

# Combined cycle power plants (Egyptian Electricity Holding Company- EEHC)

## Basic information

*Project name:* three combined cycle power plants in New Administrative Capital, Kafr El Sheikh – El Borolos and Beni Suef

*Borrower:* Egyptian Electricity Holding Company (EEHC)

*Sponsor:* Ministry of Electricity MOE- the government

*Sector:* Electric power generation, transmission and distribution

*Country:* Egypt

*Financial Product:* Project Finance /Syndicated Loan

*ALEXBANK- Intesa Sanpaolo's role:* Participant- MLA and underwriter

*Equator Principles category:* A

## Project Overview

There is a government program (2012-2017), part of the 7th National Electricity Development Plan, that aims to introduce a new electric generation capacity of 13,200 MW thermal power plants.

Accordingly, and in order to meet the expected electricity peak demand especially during summer period, EEHC conducted a techno-economic study for evaluating different power options, and determined that the addition of gas turbine peaking units will be the most practical solution which will be achieved through the establishment of new peaking gas turbine power plants in existing power stations; this solution can serve the system requirements in a timely manner due to its short construction period, easily start up and cost saving.

The Ministry of Electricity has opened a fast-track process to develop different technologies of power plants to address the power generation gap and to establish long-term fuel source diversification. Plants would be built utilizing the following technologies:

- Combined Cycle Power Plants
- Coal Power Plants
- Wind Power Plants
- Solar Power Plants

The government has set a plan to release the subsidies on electricity selling price by increasing prices gradually over 5 years, with the first 2 phases of increase already implemented.

During the Egypt Economic Development Conference, the government signed an agreement with Siemens to create 3 power plants in cooperation with two local partners (Orascom Construction and EL-Sewedy Electric) with a total capacity of 14,400 MW in normal temperatures in Beni Suef, Kafr El Sheikh & the New Administrative Capital, in order to produce 4,400 MW by May 2017.

The project consists of the construction of three combined cycle power plants in New Administrative Capital, Kafr El Sheikh – El Borolos and Beni Suef with a capacity of 4,800 megawatt each (total capacity 14,400

megawatt) to be established through an EPC contract between the Borrower and a consortium comprising Siemens & Orascom Construction "OC" regarding the New Administrative Capital and Kafr El Sheikh – El Borolos power plants, and between the Borrower and a consortium comprising Siemens & El Sewedy Electric regarding Beni Suef power plant.

### **1. Siemens & OC contracts**

A consortium comprising Siemens & Orascom Construction will build two combined cycle power plants with a combined capacity of 9,600 megawatts. One of the stations will be located on the Mediterranean coast, north of Borolos Lake in Kafr El Sheikh Governorate, and the other in the new administrative capital.

#### **a) New Capital Power Plant:**

- the New Capital power plant configuration shall be a combined cycle power plant consisting of four modules each with the following characteristics: 2x gas turbine (8000 H) + 1x steam turbine (e.g. SST 5000/6000) with total installed power capacity of 4,800 MW.
- the execution period is expected to range from 30 to 36 months.
- the total estimated cost for the combined power plant shall amount to EUR 2 billion.

#### **b) Kafr El-Sheikh- El Borolos Power Plant:**

- The said plant configuration is a combined cycle power plant consisting of four modules each with the following characteristics: 2x gas turbine (8000 H) + 1x steam turbine (e.g. SST 5000/6000) with total installed capacity of 4,800 MW.
- The execution period is projected to range from 30 to 36 months.
- The total estimated cost for the combined power plant shall amount to EUR 2 billion.

### **2. Siemens & El-Sewedy Electric contract "Beni Suef power plant"**

A consortium comprising Siemens & El Sewedy Electric will also be the contractor responsible for engineering, procurement and construction (EPC) for the Beni Suef power plant in Upper Egypt, with El-Sewedy Electric being the local partner.

- The power plant will have a power generation capacity of 4,800 MW with total cost of EUR 2 billion. The said power station shall be built in four modules, each consisting of two H-class gas turbines, two heat recovery steam generators, one steam turbine, and three generators. Siemens H-Class technology is matching Egypt's requirements, combining high output with record-breaking levels of efficiency.
- The execution period is expected to range from 30 to 36 months.

Total Investment Cost for the three power plants is around EUR 6 billion, whereby 20% of the total investment cost represents local component amounting to around EGP 10 billion / EUR 1.18billion which shall be financed through the proposed Syndicated Facility.

## Summary of Key Environmental Impacts and Risks

<b>Subject Area</b>	<b>Potential impacts during construction</b>	<b>Potential impacts during operation</b>
Air Quality	Dust from construction activities. Traffic-related air quality impacts.	Impacts of emissions from stacks on ambient air quality. Traffic-related air quality impacts. Global warming potential.
Aquatic Environment	Control and management of site drainage. Wastewater discharge. Sewage disposal and foul Drainage.	Thermal water discharge. Water requirements for power plant operation. Discharge of treated process and wastewater. Operation of drainage systems on site. Discharge of storm water, sewage and drainage.
Noise and Vibration	Noise from construction activities.	Noise from power plant operations on surrounding land uses
Land Use, Landscape and Visual Issues	Land use on site. Land use in the surrounding area. Effects of construction activities on landscape character. Visual impact of construction activities.	Land use on site. Land use in the surrounding area. Effects on landscape character. Visual impact of the power plant and operation activities.
Soils, Geology and Hydrogeology	Effects on soils and geological features. Soil contamination. Effects on groundwater.	Soil contamination. Effect on groundwater.
Flora and Fauna	Loss of habitat or species due to landtake. Disturbance or damage to adjacent habitat of species.	Disturbance or damage to adjacent habitat. Effects of structures on bird migration routes.
Traffic	Traffic conditions/disruption to road users. Traffic-related air quality. Traffic-related noise.	Traffic conditions/disruption to road users. Traffic-related air quality impacts. Traffic-related noise impacts.
Major Accident Hazards	Risk to third-party hazardous industry.	Risk to third-party hazardous industry. Risk to power plant of third party hazardous industry.
Natural Disaster Risk	Seismic risk. Flood risk.	Seismic risk. Flood risk.
Solid Waste Management	Contamination of soils and water. Hazards to workers health. Accident risks.	Contamination of soils and water. Hazards to workers health. Accident risks.
Occupational Health and Safety	Accidents. Effects on health of workforce. Safety at work.	Accidents. Effects on health of workforce. Safety at work.

## **Positive Impacts**

On the supply side, investment opportunities will be strong in the coming years as the government plans to boost wind energy capacity from current levels of 500MW to 7,200MW by 2020. This will account for approximately 12% of domestic electricity, in line with the government's plan to have 20% of total domestic electricity produced by renewable sources.

Additionally there was a program for constructing gas turbines with total installed capacity of 2,600MW that was set to meet the peak demand during summer period. The maximum capacity for Egypt increased from 27,000 MW to reach 30,000 MW and these were represented in:

- 1) 1,300MW at Al Ain Al Sokhna power station, expected operation in 2015.
- 2) 1,100MW; Damietta West 500MW and 6<sup>th</sup> of October 600MW sites were fully operational in second half of 2012.
- 3) In June 2013, the government raised EGP 2.2bln / EUR 260mln to double the capacity of 6<sup>th</sup> of October site to 1,200MW.

Moreover, the Egyptian government succeeded in achieving a very promising plan to meet the electricity peak during summer (EEHC emergency plan) so it signed contracts with reputable contractors in the market (OC, GE, El Sewedy & Siemens) which successfully constructed new production plants with total capacity of 2630 MW & 960 MW increasing total capacity to reach around 33,600 MW.