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Renewable Energy Program in Jordan

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Jordan enjoys world class quality Solar and Wind Energy

- Wind speeds could reach 9.0 m/s in some places.
- Wind projects are site specific, feasible and competitive without further concessional support.
- High solar radiation figures of 5 – 7 kWh/m2 per day with about 300 sunny days per year.
- PV are mature, CSP and CPV still need further development.
Figures of the Jordan Energy Sector (2016)

- High dependency on imported energy (95%)
- Cost of consumed energy (7.0% of GDP)
- Annual growth of primary energy demand (7.0%)
- Annual growth of electricity demand (2.5%)
Key Figures of the Jordan Electricity Sector (2016)

- Installed Capacity (Conventional): 4100 MW
- Installed Capacity (Renewable): 544 MW
- Peak Load: 3250 MW
- Per Capita Electricity Consumption: 1719 KWh
- Total Electricity Generation: 19730 GWh
- Total Electricity Consumption: 16843 GWh
- Renewables Contribution to Installed Capacity: 13%
- Renewables Contribution to Gen. Electricity: 5.6%
Why Investment Security is High in Jordan
(Incentives)

- Clear Development Path of the Government of Jordan
- Stable Political and Regulatory Frameworks
- Adequate and Transparent Public Policies
- Clear Financial and other Support Schemes (tax regime)
- Well defined Infrastructure Provisions (land, grid connections, etc.)

National Energy Strategy
10% RE contribution to Jordan’s energy mix by 2020.
Capacity: 800 MW of Wind and 800 MW Solar.
Regulatory Framework

- The Renewable Energy and Energy Efficiency Law was passed as a permanent Law in 2012 and amended in 2014.

- This law allows investors to identify and develop grid-connected electricity production projects through the so called unsolicited or direct proposal submission.

- The Bylaw of Direct Proposals for Renewable Energy Projects has been issued in Mid 2015.
Regulatory Framework

- A well-founded reference price list (ceiling prices) for different Renewable technologies was set by the EMRC.

- Net-Metering for small RE Systems (Roof Tops) with Fixed Purchase Prices for Excess Power.

- Tax Incentive regime, a By-Law was issued on Tax exemptions for RE and EE systems and Equipment.
The Jordan Renewable Energy and Energy Efficiency Fund has been established.

Grid Expansion and Reinforcement Plans are ongoing (Green Corridor Project)
Renewable Energy Development Schemes

About 2400 MW of Wind and Solar PV projects are expected to be developed in Jordan until 2020, 625 MW of them are already operational (sharing with 6.5% of generated electricity).

We follow a policy of 4-tracks-approach to develop renewables:

- Direct Proposal scheme
- Competitive Bidding
- EPC Turn-Key projects
- Small Scale RE Schemes (Net Metering)
Small Scale RE Projects

- Small scale consumers has been given the opportunity to generate their own electricity and sell the extra (if any) to the distribution utilities at a fixed tariff.
- This covers consumers from different sectors like residential, industrial, commercial, agricultural…etc.
- More than 2000 Applications received so far by DisCos.
- Currently about 200 MW installed capacity by Net-Metering (rooftop systems) and Wheeling.
Operational Renewable Energy Projects

- 117 MW/ JWPC Wind/ Tafila Direct Proposal Operational Sep2015
- 10 MW / Philadelphia Solar PV Mafraq/ Direct Proposal Operational Oct2015
- 5 MW/ Azraq Solar PV Spanish Grant/ EPC Atersa & Ennera Operational Apr2015
- 200 MW / Solar PV Direct Proposals Round I International + Local Developers Operational 2016
- 80 MW/ Ma’an Wind Gulf Grant/ EPC/ Elecnor 66 MW Operational Sep2016 14 MW Operational Sep2017
- 13 MW/ Zatari Solar PV German Grant/ EPC Belectric Gulf Operational Oct 2017
- 200 MW of Small Scale Solar PV Operational Systems

625 MW

6.5% of Generated Electricity
Tafila Wind Project (JWPC)
Tafila Wind Project (JWPC)
Philadelphia
10 MW Solar PV Project at Mafraq
Azraq Solar PV Projects
Ma’an Wind Project
Arabia One (Ennera) at Ma’an
Zatari Solar PV Project
Renewable Energy Projects Under Construction

103 MW/ Qweira Solar PV
Gulf Grant/ EPC
TSK+Enviromena
To be Operational in Jan 2018

50X4=200 MW / Solar PV
Direct Proposals Round II
To be Operational in 2018

654MW

89 MW/ KEPCO/ Wind
Direct Proposals Round I
To be Operational in 2018

82 MW/ Green Watt/ Wind
Direct Proposals Round I
To be Operational in 2018

180 MW of Small Scale Solar PV Systems
Qweira Solar PV Project
Renewable Energy Projects Under Financial Close

- 50 MW / Abour/ Wind
  Direct Proposals Round I
  To be Operational in 2019

- 45 MW / Hecate/ Wind
  Direct Proposals Round I
  To be Operational in 2019

- 50 MW / Acwa/ Solar PV
  Direct Proposals- Generation Co.
  To be Operational in 2019

- 50 MW / AES-Mitsui/ Solar PV
  Direct Proposals- Generation Co.
  To be Operational in 2019

- 200 MW/ Masdar /Solar PV
  Governmental Initiative
  To be Operational in 2019

- 100 MW / Mass/ Wind
  Direct Proposals Round I
  To be Operational in 2019

- 50 MW/ KOSPO/ Wind
  Direct Proposals Round I
  To be Operational in 2019

545 MW
**Renewable Energy Projects in the Pipeline 1/2**

<table>
<thead>
<tr>
<th>Project Details</th>
<th>Status</th>
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<tbody>
<tr>
<td>200 MW / Solar PV + 100 MW Wind</td>
<td>Direct Proposals Round III</td>
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<tr>
<td></td>
<td>Under Tendering</td>
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<tr>
<td></td>
<td>Operational 2020/2021</td>
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<tr>
<td>40 MW Solar PV/ South Amman</td>
<td>German Grant/ EPC</td>
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<tr>
<td></td>
<td>Just Awarded</td>
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<tr>
<td></td>
<td>Operational 2019</td>
</tr>
<tr>
<td>200 MW of Small Scale Solar PV Systems</td>
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50 MW/ Philadelphia Solar PV/ Direct Proposal

To be Operational in 2019
Renewable Energy Projects in the Pipeline 2/2

- **5 MW Solar PV**/
  - Azraq
  - EU Grant (REEE II)/ EPC
  - Under Tendering
  - Operational 2018

- **Energy Storage**
  - 30 MW/ 2 hrs
  - Direct Proposal
  - Operational 2019

- **24 MW Waste-to-Energy**/
  - Al-Ekaider
  - Direct Proposal
  - Under Tendering
  - Operational 2022

- **50 MW**

- **1 MW Solar PV**/
  - Azraq
  - Spanish Grant/ EPC
  - Under Tendering
  - Operational 2018

- **Operational 2020**
Template Contractual Documents
(Transparent Process – Minimum Risk - Less cost)

- Instructions for developing RE projects (IRPP)
- Prequalification requirements
- Power Purchase Agreement (PPA)
- Land Lease Agreement (LLA)
- Government Guarantee Agreement (GGA)
Conclusion

- Jordan has laid down the necessary Policy and Regulatory framework for Renewable Energy, and is ready now to attract and receive commercial investments.

- Template contractual documents (PPAs) and Instructions for developing RE projects do exist.

- Grid reinforcement (Green Corridor) is undergoing by NEPCO in order to install more RE Capacities.

- Jordan is now a leading country of Renewable Energy in the MENA Region.
THANK YOU!