Project Overview

- Project title: Flexible Assembly Solar Technology
- Goals: Develop and demonstrate transportable and field-deployable heliostat reflector assembly systems
- Awardees: BrightSource Construction Management and BrightSource Industries Israel
- Key subcontractor: Grenzebach
- Principal Investigator: Elad Toister, BSII
- Project start date: June 2012
- Current status: preliminary design
About BrightSource Energy

- We develop and build solar thermal projects using our own central tower technology
- Headquartered in Oakland, CA, with R&D, engineering, project management and supply chain management in Jerusalem, Israel
- Founded by key managers of 1980s solar thermal pioneer Luz International
Ivanpah SEGS Complex

- 3 x 130 MWe towers in the Mojave desert of California, 50 miles SW of Las Vegas
- Forced-recirculation drum-type boilers with SH to 560°C @ 160 bar and RH
- 140m towers
- 173,500 heliostats, each 15m²
FAST Project in the context of overall cost reduction
Comparison of LH-2.3 to LH-2.2 (Ivanpah)

<table>
<thead>
<tr>
<th></th>
<th>LH-2.2</th>
<th>LH-2.3</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror dimensions</td>
<td>2300 x 3300x 4mm</td>
<td>2600 x 3660 x 4mm</td>
<td></td>
</tr>
<tr>
<td>Reflective area per heliostat</td>
<td>15.2 m²</td>
<td>19.0 m²</td>
<td>+25%</td>
</tr>
<tr>
<td>Gap between mirrors</td>
<td>300 mm</td>
<td>30 mm</td>
<td>-90%</td>
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</tbody>
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Net result: fewer heliostats for same output
A closer look at the LH2.3 Heliostat Reflector

LH2.2

LH2.3

- Support Arm
- Mirrors
- Diagonal
- Torque Tube
- Adhesive
Major steps:

1. Mirror assembly
2. Flexible on-site reflector assembly
3. Pylon insertion
4. Final reflector installation
1. Mirror assembly

- Diagonals fold into support arm for transport efficiency
- Single design supports all focal lengths

Designed to enable on-site transportability and FAST deployment
Mirror assembly

Support Arm Assembly

+ + +

Adhesive tape

“Sub-assembly” Machine

Mirror sub-assembly

Mirror

30 mirror sub-assemblies/Crate
2. Flexible on-site reflector assembly
Manual ‘alpha’ prototype used at our test facility

150 LH2.3 heliostats assembled and tested
3. Pylon insertion

Ivanpah:
Drilling & Driving – 2 separate steps
4. Final reflector installation
Thank you