Tafila Wind Farm
Jordan Wind Project Company PSC

EIB Investments in Renewable Energy outside EU

By: Samer S. Judeh, Chairman
26th April, 2017
Jordan Wind Project Company

A Success Story - First Commissioned Wind Project in Jordan/Region
Participants - Sponsors & Lenders

Sponsors
- InfraMed
- Masdar (A Mubadala Company)
- EP Global Energy (Member of the Paraskevaides Group)

Lenders
- IFC (International Finance Corporation)
- European Investment Bank
- FMO (Finance for Development)
- DFID (Department for International Development)
- Europe Arab Bank
Advisory & Service Providers

Legal
- Lux Nova Partners
- Hadidi & Co. Law Firm

Engineering
- CUBE Engineering GmbH
- Mott MacDonald

Accounting, Tax
- pwc
- EY

Account Banks
- citi
- ARAB BANK

Insurance
- sgurr energy
- Charles Taylor
- Lockton
<table>
<thead>
<tr>
<th>Timeline</th>
<th>Event</th>
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<tbody>
<tr>
<td>Q2 2011</td>
<td>MOU Signed with GOJ</td>
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<tr>
<td>Q4 2013</td>
<td>PPA / EPC / Finance Docs signed</td>
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<tr>
<td>Q2 2014</td>
<td>Commenced site works (21 month construction period)</td>
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<tr>
<td>Q1 2015</td>
<td>Turbine erection commenced</td>
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<tr>
<td>9/2015</td>
<td>Commercial Operations Start (20 yrs)</td>
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**Total Project Cost:** $287m

**Lenders:**
- International Finance Corporation (IFC),
- European Investment Bank (EIB),
- Netherlands Development Finance Company (FMO),
- Europe Arab Bank (EAB),
- OPEC Fund for International Development (OFID),
- Danish Export Credit Agency (EKF) 77% of funding ($221m)

**Sponsors:**
- Inframed Infrastructure,
- Masdar Power,
- EP Global Energy Ltd. 23% of funding ($66M)
Lenders

IFC: Mandated bank

EIB: Largest lender at $72m

Loan: Repayments: Three to date
Required studies received input from lender technical/legal advisor throughout the process.

- Environmental & Social Impact Assessment
- Baseline Environmental Surveys
- Avifauna surveys & reporting
- Wind measurement & reporting
- Topographic study
- Geotechnical study
- Grid Impact Study
- Transport study
- Preliminary Design works
Development:

- Land Acquisition & Title Documentation
- Tax Framework
- Project Documents
  - PPA / TCA
  - Financing Docs
  - EPC (DBOM) Contract
- Environmental (Avian monitoring / risk assessment)
- Permitting
De-risking (Bankability)

- GOJ Guarantee on NEPCO Obligations
- Lender direct agreements (GOJ, Contractor, etc)
- PPA – currency adjustment provision
- Security Provisions (onshore / offshore assets)
- Due Diligence / KYC
- Strict environmental mitigation / monitoring program
- Bankable studies and contracts
Accomplishments

- First privately sponsored utility scale wind farm in the Middle East
- First non recourse project finance renewable deal in Middle East
- First utility scale renewable plant in Jordan
- First renewable PPA and Generation License in Jordan
- Middle East Renewable Deal of the Year 2013 – Project Finance magazine
- First successfully commissioned RE project onto the NEPCO grid in September 2015
- Government Agreements, Financing Docs, DBOM
  Contract signed simultaneously
- December 2013 year end conditions satisfaction (DBOM)
- Deal of the Year Award 2013
PROJECT COMPONENTS

Permanent

- Roads
- Crane pads
- Foundations
- Turbines
- Cabling
- Substation (MV / HV)
- Warehouse & Control building
- Permanent wind measurement mast

Temporary

- Sections of roads and crane pads
- Construction compound & storage area
- Some road entrances
- Temporary wind measurement masts
Vestas V112 Turbine (Qty 38)

- 3.075 MW rated capacity
- 112m rotor diameter
- 94m tower height
- 3 – 25 m/s operating range
- Fully automated

Towers: Spain  
Nacelle: Denmark  
Gearbox: Germany  
Blades: USA, Denmark

~400GWH / Year  
CF @ 39%  
Class II site
Construction:

- Customs / Importation / Transport
- Wind conditions during turbine erection
- Crane logistics
HM the King landing onsite to inaugurate the wind farm project.
PROJECT COMPONENTS
Transformer Transport and Installation
PROJECT COMPONENTS

Snow storm on site
PROJECT COMPONENTS

Rocks / Crane Pads

Foundation excavation

Completed site road

Completed crane pad
PROJECT COMPONENTS

MV Cable works

Cable drum storage

33kV cable works
PROJECT COMPONENTS

Foundations

Foundation reinforcement works

Completed Foundation ready for backfilling

Backfilled foundation
PROJECT COMPONENTS
Unloading & Transport

Component unloading in Aqaba
PROJECT COMPONENTS

Pictures from the construction
View from the permanent met mast during the maintenance

Inspection of the top cooler at WTG
View from WTG 24
Summary:

• The wind farm is operating at full installed capacity of 117MW
• The availability / performance of the turbines is very good (97.37% after TOC)
• Turbines do not have any major technical issues
• Cooperation with NEPCO is without any problems
• ESMMP tasks are being carried out in line with requirements
Regular JWPC site team activities:

- Weekly inspections of substation electrical equipment
- Weekly inspections of the buildings and site roads
- Monthly inspections on the spare parts
- Monitoring Vestas activity
- Regular WTGs inspection
- Monitoring WF performance – evaluation of the data from the WTGs
- Reporting – weekly internal reports, monthly reports
- Billing
- Monitoring H&S on site

Environmental activities:

- Carcass searching on weekly basis (dropping to 2 x month in winter)
- Bird monitoring
- Monthly inspection of the site in terms of environmental.
## HSE Statistics – Since Taking Over

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Thank you very much