THE INTERNATIONAL REC STANDARD

Country Assessment Report

Country/Region Name- Egypt:

Egypt is situated in Northern Africa; bordered by Israel, Sudan and Libya. It has a population of $98 million and GDP of $250 billion with a growth rate of 5.3%.

Economic structure and activity:

In 2016, Egypt with the support of the IMF established an economic reform program to stabilise the economy and address the macroeconomic imbalances through liberalising the exchange rate, fiscal consolidation and the energy sector. The program helped stimulate economic growth, reduce debt, create a budget surplus and replenish the foreign reserves.

The service sector accounts for 51.36% of GDP, dominated by revenues from telecommunications and tourism. Industry contributes 35.08%, with manufacturing expertise in automotive, steel, cotton cultivation, textiles and construction. The agricultural sector has important historical roots in Egypt and still contributes 11.2% of the nation's GDP. The warm climate and abundant Nile river present favourable conditions for crop cultivation, with Egypt's main exports being cereals, cotton, sugar cane and beetroots.

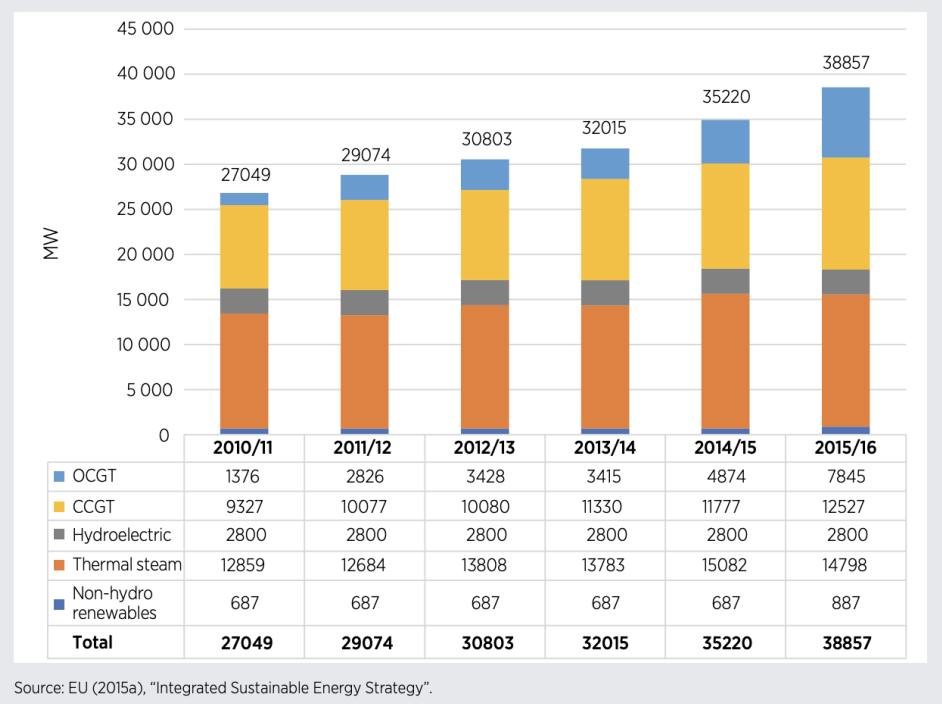
(Statista 2018; Santander 2020; World Bank 2020)

Top private companies with RE commitments:

Generation and demand: (e.g. type, MW, TWh)

Figure 1 demonstrates Egypt's existing and projected installed capacity for electricity generation, displaying a significant reliance on fossil fuels. Figure 2 conveys how 15% of electricity generated in 2015 derived from RE.

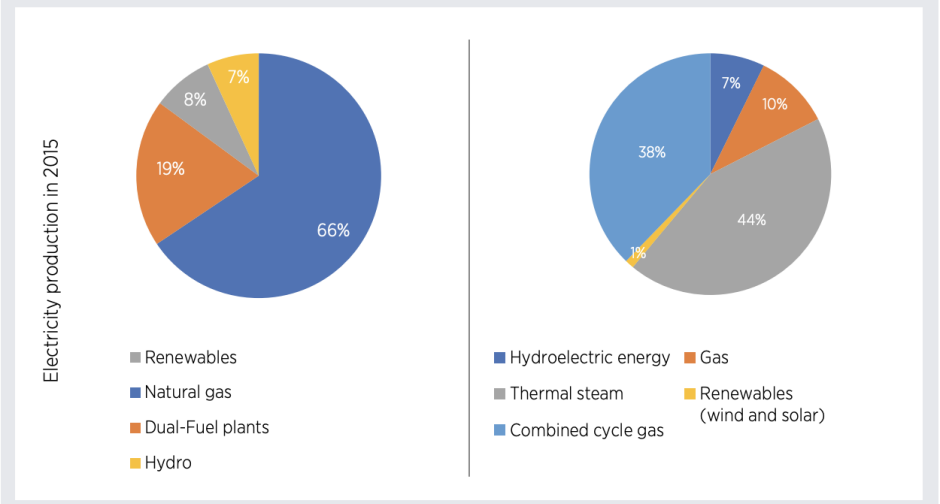
Growth in installed capacity has outpaced the nation's demand for electricity. In 2017, power capacity reached 45 GW, while maximum load during summer was 31 GW.



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
OCGT	1376	2826	3428	3415	4874	7845
CCGT	9327	10077	10080	11330	11777	12527
Hydroelectric	2800	2800	2800	2800	2800	2800
Thermal steam	12859	12684	13808	13783	15082	14798
Non-hydro renewables	687	687	687	687	687	887
Total	**27049**	**29074**	**30803**	**32015**	**35220**	**38857**

Source: EU (2015a), "Integrated Sustainable Energy Strategy".

Figure 1. Past and existing installed capacity by source (IRENA 2018).



Based on: EEHC (2016a), Egyptian Electricity Holding Company Annual Report 2015/16; EEHC (2015), Egyptian Electricity Holding Company Annual Report 2014/15. IEA Energy Balances for 2015, Egypt.

Figure 2. Electricity generation by source (IRENA 2018).

Electrical Interconnection and import/export:

Egypt is considered a hub for Energy in the MENA region, with two-way interconnections to other National electricity grids (East and West). Electrical interconnection currently exists between Egypt, Iraq, Jordan, Lebanon and Syria (see table 1).

Egypt continues to collaborate with the EU to plan future exchange of electricity across the Mediterranean. Possible interconnections have been cited between Tunisia and Italy, and between Egypt, Cyrus and Greece, mainly trading electricity produced from renewable energy.

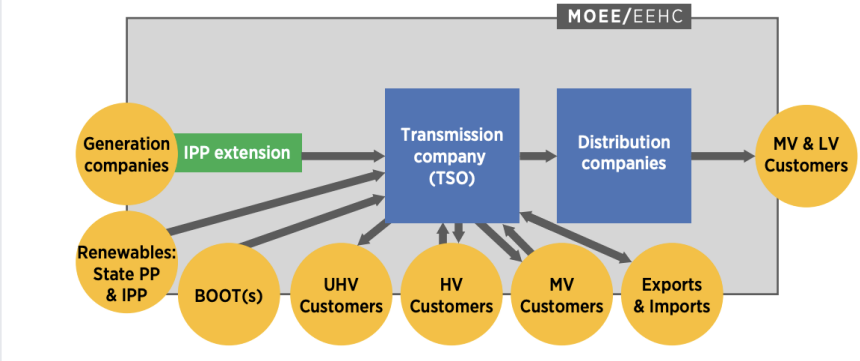
Description	Egypt/Libya	Egypt/Jordan		
Interconnection date	May 1998	October 1998		
Interconnection voltage (kV)	220	400		
Interconnected countries	Libya	Jordan	Syrian Arab Republic	Lebanon
Sold and exported energy (GWh)	292	454.7	-	-
Purchased and imported energy (GWh)	15.98	37.8	-	-

Based on: EEHC (2016a), Egyptian Electricity Holding Company Annual Report 2015/16.

Table 1. Egypt's transnational electrical interconnections.

Market Structure:

The majority of electricity generation installed capacity is owned by the Egyptian Electricity holding company (EEEHC) Geographical distribution for five generation companies and hydro Plants Company. At 2000, the Egyptian electricity market start early steps to reform for privatization of the generation component and add three power plants total capacity around 2 GW with BOOT schemes. At the end of 2014 start new program to establish Renewable Energy FIT program with total capacity 4300 MW, and prepare several BOO projects (Wind & solar technology PV & CSP) in pipeline. The transmission and unified grid, are managed by the Egyptian Electricity transmission company (EETC) and will remain so in the near future until to convert to transmission sole operator (TSO) by new Electricity Law no. 78 for year 2015. At this stage, the whole the of Egyptian's renewable energy facilities (rooftop) are selling the electricity they generate to the distribution companies according to direct contracts.



Notes: BOOT = build-own-operate-transfer; HV = high-voltage; IPP = independent power producer; LV = low-voltage; MV = medium-voltage; PP = power producers; TSO = transmission system operator; UHV = ultra-high-voltage.

Sources: Mohamed Salah El Sobki (Jr) (2017), "Integration of Renewable Energy into the Egyptian Electricity Grid"; EEHC (2016a), Egyptian Electricity Holding Company Annual Report.

Figure 3. Diagram of Egypt's Power Sector Market Structure (IRENA 2018).

Responsible Government Department: (include key contacts)

Supreme Energy Council (SEC) was established in 1979, reformed in 2014 and headed by Egypt's Prime Minister and all relevant ministries. It is mandated to review and endorse national energy strategies and policies and monitor the sector's performance, energy pricing/incentives. It also approves policies and regulations on energy pricing and incentives, including the promotion of RE and energy efficiency.

Ministry of Petroleum and Mineral Resources (MPMR) is responsible for managing all petroleum activities, including exploration, production and distribution of different fossil fuels. MPMR implements this mandate through three affiliated entities: the Egyptian General Petroleum Corporation (EGPC), the Egyptian Natural Gas Holding Company (EGAS), and Ganoub El Wadi Petroleum Holding Company (GANOPE).

Ministry of Electricity and Renewable Energy (MOERE) is charged with managing the electricity sector through its subsidiary Egyptian Electricity Holding Company (EEHC) and the Egyptian Electric Utility and Consumer Protection Regulatory Agency (EgyptERA), NREA, Hydro Power Plants Executive Authority, Nuclear Power Plant Authority and Atomic Power Plants Authority.

EgyptERA ensures all electrical activities (generation, transmission, distribution, and sale) are carried out in compliance with the laws and regulations in effect in Egypt, especially those relating to environmental protection. It reviews the plans prepared for the electric power consumption, production, transmission and distribution, including the investments necessary for such plans, in order to ensure readily available power throighout the country, at all times. It also sets regulation to ensure there is lawful competition in the field of electric power production and distribution in the best interests of the consumer.

Environment, the Egyptian Environmental Affairs Agency (EEAA) represents the executive arm of the Ministry. It prepares draft laws and decrees related to the fulfilment of its objects and express its opinion on proposed legislation related to the protection of the environment. It conducts studies on the state of the environment, formulate the national plan with the projects included for the protection of the environment, prepare the estimated budgets for each as well as environmental maps of urban areas and areas to be developed and lay down the criteria to be observed when planning and developing new areas as well as the criteria targeted for old areas.

New and Renewable Energy Authority (NREA) established in 1986 was to enhance renewable energy deployment. NREA focuses particularly on wind and solar technologies, other institutions have devoted efforts to biomass development.

Existing/Planned Energy Legislation: (is there a CPO)

Renewable Energy incentives law no 203 has been issued in 2014 to allocate lands owned by the state to renewable energy power projects and oblige the electricity distribution companies to buy and transmit energy produced from these projects

through long term power purchase agreement, in addition, an attractive mechanism has been developed to encourage buying energy produced from renewable sources through defining some of the consumers to buy this energy. Moreover the applied customs on components and spare parts of renewable energy components have been decreased to 2%.

The Electricity Law No. 87 of 2015 has been issued on 7 July, 2015 within the context for continuous upgrading of electricity service development to meet the growing electric power demand, and to ensure fulfilment of the social and economic development plans of the government, and considering the importance of consumers' interests and service providers aiming to achieve the following objectives: a) Set the rules to raise the performance efficiency and the quality of services provided by the companies operating in the field of production, transmission, distribution and sale of electricity through legitimate competition. b) Create appropriate atmosphere that attracts investments to the electricity sector in order to cope with the increasing demand for electric power and to confirm the principles of transparency, antimonopoly and anti-favoritism. c) Approve the role of the electricity regulatory and consumer protection agency as the entity responsible of securing a balanced relation between the consumers' rights and the different electricity utilities stakeholders. d) Separate between the activities of production, transmission and distribution of electricity to ensure free legitimate competition. e) Cope with the new legislations applied in the International Regulatory Agencies to allow liaison between the Egyptian Regulatory Agency and the Regional Regulatory Agencies through electrical interconnection projects. f) Undertake actions to improve energy efficiency and load management in order to preserve the natural resources and provide service with economical price.

The Constitution of the Arab Republic of Egypt (Article 32) to help gain optimum benefits from RE, promote its investments, and encourage R&D, in addition to local manufacturing.

Cabinet Decree No. 1947 passed in 2014, introduced a FIT for electricity generated from RE projects.

Environmental Legislation for RE:

Prime Ministerial Decree No. (37/4/15/14) of the year 2015 • Regulations to avail land for renewable energy projects.

Existing/Planned Certificate Systems: (purpose, extent)

Egyptian Designated National Authority (DNA) consist of two main pillars, Egyptian council for CDM established by ministerial decree no. 42 for year 2005, and Egyptian Bureau for CDM established by ministerial decree no. 45 for year 2005 working to review and approve CDM projects and issuing supportive letter for international registration process

RE market potential:

Egypt possesses an abundance of RE resources. Average sunshine hours vary between 9 to 11 hours per day, with solar direct radiation intensity of about 2 000–3 200 kilowatt hours per square metre (kWh/m²). Wind potential is promising with average speeds of 8-10 m/s by the Red Sea coast and 6-8 m/s along the south-west Nile banks Egypt is endowed with vast wind resources, with average annual speeds reaching 8–10 metres per second (m/s) by the coast of the Red Sea and 6–8 m/s along the south-west Nile banks and in the south of the Western Desert. Waste generated from municipal resources and agriculture exceed 30 million tonnes of solid biomass every year and remains untapped as a renewable resource.

Egypt's strategy is to increase the share of generated energy from renewable energy to 20% by 2022: 6% from hydro resources, 12 % from wind energy and 2% from other renewable energy sources but especially solar energy. The strategy includes the construction of wind projects with the participation of the private sector to bring the total installed capacity to 7200 MW by 2022. EEHC is coordinating with NREA to generate a plan for diversifying Egypt's electricity generation mix and network planning necessary for the evacuation of power generated from RE projects.

Project	Technology	Status	Size	Contract
Gulf of Suez	Wind	Under development	250 MW	NREA-KfW, EIB, AFD EPC scheme
Gulf of Suez	Wind	Under development	250 MW	GDF Suez, Toyota, Orascom BOO scheme
Gulf of Suez	Wind	Under development	200 MW	NREA-Masdar EPC scheme
Gulf of Suez	Wind	Under development	200 MW	AFD-KfW EPC scheme
Gulf of Suez	Wind	Under development	2 000 MW	Siemens EPC scheme
Gabal El Zayt	Wind	Under construction	220 MW	NREA-Japan-JICA EPC scheme
Gulf El Zayt	Wind	Under construction	320 MW	Italgen BOO scheme
Gabal El Zayt	Wind	Under construction	120 MW	Spain-NREA
West Nile-1	Wind	Under development	250 MW	BOO scheme
West Nile	Wind	Under development	200 MW	Japan EPC scheme
West Nile	Wind	Tender-bidding Phase	600 MW	NREA IPP scheme

Notes: AFD = Agence Française de Développement; EIB = European Investment Bank; JICA = Japan International Cooperation Agency. Based on: EEHC (2016a), Egyptian Electricity Holding Company Annual Report 2015/16; EU (2015a), "Integrated Sustainable Energy Strategy"; Eversheds and PricewaterhouseCoopers (2016), Developing Renewable Energy Projects: A Guide to Achieving Success in the Middle East, Fourth Edition; MOERE (2017), Full Scale Program for Renewable Energy in Egypt.

Table 2. Planned Wind projects up to 2023 (IRENA 2018).

Project	Type	Status	Size	Contract
Kom Ombo	PV	Binding	200 MW	BOO scheme
West Nile	PV	Binding	600 MW	Sky Power and EETC BOO
West Nile	PV	Binding	200 MW	EETC BOO
West Nile	PV	Binding	600 MW	BOO scheme
FIT	PV	Operational	50 MW	EETC PPA
FIT	PV	Under development	1 415 MW	EETC PPA
Hurghada	PV	Tendering	20 MW	NREA-JICA EPC scheme
Zaafarana	PV	Under development	50 MW	NREA-AFD EPC scheme
Kom Ombo	PV	Under development	26 MW	NREA-AFD EPC scheme
Kom Ombo	PV	Under development	50 MW	NREA-AFD EPC scheme

Based on: EEHC (2016a), Egyptian Electricity Holding Company Annual Report 2015/16; Eversheds and PricewaterhouseCoopers (2016), Developing Renewable Energy Projects: A Guide to Achieving Success in the Middle East, Fourth Edition; EU (2015a), "Integrated Sustainable Energy Strategy"; Meza, E. (2015), "Solar opportunities on the rise in Egypt"; MOERE (2017), Full Scale Program for Renewable Energy in Egypt.

Note: BOO = build, own, operate; EETC = Egyptian Electricity Transmission Co.; PPA = power purchase agreement; NREA = New and Renewable Energy Authority (Egypt); JICA = Japan International Cooperation Agency; EPC = engineering, procurement and construction; AFD = French Development Agency (Agence Française de Développement).

Table 3. Planned Solar PV projects up to 2023 (2018).

Market risks and challenges:

Extent of Engagement with Government: (brief summary of any contact already made with the national government regarding certification in general and I-REC)

NERA have already registered 4 projects for Renewable energy (wind power plants) at Zafarna area- Suzie Governorate since 2007- 2010 and another 4 projects for energy efficiency field totally 71 CDM projects from different fields.

Expected response from Government:

Current Environmental Reporting in Energy:

Currently there are no environmental reporting measurements in energy by the government.

Any other Relevant Information:

Report Prepared by	

Contributors	
Preparation Date	