Egypt’s Renewable Energy

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Executive Chairman
New and Renewable Energy Authority (NREA)
Ministry of Electricity and Renewable Energy (MoE&RE)

April, 14th, 2016
Expected / Targeted Future Energy Status up 2022 (conservative)

**Currently 2015**
- 94% from fossil fuel and NG
- 5% hydro
- 1% from wind and others

**Reduce energy use by 8.3% (2022)**

**Nuclear up 4000-5000 MW (6%) (2022)**

**Renewable - current 3000 MW and target 13500 MW (9%) (2022)**

**Retain Oil and NG levels of production (40%) (2022)**

Additional energy needed to get from elsewhere (solar & others) (37%)
Expected / Targeted Future Energy Status up 2022 (ambitious)

Retain Oil and improve on NG levels of production (5% annually) (61%)

Still need additional energy to get from else where (15%)

From fuel products
From N.G.
From Hydro
From Nuclear
From Wind
Local energy needs with energy eff.
Additional needed energy
Generation Plan by 2022

The Egyptian RE strategy is targeting 20% of the electricity generation by year 2022 as follows:

<table>
<thead>
<tr>
<th>Source</th>
<th>Capacity (MW)</th>
<th>Energy (TWh) &amp; %</th>
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<tbody>
<tr>
<td>Wind</td>
<td>7110</td>
<td>30.6 (12%)</td>
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<tr>
<td>Solar</td>
<td>2870</td>
<td>2.2 (2%)</td>
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<tr>
<td>Hydro</td>
<td>2800</td>
<td>14 (6%)</td>
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</table>
What are the different mechanisms used for renewable energy contracts? What opportunities do they open for smaller and larger projects?
RENEWABLE ENERGY DEVELOPMENT SCHEMES

RE Development Mechanisms (Current & law 203 year 2014)

- Competitive Biding
- Merchant IPP since 2012
- Fit since 2014
- New& Renewable Energy Authority (NERA) (EPC contracts) since 1999
- Transmission (BOO) since 2009
End users

Transmission and/or Distribution Company

Under payment

Prevailing tariffs (subsidized)

Energy

RE sources by NREA EPC

Competitive biding on the supply side

مناقصات تنافسية على مستوى الأنتاج
## Renewable Energy Plan until 2022

### NREA (EPC contracts) Mechanism

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<td>Wind Gabal El Zayt (Japan)</td>
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<td>Wind Coop. Spanish Gov.</td>
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<td>Wind KfW, EIB, AFD, EU</td>
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<td>Wind West Nile (Japan)</td>
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<td>PV Hurghada (Japan)</td>
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<td>PV Kom Ombo (AFD)</td>
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<td>PV-offgrid (NREA-Masdar)</td>
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<td>Siemens - Wind</td>
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End users

Competitive bidding on the supply side

Transmission and/or Distribution Company

Fair Charge + Gov. guarantee

Prevailing tariffs (subsidized)

RE sources by EETC

BOO

Energy

Energy

Future of Renewable Energy & The Potential for micro-grid power plants in Egypt
## Renewable Energy Plan until 2022 (Cont.)

### EETC (BOO) Mechanism

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<td>WIND BOO Suez Gulf</td>
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<td>Wind BOO West Nile – 1</td>
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<td>Wind BOO West Nile – 2</td>
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<td>EETC PVs</td>
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<td>EETC CSP</td>
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Bilateral agreements (merchant scheme)

Renewable energy sources by IPP

Transmission and/or Distribution Company

Energy

Fair payment including wheeling charges

End users

Future of Renewable Energy & The Potential for micro-grid power plants in Egypt
# Renewable Energy Plan until 2022 (Cont.)

## IPP Mechanism

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<td>Wind Six projects</td>
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Future of Renewable Energy & The Potential for micro-grid power plants in Egypt
# Renewable Energy Plan until 2022 (Cont.)

## Feed In Tariff Mechanism

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<td>FiT - Wind</td>
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<td>FiT - PV</td>
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<td>FiT - Rooftop</td>
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Future of Renewable Energy & The Potential for micro-grid power plants in Egypt
The Need for Smart Grids for RE

• Size of the system
  – Suppliers (went up from less than 20, including one RE, to over 300, including more than 280 RE)
  – End users (over 30 millions)

• Dispatching renewables:
  – Market form & rules (single byer, liberalized, must feed, ...etc.)
  – Technical (technology, cost, system capacity, ...etc.)

• Cash flow management (from end users to suppliers)
System Model
(energy flow almost there)

Conventional sources (around 50)

REs sources (over 300)

Transmission & Distribution

End user

End user

Con. Charged
System Model

(Cash flow almost there)

RE supplier
RE supplier
RE supplier
RE supplier

One RE acc.

RE acc.
RE acc.
RE acc.

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End user
End user
End user
End user
What are the lesson Learned from the 1st round of Egypt’s hugely attractive Feed In Tariff Program and EETC’s experience with the private sector?

How does this set the ground to a second stage of renewable energy development in the country?
The lessons Learned from the 1st round of Egypt’s FIT Program

• It is a workable scheme in Egypt, even that a number of entities were involved (state, financers and developers).
• It would have been faster if the associated documents were ready (PPA, UA, CA, ......).
• The FIT scheme attracted developers more than the others 3 schemes
  – 187 applicants,
  – 136 qualified ( 87 + 13+ 36),
  – 152 were qualified to PV rooftop installations.
The lessons Learned from the 1st round of Egypt’s FIT Program (Cont.)

• It is pushing to excel on developing the obligatory quota scheme.
• The quota scheme will help in guaranteeing a secure cash flow for all the developers.
• It is helping in sending the right tariff signal to end users.
• It helps in attracting direct foreign investments; as well as technology know-how.
What are the lesson Learned from the 1st round of Egypt’s hugely attractive Feed In Tariff Program and EETC’s experience with the private sector?

How does this set the ground to a second stage of renewable energy development in the country?
Setting the ground to a second stage of renewable energy development in the country

• It sets a solid ground for a second stage of RE developments, where possible identifications for prevailing schemes will arise.

• The 1\textsuperscript{st} stage helped in:
  – Increasing the creditability of the RE market in Egypt.
  – Mitigating the financing risk and the administrative challenges.
How is Renewable Energy ready to be integrated into Egypt's Electricity Supply? What are the additional development needed?
How is Renewable Energy ready to be integrated into Egypt's Electricity Supply? What are the additional development needed?

RE is fully ready to be integrated into the electricity supply mix. This is very much controlled by:-

1. The technical capability of the network.
2. The investment competitiveness on the supply side.
3. The development of a mature set of regulations, addressing the network as well as market rules.
Is there potential for an REIPPP Programme like South Africa’s hugely successful offering? What does the tariff structure look like to support such a programme in Egypt?
Is there a potential for an REIPPP Programme like South Africa’s hugely successful offering? What does the tariff structure look like to support such a programme in Egypt?

1. Sharing the lessons learned, even though, each country has its own specific.
2. Current legislation in Egypt does not prohibit that.
3. NREA is targeting Public Private Partnership (PPP) in some of its future projects.
4. Egypt welcome other possible schemes in order to guarantee its RE plans.
Thank you for your attention

Chairperson@nrea.gov.eg