



Figure 1: Energy profile of Egypt



Energy Consumption and Production

Egypt has a large population, which was 82.06 million in 2013 (Table 1). In 2015, the total production of electricity was 16,504 ktoe of which 90.7 per cent is from fossil fuels. Final consumption of electricity in the same year was 13,385 ktoe. Consumption by industry was 2.4 per cent (AFREC, 2015) (Table 2). Key consumption and production statistics are shown in Figures 2 and 3.

Table 1: Egypt's key indicators

Key indicators	Amount
Population (2013 million)	82.06
GDP (billion 2005 USD)	128.55
CO2 emission (Mt of CO2)	184.32

Source: (World Bank, 2015)

Energy Resources

Hydropower

Most hydropower in Egypt is produced by the large dam projects on the Nile: the High Dam, Aswan I and Aswan II. In 2013, 13.7 billion kilowatt-hours (KWh) of electricity was generated accounting for 9 per cent of total country power generation (EIA, 2015).

Oil

The proven oil reserves in Egypt are the sixth largest in Africa and more than 50 per cent are located offshore in the Western Desert and the Gulf of Suez region (WEC, 2013). By 2014, proven oil reserves were estimated

Figure 2: Total energy production, (ktoe)

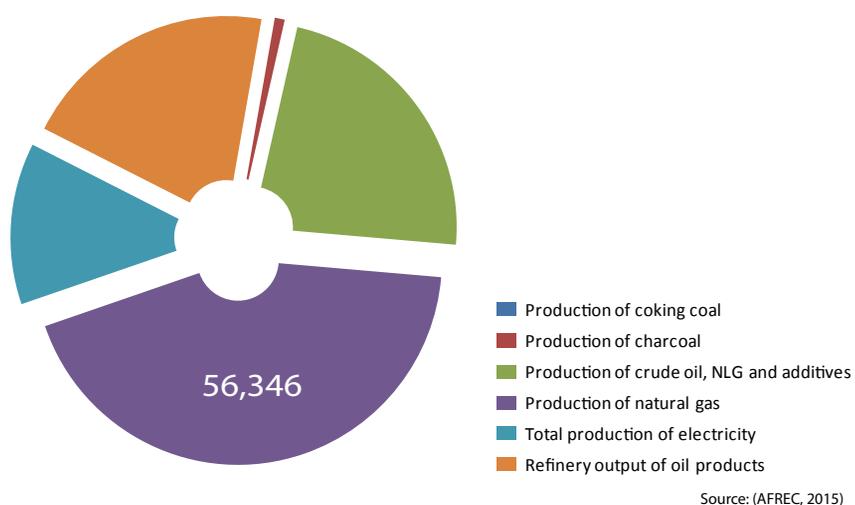
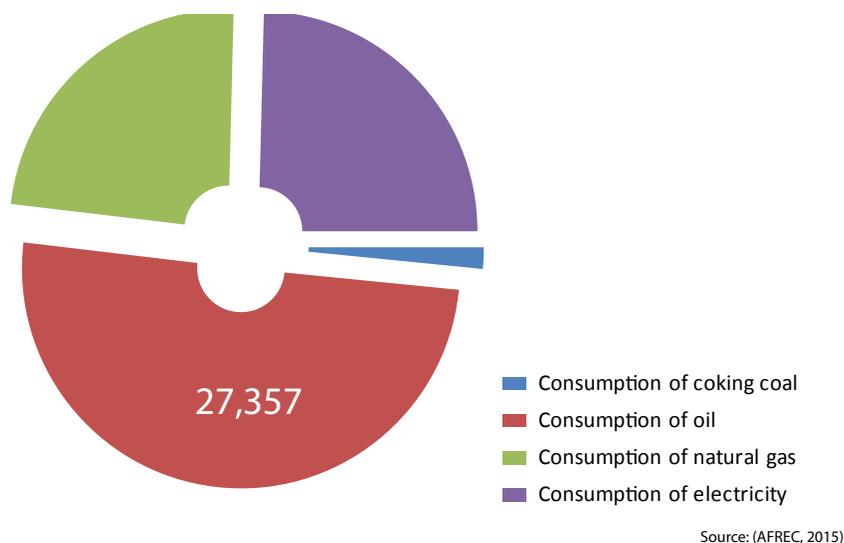
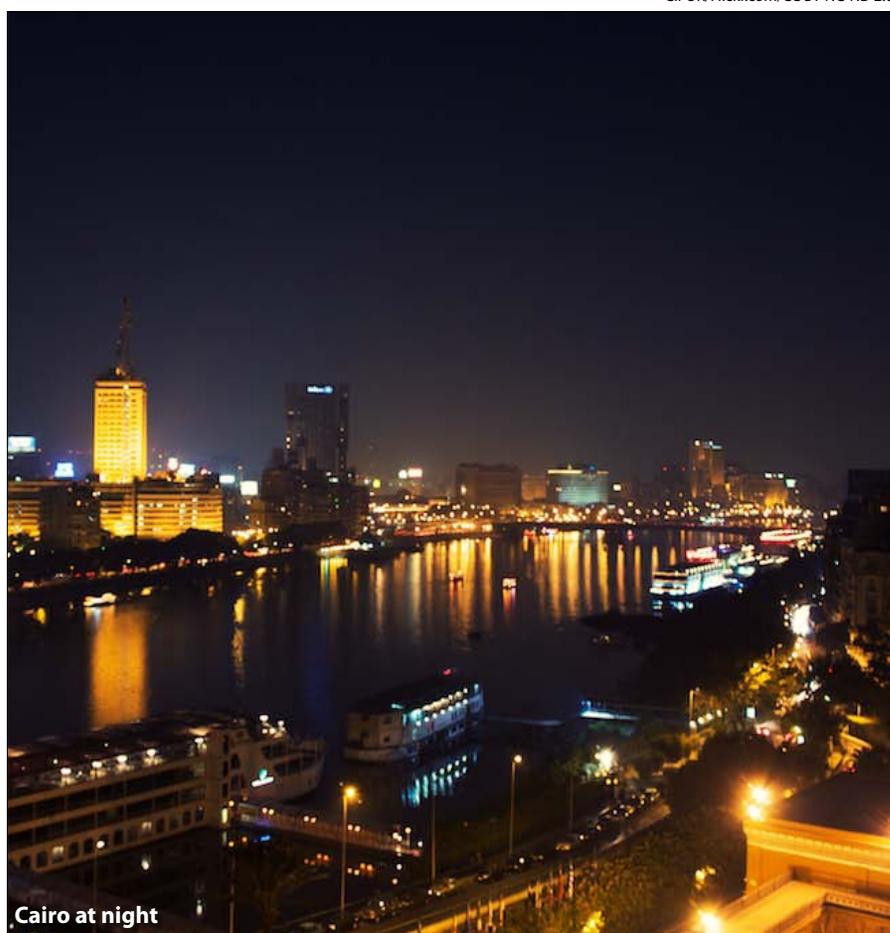


Figure 3: Total energy consumption, (ktoe)



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Cairo at night

Table 2: Total energy statistics (ktoe)

Category	2000	2005	2010	2015 P
Production of coking coal	20	14	12	0
Production of charcoal	0	0	1,000	1,030
Production of crude oil, NLG and additives	35,293	29,226	26,410	29,608
Production of natural gas	18,555	35,901	57,629	56,346
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	5,302	8,211	11,354	14,970
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	1,260	1,087	1,122	1,097
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	12	47	147	438
Total production of electricity	6,575	9,346	12,622	16,504
Refinery output of oil products	26,105	34,318	28,082	26,404
Final Consumption of coking coal	453	755	511	855
Final consumption of oil	20,285	23,562	28,323	27,357
Final consumption of natural gas	7,015	8,829	12,171	12,795
Final consumption of electricity	5,627	7,801	11,215	13,385
Consumption of oil in industry	5,461	5,548	5,231	3,697
Consumption of natural gas in industry	2,072	5,567	5,970	6,958
Consumption of electricity in industry	2,111	2,812	3,500	3,314
Consumption of coking coal in industry	453	203	203	189
Consumption of oil in transport	9,060	9,374	13,758	15,060
Consumption of electricity in transport	0	0	0	29
Net imports of coking coal	720	945	504	496
Net imports of crude oil, NGL, Etc.	-7,379	2,892	-3,969	-6,110
Net imports of oil product	-692	-6,737	4,567	7,546
Net imports of natural gas	0	-14,049	-11,776	-5,874
Net imports of electricity	14	-67	-137	-34

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

at 4 billion barrels (EIA, 2015), but the country is facing challenges meeting local demand in the face of declining domestic production. Egypt is a member of Organization of Arab Petroleum Exporting Countries (OAPEC). Domestic oil consumption has grown by over 30 per cent over the last decade, from 550,000 bbl/d in 2000 to 815,000 bbl/d in 2011 (WEC, 2013).

Natural gas

Proven recoverable reserves by December 2011 amounted to 2,186 bcm and production is 61.3 bcm (WEC, 2013).

Coal

By the end of 2011, Egypt had proven reserves of 16 million tonnes of bituminous coal, including anthracite (WEC, 2013).

Wind

The coastal area around the Red Sea has high potential for wind energy, recording wind speeds

Table 3: Installed wind power capacity in Egypt, (MW)

Region	Year							
	End 2007	End 2008	End 2009	End 2010	End 2011	End 2012	End 2013	End 2014
Egypt		365	430	550	550	550	550	610
Africa	539	635	866	1,065	1,033	1,165	1,602	2,535

Source: (OECD/IEA, 2014)

of 7-10 m/s (GWEC, 2014). By the end of 2013, 550 MW of wind power was installed, which increased to 610 MW in 2014; there is a target to reach 7,200 MW by 2020 (representing 12 per cent of national electric capacity installed and contributing to the country's 20 per cent renewable electricity target by 2020) (Table 3) (GWEC, 2014).

Nuclear

Egypt established a Nuclear Power Plants Authority (NPPA) in 1976, and in 1983 the El Dabaa site on the Mediterranean coast was selected for development of nuclear power. However, these plans were frozen after the Chernobyl accident. In 2006, there were indications of a revival of the

civilian nuclear power programme, with a commitment to build a 1,000 MW nuclear power station at El Dabaa at an estimated cost of US\$1.5 bn. In March 2008, Egypt signed an agreement with Russia on the peaceful uses of nuclear energy.

Solar

Solar opportunities are good in Egypt, with 140 MW already in operation (NBI, 2013). Many of the installed photovoltaic systems are used in remote areas for water pumping, desalination, rural clinics, telecommunications, and so on.

Tracking progress towards sustainable energy for all (SE4All)

Egypt is one of the top 10 countries worldwide that has made the most progress in providing electricity to its population. According to the World Bank (2013), about 1.3 million Egyptians acquired access to electricity in the last two decades (1990-2010). As shown in Table 4 and Figure 4, by 2010, 100 per cent of the population (both urban and rural) had access to electricity and 99.99 per cent to non-solid fuels (World Bank, 2015).

Egypt's energy intensity increased at a compound annual growth rate (CAGR) of -0.41 per cent over the 20 years between 1990 and 2010 and at 1.62 per cent over the tracking period 2010-2012 (World Bank, 2015). The energy intensity of the Egyptian economy (the ratio of the quantity of energy consumption per unit of economic output) between 2010 and 2012 increased from 3.7 to 3.8 MJ per US dollar (2005 dollars at PPP) (World Bank, 2015).

A National Energy Conservation plan is being implemented; activities include increasing the use of compact fluorescent lamps, improving energy efficiency in street lighting and public buildings, and scaling up solar water heating. The Credit Guarantee Company (CGC) is operating an energy efficiency program for small and medium enterprises. On the supply side, the main effort is on improving the use of fossil fuels through the increased use of combined cycle gas turbine power plants and supercritical technology for steam power plants. Egypt has adopted a National Energy Efficiency Action Plan (NEEAP) (2012-2015) with cumulative energy efficiency targets of 5 per cent. There is an Energy Efficiency (EE) unit at the Council of Ministers secretariat, which is the mandated entity for developing and implementing this

Table 4: Egypt's progress towards achieving SDG7 – Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicators	Year					
		1990	2000	2010	2012	2000-2010	2011-2015
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Per cent of population with access to electricity	96	98	100	100		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	88	97	100	99.99		
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	8.6	8.2	6.1	5.5		
7.3 By 2030, Double the rate of improvement of energy efficiency	7.3.1 GDP per unit of energy use (constant 2011 PPP \$ per kg of oil equivalent)	10.5		11.3	10.9		11.36 (2013)
	Level of primary energy intensity(MJ/\$2005 PPP)	4.0		3.7	3.8	3.79	3.80

Sources: (World Bank, 2015); (World Bank, 2016)

Figure 4: SDG indicators

Percentage of population with access to electricity	Access to non-solid fuel (% of population)	GDP per unit of energy use (PPP \$ per kg of oil equivalent) 2013	Renewable energy consumption (% of total final energy consumption), 2006-2011, 2012
100%	99.99%	11.73	5.5%
			

Table 5: Egypt's key aspects/key mitigation measures to meet its energy related Intended Nationally Determined Contributions (INDCs)

INDC
*Conduct comprehensive studies to assess the impact of climate change on the energy sector, propose appropriate adaptation measures, and estimate the economic cost of those proposed adaptation measures. In addition, these studies should determine the safe locations for the construction of power generation projects
* Build institutional and technical capacities of different units in the energy sector regarding climate change issues
*Support research and technological development to enable the electricity sector to deal properly with climate change

Source: (ROC, 2015)

plan. However, there is no designated energy efficiency agency and no general legal framework for EE measures.

The share of renewable energy in the total final energy consumption declined from 8.5 per cent in 1990 to 5.5 per cent in 2012 (World Bank, 2015); (World Bank, 2016). The New National Renewable Energy Strategy adopted in February 2008 aims to achieve a generation of 20 per cent of the country's electricity from renewable resources by 2020.

Intended Nationally Determined Contributions (INDC) within the framework of the Paris climate Agreement

Egypt is keen to contribute to global efforts to address climate change, as rising temperatures are likely to negatively impact the energy and other productive sectors, such as agriculture and tourism. The energy-related Intended Nationally Determined Contributions (INDC) articulated by the government are highlighted in Table 5.

Table 6: Egypt's institutional and legal framework

Basic Elements	Response
Presence of an Enabling Institutional Framework for sustainable energy development and services (Max 5 institutions) most critical ones	<ul style="list-style-type: none"> • Ministry of Electricity and Energy (MOEE) manages the General Plan of the Energy Generation, Transmission and Distribution; • Ministry of Petroleum (MOP) regulates the petroleum subsector. • Egyptian Electricity Holding Company (EEHC); • Rural Electrification Authority (REA); • Hydro Power Plants Authority (HPPA); • Atomic Energy Authority (AEA); • Nuclear Power Plants Authority (NPPA); • Nuclear Materials Authority (NMA); • New and Renewable Energy Authority (NREA).
Presence of a Functional Energy Regulator	Electric Utilities and Consumer Protection Regulatory Agency (EEUCPRA) - established by Presidential Decree No. 339/2000 – and under the supervision of the MOEE.
Ownership of sectoral resources and markets (Electricity/power market; liquid fuels and gas market)	Egyptian Electricity Holding Company (EEHC), owned by government with 16 affiliated companies (six production; nine distribution; and the Egyptian Electricity Transmission Company).
Level of participation in regional energy infrastructure (Power Pools) and institutional arrangements	East African Power Pool (joined in 2005 and temporarily left in 2016 pending resolution of issues regarding utilization of the Nile River waters.
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	EEHC owns over 90 per cent of Egypt's generating capacity. Transmission and distribution are a monopoly under the EEHC umbrella.
Where oil and gas production exists, whether upstream services and operations are privatized or state-owned, or a mixture (extent) e.g., licensed private exploration and development companies)	Egyptian General Petroleum Corporation (EGPC) is the state entity charged with managing upstream activities – including the infrastructure, licensing and production of oil and gas. International and foreign national oil companies play a significant role in Egypt's upstream sector on a production-sharing basis with the EGPC. The energy sector consists of three holding companies in addition to the EGPC and the Egyptian Mineral Resource Authority (EMRA). These include: the Egyptian Natural Gas Holding Company (EGAS); the Egyptian Petrochemicals Holding Company (ECHEM); and Ganoub El Wadi Petroleum Holding Company (GANOPE).
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	
Presence of Functional (Feed in Tariffs) FIT systems	Feed-in Tariffs for Smaller RE Projects, including solar.
Presence Functional IPPs and their contribution	PowerTech of Malaysia.
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	<ul style="list-style-type: none"> • National Strategy for the Development of Energy Conservation Measures and Renewable Energy Application 1982. • Renewable Energy Strategy of 2008 set a 20 per cent target of total electrical energy mix from renewable energy by 2020. This target is expected to be met largely by scaling-up of wind power. The Government also made a policy proposal to establish a dedicated transmission body for solar energy, the Solar Energy Trader (SET).
Current enabling laws/pieces of legislation (including: RE; EE; private sector participation; & PPPs facilitation) – including electricity/grid codes & oil codes (5 max or yes/no) most critical ones	<ul style="list-style-type: none"> • Law No. 1103/1974 – on re-organization of the Ministry of Electricity and Energy (MOEE); • Law No. 63/1974 – concerning establishing the institutions of the electricity body; • Law No. 12/1976 – on establishing the Egyptian Electric Utility; • Law No.100/1996 – on amendment of Law No. 12/1976 – related to establishing the Egyptian Electricity body; • Law No. 18/1998 – on some provisions of electricity distribution companies, power plants and the transmission grid; • Egyptian Electricity Holding Company Decree No. 86/2005 – concerning the commercial status of electricity distribution companies; • Prime Minister's Decree No. 1795/2008 – to amend the price of natural gas and electricity to the intensive industrial companies; and • the Prime Minister's Decree No. 2130/ 2010 – regarding amendment of the law on selling electricity to some of the industrial companies.

This table was prepared with material from (MMEH, 2013); (REEEP, 2012) and (WTO, 2013)

Institutional and Legal Framework

The Ministry of Electricity and Energy (MOEE) is in charge of the energy sector (Table 6). The energy regulator is the Egyptian Electric Utilities and Consumer Protection Regulatory Agency (EgyptERA). The state owned Egyptian Electricity Holding Company (EEHC) dominates the electricity sector. It has 16 affiliated companies (six productions; nine distributions; and the Egyptian Electricity Transmission Company). On a regional level, the country used to be a member of the East African Power Pool, but pulled out in early 2016. The legal framework is provided by the new Egyptian Electricity Law, issued by law no. 87 in 2015.

The main objectives of the Energy Policy Strategy include energy security, meeting domestic demand and developing available energy resources.