Ashalim Plot A Project
Construction of 121 MW Thermo Solar Power Plan in the Negev

September 2016
Project location
Project location – Plot A

Solar energy's silicon valley is under construction near by the town of Ashalim – a complex of four projects of 340 MW total power installed.

30MW PV

40MW PV – new bid

130 MW Tower

136 MW Parabolic Trough
The Project
### Summary of the Project

<table>
<thead>
<tr>
<th>Description of the project</th>
<th>BOT (build, operate, transfer) concession agreement for planning, financing, construction and operation of a thermosolar power station for 28 years through 2043</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of the project</td>
<td>The project is a milestone in the implementation of a national objective of 10% electricity generation from renewable energies by 2020. The project is being constructed pursuant to National Outline Plan (NOP) 10/B/1 – Solar Power Stations at Ashalim, which has been approved by the Government</td>
</tr>
<tr>
<td>Total project volume</td>
<td>Approximately NIS 4 billion</td>
</tr>
<tr>
<td>Duration of the construction period</td>
<td>3 years 7/2015 to 7/2018</td>
</tr>
<tr>
<td>The electricity purchaser</td>
<td>Israel Electric Corporation with State guarantee</td>
</tr>
<tr>
<td>Global financing</td>
<td>USA OPIC, European EIB, Israeli Bank Leumi, Bank Hapoalim and a consortium of Israeli financial entities</td>
</tr>
</tbody>
</table>
Project Schedule

Development Phase

Construction Phase (36 months)

Operational Phase (25 years)

- Signing of concession September 2013
- Financial close - July 16, 2015
- Notice to Proceed (NTP) by the State – July 17, 2015
- Full commercial operation July 17, 2018
- Concession end 2043
Main Technology Properties

<table>
<thead>
<tr>
<th>Natural gas</th>
<th>Thermal storage</th>
<th>Cooling</th>
<th>Land area</th>
<th>Technology</th>
<th>Annual output</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 15% of generated energy</td>
<td>Molten salt; 4.5 hours</td>
<td>Water</td>
<td>About 3.9 Million m² – Israel Land Authority land</td>
<td>Parabolic trough</td>
<td>About 440 GWh Supply to about 60,000 Homes (Haifa)</td>
<td>136MW steam turbine</td>
</tr>
</tbody>
</table>
Main entrance gate

The town Ashalim
Project Layout

Parabola Assembly Building

Natural Gas Oil Heaters

Thermal Oil Tanks

Water Treatment Plant

Thermal Energy Storage System

Steam Turbine Building

Electrical HV Substation

Administration Building

Cooling Tower
How it works
Technology in a Nutshell – Parabolic Trough

Sunlight is collected by a panel system in the solar field – parabolic mirrors supported by a metal construction

The mirrors track the sun and concentrate sunlight to special tubes that are at the focus of the parabola

Due to the irradiation concentrated to the tubes, a heat transfer fluid (a synthetic oil with unique thermal specifications) that is flowing inside the tubes is reaching a temperature of about 400 °C

Using heat exchangers, the heat is transferred to water, which turns into steam, driving a turbine that generates electricity
Technology – Parabolic Trough

Parabolic trough

Trough tracking of the sun during the day from east to west
Solar Thermal System – Basic Configuration

[Diagram of a solar thermal system with labeled components such as Solar Field, HTF-Heater, Hot Salt Tank, Cold Salt Tank, Expansion Vessel, Solar Preheater, Solar Superheater, Solar Reheater, Steam Turbine, Condenser, Deaerator, Water Supply, Cooling System, and G.]
Status of Works
# Overall Progress Status – 31 July 2016

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Weight</th>
<th>Actual Accumulative Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>6 %</td>
<td>92.1%</td>
</tr>
<tr>
<td>Procurements</td>
<td>4 %</td>
<td>89.8%</td>
</tr>
<tr>
<td>Manufacturing and Supply</td>
<td>49 %</td>
<td>60.3%</td>
</tr>
<tr>
<td>Construction Overall</td>
<td>34 %</td>
<td>36.7%</td>
</tr>
<tr>
<td>• Civil Construction</td>
<td>17 %</td>
<td>66.2%</td>
</tr>
<tr>
<td>• Mechanical Construction</td>
<td>14 %</td>
<td>8.7%</td>
</tr>
<tr>
<td>• Electrical Construction</td>
<td>2 %</td>
<td>1.2%</td>
</tr>
<tr>
<td>• I&amp;C Construction</td>
<td>1 %</td>
<td>0.0%</td>
</tr>
<tr>
<td>Commissioning</td>
<td>7 %</td>
<td>0.0%</td>
</tr>
<tr>
<td>Project Overall</td>
<td>100 %</td>
<td><strong>51.2%</strong></td>
</tr>
</tbody>
</table>

Contract accumulative progress: 46%
New Mirror Modules Erected in Area 4
Construction - Main Electrical Building civil works
Solar Field Auxiliary Electrical Building No. 1
The Abengoa Crisis
25 November, 2015  Abengoa Financial Crisis begins:
“Receives Protection under Article 5 BIS of the Spanish Insolvency Law which, for a period of three months (extendable to four), allowing the company to protect and preserve the company’s value while it works on the design and development of an appropriated viability plan for its future...”
Actual progress: 36% ; Contractual progress: 18% ; Early works since May 2014

SB and Abenoga are sharing 50:50: Ownership (SPC), EPC, O&M

Injected Equity: 100 % ; Abengoa’s share in Equity as a loan from SB

Abenoga – sole Technology Provider : Solar Field and TES (design only)

Lender’s contribution: ZERO ...... out of $800 M
Abengoa 5 BIS – Was it expected?

December 2013
Concession Agreement

July 16, 2015
FC / NTP

25 Nov. 2015
5 BIS
Abengoa 5 BIS – 9 months after – 8.8.16

- Actual progress: 50% (36% in Nov. 2015); Contractual progress: 45%
- Effect on Completion Date: ZERO

- New Structuring: EPC - SB 67.4%; TSK 32.5%
  Ownership and O&M - SB 50%; Noy Fund 40%; TSK 10%

- State of Israel: no change in Concession Agreement and Tariff

- Abenoga – As subcontractor for Solar Field

- Lender’s contribution: $ 250 M
Design Changes

1. Schedule
2. Process
Notice To Proceed
17.07.2015

Contractual Schedule

Updated Schedule

Practical Completion
16/7/2018
36 MONTHS
Project Timeline

Updated Schedule

Contractual Schedule

Notice To Proceed
17.07.2015

Plant Energizing
17/8/2017
25 MONTHS

Project Timeline

Energizing

Plant Energizing
1/5/2017
21.5 MONTHS

Practical Completion
16/7/2018
36 MONTHS
Project Timeline

Contractual Schedule

Updated Schedule

Notice To Proceed
17.07.2015

Plant Energizing
17/8/2017
25 MONTHS

HTF Fill
20/7/2017
24 MONTHS

HTF Fill
26/9/2017
26.5 MONTHS

Practical Completion
16/7/2018
36 MONTHS
Project Timeline

Contractual Schedule

Updated Schedule

Notice To Proceed
17.07.2015

Plant Energizing
17/8/2017
25 MONTHS

Start of salt melting
20/7/2017
24 MONTHS

HTF Fill
26/9/2017
26.5 MONTHS

Salt Melting

Start of salt melting
16/10/2017
27 MONTHS

Practical Completion
16/7/2018
36 MONTHS

HTF Fill
20/7/2017
24 MONTHS

Project Timeline

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24 MONTHS
Project Timeline

Contractual Schedule

**Notice To Proceed**
17.07.2015

- **Plant Energizing**
  - 17/8/2017
  - 25 MONTHS

- **HTF Fill**
  - 26/9/2017
  - 26.5 MONTHS

- **Start of salt melting**
  - 16/10/2017
  - 27 MONTHS

- **TES system ready**
  - 22/2/2018
  - 31 MONTHS

Updated Schedule

- **Plant Energizing**
  - 1/5/2017
  - 21.5 MONTHS

- **Start of salt melting**
  - 20/7/2017
  - 24 MONTHS

- **HTF Fill**
  - 20/7/2017
  - 24 MONTHS

- **TES system ready**
  - 13/1/2018
  - 30 MONTHS

- **Practical Completion**
  - 16/7/2018
  - 36 MONTHS
Project Timeline

Contractual Schedule

- Plant Energizing: 17/8/2017, 25 MONTHS
- HTF fill: 26/9/2017, 26.5 MONTHS
- Start of salt melting: 16/10/2017, 27 MONTHS
- TES system ready: 22/2/2018, 31 MONTHS

Updated Schedule

- Notice To Proceed: 17.07.2015
- Plant Energizing: 1/5/2017, 21.5 MONTHS
- Start of salt melting: 20/7/2017, 24 MONTHS
- HTF Fill: 20/7/2017, 24 MONTHS
- 1st Syncro: 20/12/2017, 29 MONTHS
- TES system ready: 13/1/2018, 30 MONTHS
- Practical Completion: 16/7/2018, 36 MONTHS
Updated Schedule

Notice To Proceed 17.07.2015

- Plant Energizing: 17/8/2017 (25 MONTHS)
- Start of salt melting: 20/7/2017 (24 MONTHS)
- HTF Fill: 20/7/2017 (24 MONTHS)
- HTF fill: 26/9/2017 (26.5 MONTHS)
- Practical Completion: 16/7/2018 (36 MONTHS)

Contractual Schedule

- TES system ready: 22/2/2018 (31 MONTHS)
- Start of salt melting: 16/10/2017 (27 MONTHS)
- 1st Syncro: 18/3/2018 (32 MONTHS)
- 1st Syncro: 18/3/2018 (32 MONTHS)
- 1st Syncro: 18/3/2018 (32 MONTHS)
Required design modification
Thank you