Renewable Energy market in Egypt

By : Hesham Enan

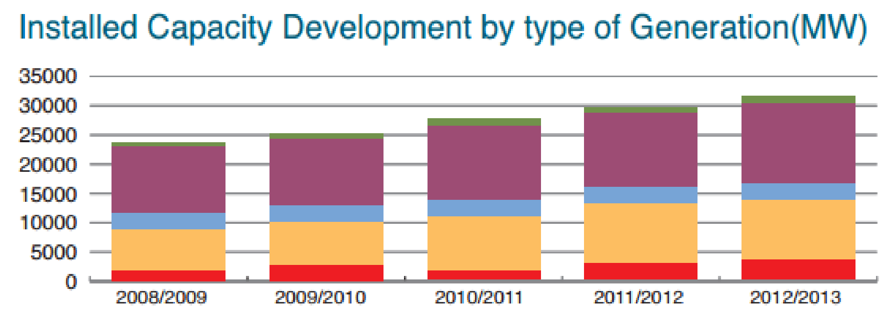
June 10th 2015

Agenda

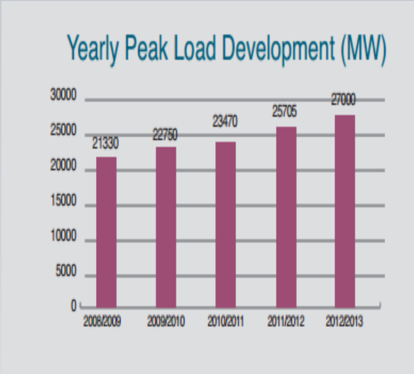
- Energy Mix in Egypt
- Electricity Authority and Electricity Tariffs
- RE Strategy & Policies
- Hydro Power
- Solar Energy & Wind Energy
- Solar Thermal Water Energy
- Conclusion Remarks

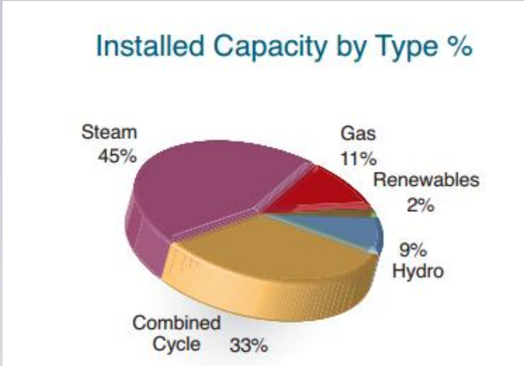
Energy Mix in Egypt

- Peak Load: **27000 MW**
- Total Produced Energy: **164628 GWh**
- Annual Growth 2012-2013: **5%**
- Number of subscribers: **29.7 Millions** with **5.8 % annual growth**
- Five year plan 2012-2017: (12400 MW thermal) power projects
  - **Government Sector**
    - 3000 MW C.Cycle in N.Giza & Banha
    - 3900 MW steam in Suez & South Helwan
  - **Private Sector**
    - 5500 MW (CC & Steam)
  - Expanding Transmission and distribution networks



	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
Renewables	425	490	687	687	687
Steam	11458	11458	12859	12684	13808
Hydro	2800	2800	2800	2800	2800
C. Cycle	7178	7137	9327	10077	10080
Gas	1641	2841	1376	2826	3428
Total	**23502**	**24726**	**27049**	**29074**	**30803**





Source: Egyptian Electricity Holding Company Annual Report 2012/2013

Current law for Electricity Tariffs

Residential Tariffs

Subscribers	2014-2015 Price c€	2015-2016 Price c€	2016-2017 Price c€	2017-2018 Price c€	2018-2019 Price c€
51-200Kwh	1.45	2	2.6	3.1	3.7
201-350kwh	2.4	2.9	3.5	4.5	5.5
351-650Kwh	3.4	3.9	4.4	5	5.5
651-1000Kwh	6	6.8	7.1	7.6	8.6
Over 1000Kwh	7.4	7.8	8.1	8.6	8.6

Commercial Tariffs

Subscribers	2014-2015 Price c€	2015-2016 Price c€	2016-2017 Price c€	2017-2018 Price c€	2018-2019 Price c€
0-100Kwh	3	3.2	3.4	3.6	3.8
100-250kwh	4.4	5	5.8	6.2	6.8
251-600Kwh	5.9	6.1	5.8	6.2	6.8
601-1000Kwh	7.8	8.1	8.6	9.1	9.8
Over 1000Kwh	8.3	8.6	8.6	9.1	9.8

Source: Law # 1257 year 2014

RE Strategy & Policies

Government Strategy

20% of the Energy Mix by 2020 will be generated by RE

Renewable Energy Policies

- **IPP** allowed to investors in June 2012
- **FiT law issued** in September 2014 (Law# 1947, year 2014) Targets 4300 MW by 2017
  - 180 Consortiums applied for the licenses
  - 100 Shortlisted for the Solar projects with 2880 MW capacity
  - 36 shortlisted for Wind projects with 1670 MW capacity

Type of plant	Feed in Tariff	Method of calculation
Resedential	0.84 EGP/KWh	paid in EGP
less than 200KW	0.91 EGP/KWh	paid in EGP
200KW to 500KW	0.97 EGP/KWh	paid in EGP
500KW to 20MW	0.136 USD/KWh	FiT in EGP= 15%(0.136)*7.15+85%(0.136)*Current Exchange rate on the day of payment
20MW to 50MW	0.143 USD/KWh	FiT in EGP= 15%(0.143)*7.15+85%(0.143)*Current Exchange rate on the day of payment

Hydro Power

Installed Capacity

- High Dam **(2300MW)**
- Aswan 1 & 2 **(540MW)**
- Esna **(84MW)**
- Naga Hammady **(70MW)**

It represents **8.2%** of the total generation in 2011/2012

Future Plans

- New Asyut Barrage Hydro power plant with a capacity of **32MW** (2017)

Source: New & Renewable Energy Authority Annual Report 2015

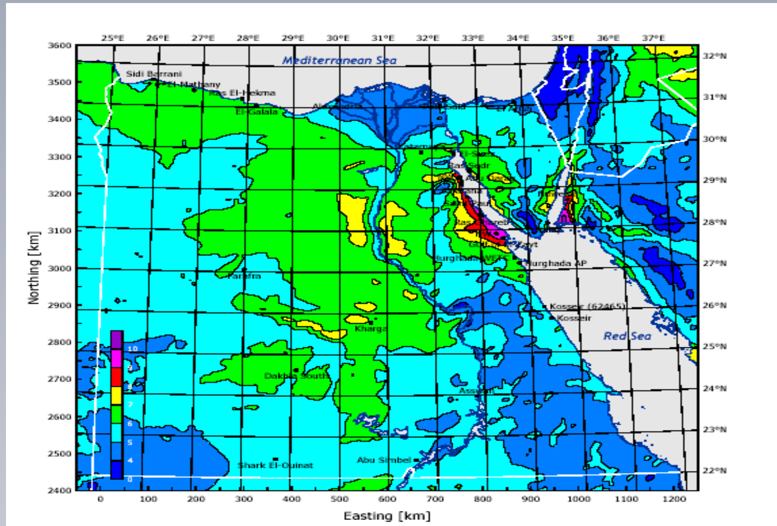
Wind Energy

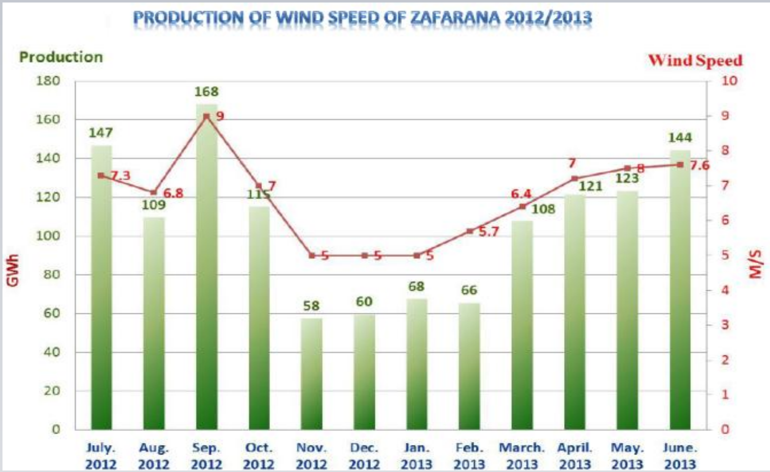
Installed Capacity

- **1993 :**Hurghada wind farm (5MW).
  1st generation wind turbines capacity of 100-300 KW .

- **2001:** Zaafarana Wind Farm
  (545MW)
  700 turbines of different sizes (600KW,660KW, 850KW)
  with cooperation protocols with **German**, **Danish**, **Spanish** and **Japanese** governments.

Source: New & Renewable Energy Authority Annual Report 2015





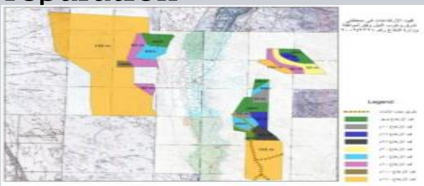
KEMET

Wind Energy

Future Plans

- Government agreements **(1340 MW)**
  - **200 MW** wind farm projects in Gabal El zayt. (100 wind turbines x 2MW)
    - Cooperation project between Egyptian & German Governments, and EU commissionaire
    - Installation is finalized and testing started in Feb 2015
  - **1140 MW** in the pipeline
    - 340MW in Gabal El Zayt **(COD 2017) (Spanish & Japanese EPC awarded)**
    - 600MW in Gulf of Suez **(COD 2018) (Tender under preparation)**
    - 200MW in West of Nile **(COD 2018) (Tender under preparation)**

- Private Sector **(750MW)**
  - **250MW** on BOO basis in Gulf of Suez ➔ tender awarded
  - **2 x 250MW** on BOO basis in Gulf of Suez➔ tender under preparation



- IPP projects **(720MW)**
  - **120MW** wind farm with Italgen in Gulf of Suez
  - **6x100MW** under auction system in 6 lands areas of 15KM square each.

Source: New & Renewable Energy Authority Annual Report 2015

Solar Energy

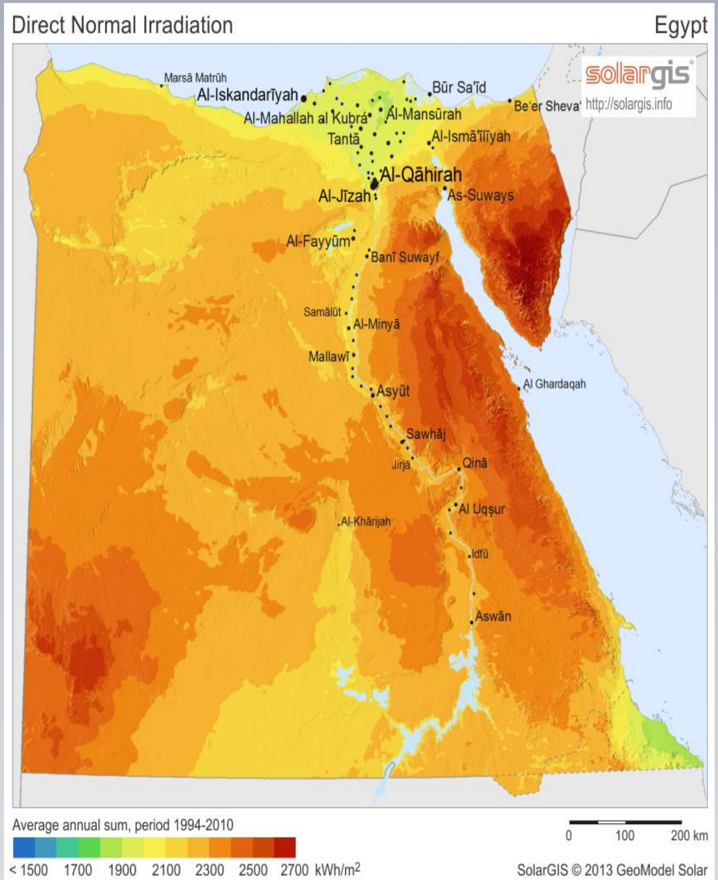
- Average normal solar radiation ranges between **2000 – 3200 KWh/m2/year**

- The sunshine duration ranges between **9 – 11 hr/day**

Installed Capacity

- Koraymat **140 MW** integrated Solar Combined cycle power plant including solar share of 20MW in operation since 2011.

First CSP project in the region



Source: New & Renewable Energy Authority Annual Report 2015

KEMET

Solar Energy

- **FiT** plans in solar to reach **2300 MW**
  - **2000 MW for above 500KW**
  - **300 MW below 500KW**
- **100MW** Solar Thermal power plant Kom Ombo (600 Million Euro project)
- **10 x 20MW BOO** system (PPA 20 years)
  - 35 offers were received and 15 companies were shortlisted.
  - Project planned to be operation in 2017/2018
- **2 x 20MW NREA** (National Renewable Energy Agency) with JICA & AFD
  - Projects are expected to be operation in 2017& 2018
- **Electrifying Off Grid Rural Areas**
  - **195** remote villages and cities through funds from UAE
  - Tender awarded for remote villages in south of Egypt

Source: New & Renewable Energy Authority Annual Report 2015

Solar Thermal Water Heater

Installed Capacity

- The total installed area is 750,000 m2.
- Annual Sales volume (10,000 - 12,000 systems) ➔ Area between 25,000 and 40,000m2
- 20 Egyptian companies are currently active in the field of manufacturing, importing, and installation of solar water heaters.

Source: New & Renewable Energy Authority Annual Report 2015

Potential Market (TARES Report- Project Finance by EU)

- A mean installed surface of **9.8m2 per 1000 capita** yearly.
- Conservative assumptions compared to
  - Greece, Turkey, Cyprus is 18-20 m2 per 1000 capita yearly.
  - Tunisia & Italy are 7-8 m2 per 1000 capita yearly.

- Industrial Process Heating was not considered in this study

KEMET

Conclusion Remarks

- High Potential Market
- Ambitious & Realistic targets for RE in Egypt
- Government Commitment
- Strong and sound financial system backed up by CBE
- Partnership between German & Egyptian Companies is inevitable

Thank You
Kemet Engineering Industries
Solar Mounting Systems

By : Hesham Enan
Sales Director
Hesham.enan@kemet-towers.com
Phone # +20 100 1900 280

KEMET