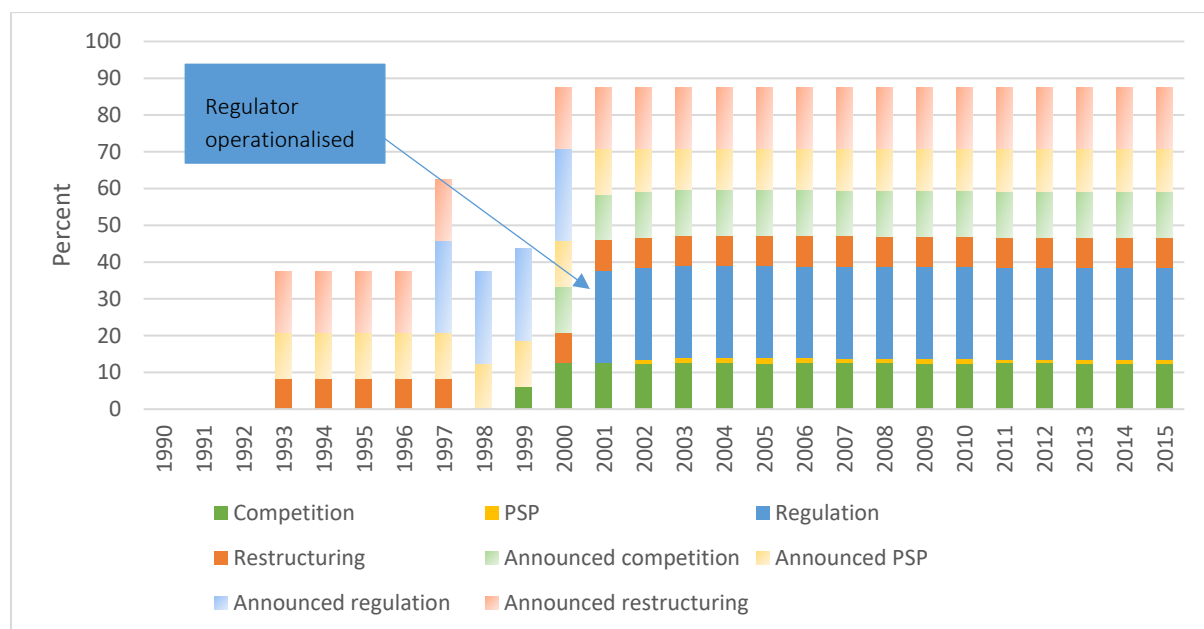
Figure 2: Institutional structure of the power sector, 2015



Egypt's Power Sector Reform Story

The story of Egyptian economic reform over a long period of time has been one of short bursts of partial reform of a highly centralized, public sector-led economic model, followed by longer periods with relatively little reform, largely because of political economy challenges. The power sector has been no exception to that overall trend. Egypt has at times committed to a major role for private sector participation, the restructuring of the sector by full unbundling, the creation of a competitive market, the establishment of an independent regulator, and full cost recovery. However, as seen in figure 3, only a limited amount of these commitments have been met.

Figure 3: Egypt Power Sector Reforms⁴



Source: Rethinking Power Sector Reform.

PSP = private sector participation.

Currently there is a revived attempt at reform in the power sector, focusing primarily on the core issue of addressing the supply deficit, annual price and subsidy adjustment to reach the subsidy target of 0.5% of GDP, a partial reopening to private participation in generation (particularly in renewable energy), and a

⁴ In order to aggregate across the four dimensions of power sector reform considered in this study, a simple Power Sector Reform Index is constructed. The index gives each country a score on an interval of 0 to 100 on each dimension of power sector reform. The scores are based on giving equal weight to each step on each dimension of the reform continuum. The average of the four 0-100 scores is used to provide an overall summary of the extent of reform. Announced reforms are by no means always implemented, and Figure 3 disaggregates each of the four reform components into that which was implemented and that which was only “announced” but not implemented.

gradualist approach to reform of sector structures to create a more efficient and competitive framework over the medium term. That phase of renewed reforms has been in place since 2014 and appears to have been sustained to date because of a combination of a top-down political process, and an appropriate sequencing and level of ambition in the reforms actually being attempted. Only time will tell if the current phase has overcome the past pattern of reform bursts being short. What follows is a description of the phases of power sector reform in Egypt.

1962-1996: Nationalization and institutional consolidation

Electricity service began in Egypt in 1893 under private initiative. In 1962, the electricity companies were nationalized, and in 1964 the Ministry of Electricity was established. The nationalized companies were grouped into three public authorities, namely the generation authority, transmission and distribution authority, and authority for project execution. In 1965, these authorities were bundled into a vertically integrated entity, the Egyptian General Establishment for Electricity. In 1976, the Egyptian General Establishment for Electricity was replaced by the Egyptian Electricity Authority (EEA) by Law 12. According to Law 12, EEA could propose tariffs (following tariff guidelines approved by the Supreme Council for Electricity and a ministerial committee), which needed to be approved by the Cabinet of Ministers. At the same time, the Rural Electrification Authority was established to extend access to electricity service; as such access projects were completed, they were transferred to EEA.

In 1978, EEA created seven geographical distribution companies (owned by EEA), and in 1983 those companies were spun off into the General Authority for the Distribution of Electric Power. Initially, both EEA and the General Authority were under the Ministry of Electricity, but in 1993 the General Authority was moved to the Ministry of Public Enterprises (and became the Holding Company for the Distribution of Electric Power). The move to the Ministry of Public Enterprises was seen as a first step towards privatization, which did not subsequently take place.

Overall, during this period, two clear patterns emerged, which have dominated power sector reform in Egypt since. One is the very centralized government-led approach to tariff-setting, with political considerations being very important. The other pattern is that, in the absence of tariffs which would create clear incentives for efficiency in power sector entities, reforms of structures were generally more symbolic than real. Names of entities changed, as did their legal basis, but there is little evidence from this period of real change in their governance or behavior.

1996-2003: Marginal opening to private participation in generation, and further institutional consolidation

In 1996, Law 100 was adopted which allowed the private sector to generate electricity (under a “build, own, and operate” concession), and to sell the electricity to EEA under power purchase agreements. Three such IPPs were created, which were commissioned in 2002/2003. A further 10 IPPs were planned to be procured. This was perhaps the single most important structural reform in the power sector since nationalization in 1962.

However, the tariffs in those PPAs obviously reflected full recovery of costs, in the context of an overall power sector which was far from having such tariffs, and the IPP’s PPAs were denominated in US dollars to reflect the opportunity cost of capital and of internationally-tradeable fuel. Consequently, when the

overvalued currency sharply depreciated in 2003/2004, the local currency cost of the PPAs to a financially unhealthy sector was deemed to be excessive. The plan to procure more IPPs was therefore suspended, and procurement switched to public sector plants (albeit largely financed by foreign currency-denominated loans from development partners, so that the net effect of that switch on overall financial risk to the government and power sector is unclear).⁵

More consolidation and rearrangement of institutions took place: in 1998, the distribution companies left the Ministry of Public Enterprises, and were moved back into EEA. They were then integrated with EEA's generation companies to form seven geographical vertically-integrated companies under EEA (transmission was a separate company within EEA). Those seven companies were formed as joint-stock companies, allowing for the sale of 49 percent of the shares to be offered to the public (with approval from the Cabinet), but that sale did not actually happen.

In 2000, EEA was corporatized and renamed the Egyptian Electricity Holding Company (EEHC), and the seven vertically-integrated companies created in 1998 were transformed into five generation companies (in 2004 this became six generation companies), seven distribution companies (in 2004, this became nine), and one transmission company. EEHC's affiliate generation and distribution companies were also formed as joint-stock companies (but no sale of their shares actually happened either). The transmission company was designated as the single buyer (and seller) of bulk electricity.

Also in 2000, the Egyptian Electric Utility and Consumer Protection Regulatory Agency (EgyptERA) was created by presidential decree, and commenced operations in 2001. By 2005, EgyptERA had completed its cost of service procedures, licensing system, and benchmarking and performance evaluation. EgyptERA essentially played an oversight and advisory role – tariff and subsidy decisions remained with the Cabinet of Ministers, given the political sensitivity of such decisions.

2003-2014: Shift back to the public sector model and stalling of reform

In this period, reforms effectively stalled. No further attempts at private participation were made. The sector's investments were externally financed primarily by development partners and state-owned banks. Tariff and subsidy adjustment occurred in nominal terms, but tariff increases were eroded by inflation – in real terms, tariffs often declined year-on-year. Nominal tariff increases were not always announced, at least not with high profile, and were not necessarily even transparent on electricity bills. Arrears started to accumulate for supplies of natural gas to the power sector and reached US\$6.8 billion by 2014, leading to gross underinvestment in the upstream gas sector. The resulting import of LNG eventually led to supply shortages (and the curtailment of gas exports, a significant source of foreign exchange for Egypt). In 2013/2014, there were widespread blackouts of up to 6 hours daily in the electricity sector,⁶ which later led to gas sector reform to attract foreign direct investment, and undertake emergency power

⁵ Ongoing PPAs were however fully honored.

⁶ These blackouts became a significant source of popular discontent, contributing to the events which led up to the 2013 regime change, and making resolving them a very high priority for the new government. This period also coincided with the discovery of the very large Zohr gas field, with its potential for providing Egypt with low-cost natural gas.

procurement of about 2500 MW and large-scale public procurement of 14,400 MW of conventional power capacity backed by 2000 MW of private sector capacity in solar and wind.

However, some preparation for future reforms nonetheless took place in this period. This centered on preparing the legal framework for eventual competition and enhancement of the business environment in the electricity sector. The draft law was considered by EgyptERA over the 2005-2008 period, was subject to public consultation in 2010, and reviewed by Parliament in 2014.

Also in this period, Egypt was able to declare success in the campaign to create near-universal electricity access (achieving a commendable grid access rate of 99 percent). In consequence, the REA was dismantled (gradually over the 2007-2012 period) and its assets transferred to the respective distribution companies (and any further grid expansion became their responsibility).

2014-present: Renewed efforts at reform

In 2014, a subtle but important shift took place in the Egyptian government's approach to power sector reform. This shift had various interrelated aspects. Years of providing subsidized electricity and the consequent underinvestment in the power sector had manufactured a power crisis in the country. The public was facing major power outages while the government was tackling the massive fiscal burden of the subsidies in the sector.

The new government decided to change its approach to the sector and committed to a comprehensive power sector reform program as part of a larger macroeconomic reform planned in collaboration with the IMF and the World Bank. The reform steps include subsidy reform in the fuel and power sector bringing down energy subsidies from 6.8% of GDP in 2014 to 1.4% of GDP in 2019 even after accounting for almost 100% currency devaluation in 2016, institutionalizing an automatic fuel price indexation, initiating a long-term reorganization of the sector and attracting the private sector for investment in more sustainable forms of power supply.

Tackling the subsidies in the power sector is by far the most significant challenge in the sector. The government committed to bringing the tariffs in line with the costs of supply over a specific period of time. A key aspect was that electricity price and subsidy reform became much more public. Adjustments were publicly announced, in a quite high-profile way, with justifications being given to the public for price increases. This was a significant increase in transparency from previous practice and may have served to deepen the public consensus behind the necessity of reform (although the relatively authoritarian political context and controlled media make this difficult to ascertain). It should be noted that the government had a more proactive communications strategy about power sector reform than had been evident in Egypt hitherto.

Price increases were sharper than had previously been adopted and were more explicitly based on actually reflecting costs as costs changed, rather than accumulating financial deficits for the future. Price increases for fuel (particularly natural gas) became an important input into the electricity price adjustment process (instead of electricity's problems just being shunted into the natural gas supply chain by underpricing gas as a fuel for electricity and accumulating payment arrears for it). Interestingly, in 2015, Egypt also announced the discovery of large natural gas fields in Zohr. The gas field started production in 2018- a significant development for the power sector in Egypt which is largely dependent on natural gas. Prior to

the development of Zohr and discovery of other gas fields, Egypt was a net importer of fossil fuels but declared itself to be self-sufficient in natural gas at the end of 2018, reducing the import bill significantly.

It is notable that Egypt's social protection system was being reformed in parallel to energy price adjustment (indeed the energy subsidy reductions allowed government budget reallocations to social protection)—cash transfers to the poor and non-energy consumer subsidies were becoming better-targeted with almost 2.2 million households receiving conditional cash transfers in 2018 compared to zero in 2014, relieving the energy subsidy system of some of the political burden of protecting the poor. It is also worth noting that international fuel price decline for part of this period facilitated the move towards cost recovery in the power sector, and that the major currency devaluation of November 2016 caused a three-year extension of the program of electricity price increases in order to not magnify the impact of the increases in the cost of supply (caused by the devaluation⁷) on the population and the economy. Indeed, in addition to being willing to slow the pace of electricity price increases in the face of shocks, the reform of underlying incentives was very gradualist. Electricity pricing did not move to an incentive-based form of regulation, or to a significantly greater public transparency about electricity company budgets (although there was more transparency about actual costs of service). Moreover, electricity price adjustments did not become any less politically-determined, although subsidy decisions became more transparent and explicit.⁸ This is perhaps inevitable, particularly given the large size of financial and economic catch-up needed after years of power and gas price⁹ adjustments being so modest.

Perhaps even more fundamentally, the sector avoided the past practice of restructuring in appearance only because lack of price adjustment made changes in structural incentives ineffective in their impact on efficiency. The new Electricity Law (adopted in July 2015) provided a three-year transition period for EETC to become a transmission system operator independent from generation and distribution (such that a competitive electricity market could later emerge on a level playing field), and provided EEHC an eight-year period to be restructured into potentially competing entities to play on that field.

In parallel, a law to encourage private sector investment in renewable energy was adopted, and with some necessary adjustments to enhance the business environment, began to attract significant private investment into the Egyptian power sector again. Solar capacity in Egypt was limited to mostly standalone applications in 2015 apart from one 10MW PV-diesel hybrid plant. However, the government introduced net metering and FiT schemes to encourage investment in the solar sector. While the net metering scheme had limited uptake given the low electricity tariffs, as the government moves to make tariffs more cost reflective, it is expected to become more popular. The FIT scheme was introduced in October 2014 with transmission and distribution companies committed to purchasing all power from available plants through 25 year PPAs. More than 40 utility scale PV projects with a total of 2000MW capacity were under

⁷ The devaluation increased the local currency cost of fuel payments and debt service.

⁸ In the new approach, the regulator's methodology determines the cost of supply and hence the revenue requirement of the electricity companies; the resultant revenue is then paid partly by the consumer as a tariff and partly by the Ministry of Finance in the form of an explicit subsidy, as decided by the Cabinet of Ministers according to the tariff adjustment program.

⁹ Gas supply costs may increase sharply in the coming years as gas production moves into deeper water with new discoveries; this will be a challenge for the electricity price adjustment program.

development by 2016 but the program was hit hard by the foreign exchange shortage of 2016.¹⁰ By 2018 the FiT program was concluded with \$2.5 billion in FDI and PPAs signed for about 1600MW of solar and 250 MW of wind power.

At the same time, large public investments in conventional power continued to take place (particularly the EPC deal for 14,4000 MW concluded with Siemens in 2015). In essence, Egypt turned to the private sector to access the experience and rapidly falling costs in renewable energy but has not yet followed that path for conventional energy. It remains to be seen whether this represents a permanent shift towards now-cheap disruptive technologies, or instead represents the power of vested interests in conventional energy to protect those interests. In a similar vein, a modernization program initiated in the Ministry of Petroleum and Natural Gas aimed to bring gas security has managed to eliminate gas imports and initiated gas exports after a gap of 7 years.

In short, the period since 2014 shows a genuinely new phase in Egyptian power sector reform, more ambitious and deliberately sequenced and coordinated than hitherto, but nonetheless the reforms are still to be deeply institutionalized and their sustainability to be assured. Much will depend on how conflicts between various interests play out, and how Egypt’s politics evolve. Table1 highlights the various policies and legislations implemented in the sector from 1976 to 2016.

Table 1: Egypt Power Sector Policy and Legislation, 1976-2016

<u>Policy, Master Plans, and Roadmaps</u>	<u>Legislation</u>
	Law 12/1976 Establishment of Egyptian Electricity Authority Law 27/1976 Establishment of Nuclear Power Plants Authority
	Law 189/1981 Corporate Law
	Law 203/1993
1996 Sector Reform Review developed by international consultant Merrill Lynch	Law 100/1996
	Law 18/1998
	Law 164/2000 Transformation of EEA into EEHC Presidential Decree 339/2000 Establishment of EgyptERA
	Law 13/2007 Dissolution of Rural Electrification Company
	Law 203/2014 to Promote Renewable Energy Production
2005 First draft of new law developed with help of international consultant (IRG, USA).	Law 87/2015 the New Electricity Law Issuance of executive regulations of Law 87/2015
2005-2008 First draft discussed and enhanced substantially through the board of EgyptERA over several sessions extended over three years, ended mid-2008.	
2010 public consultation	Ministerial Decree 230/2016 the Executive Regulations of Electricity Law

¹⁰ Discussion on renewables based on Sakr, Dalia Abdelhamid Mahmoud; Huenteler, Joern Torsten; Matsuo, Tyler Marissa; Khanna, Ashish. 2017. *Scaling up distributed solar in emerging markets : the case of the Arab Republic of Egypt (English)*. Policy Research working paper; no. WPS 8103. Washington, D.C. : World Bank Group.

Egypt's Power Sector Performance

The above sections summarized Egypt's power sector reforms, and this section now looks at the effects of those reforms on sector performance and development. It considers how performance changed in a number of key areas: security of supply; access and affordability; efficiency and financial viability, and tariffs and cost recovery. It then evaluates how the institutional reforms have been responsible for that evolution of performance.

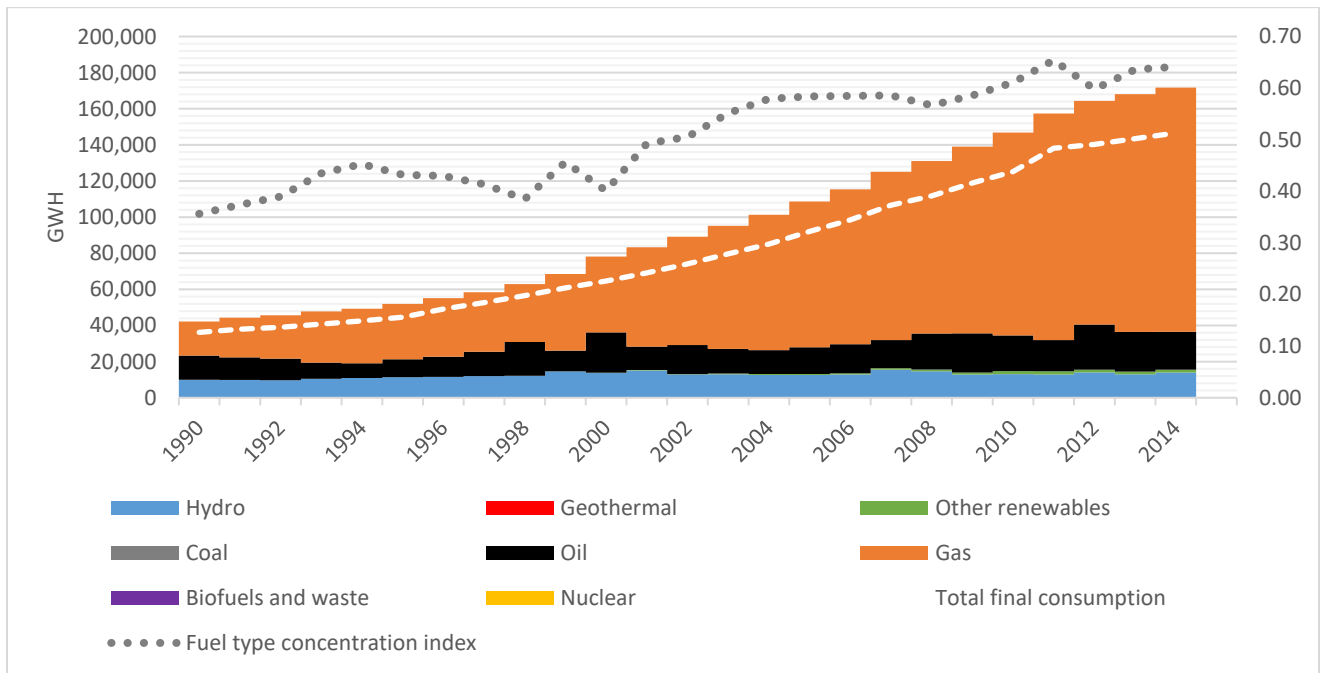
Security of Supply

Performance

Over the long period, electricity supply in Egypt has generally been secure. With occasional exceptions, perhaps most notably during the 2012-2013 period (a period of high political turbulence and contestation), supply has been provided throughout Egypt without significant load-shedding or major disruptions. This has been due to a considerable extent to the overall effectiveness of electricity sector planning and procurement (even if it has not been with full regard to the financial viability of the electricity sector to provide such continuity of supply and universal access to it, nor with full regard to the financial impact on the natural gas sector in its supply of fuel to the electricity sector). After the assumption of office by the Al-Sisi government, the public sector procurement of conventional power capacity, the procurement of private sector renewable energy capacity, and the resolution of pricing and payment issues impeding development of the upstream gas sector were all accelerated to prevent the recurrence of load-shedding that had exacerbated the political turbulence.

While the sector has been able to provide reliable power over the years, the dependence on natural gas has only grown over the years (figure 4). This was a big concern for the country, as non-cost reflective tariffs increased fiscal deficits at a time when Egypt was importing natural gas and oil. However, consequent discoveries of natural gas reserves since 2015 set the country on a path to becoming a net exporter of natural gas in 2019 and have diminished these concerns.

Figure 4. Generation of power, by fuel (1990-2014)



Source: IEA, 2015

Institutions

In general, planning and procurement of generation and transmission in the Egyptian power sector are conducted by the Ministry of Energy, EEHC, and EETC, in close coordination and reasonably in advance of the new assets being needed by the power system. The power sector saw several new laws and policies put into place in 2015 and the country is transitioning to this new framework currently. Since 2000, generation planning was done by the EEHC and the transmission planning was done by EETC. Once the plans were submitted to and approved by the Ministry of Electricity and Renewable Energy, they were presented to the cabinet of the ministers for approval and allocation of the necessary financial resources for the execution of the plan. However, the new electricity law in 2015, Law 87, assigned the planning task to the EETC (functioning post 2015 as a TSO) jointly with the Ministry of Electricity and Renewable Energy, allowing for three transitional years. The plan will be more or less indicative, with an annual report for adequacy of generation issued by the EETC and reviewed by the regulatory agency- EgyptERA. The regulator will then report to the cabinet of ministers and make suggestions to overcome any challenge to the security of supply.

Most procurement has of course been conducted for public sector projects (with the exception of the brief burst of IPP procurement 20 years ago, and the recent rounds of renewable energy generation procurements), as EPC contracts on a competitive basis (usually with a high degree of transparency, particularly for projects with development partner financing). As of 2015, the procurement was carried out based on the five-year generation or transmission plans. The respective generation or transmission companies raise funds locally and globally (mostly through IFIs such as World Bank, EBRD, AfDB etc.). Once financing is in place, the project equipment, engineering and construction services are procured through

internationally competitive tenders in most cases. While procurement is usually carried out through competitive bidding, some large plants procured in the period 2010-2015 were through direct negotiations.

It is worth noting that part of the government resistance to procurement of private investment stemmed from the belief that reserve margins in the sector were not sufficient to tolerate the uncertainty about timing that is intrinsic to negotiating with the private sector – that can be seen as an inadequacy in the planning process (i.e. private sector procurements should have been initiated early enough). However, after initial teething troubles, this belief may have been overcome by the recent renewable energy procurements, which have successfully involved private investment.

Egypt scores relatively high when it comes to the procurement and planning index developed for the rethinking power sector reform project (table 2). The country scores higher than the international average for the various indicators used in the index.

Table 2: Benchmarking institutional arrangements for power sector planning, 2015¹¹

	Egypt	India	Morocco	Pakistan	International benchmark
Planning and Procurement	82%	78%	61%	63%	71%
Generation Planning	71%	57%	43%	29%	56%
Procurement of Generation	100%	95%	100%	100%	85%
Transmission Planning	75%	75%	50%	25%	74%
Transmission Procurement	83%	83%	50%	100%	68%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project.

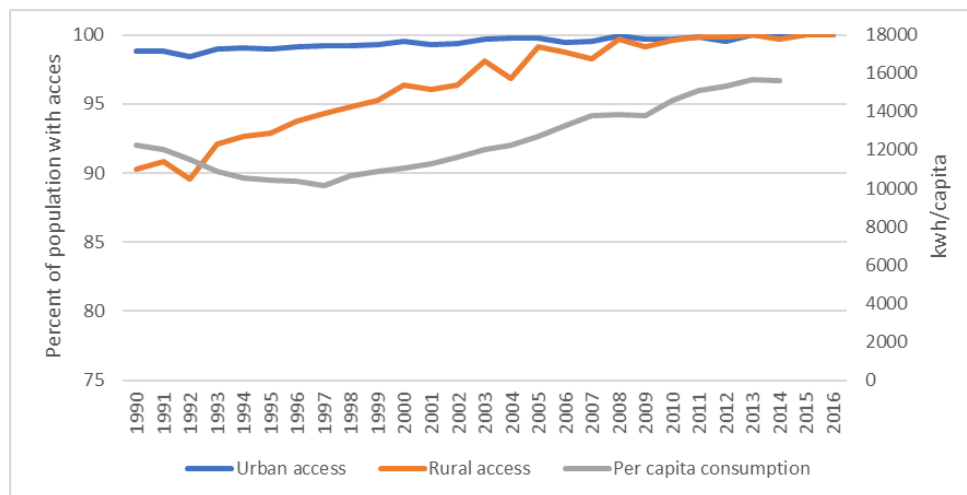
Nonetheless two aspects can usefully be emphasized. First, sector institutions have not yet demonstrated that they can sustain their effectiveness in procurement of private investment over a long period of time. Secondly, and perhaps more importantly, they have not yet shown that they can procure the appropriate power system mix of flexible generation (and energy storage), variable renewable generation, and transmission, in a context of the rapidly falling costs of variable renewables, and growing penetration of those renewables. That is the big planning challenge now for Egypt.

Access and Affordability

Egypt's track record on access and affordability is quite good. In 1971, the Rural Electrification Authority (REA) was established to create universal access to grid electricity, without a strong regard for the actual cost of providing grid electricity service. By 2007, more than 99 percent of the Egyptian population had access to grid electricity, and in 2012 the REA was dissolved. The distribution companies took over the networks of connections the REA had created, and they assumed responsibility for further expansion as the number of households or commercial customers grew.

¹¹ For the detailed planning and procurement index, see the annex.

Figure 5. Electricity access and consumption, 1990-2016



Source: Tracking SDG7 Report, 2017 and IEA, 2016

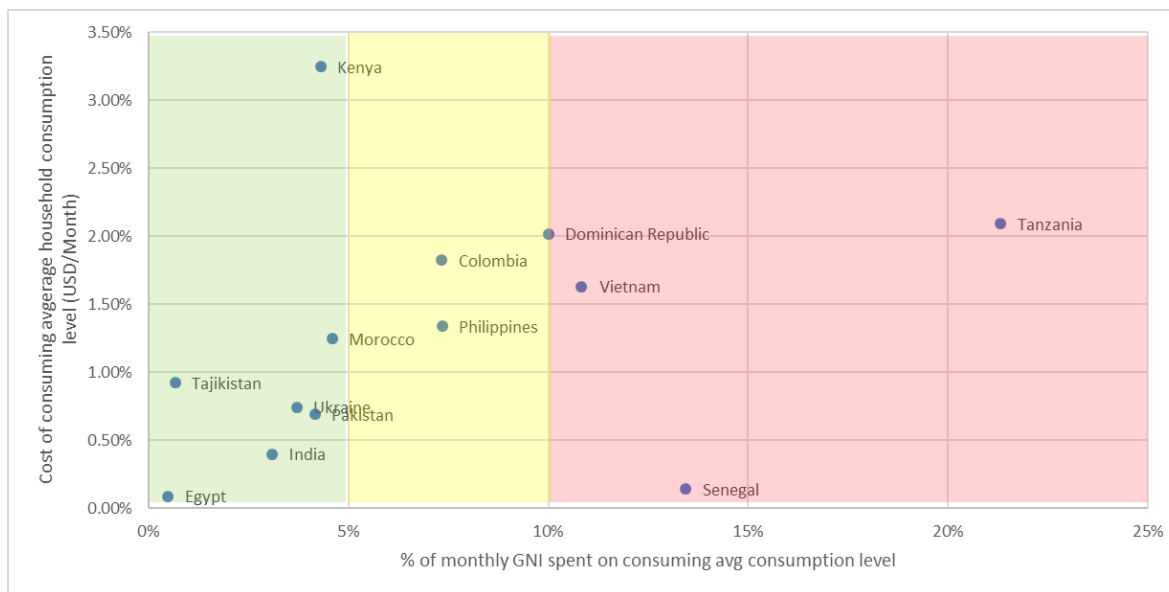
While universal access was achieved early through grid expansion, electricity was also very affordable in Egypt.¹² To purchase the average consumption level of electricity, the bottom 40 percent of households would have to spend 0.5 percent of the income in 2015, making it the most affordable electricity tariffs among the 17 rethinking power sector reform project economies (figure 6).

In essence, a policy decision had been taken in Egypt that electricity would be supplied to all customers at well below cost, and that expansion to universal access would take place within that policy framework. Egypt was greatly successful in implementing the policy of universal access over a 36-year period, but at the cost of greatly burdening¹³ the financial viability of electricity service providers and therefore impeding the uptake of more efficient investments or operating practices (given that adjustment to cost-recovery only proceeded in short and largely unsustainable bursts in that period). This was not atypical of Egyptian policy decisions about trade-offs across the economy, perhaps best exemplified by the absorption of vast numbers of people in public employment, without a strong regard for the impact on the productivity of labor, private sector development, international competitiveness, or the pace of innovation. And yet, most people had jobs, almost everyone had electricity, and social peace was broadly maintained.

¹² Analysis based on 2015 data; tariffs have increased substantially since then.

¹³ However, it is worth pointing out that the population of Egypt is highly concentrated around the Nile, which served to mitigate the cost of providing universal access.

Figure 6. Affordability of electricity in Egypt, 2015



Source: Own elaboration based on data from Tracking SDG7 and RISE 2017

Efficiency & Financial Viability

Performance

An observer of regulated electricity utilities can divide an analysis of their performance into what is done to them and what they do for themselves. The latter is the subject of the present section (and the former the subject of the subsequent section on “Tariffs and Cost Recovery”).

In essence, in Egypt utilities have done reasonable things for themselves, given that most of the challenges to their efficiency and financial viability have not actually come from within, but result largely from what is done to them (by the government and the regulator). A good example of this is the collections record of the distribution companies, which has been generally rather good when it comes to collecting dues from the private citizens but becomes poor when we include public consumers such as ministries and other government entities.

Understandably, the restructuring of utilities in Egypt has been deliberately not very deep, because of the very realization that restructuring cannot have much impact on efficiency or financial viability if tariffs continue to be set well below the revenue requirements that could be utilized to induce and incentivize that efficiency.

Two of the largest distribution utilities in Egypt- North Cairo Electricity Distribution Company and Alexandria Electricity Distribution Company – have been selected for a detailed analysis of utility efficiency. Both North Cairo and Alexandria have distribution losses that are just above the regional efficient loss levels of 7 percent but have low collection rates (table 3). As mentioned above, the collection rates for both the utilities are affected by nonpayment of dues by government entities.

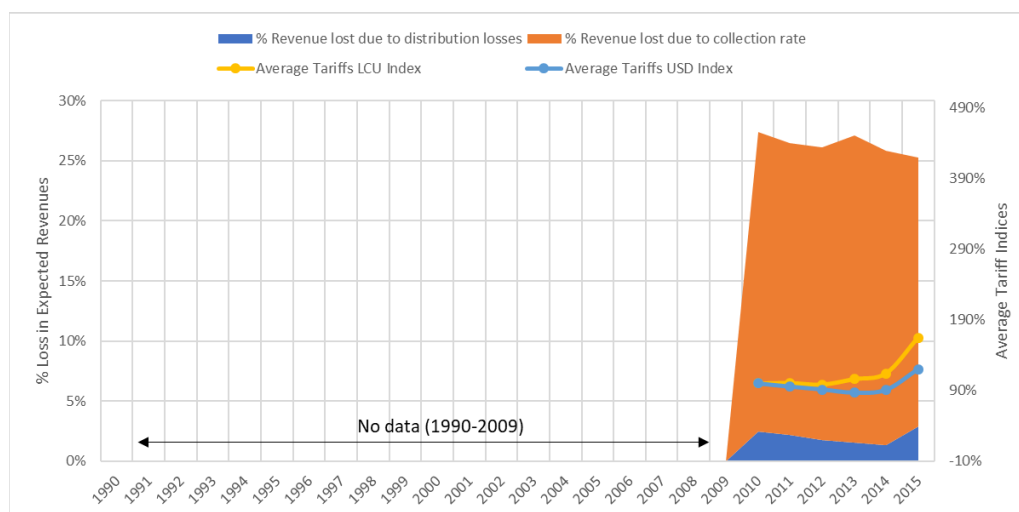
Table 3. Collection rates and distribution losses for Cairo North and Alexandria, 2010-2015

	Alexandria		North Cairo	
	Collection rate	Distribution Losses	Collection rate	Distribution Losses
2010	80%	9%	66%	11%
2011	81%	12%	67%	10%
2012	81%	13%	67%	10%
2013	82%	11%	65%	10%
2014	82%	10%	67%	9%
2015	85%	11%	70%	12%

Source: Rethinking power sector reform project, 2015

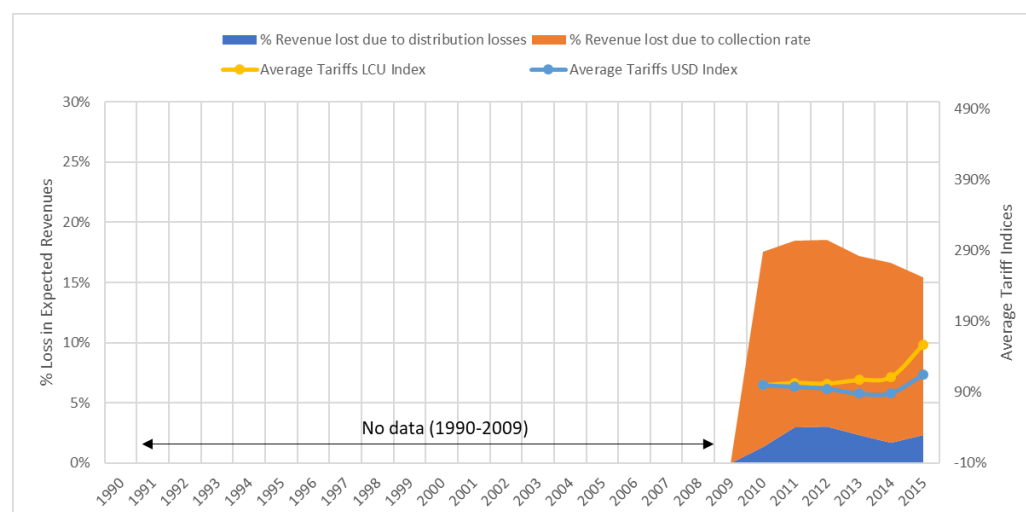
In order to understand the impact of these inefficiencies, the under-collection and excessive system losses are expressed in terms of revenue lost. Figure 7 shows the percent of revenue that Cairo North (fig 7a) and Alexandria (Fig 7b) are foregoing because inefficiencies such as distribution losses and collection rates are below the mark generally considered to be efficient in the region (7 percent for losses and 100 percent collection rate).

Figure 7 a. Evolution of Cairo North’s operational inefficiencies and average tariffs, 1990-2015



Source: Rethinking power sector reforms project, 2015

Figure 7 b. Evolution of Alexandria’s operational inefficiencies and average tariffs, 1990-2015



Source: Rethinking power sector reforms project, 2015

Given the high level of operational inefficiencies seen in the discoms, it is not surprising that their financial condition is not good. Table 4 highlights some of the important indicators that underline the financial health of a utility.

Table 4: Summary of financial indicators for Alexandria and Cairo North, 2015

	Alexandria	Cairo North	Global comparator *
Net profit (loss) margin	-13 percent	-12 percent	-12 percent
EBITDA margin	-9 percent	-12 percent	6 percent
Current ratio [^]	0.53		0.79
Debt service coverage ratio [^]	-0.04		-4.56
External Financing Index Ratio ¹⁴	0.83	1.40	6.92
Investment as a percent of revenues	3 percent	4 percent	18 percent
Government transfers as a percent of utility revenue			6 percent
Net capital cost recovery ratio ^{15^}	-86 percent		16 percent

[^] Data is for EEHC the holding company and not for the individual distribution companies.

* Note: Sample average is derived from the Rethinking Power Sector Reform Project data observatory and includes data from Tanzania, Senegal, Peru, Colombia, Pakistan, the Philippines, Vietnam, Kenya, Uganda, Tajikistan, the Indian states of Rajasthan, Odisha, and Andhra Pradesh, and Egypt

¹⁴ *External financing index ratio* measured as net cash flow from financing divided by the net cash flow from operations.

¹⁵ *Net capital cost recovery ratio* is the percent of full capital costs that can be recovered through tariff revenues net of operating costs.

Institutions

The story of Egypt's utility restructuring is described in detail in the section on Egypt's power sector reform strategy. In essence, in the long period through the 2014 Electricity Law's adoption, much was done but little was achieved. Institutions were rearranged more than they were genuinely restructured. Incentives, performance, and behavior changed little.

The 2015 Electricity Law initiated a process of restructuring, with a long transition process. Eventually, sector companies will operate autonomously of the Ministry of Electricity and Renewable Energy and will be accountable to the regulator and to their owners for performance. More private participation is already happening in renewable energy and that may spread to conventional energy. The transmission company is being gradually made more autonomous in preparation for becoming an independent system operator within an eventually competitive wholesale electricity market. Of course, much of this depends on the sustainability of the gradual price and subsidy reform now underway.

Table 5. Utility restructuring index for Egypt and its comparators, 2015

	Egypt	India, AP	India, Odisha	India, Raj	Morocco	Pakistan	International benchmark
Utility Restructuring	31%	51%	62%	51%	0%	62%	40%
<i>Vertical Unbundling</i>	0.40	0.80	0.80	0.80	0.00	0.80	55%
<i>Horizontal Unbundling</i>	0.22	0.22	0.44	0.22	0.00	0.44	24%

Source: Rethinking power sector reforms, 2015

The commercial and operational efficiency of utilities may be a reflection of the corporate governance and management practices followed at the utility. To understand this relationship better, the corporate governance data for utilities in the rethinking power sector reform project were collected. The data reflect the practices followed in 2015. Given the structure of the power sector in 2015, all distribution companies follow exactly the same governance and management practices given their common ownership and nesting in a holding company. Thus, for this section we do not look at Cairo North and Alexandria separately.

Table 6: Utility governance of Alexandria and Cairo North with their comparators, 2015¹⁶

	Egypt	India, Odisha		India, AP		India, Raj		Pakistan		Morocco	International benchmark
	EEHC (Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVVNL	JDDVNL	LESCO	KE	ONEE	
Overall Utility Governance	55%	68%	26%	52%	52%	63%	63%	52%	90%	53%	63%
Corporate Governance	49%	86%	13%	47%	47%	67%	67%	56%	94%	35%	62%
<i>Accountability</i>	42%	83%	25%	50%	50%	67%	67%	67%	100%	25%	60%
<i>Autonomy (SOEs)</i>	56%	89%	0%	44%	44%	67%	67%	44%	89%	44%	63%
Utility Management	61%	50%	40%	56%	56%	60%	60%	48%	86%	72%	64%
<i>Financial Discipline</i>	53%	43%	36%	53%	53%	64%	64%	50%	79%	64%	59%
<i>Human Resource</i>	71%	70%	40%	43%	43%	36%	36%	43%	86%	79%	62%
<i>Information and Technology</i>	60%	36%	43%	73%	73%	80%	79%	50%	93%	73%	71%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

¹⁶ For the more detailed utility governance index, go to the annex.

The distribution companies in Egypt score poorly on **accountability** (42 percent) as compared to their counterparts in South Asia and North Africa studied in the rethinking project. Appointment of the Board as well as the CEO and the top management is not transparent and there is no audit committee of the board bringing the score down. The Board also struggles to be **autonomous** given the structure of the sector where all utilities report to the minister and several important decisions such as raising capital and appointing the CEO are taken only after approval from the ministry is obtained. Under these circumstances the Board is essentially appointed by the government, is not independent and lacks transparency in its functioning

On **financial discipline** the discoms get closer to the international average (still below it) by following good practices such as having an internal auditing function, external auditing of financial accounts and requirement to meet financial performance targets (the requirement does not seem to be followed in practice though). Nonetheless, the discoms have not been able to get a credit rating, do not have the freedom to issue new bonds or equity and financial reporting does not meet international reporting standards.

The discoms have adopted a number of good **human resource** practices but their implementation remains an issue. Thus, we see that the discoms score higher than the international average on this particular indicator but most of these practices remain on paper and are not really implemented. The discoms claim to have a system of annual staff review in place and claim to have transparency in the hiring process- both claims that are not reflected on the ground.

The Egyptian discoms seem to be trailing in adoption of **information and technology** solutions for managing the system and dealing with the customers. The utilities do not have IT systems that support distribution management or help in incident resolution. The discoms also seem to lack any advanced metering infrastructure.

Summary

Electricity sector restructuring can be divided into two phases, one of which was not really expected to have much impact on efficiency and financial viability (because it was not accompanied by adequate tariff and cost recovery regulation), and the more recent (post-2015) phase in which preparatory restructuring is being done in anticipation of the continuation of the current electricity tariff and subsidy reform program being sustained. Operational and commercial efficiency of the utilities suffers mainly because of nonpayment of dues from government entities forcing them to forego a substantial amount of their revenues. The utilities also lag behind in adopting and implementing best practices to improve their internal governance and management.

Tariffs & Cost Recovery

Performance

Throughout the period (1990-2015) not much effort was put into bringing end user tariffs to cost recovery level in the power sector and correspondingly in the natural gas sector too, as an important supplier of the fuel for the power sector. Large-scale subsidies in both the sectors have been central characteristics of the

energy policy in the country. However, from 2015 onwards momentum towards sustainable cost recovery reforms has been created.

In fact, tariffs have been very low in relation to costs over most of the period covered by this paper, with the exception of the years from 2015. As a result, the economy and society have enjoyed a massive subsidy flow over many years, supporting disposable incomes and employment, and postponing the need to painfully achieve international competitiveness. And in consequence, the power sector has been deprived of self-generated resources, so has needed very extensive propping up.

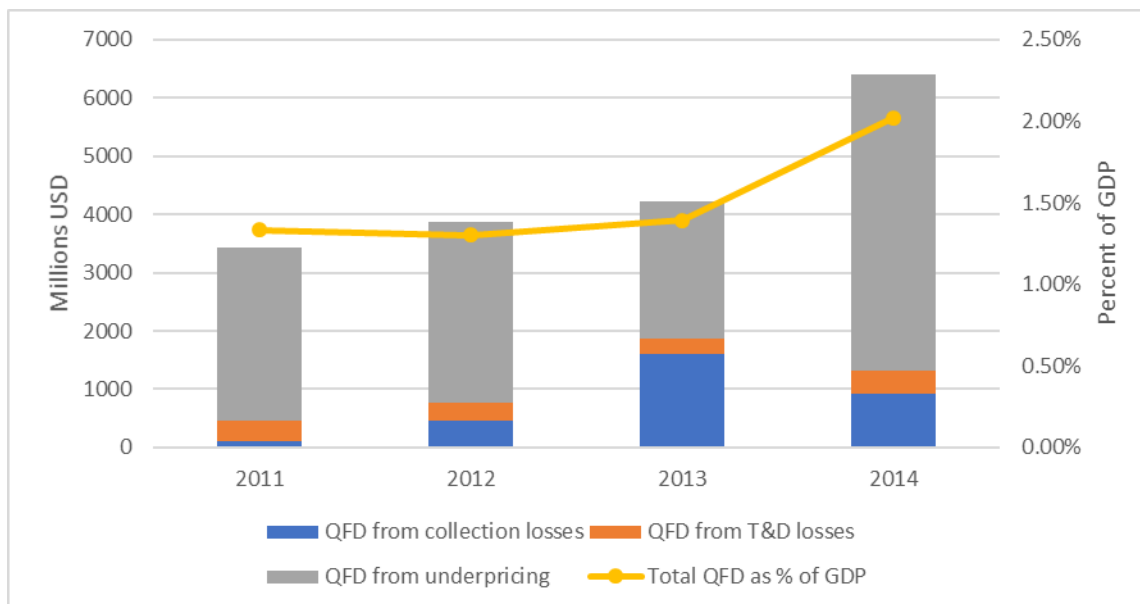
This policy combination is now starting to change in favor of actual cost recovery, and the relevant institutions may perhaps be adapting to make that changes at last. Time will tell, and much will depend on the political will and ability to ride out the adjustment process, and society's will and ability to endure it.

It is very important to note in the data given below, that the most recent years are not reflected, although that is where the recent policy changes have been mostly happening, and the large effects on electricity of underpricing from and underpayment to the natural gas sector are not really captured either. But we do still get a sense of what the performance has been, albeit a partial one. In short, what we see is tariffs well below costs (even on a financial basis without accounting for the economic cost of underpricing natural gas), and a high degree of cross-subsidies between customer classes.

The analysis of cost recovery focuses on the data for the holding company- EEHC. The Quasi fiscal deficit (QFD) measures the revenue gap for a utility by measuring the difference between what an ideal utility with no underpricing, no under collection and technical losses within the 5 percent level would earn and what the real utility actually collects as revenues. The QFD can be divided into three main components: revenue gap attributable to under collections, underpricing, and excessive losses. For Egypt given the structure of the sector, it makes more sense to look at the accounts of the holding company – EEHC.

Complete data are available for only four years 2011-2014 to calculate the QFD (figure 8). There is clearly a trend of rising revenue gap for EEHC during this period with the absolute QFD rising from just over \$3 billion in 2011 to over \$6 billion by 2014. In terms of GDP the QFD rose alarmingly during this period from 1.3 percent to 2.2 percent of the GDP. Over 79 percent of the QFD is attributable to underpricing, a theme that comes up repeatedly during this study. Tariffs have been kept below costs pretty much the entirety of the time period from the 1970s to 2014.

Figure 8: Quasi-Fiscal Deficit Attributable to EEHC, 2011-2014

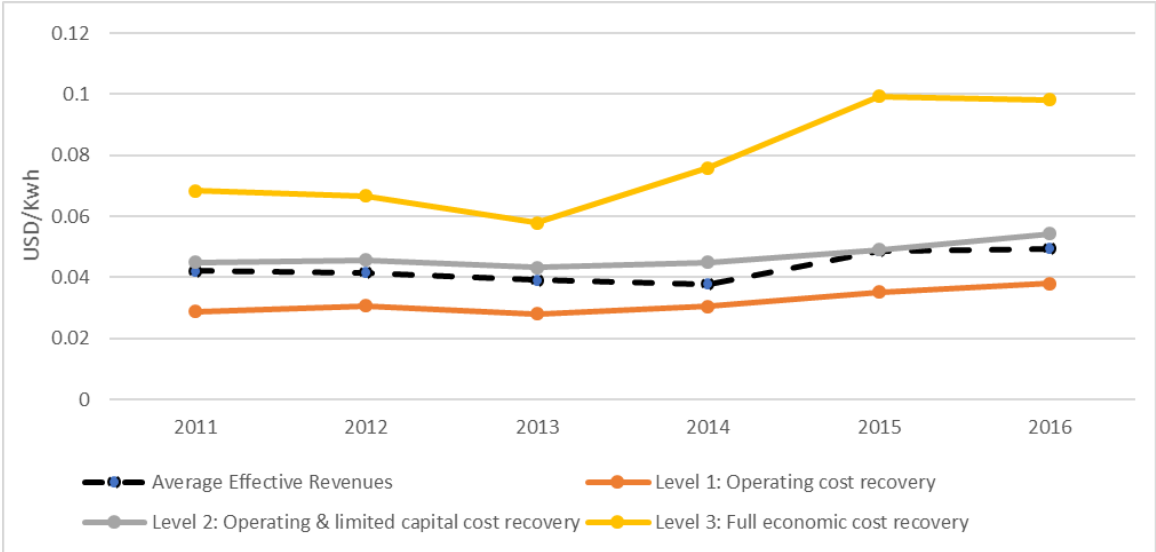


Source: Rethinking power sector reforms, 2015

The financial viability of utilities depends largely on cost recovery through appropriate tariffs. To understand the impact of tariffs on the utilities, a cost recovery analysis was carried out for the rethinking project. The cost recovery analysis sets benchmarks for three levels of cost recovery: first, covering only operating costs; second, covering in addition limited capital costs such as debt service; and third, covering full capital costs on current and planned future investments. The financial viability analysis (stage A) does not account for costs associated with service delivery that are covered separately by other parties, for example if a donor provides concessional capital. In a second stage (called 'stage C'), the analysis evaluates the sector against a full cost recovery benchmark that incorporates any costs that are currently subsidized. Figure 9 below uses both the stages to analyze cost recovery (level 1, level 2 from stage A and level 3 from stage C).

From 2011 to 2016, the tariffs set by the government are able to cover the operational costs, though this is in large part due to the subsidized price of natural gas available to the sector. As far as economic cost recovery goes- a level that includes current and future capital costs, the tariffs in 2015 were much below the cost recovery levels.

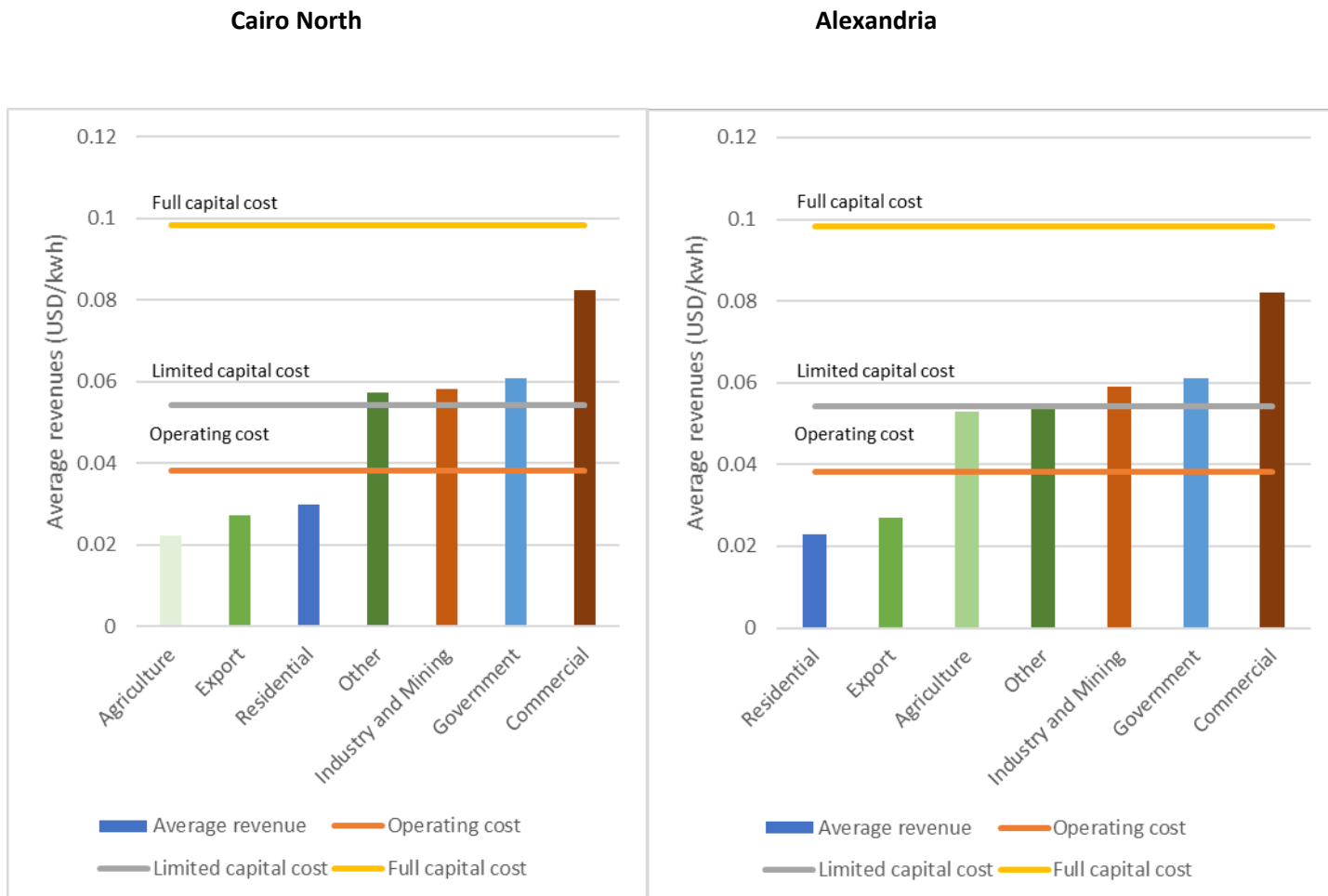
Figure 9: Evolution of full financial cost recovery for EEHC



Source: Rethinking power sector reforms, 2015

Digging deeper into the revenues of Alexandria and North Cairo distribution companies, we find that residential customers are cross subsidized by other customer categories. Residential customers make up 53 percent of Cairo North’s consumption and 52 percent of Alexandria’s consumption, but only 34 percent of Cairo North’s revenues and 29 percent of Alexandria’s (figure 10) . Residential customers are cross-subsidized by commercial, government, and industry and mining customers, which all contribute higher shares of revenue than their shares of consumption. Figure 11 compares the percent of consumption for each customer class to the percent of revenue from that class.

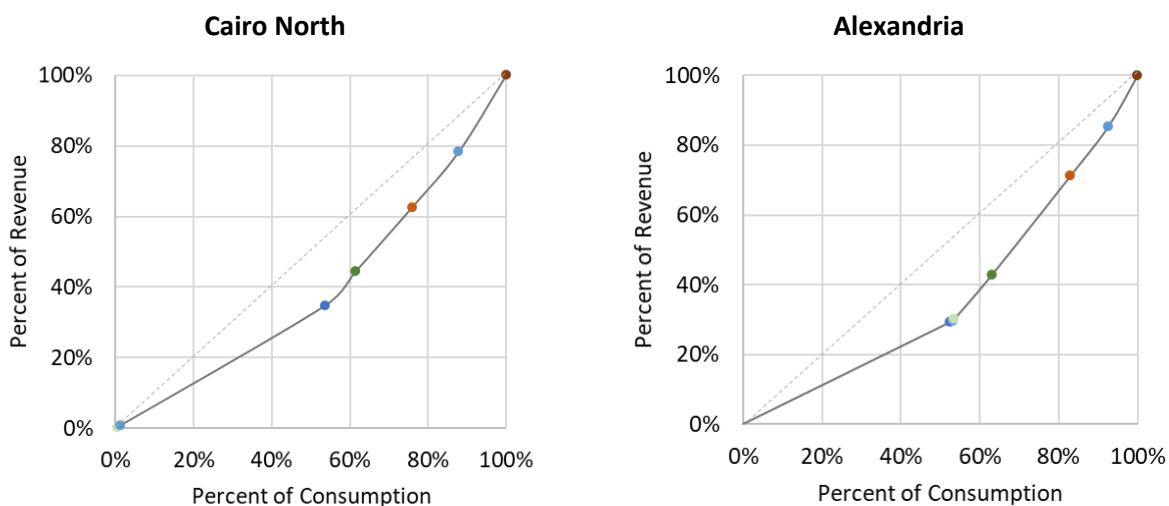
Figure 10: Average tariff revenue and cost recovery level by customer group, 2015



*Export refers to sales to other distribution companies

Source: Rethinking power sector reform project, 2016

Figure 11. Percentage of revenue against percentage of consumption by customer group, 2016



Source: Rethinking power sector reform project, 2016

While subsidies in the electricity sector were a major problem, they extended to the entire energy sector. By 2013 energy subsidies reportedly accounted for 22 percent of government expenditure and 6 percent of the GDP.¹⁷ Realizing the dire situation the government embarked on an ambitious subsidy reform program (as part of macroeconomic reforms) in 2014 with a goal of reducing fossil fuel subsidies to 0.5 percent of the GDP by 2019. Breisinger et al. calculate that electricity tariffs since 2014 have increase by 26 percent in 2014, 17.3 percent in 2015, 30 percent in 2016 and 40 percent in 2017.¹⁸ According to media reports, electricity tariffs were further increased by 26 percent in 2018¹⁹ and are expected to increase again in July 2019.

Institutions

EgyptERA was created through Decree 339 of 2000 and reorganized by the 2015 Electricity Law. The following analysis is based on the framework created by the 2015 law. Information collected for the rethinking power sector reform project was used to create an index that looks to score regulatory frameworks in a country based on two main aspects- governance and performance of the regulatory entity. In the second round of analysis a perceived index was created with the same variables but with input from country experts and World Bank staff on whether the adopted regulatory practices were actually followed in the sector.

According to the 2015 law, EgyptERA is responsible for setting the electricity tariff for regulated consumers, setting economic rules and principles to calculate tariffs and charges, approving access charges to the transmission and distribution networks, setting technical quality standards on the performance of various

¹⁷ Breisinger et al. 2019. Energy subsidy reform for growth and equity in Egypt: The approach matters. Energy Policy 129, pp 661-671.

¹⁸ Ibid. The calculation is done based on the weighted average of prices for residential and non-residential users.

¹⁹ Reuters June 12, 2018- Egypt to cut electricity subsidies in latest austerity move.

electricity services (and monitoring that performance), issuing licenses (and imposing penalties in case of licenses violations), reviewing utility investment plans, and setting rules and procedures to encourage renewable energy production and the efficiency of electricity use. Thus, the regulatory body seems to be responsible for a wide range of activities on par with what is generally considered a regulator’s mandate.

EgyptERA’s **accountability** is governed by an annual report to Government, which is then assessed, as well as some independent evaluations by MedReg, a regional organization of regulators of which EgyptERA is a member. There are legally established processes to allowing regulated entities to appeal decisions of EgyptERA (although this has never yet happened), and those decisions could also be subject to the judicial review of the State Council (under Article 10 of the State Council Law No. 47 of 1972). Transparency is served by the website publication of the annual report, as well as of EgyptERA’s decisions and regulator’s reports (cost of service report, performance evaluation and benchmarking report, indicators for electricity consumption by sector, etc.), and of licensing procedures. All these practices provide the regulator with a high accountability score, higher than the international average for the rethinking project (table 7).

As regards EgyptERA’s *autonomy*, there are no formal provisions under which any government body can overturn EgyptERA’s decisions. The funding of EgyptERA is covered in effect by consumer levies (through the fees paid by the licensees) and can also legally be funded by government budget allocations (but never has been). Again the regulator scores much higher than the global average for the project.

Table 7: Formal regulatory governance in Egypt and comparators, 2015²⁰

Indicators	Egypt	India, AP	India, Odisha	India, Raj	Morocco	Pakistan	International benchmark
Regulatory Governance	77%	68%	68%	68%	NAP	72%	59%
Accountability	87%	91%	91%	91%	NAP	79%	83%
<i>Regulatory Oversight</i>	100%	100%	100%	100%	NAP	67%	81%
<i>Legal Appeals</i>	100%	100%	100%	100%	NAP	100%	100%
<i>Transparency</i>	62%	73%	73%	73%	NAP	70%	67%
Autonomy	89%	75%	75%	75%	NAP	92%	71%
<i>Decision-Making Autonomy</i>	86%	100%	100%	100%	NAP	92%	79%
<i>Budgetary Autonomy</i>	94%	50%	50%	50%	NAP	100%	80%
<i>Leadership Autonomy</i>	75%	50%	50%	50%	NAP	75%	66%
<i>Managerial Autonomy</i>	100%	100%	100%	100%	NAP	100%	59%

Tariff regulation is usually argued to be the most important function for a regulator in the power sector. EgyptERA scores right around the international benchmark for the rethinking project (table 8). The framework provides EgyptERA the authority to fix tariffs however in a sector where the ownership of the utilities lies with the ministry to which the regulator reports to as well, creates an inherent conflict. The government might want to keep tariffs lower than warranted for political reasons creating a problem for the utility finances. Article 41 of the Electricity Law provides that the Cabinet can decide that any tariff be different than one decided by EgyptERA, as long as the government pays the difference (i.e. subsidizes) between the tariffs to the licensees in question. Similar provisions have been made in Pakistan and Senegal, both countries with mostly state owned utilities like Egypt. Needless to say, the proper functioning of this

²⁰ For more detail about the material in this table, see the Annex.

arrangement is dependent on the government paying its dues on time- something that has not happened in Senegal and Pakistan. How this will translate as we the new framework is implemented remains to be seen. As of the time of the writing of this paper, the government seems to be committed to raising tariffs and has done so every year since 2014.

On **quality regulation**, the new framework incorporates a number of established good practices such as requirements to meet quality standards (penalties for not meeting them), requirement for utilities to report technical data to the regulator on a periodic basis and making the reliability measurements public.

On **market entry**, also the regulator has been provided the requisite responsibility and power for providing permits to new entrants. However, EgyptERA is not legally required to approve all power sales contracts. Needless to say, given the state control of the sector, the regulator has not had a lot of scope to exercise its power in the past. However, with the country aiming to introduce significant solar generation through the IPP route, the regulator's role will be important in the coming years.

Table 8: Formal regulatory substance in Egypt and comparators, 2015²¹

	Egypt	India, AP	India, Odisha	India, Raj	Morocco	Pakistan	International benchmark
Regulatory Substance	78%	76%	76%	79%	40%	83%	76%
Tariff Regulation	75%	75%	75%	75%	29%	83%	77%
<i>Regulatory Framework for Tariffs</i>	100%	100%	100%	100%	33%	100%	90%
<i>Determination of Tariffs</i>	50%	50%	50%	50%	25%	67%	64%
Quality Regulation	83%	83%	83%	92%	33%	100%	75%
<i>Quality of Service Standards</i>	100%	100%	100%	100%	50%	100%	82%
<i>Quality of Service Enforcement</i>	67%	67%	67%	83%	17%	100%	68%
Market Entry Regulation	75%	71%	71%	71%	58%	67%	77%
<i>Permitting New Entrants</i>	100%	75%	75%	75%	50%	100%	90%
<i>PPA Approvals</i>	50%	67%	67%	67%	67%	33%	57%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

The new law governing the sector was incorporated in 2015 and all institutions are adjusting to the changes made under the law. At the time, when data was collected for the study, the new regulations and framework were being implemented and not enough time had passed to judge whether the new framework was actually being implemented in their true spirit. However, the perceived index gives us an opportunity to understand how regulation is being practiced in the sector as of 2015.

A very interesting picture emerges from the comparison of the de jure and perceived indices. The overall score on regulatory framework falls from 60 percent to 28 percent (table 9). On every indicator- accountability, autonomy, tariffs, quality and market entry the regulator is seen to be not implementing all the practices that are part of the 2015 framework. The differences are extremely egregious in quality regulation and transparency practices. The regulator is unable to exercise its authority on tariff levels and

²¹For more detail about the material in this table, see the Annex.

in a completely state dominated sector its standing is precarious as compared to the utilities as all report to the same ministry.

Table 9: De jure vs De facto regulation

Indicators	De Jure	Perceived
Overall Regulation	60%	28%
Regulatory Governance	77%	56%
Accountability	87%	77%
<i>Regulatory Oversight</i>	100%	100%
<i>Legal Appeals</i>	100%	100%
<i>Transparency</i>	62%	31%
Autonomy	89%	73%
<i>Decision-Making Autonomy</i>	86%	86%
<i>Budgetary Autonomy</i>	94%	94%
<i>Leadership Autonomy</i>	75%	63%
<i>Managerial Autonomy</i>	100%	50%
Regulatory Substance	78%	50%
Tariff Regulation	75%	67%
<i>Regulatory Framework for Tariffs</i>	100%	83%
<i>Determination of Tariffs</i>	50%	50%
Quality Regulation	83%	33%
<i>Quality of Service Standards</i>	100%	50%
<i>Quality of Service Enforcement</i>	67%	17%
Market Entry Regulation	75%	50%
<i>Permitting New Entrants</i>	100%	100%
<i>PPA Approvals</i>	50%	0%

Summary

Tariffs have been largely set well below costs, impacting the financial health of the utilities and the entire sector. The regulator is considered to have good technical expertise but has not been able to impose its will on a state controlled sector where decision, especially those related to tariffs, were taken by the Cabinet of Ministers under political considerations. The new regulatory framework adopted in 2015 incorporates almost all good practices found in comparable regulatory framework but its success will depend on how much control the government wants to cede to the regulator.

Conclusion

The challenge of power sector reform in Egypt has long been dominated by extremely high subsidies, with prices being set well below the costs of supply. These subsidies have taken a variety of forms: explicit subsidies in the government budget; implicit subsidies in the underpricing of fuel supply (particularly natural gas) to the power sector; the accumulation of arrears from the sector (including to the state-owned banking sector and to gas suppliers/investors); the consumption of poorly-maintained physical capital; and cross-subsidies across customer classes. Egypt's social contract was linked to expanding energy access with good quality supply (almost 24*7) on the basis of public financing and huge subsidy. Egypt has been able to achieve universal access with more or less reliable power over the entire period except very recently when chronic underinvestment in the sector caused blackouts in 2011-2014 at time of severe political uncertainty. The utilities have never been judged on their financial viability, which they have not been able to achieve, given the underpricing of electricity. The social compact came under

pressure in 2014 when energy subsidies reached 6.8% of GDP, being higher than education, health and social protection combined, with a 6,000 MW shortage leading to 6-hour daily power outage. Since 2014, the reform process has been revived based on new electricity, gas and renewable laws. This paved the way for price and subsidy adjustments, with almost 430% increase in fuel prices and about 350% cumulative increase in electricity prices over 2014-19. Structural reforms were also launched with a deliberately long time frame of up to 8 years. While the power sector value chain continues to be dominated by state-owned enterprises, a greater emphasis has been placed on the role of the private sector, with over US\$22 billion of private investments since 2014 in renewable energy and oil and gas.

Egypt has supplied electricity to everyone, but the opportunity cost of doing so has been very large (and perhaps not fully known). Until recent years, power sector reforms have been quite limited (not differentiating the sector very much from the economy at large), because of the seemingly intractable politics of inducing adjustment by the economy and population in a political environment which was not deemed conducive to doing so. However, since 2015, that situation has changed, and Egypt has embarked on a power sector reform, in the context of a macroeconomic reform process. Time will tell whether the environment is sufficiently transformed for the process to be sustained.

Table 10: Summary evaluation of Egypt’s power sector reform efforts

	Performance	Institutions
Security of Supply	For most of the period electricity supply has been secure, although the cost of achieving that was not always a major consideration. In the period from 2014 onwards, in the face of significant blackouts leading up to that, key measures included large-scale public procurement of conventional energy, scaling up of procurement of renewable energy capacity from the private sector, and some resolution of financial imbalances and supply shortages in the natural gas sector as a fuel for electricity.	Planning and procurement institutions have generally ensured security of supply, although they have been at their most effective in public sector projects. Most importantly, those institutions have shown what they can do in an era of stable technologies, but not at all what they can do in the new era of disruptive technology change.
Access & Affordability	Access to grid electricity became near-universal (but without much regard for the cost). Electricity was largely affordable in most of the period because of high subsidy levels.	The Rural Electrification Authority succeeded in achieving near-universal access and was disbanded once its mission was accomplished. The electricity distribution companies took over the responsibility of keeping up with the demand for new connections.
Efficiency & Financial Viability	Some restructuring reforms have been undertaken to help achieve efficiency and financial viability, but their impact could	Some restructuring of institutions has been undertaken, but of a predictably limited scope. The 2015 Electricity Law mandated a

	only be very limited in the absence of cost recovery being allowed by Government (and the regulator).	deeper institutional restructuring, to be implemented over a long period of time. That process is still underway.
Tariffs & Cost Recovery	For most of the period, Government did not enable cost recovery for political reasons, but since 2014 tariffs have been placed on a multi-year trajectory towards cost recovery.	The regulator, EgyptERA, has built significant technical capacity, but acts only as an adviser with the Government making final tariff decisions. Post 2015, the new law seeks a larger role for the regulator but the ultimate deciding authority on tariffs remains with the Government.

Egypt’s experience over the decades with power sector reforms offers the following main lessons.

First, tariff and subsidy reform can be socially and politically difficult and require prior improvement in power supply and service quality as an essential pre-requisite to build trust and credibility of subsidy reforms.

Second, once tariff and subsidy reforms are initiated after a very long period of underpricing, it is not advisable to rush the deeper structural reforms. Nevertheless, providing policy clarity through a medium-term reform timetable announced upfront is helpful in reducing uncertainty.

Third, in a power system heavily based on domestically-produced natural gas, coordination between electricity and gas sector planning and reform timelines (opening of sector and coordinated fuel and power subsidy reforms) is critical. Equally, decisions about gas pricing and electricity pricing are closely related.

Fourth, it is critical to have policy clarity regarding which sub-sectors should be targeted for private sector investments (renewables and oil and gas in Egypt’s case) versus those that will be retained for public sector investments. This helps to ensure stakeholder alignment, generate interest from the private sector, and secure an efficient bidding process with timely commissioning of assets.

Fifth, strong political will combined with stable tenure of technocratic leadership makes it possible to take difficult sector reform decisions while seeing them through to efficient implementation, despite the absence of strong civil society dialogue.

Annex

The standard package of reforms prescribed by international donors in the 1990s included four principal components: restructuring (vertical and horizontal unbundling of power utilities); private sector participation; creation of an independent regulator; and competition in power generation.

In order to aggregate across the four dimensions of power sector reform considered in this study, a simple Power Sector Reform Index is constructed. The index gives each country a score on an interval of 0 to 100 on each dimension of power sector reform. The scores are based on giving equal weight to each step on each dimension of the reform continuum (see tabulation below). The average of the four 0-100 scores is used to provide an overall summary of the extent of reform.

Regulation	No regulator = 0		Regulator = 100		
Restructuring	Vertically integrated = 0	Partial vertical unbundling = 33	Full vertical unbundling = 67	Vertical & horizontal unbundling = 100	
Competition	Monopoly = 0	IPPs = 25	Single Buyer Model = 50	Bilateral Contracts = 75	Competitive market = 100
Private Sector Participation	$0.5 * (\text{Percentage of generation capacity with private sector participation})$ $+$ $0.5 * (\text{Percentage of distribution utilities with private sector participation})$				

Table A.1: Generation and transmission planning index for Egypt and comparators, 2015

	Egypt	India	Morocco	Pakistan	International benchmark
Planning and Procurement	82%	78%	61%	63%	70%
Generation Planning	71%	57%	43%	29%	56%
Country has a generation master plan	○	○	○	○	94%
Country has an overall energy plan	○	●	○	●	65%
Competent entity is responsible for producing the plan	○	○	○	○	88%
Inter-governmental committee oversees the planning unit	○	●	●	●	29%
Power generation system plan is mandatory	○	●	●	●	19%
Plan leads to timely initiation of procurement	●	○	●	●	38%
Planning process is transparent and participatory	●	○	●	●	59%
Transmission Planning	75%	75%	50%	25%	72%
Competent entity is responsible for producing the plan	○	○	○	○	100%
Explicitly linked to power generation plans	○	○	○	●	88%
Plan is mandatory	○	●	●	●	29%
Planning process is transparent and participatory	●	○	●	●	71%

Table A.2: Generation and transmission procurement index for Egypt and comparator, 2015

	Egypt	India	Morocco	Pakistan	International benchmark
Procurement of Generation	100%	95%	100%	100%	85%
There is a framework for procurement	○	○	○	○	82%
Country allows International competitive bidding or public auction	○	○	○	○	94%
Types of procurement methods allowed					
<i>Unsolicited bids</i>	●	●	●	●	29%
<i>Direct negotiation</i>	●	●	○	○	47%
<i>International competitive tendering</i>	○	○	○	○	88%
<i>Public auctions</i>	●	○	●	●	41%
<i>Stand-alone capacity market</i>	●	●	●	●	0%
Auction design score	NAP	0.86	NAP	NAP	80%
Country uses public auctions for procurement	●	○	●	●	41%
Clear and comprehensive established rules	NAP	○	NAP	NAP	100%
Credible penalties for violating the rules	NAP	○	NAP	NAP	86%
Guarantees and penalties to ensure timely completion	NAP	○	NAP	NAP	86%
Standard, non-negotiable contracts	NAP	○	NAP	NAP	86%
Stapled financing terms or risk mitigation instruments	NAP	○	NAP	NAP	86%
No concerns regarding the transparency and fairness of the auction	NAP	●	NAP	NAP	14%
Efforts to inform and attract bidders to the auction	NAP	○	NAP	NAP	100%
Transmission Procurement	83%	83%	50%	100%	68%
There is a framework for procurement of new transmission lines	○	○	●	○	59%
Methods used to procure new transmission-					
<i>Competitive tender</i>	○	○	○	○	71%
<i>Direct negotiation</i>	●	●	●	●	29%
All projects are awarded to the incumbent transmission company	○	○	●	●	47%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.3. Corporate governance- accountability index for Egypt and comparators, 2015

Corporate governance	Egypt	India, Odisha		India, AP		India, Raj		Pakistan		Morocco	International benchmark
	EEHC(Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVNVL	JDDVNL	LESCO	KE	ONEE	
Accountability	42%	83%	25%	50%	50%	67%	67%	67%	100%	25%	60%
Private or public shareholders appoint board	●	○	●	●	●	●	●	●	○	●	36%
Transparent process exists for Board selection	●	●	●	○	○	○	○	●	○	●	36%
Board members cannot be removed at will	●	●	●	●	●	●	●	●	○	●	29%
Chairperson & CEO are separate positions	●	○	○	●	●	○	○	○	○	●	75%
Function of Company Secretary exists	●	○	○	○	○	○	○	○	○	●	82%
Board Sub-Committees for different issues	○	○	●	○	○	○	○	○	○	○	68%
Audit committee of the Board	●	○	●	○	○	○	○	○	○	○	71%
Board Code of Conduct exists	○	○	●	○	○	○	○	●	○	●	64%
Requirement to declare conflicts of interest	○	○	●	●	●	○	○	○	○	●	75%
Utility has carried out any third party transactions in last five yrs	○	○	●	●	●	●	●	○	○	●	46%
Minority shareholders' rights are protected	●	○	●	●	●	●	●	○	○	●	39%
Utility publishes an Annual Report	○	○	○	○	○	○	○	○	○	○	93%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.4. Corporate governance- autonomy index for Egypt and comparators, 2015

Corporate governance	Egypt	India, Odisha		India, AP		India, Raj		Pakistan		Morocco	International benchmark
	EEHC(Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVVNL	JDDVNL	LESCO	KE	ONEE	
Autonomy (SOEs)	56%	89%	0%	44%	44%	67%	67%	44%	89%	44%	63%
Board is the final body to take decision on-											
<i>Defining corporate strategy</i>	○	○	NAP	○	○	○	○	○	○	○	96%
<i>Approving business plans</i>	○	○	NAP	○	○	○	○	○	○	○	96%
<i>Setting and monitoring performing objectives</i>	○	○	NAP	○	○	○	○	●	○	●	92%
<i>Selecting, appointing and overseeing the CEO</i>	●	○	NAP	●	●	●	●	○	○	○	56%
<i>Raising capital from debt</i>	●	○	NAP	●	●	○	○	●	○	●	68%
<i>Raising capital from equity</i>	●	○	NAP	●	●	●	●	●	○	●	48%
<i>Major capital expenditures</i>	○	○	NAP	○	○	○	○	●	○	○	88%
<i>Deciding and implementing tariff adjustments</i>	●	●	NAP	●	●	●	●	●	●	●	24%
<i>Human resource hiring and firing decisions</i>	○	○	NAP	●	●	○	○	○	○	●	72%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.5. Utility management- financial discipline index for Egypt and comparators, 2015

Utility management	Egypt	India, Odisha		India, AP		India, Raj		Pakistan		Morocco	International benchmark
	EEHC(Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVVNL	JDDVNL	LESCO	KE	ONEE	
Financial Discipline	53%	43%	36%	53%	53%	64%	64%	50%	79%	64%	59%
Utility has a credit rating	●	●	●	○	○	○	○	●	○	●	36%
Utility can issue new bonds	●	●	●	●	●	○	○	●	○	○	36%
Utility can issue new equity	●	●	●	●	●	●	●	●	○	●	26%
Utility pays dividends to shareholders	●	●	●	●	●	●	●	●	●	●	29%
Public service obligations are explicitly defined	○	●	●	○	○	●	●	●	●	●	46%
PSO is publicly disclosed	○	NAP	NAP	●	●	NAP	NAP	NAP	NAP	NAP	38%
PSOs are costed	●	NAP	NAP	●	●	NAP	NAP	NAP	NAP	NAP	0%
PSOs are compensated by government	●	NAP	NAP	●	●	NAP	NAP	NAP	NAP	NAP	0%
Utility required to meet financial performance tar	○	●	●	●	●	○	○	●	○	○	52%
System of internal financial controls exists	○	○	○	○	○	○	○	○	○	○	96%
Internal audit function exists	○	○	○	○	○	○	○	○	○	○	93%
Utility is subject to state auditing procedures	○	○	●	○	○	●	●	○	●	○	71%
Financial accounts are produced	○	○	○	○	○	○	○	○	○	○	96%
Financial accounts are audited by external audito	○	○	○	○	○	○	○	○	○	○	93%
Financial accounts are publicly disclosed	●	●	●	○	○	○	○	○	○	○	79%
Financial accounts meet national standards	○	○	○	○	○	○	○	●	○	○	82%
Financial accounts meet international standards	●	●	●	●	●	●	●	○	○	●	57%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.6. Utility management- human resources index for Egypt and comparators, 2015

Utility management	Egypt	India, Odisha		India, AP		India, Raj		Pakistan		Morocco	International benchmark
	EEHC(Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVVNL	JDDVNL	LESCO	KE	ONEE	
Human Resource	71%	70%	40%	43%	43%	36%	36%	43%	86%	79%	62%
Annual staff performance reviews exist	○	○	○	○	○	○	○	○	○	○	93%
Employees receive performance related bonuses	○	○	●	●	●	●	●	●	○	○	70%
Employees can be fired for poor performance	●	●	●	○	○	●	●	○	○	○	79%
Government employment regulation don't apply	●	●	●	●	●	●	●	●	○	○	26%
Wages not based on government pay scales	○	●	●	●	●	●	●	●	○	○	48%
Staff training policy exists	○	○	○	○	○	●	●	●	○	○	86%
Managers are free to hire employees	●	NAV	NAV	●	●	●	●	●	●	●	12%
Managers are free to fire employees	●	NAV	NAV	●	●	●	●	●	●	●	24%
Managers can execute budget	○	NAV	NAV	●	●	●	●	○	○	○	60%
Managers can implement investment projects	○	NAV	NAV	●	●	○	○	●	○	●	44%
Recruitment involves advertisement of positions	○	○	○	○	○	○	○	○	○	○	71%
Recruitment involves short-listing candidates	○	○	○	○	○	○	○	○	○	○	89%
Recruitment involves interviewing candidates	○	○	●	○	○	●	●	○	○	○	82%
Recruitment involves reference checks	○	○	●	●	●	○	○	●	○	○	75%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.7. Utility management- information & technology index for Egypt and comparator, 2015

Utility management	Egypt	India, Odisha		AP, India		Raj, India		Pakistan		Morocco	International benchmark
	EEHC(Discos)	WESCO	CESU	APSPDCL	APEPDCL	JVVNL	JDDVNL	LESCO	KE	ONEE	
Information and Technology	60%	36%	43%	73%	73%	80%	79%	50%	93%	73%	71%
SCADA system	○	●	○	○	○	○	○	●	○	○	93%
IT system to support incidence resolution	●	●	●	○	○	○	○	●	○	○	75%
IT system to support distribution management	●	●	●	○	○	○	○	○	○	○	79%
IT system to support energy management	●	●	●	○	○	○	○	○	○	○	64%
Geographic Information System (GIS)	○	●	●	○	○	○	○	○	○	○	78%
KPIs are used to monitor quality of supply	○	○	○	○	○	○	○	○	○	○	100%
Advanced Metering Infrastructure (AMI)	●	●	●	○	○	●	●	●	○	●	52%
Accurate customer database	○	○	○	○	○	○	○	○	○	○	96%
Call center for dealing with customer complaints	○	○	○	○	○	○	NAV	●	○	○	96%
Website for submission of customer complaints	○	○	○	○	○	○	○	○	○	●	85%
Customer satisfaction regularly monitored	○	●	●	●	●	○	○	●	○	●	59%
Commercial management system (CMS)	●	●	●	●	●	●	●	●	○	○	41%
Resource Management System (RMS)	●	●	●	●	●	●	●	●	●	○	35%
KPIs are used to monitor commercial cycle	○	○	○	○	○	○	○	○	○	○	86%
KPIs are used to monitor corporate resource manag	○	NAP	NAP	●	●	○	○	NAP	NAP	●	54%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.8. Regulatory governance- accountability index for Egypt and comparators, 2015²²

	Egypt	India	Morocco	Pakistan	International benchmark	
Accountability	87%	91%	NAP	79%	83%	
Regulatory Oversight	100%	100%	NAP	67%	81%	
Regulator's objectives formally stated in law	○	○	NAP	○	100%	
Regulator required to report on its activities	○	○	NAP	○	88%	
Independent third party evaluations of regulator have taken place	○	○	NAP	●	56%	
Legal Appeals	100%	100%	NAP	100%	100%	
Legally established process to	○	○	NAP	○	100%	
Transparency	62%	73%	NAP	70%	67%	
Publicly available annual reports	○	○	NAP	○	94%	
Recommendations are required to be made	●	NAP	NAP	○	33%	
Government body receiving recommendations required to respond publicly	○	NAP	NAP	○	33%	
Regulator is required to publish its decisions on-	End-user tariffs	○	○	NAP	○	100%
	Licensing generation or supply	○	○	NAP	○	100%
	Wholesale or PPA prices and contract terms	○	○	NAP	○	100%
	Market design	○	○	NAP	NAP	100%
	Oversight of regulated utilities	○	○	NAP	○	85%
Regulatory decision-making process legally requires the participation of non-government stakeholders in case of-	End-user tariffs	●	○	NAP	●	69%
	Licensing generation or supply	○	○	NAP	●	69%
	Wholesale or PPA prices and contract terms	●	●	NAP	●	38%
	Market design	●	●	NAP	NAP	30%
	Oversight of regulated utilities	●	●	NAP	NAV	38%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

²² The three Indian states follow similar regulatory structures and thus have similar scores. They are presented here as a single entity.

Table A.9. Regulatory governance- autonomy index for Egypt and comparators, 2015

Regulatory governance		Egypt	India	Morocco	Pakistan	International Benchmark
Autonomy		89%	75%	NAP	92%	71%
Decision-Making Autonomy		86%	100%	NAP	92%	79%
Areas where entity has a mandate to regulate-	End-user tariffs	○	○	NAP	○	100%
	Quality of supply and service	○	○	NAP	○	100%
	Electrification or increased access to energy	○	○	NAP	●	53%
Decision of the regulatory entity are legally binding in the area of-	End-user tariffs	○	○	NAP	○	88%
	Grid access charges	○	○	NAP	○	87%
	PPA/wholesale prices	○	○	NAP	○	92%
	Quality of supply/service	○	○	NAP	○	87%
	Market design	●	○	NAP	NAP	50%
	Licensing	○	○	NAP	○	85%
	Utility oversight	○	○	NAP	○	71%
Government body rejecting or modifying regulatory decisions needs to	●	NAP	NAP	○	17%	
Law precribes decision making process for-	End-user tariffs	○	○	NAP	○	94%
	Grid access charges	○	○	NAP	○	81%
	Quality of supply/service	○	○	NAP	○	87%
Budgetary Autonomy		94%	50%	NAP	100%	80%
Funding for regulator established by law		○	○	NAP	○	100%
Percentage of regulator's budget that comes from levies or taxes		0.88	0	NAP	1	59%
Leadership Autonomy		75%	50%	NAP	75%	66%
Legal basis for existence is primary legislation		○	○	NAP	○	100%
Power to determine own organizational structure and rules		○	●	NAP	○	50%
Power to determine the allocation and use of budget		○	●	NAP	○	44%
Legal requirements or restrictions regarding professional profile leadership		○	○	NAP	○	94%
There is a fixed term for the leadership of the regulatory entity		○	○	NAP	○	88%
Legal provisions under which leadership an be removed from office		●	○	NAP	○	75%
Current leadership of entity connected to government or utilities		●	●	NAP	●	25%
Over 60% of employees are in technical positions		○	●	NAP	●	57%
Managerial Autonomy		100%	100%	NAP	100%	59%
Pay scale not linked to govt pay scale or is 90% of utility pay scale		○	○	NAP	○	53%
Not required to follow govt employment regulations		○	○	NAP	○	63%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.10. Regulatory substance- tariff regulation index for Egypt and comparators, 2015

	Egypt	India	Morocco	Pakistan	International Benchmark
Tariff Regulation	75%	75%	29%	83%	77%
Regulatory Framework for Tariffs	100%	100%	33%	100%	90%
Objectives in determining tariffs mentioned explicitly in policy or legal mandate	○	○	○	○	100%
Principles of tariff-setting clearly articulated	○	○	●	○	88%
Authority over the tariff level	○	○	○	○	94%
Clear definition of “cost recovery”	○	○	●	○	88%
Legitimacy of costs is used as a basis for tariff calculations	○	○	●	○	88%
Tariff-setting based on a clearly specified regulatory framework	○	○	●	○	88%
Frequency and schedule of revisions determined by law or regulation	NAP	NAP	NAP	NAP	75%
Determination of Tariffs	50%	50%	25%	67%	64%
Publicly available written formula is to be used for tariff setting and utilities are legally required to adhere to it	○	○	●	○	88%
Avoid passing-through inefficient costs to customers	●	○	●	○	76%
Requirement to submit financial information according to set standards	○	●	●	○	53%
Users bear the costs of incentive mechanisms for renewable energy generation	○	○	○	○	75%
Regulatory mechanisms to compensate generators for the provision of firm capacity or ancillary services	●	●	NAP	●	58%
Utilities are compensated for the costs of stranded assets	●	●	NAP	●	25%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.11. Regulatory substance- Quality regulation index for Egypt and comparators, 2015

	Egypt	India	Morocco	Pakistan	International benchmark
Quality Regulation	83%	83%	33%	100%	75%
Quality of Service Standards	100%	100%	50%	100%	82%
Requirement to meet quality of service standards	○	○	○	○	100%
Specific quality of service standards are formally written and publicly available for- quality of the product, quality of the service and customer	○	○	○	○	97%
Performance on quality of service standards is public	○	○	●	○	71%
Fines for failing to meet quality of service standards	○	○	●	○	59%
Quality of Service Enforcement	67%	67%	17%	100%	68%
Requirement to report technical data on a periodic basis	○	○	○	○	100%
Regulator specifies how to collect technical performance data	○	●	●	○	71%
Regulator reviews or validates technical performance data	○	●	●	○	47%
Automated information management systems are required to measure the quality or reliability of the power supply	●	○	●	○	71%
Measurements of the quality or reliability of power supply are made public	○	○	●	○	65%
Financial incentives to meet customer service standards or increase customer satisfaction	●	○	●	○	53%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available

Table A.12. Regulatory substance- Market entry index for Egypt and comparators, 2015

	Egypt	India	Morocco	Pakistan	International benchmark
Market Entry Regulation	75%	71%	58%	67%	77%
Permitting New Entrants	100%	75%	50%	100%	90%
Responsible for monitoring compliance with the terms of the license or permit	○	○	●	○	88%
Authority to impose penalties for violating license or permit terms	○	○	NAP	○	100%
Penalties are formally written and publicly available	○	●	NAP	○	80%
Provisions to force companies to relinquish licenses or permits for violation	○	○	○	○	100%
PPA Approvals	50%	67%	67%	33%	57%
Legally required to approve all power sales contracts either directly or indirectly	●	○	○	○	59%
Approve or refuse a proposed PPA in a legally specified period of time	NAP	○	●	●	60%
Authority over the process by which utilities can select or procure power from IPPs	○	●	○	●	50%

○	Satisfactory result
●	Unsatisfactory result
NAP	Not applicable
NAV	Not available