SunShot Summit 2016

Joseph Desmond

April 20, 2016

BrightSource Overview

- **Leading solar thermal technology**
  - Our proprietary technology concentrates the sun's energy to produce high-value steam to power electricity, petroleum and industrial process markets worldwide
- **Founded in 2004**
- **Corporate Structure**
  - **Oakland:** Corporate headquarters
  - **London:** Business development
  - **Jerusalem:** Engineering and Product Supply entities; Corporate Accounting/IT
  - Local offices in Beijing, China and Johannesburg, South Africa
- **Technology Deployment**
  - **Ivanpah:** 377 MW commercial scale solar project located (Mojave Desert, CA)
  - Groundbreaking October, 2010. Dedication February, 2014
  - **Coalinga:** 29 MWth demonstration thermal EOR plant for Chevron (Coalinga, CA)
  - Operated October, 2011 though - December, 2014
  - **Solar Energy Development Center (SEDC):** Fully operational 6 MWth solar-to-steam demonstration facility (Israel)
  - Dedicated June, 2008.
- **Seasoned team of CSP industry pioneers**
  - Principal members of our technical team pioneered the first utility-scale solar energy plants about three decades ago by designing and developing 354 MW of solar thermal power systems, which remain in operation today.

BSE Shareholders and Strategic Partners

Shareholders

Venture Capital

- Vantage Point Venture Partners
- Draper Fisher Jurvetson
- Riverwood
- DBL Investors

Industrial

- GE
- Chevron
- BP alternativenergy
- StatoilHydro Venture

Financial Institution

- Morgan Stanley
- CalSTRS
- Goldman Sachs

Strategic Partners

International Business Development

- GE
- 上海电气 Shanghai Electric

(China JV)

Electricity Generation Customers

- Southern California Edison — An Edison International Company
- PG&E
- The Electricity Authority

Huanghe, a subsidiary of SPI

Project Equity Investors

- nrg
- Google
- GE
- NOY Infrastructure & Energy Investment Fund
- 上海电气 Shanghai Electric

Huanghe, a subsidiary of SPI

The Past, Present and Future of BrightSource

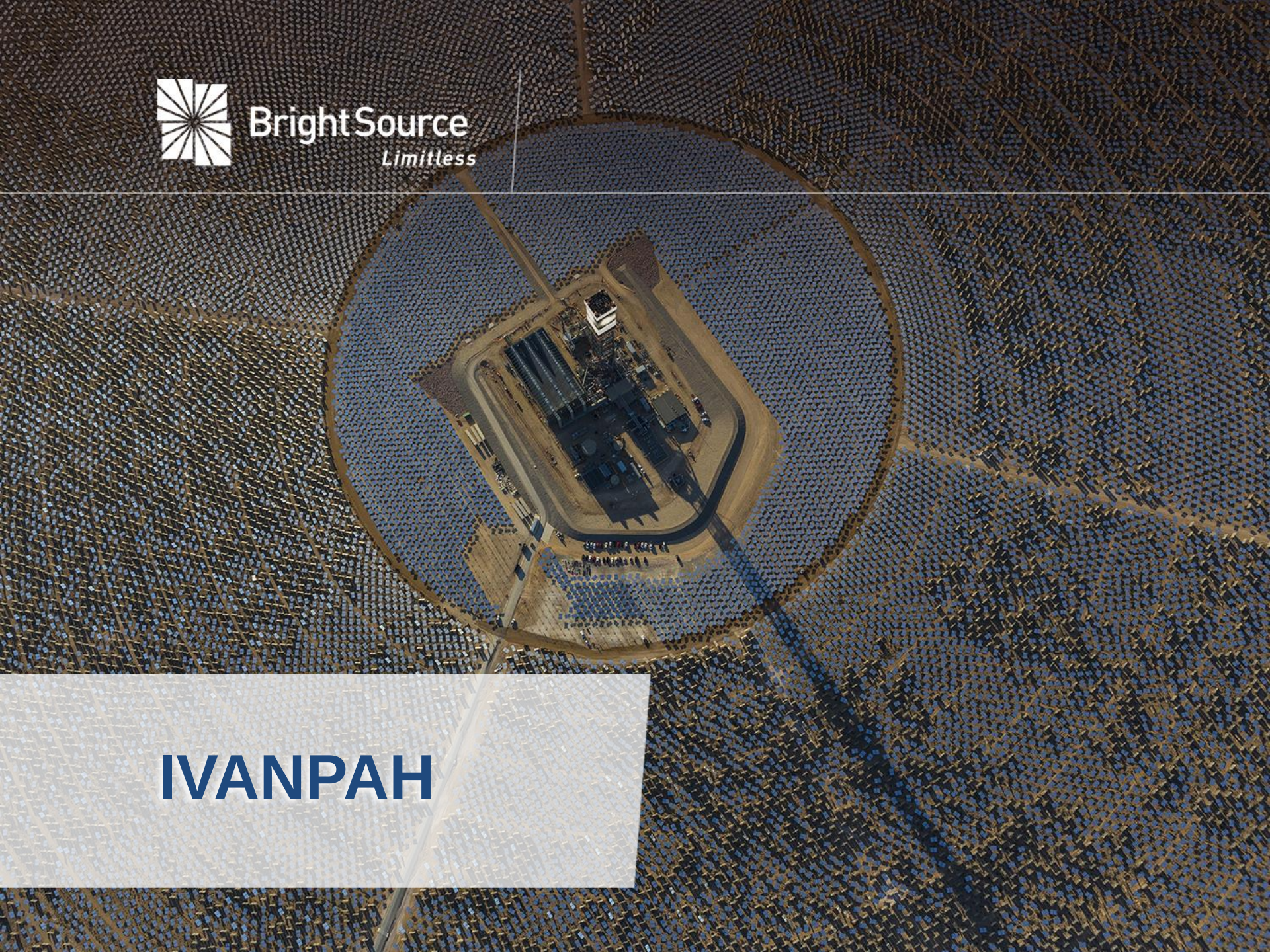
2006 - today

- Technology Validation
- Green Field Development
- Project Owner/Developer
- Significant Equity Investment
- Utility Scale Power Plants

Future

- "Sun to Steam" Leader
- Focused on Software and Services
- Lead Storage Deployment
- International Business Development through Strategic JVs

Solar Energy Development Center	Chevron Coalinga Solar Thermal EOR Plant	Ivanpah Solar Electric Generating System	Ashalim Thermal Solar Power Station	Projects in Development
(6 MWth) Operating	(29 MWth) Operating	(377 MW) Operating	(121 MW) Under construction	China (Delingha/Huanghe) South Africa (Solis) MENA


BrightSource
Limitless
IVANPAH

Flexible, Three-unit Project Structure & Scale

Shared Responsibilities

What	Who
Plant conceptual design	BrightSource
Heliostat and components	BrightSource
Solar field layout	BrightSource
SRSG (solar receiver/steam generator)	Riley Power in cooperation with BrightSource
Tower	Bechtel
Power block	Siemens and Bechtel
Plant Engineering	Bechtel (engineering procurement & construction)

Technology

Heliostats: Current Industry Designs

- Striking a balance between optical efficiency & solar field cost

Ivanpah - 15m²

120m²

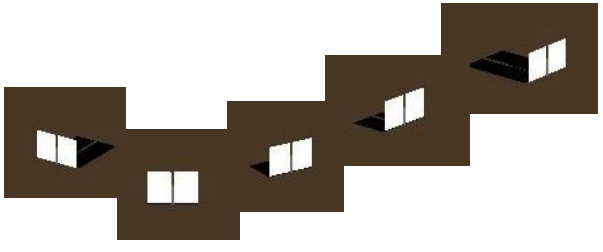
62m²

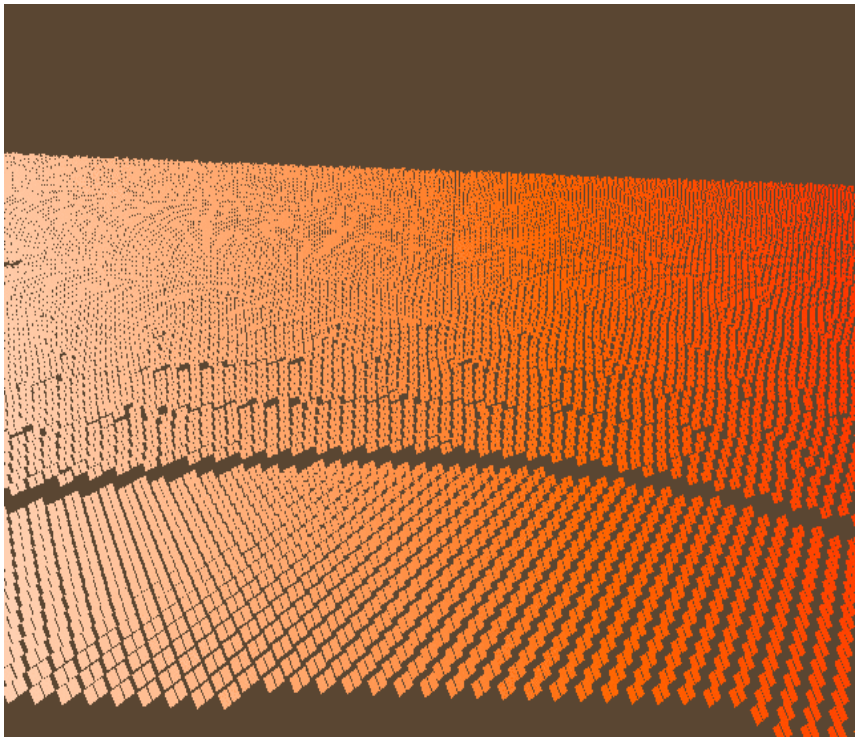
< 2m²

Solar Field Design: Optimized for Output

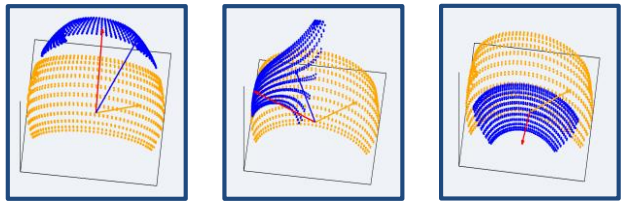
Field design provides for flexible heliostat placement to work within existing terrain while maximizing energy output.

Optimal Field Design



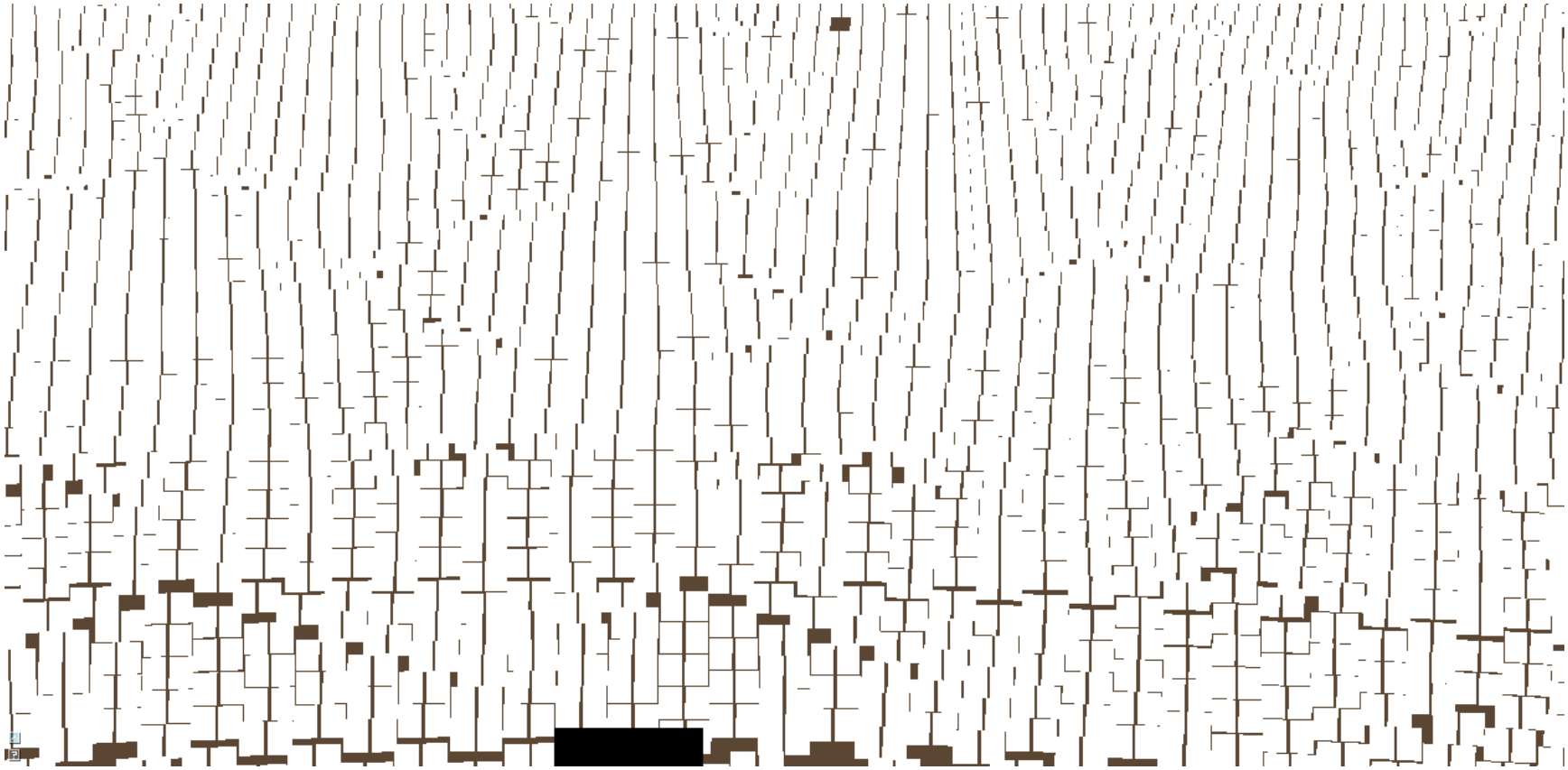


- Arrangement of the heliostats is optimized to maximize annual revenues from electricity (total electric generation weighted by value at different times of delivery)



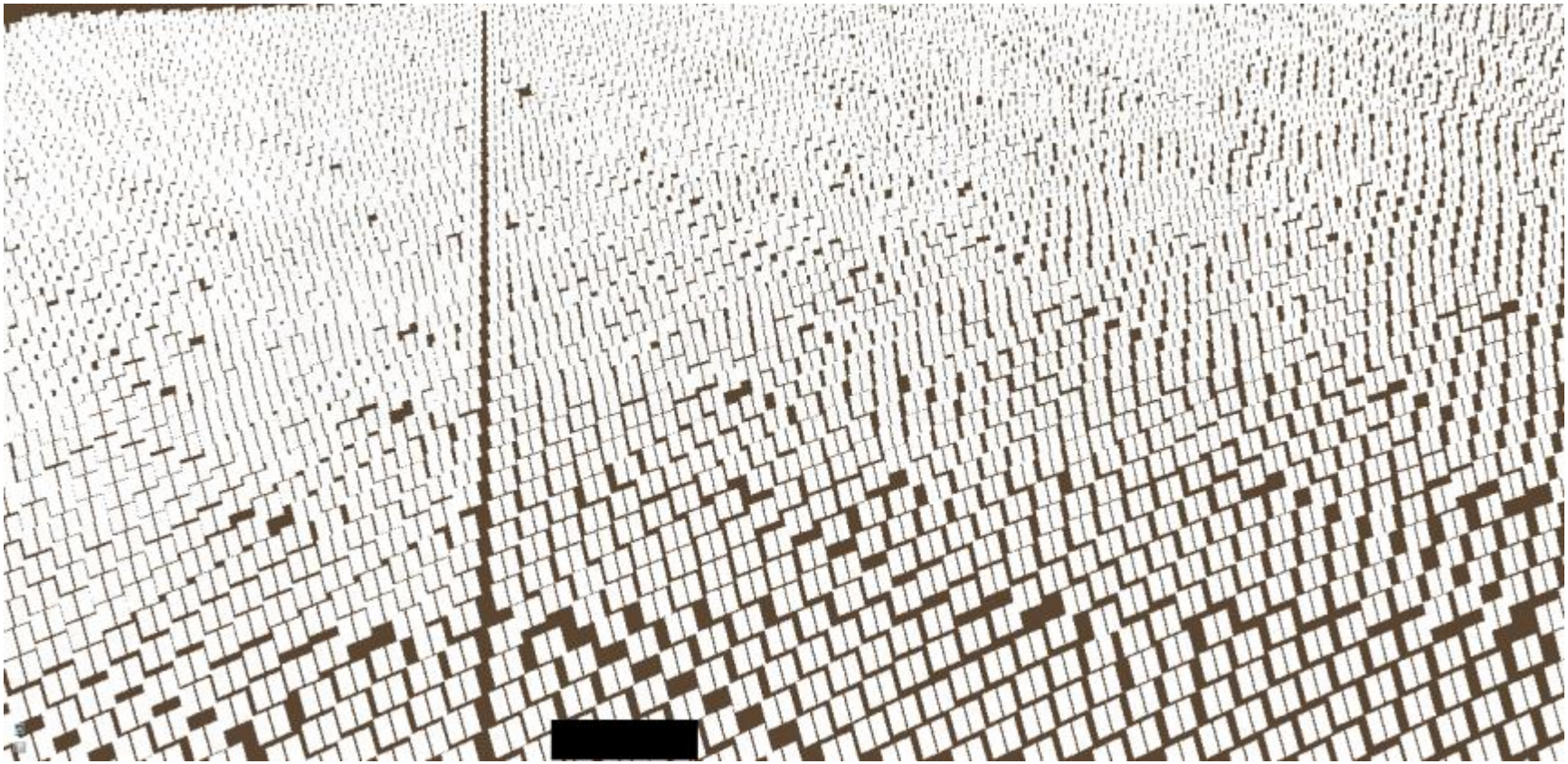
The Benefit of Optimizing Solar Field Layout

Receiver ‘sees’ maximum glass



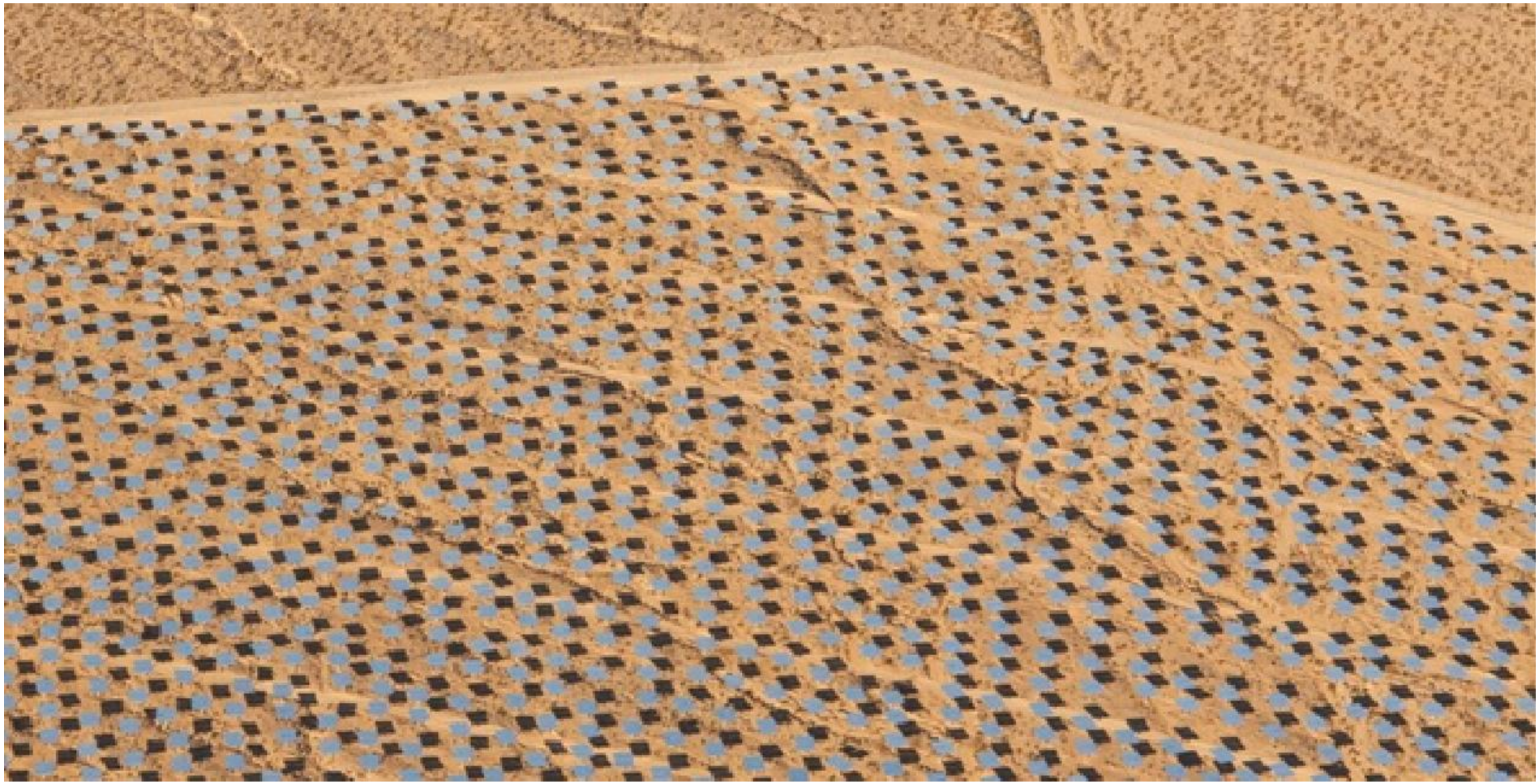
Receiver looking north at noon, Ivanpah Unit 1

South – afternoon



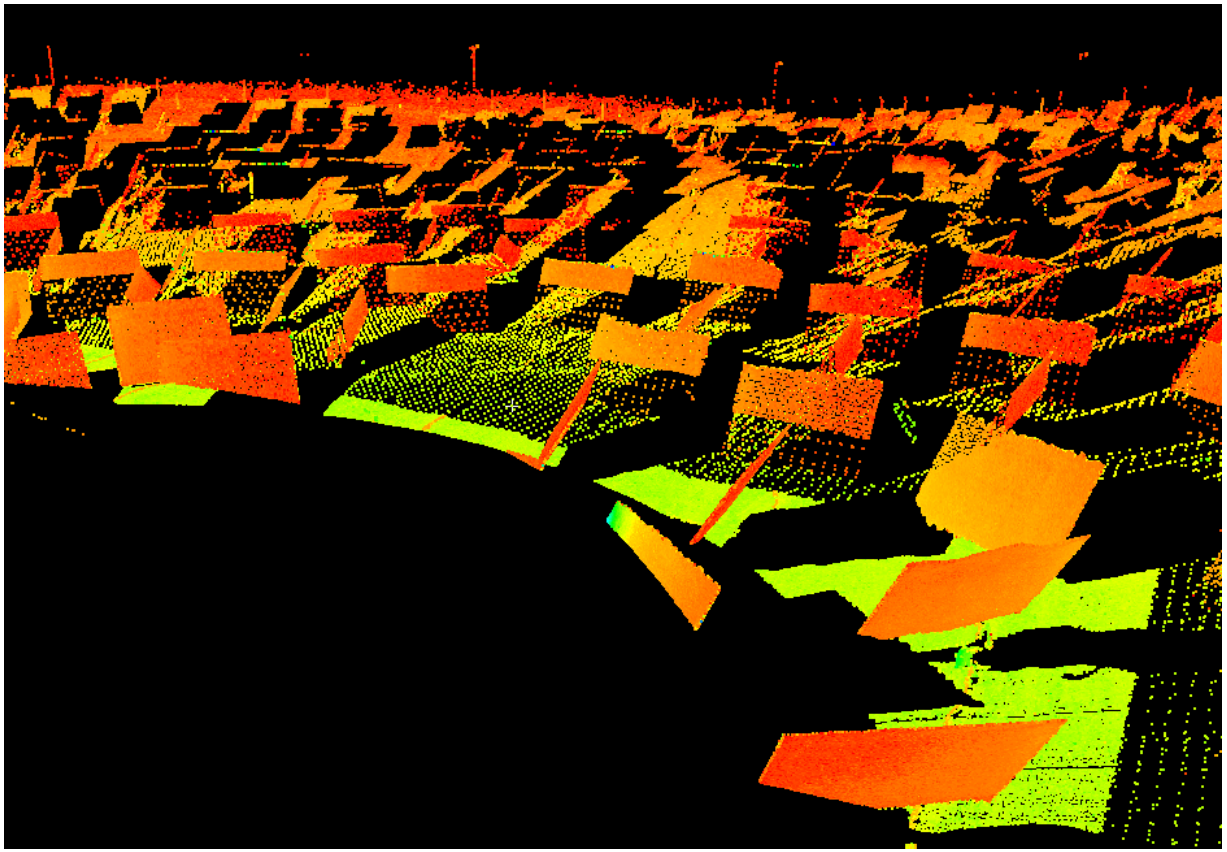
An optimized solar field yields 10-15% more energy per year

Design around topography



NW corner of solar field, Ivanpah Unit 1

Laser Scan Used in Initial Calibration of Heliostats; GPS Used in Positioning



Infrared Camera System

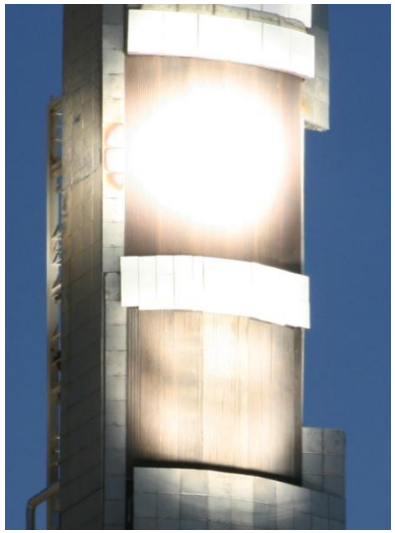
- Coordinated field of heliostats delivers flux to the receiver, enabling the system to achieve required steam temperature and pressure levels.

Receiver Size: Strikes balance between Optical & Thermal Efficiency

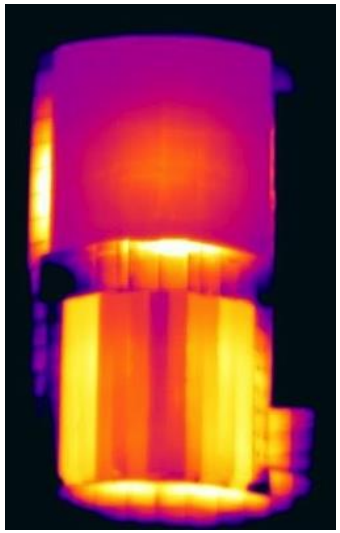
Solar Receiver

Superheater

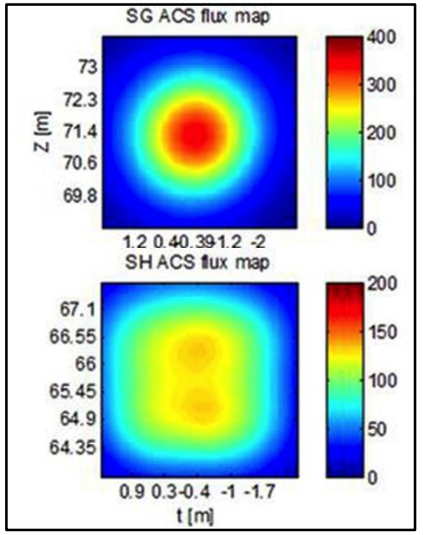
Solar Receiver Steam Generator (SRSG)



SRSG Infrared Image



SBMS Temperature Measurement



- Proprietary boiler tube coatings maximize solar energy absorption
- Camera and sensors system transmit real-time heat levels to heliostat control system
- Continuous optimization of steam production to match turbine temperature and pressure requirements based on changing operating conditions

Solar Receiver

SRSG – Inside out, upside down boiler

- Insulation Panels
- Superheater Section
- Evaporative Steam Generation Section
- Reheater Section
- Insulation Panels

SRSG – Inside out, upside down boiler

- Insulation Panels
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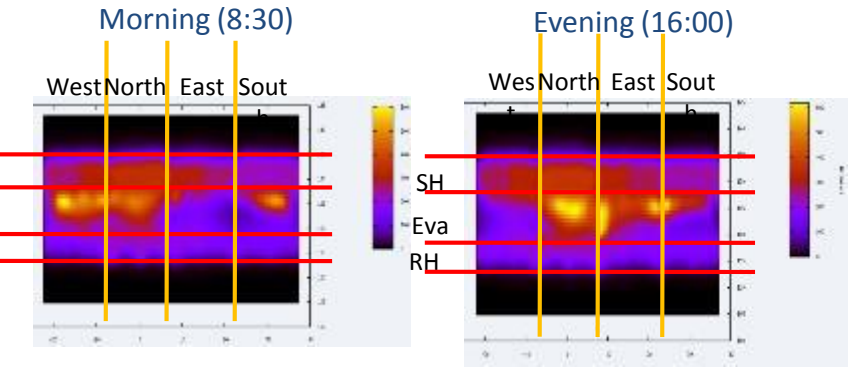
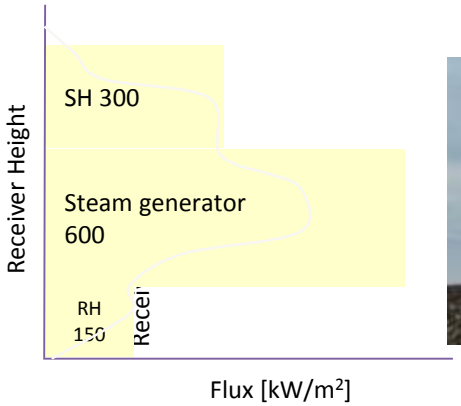
- Reheater Section
- Insulation Panels

Control Systems Based on Real-time Dynamic Optimization

Solar Boiler Management System



Flux Limits



Real-time Site Weather Data

- Visual and infrared cameras in the solar field monitor SRSG status
- Cameras on the tower are used to calibrate heliostat aiming accuracy

Solar Field Integration & Control System (SFINCS)

- The SFINCS control system manages distribution of energy across the solar receiver using real-time heliostat-aiming and closed-loop feedback
- On-site weather systems, and visual and infrared cameras provide real-time feedback into advanced algorithms for solar field management
- Proprietary optimization and control software maximizes project performance and power production efficiencies

Construction

Getting it Right – On-site

- Automated assembly equipment produced 500 heliostats/day
- Logistics management and storage for component supply
- Assembly equipment dismantled and parts re-used or sold

Heliostat Assembly

Heliostat Assemblies in Transit

Installation of Heliostats

Installation of Heliostats

BrightSource Limitless

Environmental Approach

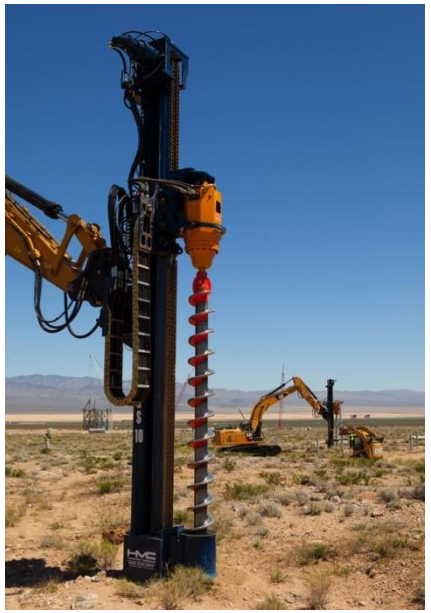
Environmentally Responsible Design

- Technology and systems
  - Designed to minimize impact on ecosystems and positively address all aspects of:
    - Site selection
    - Low-impact design
    - Water usage
    - Air quality
    - Species protection
    - Plant preservation

Sustain One

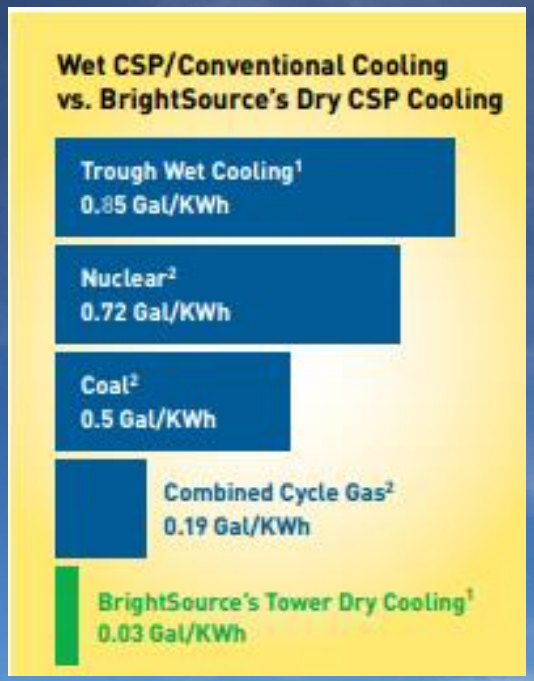
RESPECT. PROTECT. PRESERVE.

Sustainable Construction Practices



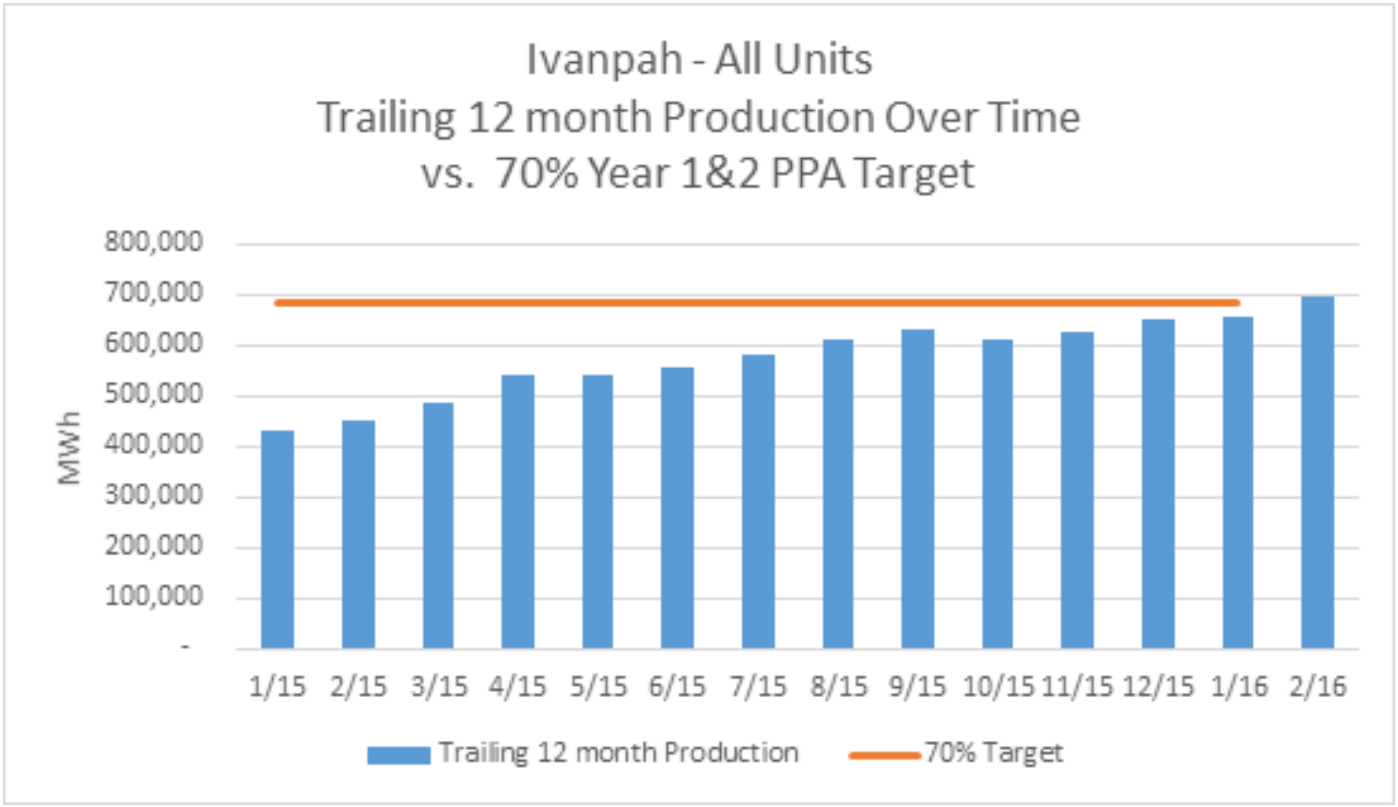
- Heliostat installation, placement
  - Pylons set into ground with low-impact “pylon driver”
    - Heliostats mounted on pylons
  - Process eliminates need for foundations, concrete pads
    - Vegetation co-exists beneath mirrors
    - Promotes natural draining and avoids corrosion
      - Preserves site’s natural hydrologic cycle to greatest extent possible

Low Water Use With Dry Cooling Technology



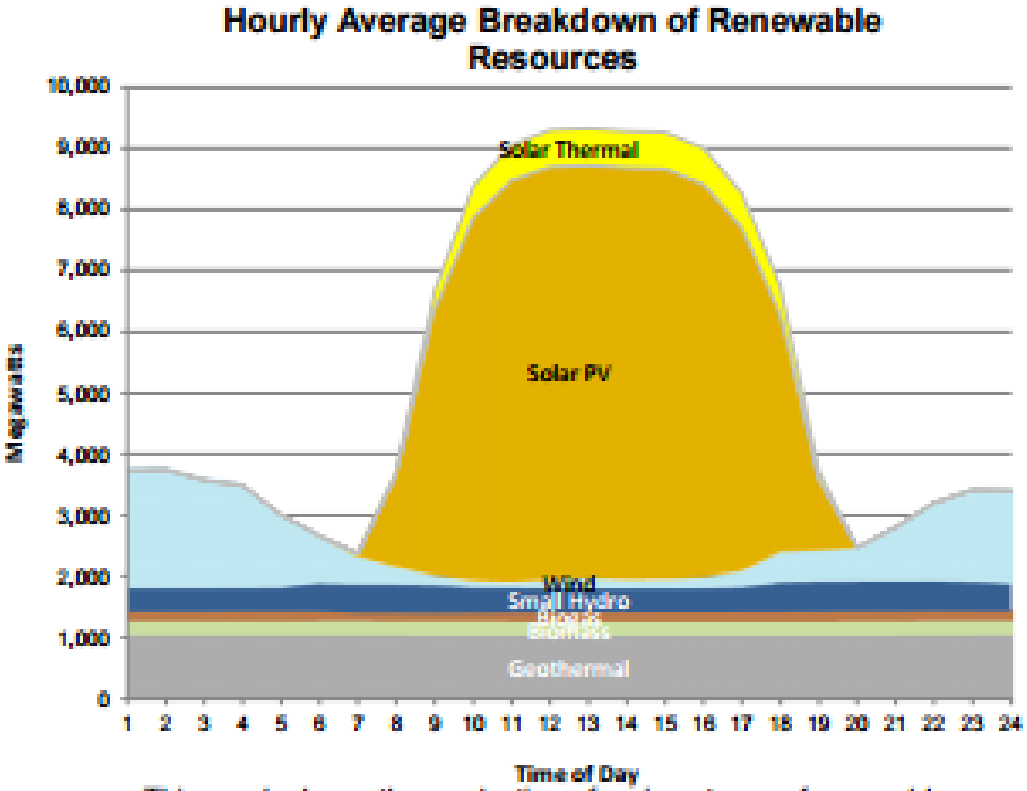
- 95% Less Water
- Up to 100 acre-feet/yr (123,348 cubic meters)

Performance



- Ivanpah is not only a new plant, but the first of its kind at this scale. A multi-year performance “learning curve” has always been assumed since the earliest stages of planning and is typical for opening a major utility-scale thermal power plant of any kind. In fact, the annual expected generation was developed considering performance in the fourth year of operation.

CAISO Renewables Production: April 2, 2016



This graph shows the production of various types of renewable generation across the day.

- Ivanpah produced 3,672 MWh, representing approximately 65% of the 5,695 MWh for solar thermal produced on this day.

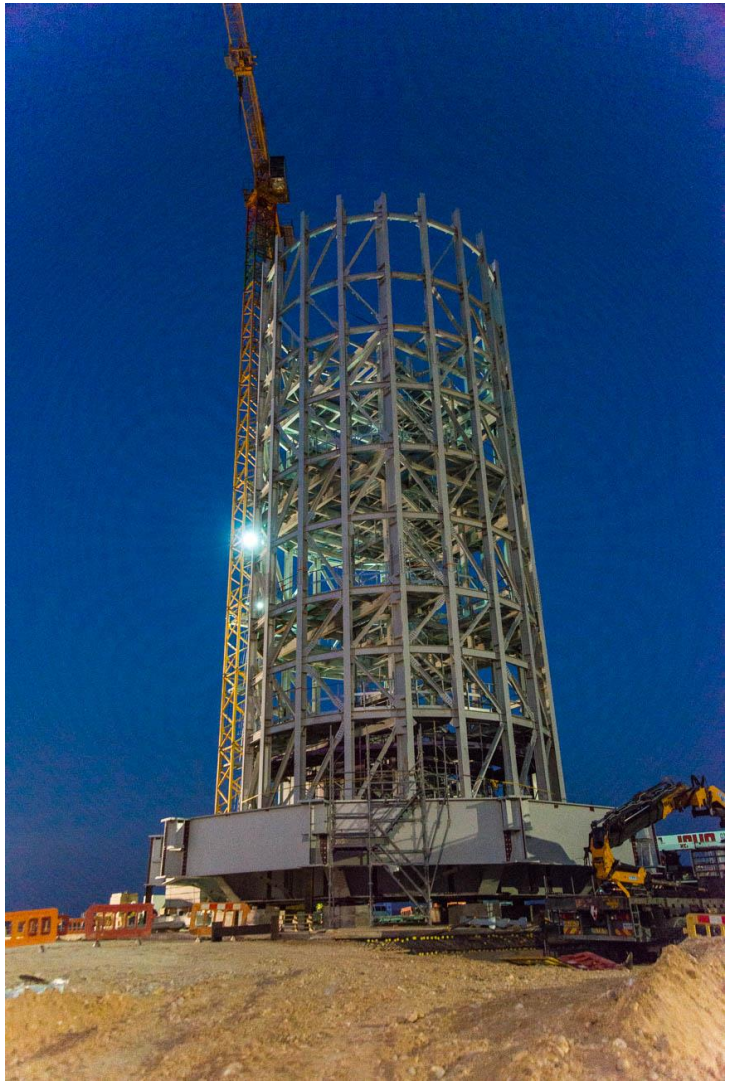
CAISO Daily Renewables Watch report for April 2, 2016. It is unverified raw data and is not intended to be used as the basis for operational or financial decisions.

Global CSP Deployment

Technology Advances & Cost Reduction

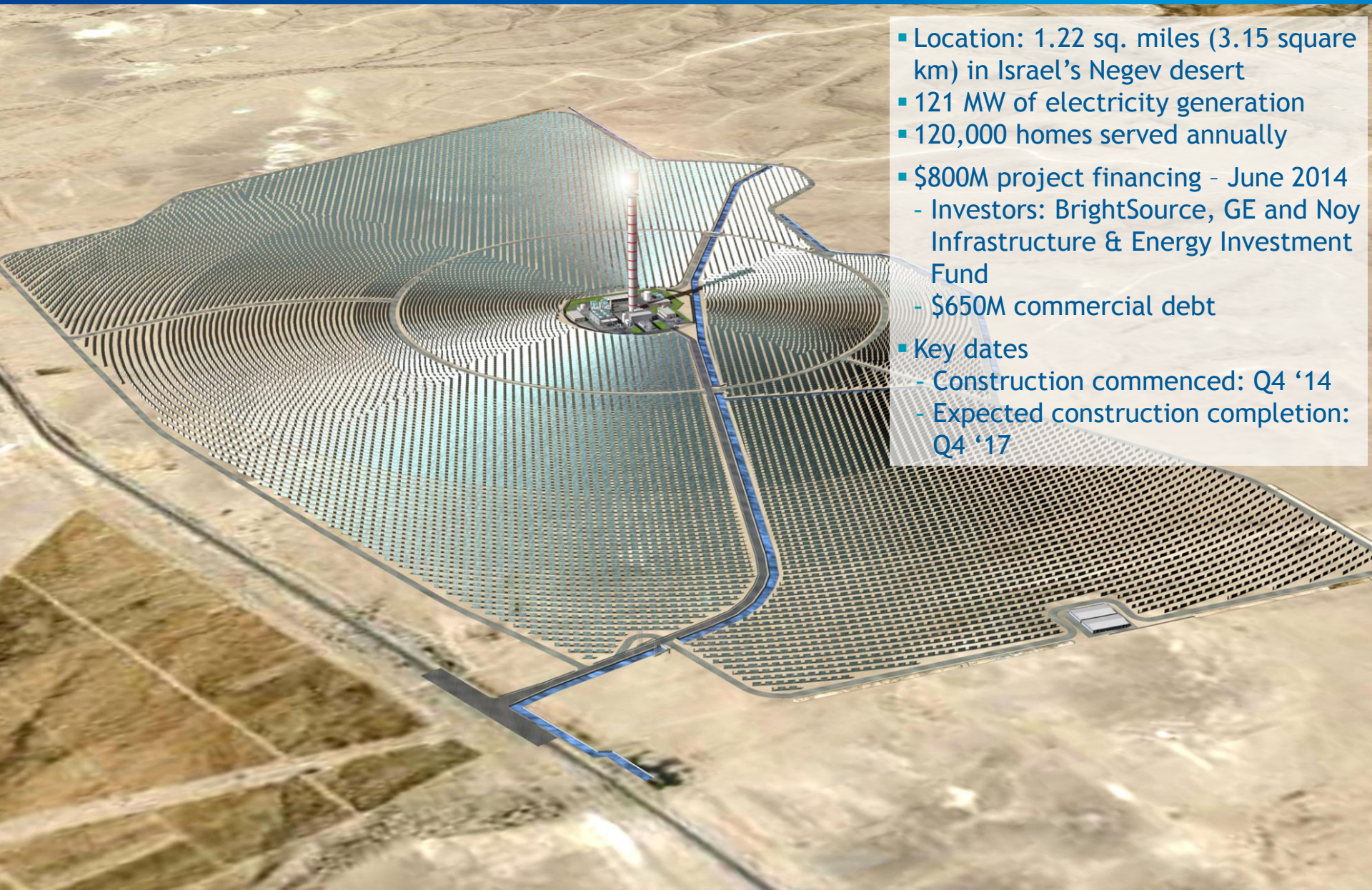
Key Enabling Technologies

1. Low-cost heliostat design
2. Receiver coatings
3. Solar field layout
4. Solar field control systems
5. Wireless solar field network (first implementation in Ashalim project)
6. Thermal Energy Storage



Ashalim: World's tallest power tower, 750 feet (240 meters)

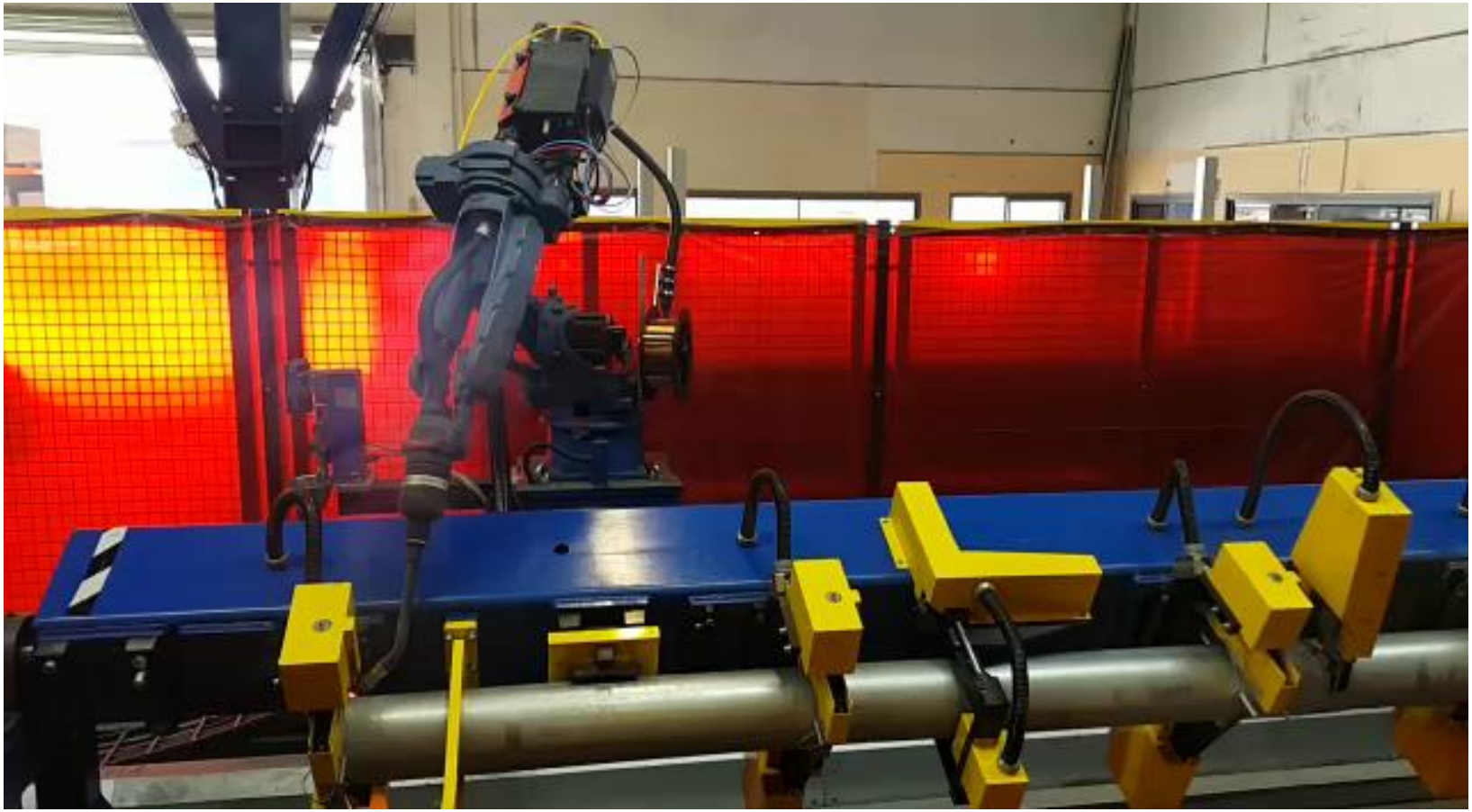
Ashalim: Combines GE's Power Experience with BrightSource's Industry-Leading Solar Field Technology



- Location: 1.22 sq. miles (3.15 square km) in Israel's Negev desert
- 121 MW of electricity generation
- 120,000 homes served annually
- $800M project financing – June 2014
  - Investors: BrightSource, GE and Noy Infrastructure & Energy Investment Fund
  - $650M commercial debt
- Key dates
  - Construction commenced: Q4 '14
  - Expected construction completion: Q4 '17

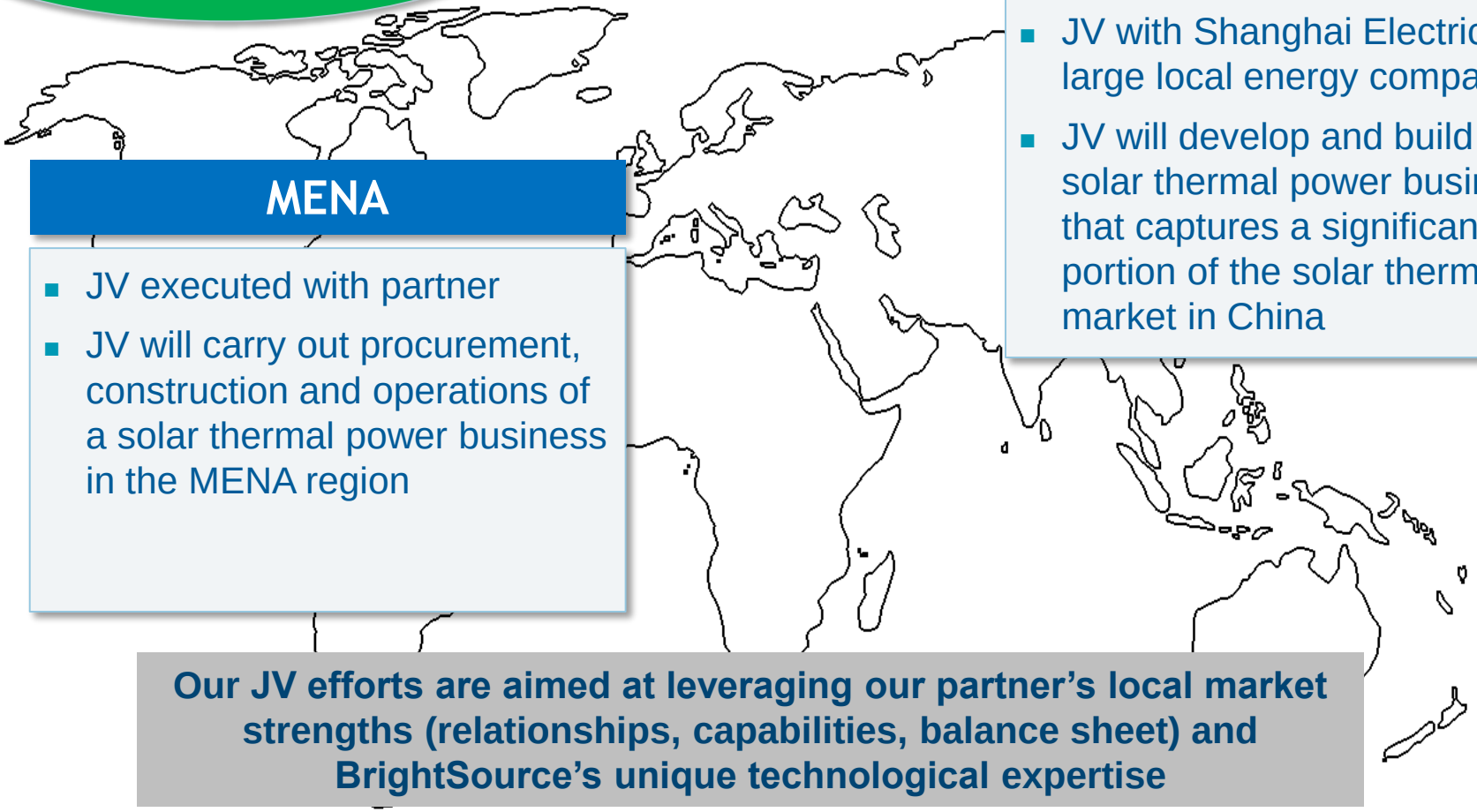
TT Production Line

TT Production Line



Strategic Joint Ventures in China & MENA

China & MENA
~65% of the global CSP market by 2020



China

- JV with Shanghai Electric, a large local energy company
- JV will develop and build a solar thermal power business that captures a significant portion of the solar thermal market in China

MENA

- JV executed with partner
- JV will carry out procurement, construction and operations of a solar thermal power business in the MENA region

Our JV efforts are aimed at leveraging our partner's local market strengths (relationships, capabilities, balance sheet) and BrightSource's unique technological expertise

BrightSource, SPI Huanghe and Other Partnerships
US China Government Energy Collaboration

US-China Energy Cooperation Framework

China NEA

US DOE

Commercial Pilot Project to Support National CSP Handbook

国家电力投资集团公司 STATE POWER INVESTMENT CORPORATION

BrightSource

Technical Assistance to National CSP Handbook

CREEI 水电水利规划设计总院 China Renewable Energy Engineering Institute

BrightSource

Research on CSP 's Value and Contribution to Grid

国家电网公司 STATE GRID CORPORATION OF CHINA

BrightSource

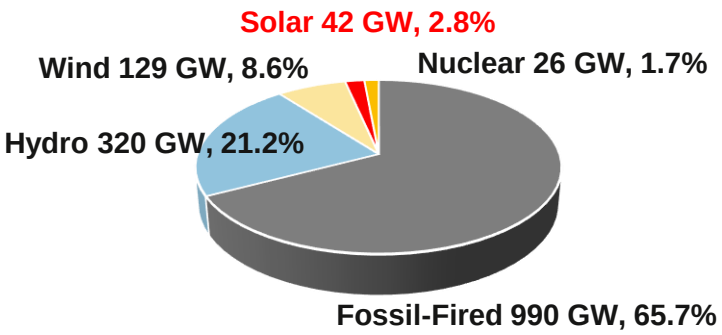
NREL NATIONAL RENEWABLE ENERGY LABORATORY

Huanghe Qinghai Delingha 6 x 135MW Solar Thermal Tower Project

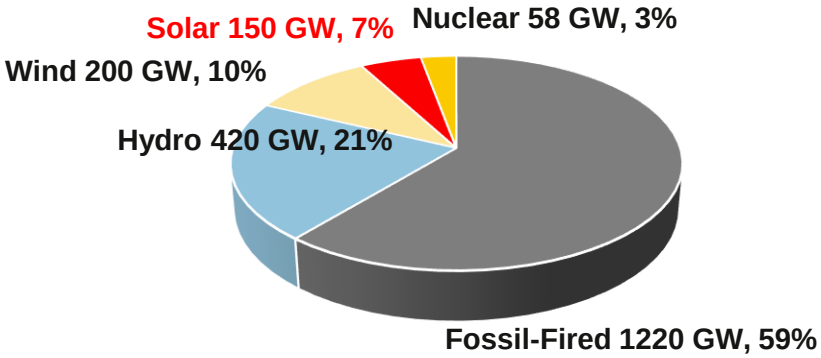
Create a stepping stone for BrightSource to shape the future of China CSP market

China Power and CSP Market

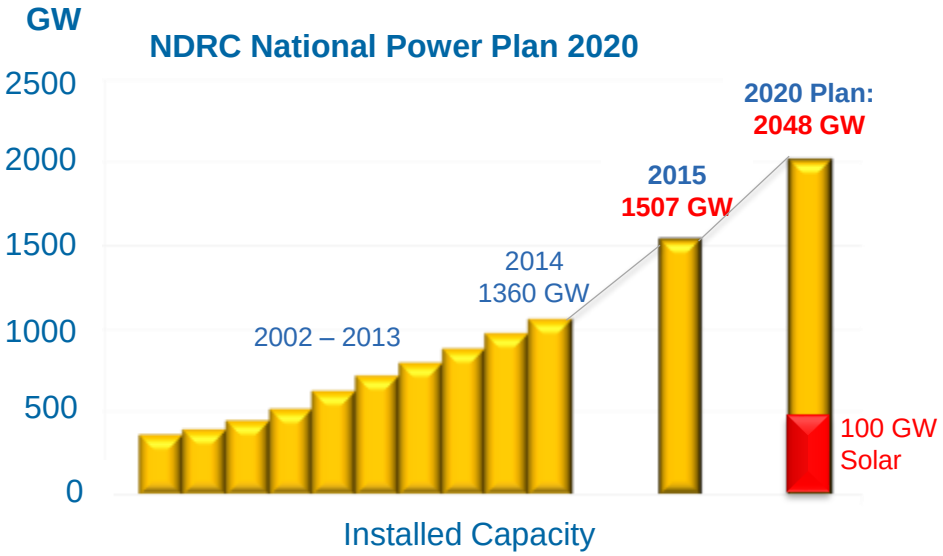
China 2015 Power Capacity Mix by Fuel (1507 GW)



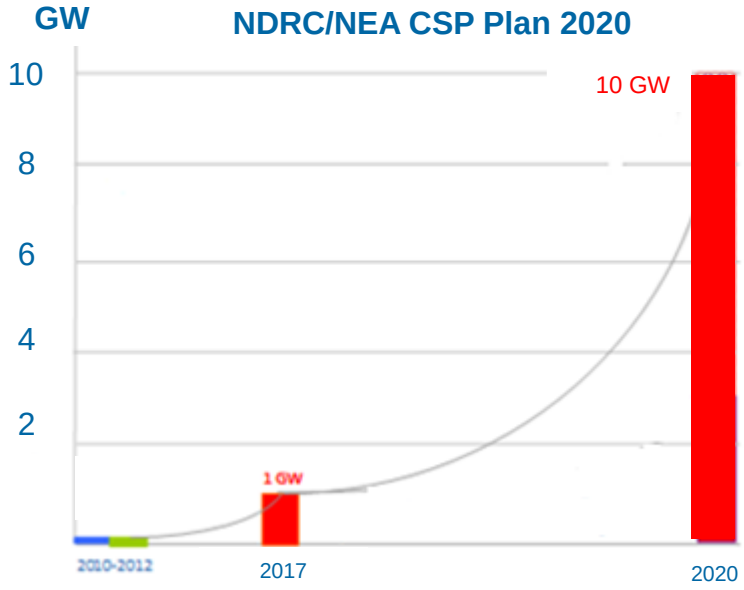
China 2020 Power Capacity Mix by Fuel (2048 GW)



NDRC National Power Plan 2020



NDRC/NEA CSP Plan 2020



Cooperation with SPI Huanghe and Shanghai Electric

2012/1 — Strategic Agreement signed between BSE and SEC

2013/4 — State Grid ERI CSP Report Conference

2013/7 — US-China Renewable Energy Industry Forum Witnessed by NEA Liang Zhipeng and Robert Sandoli

2014/2 — Delingha listed into US-China G2G Energy Pilot Program

2014/3 — JV Termsheet Signed

2014/11 — SEC/BSE JV contract signing during APEC Witnessed by US DOC Vice Secretary Bruce Andrews

2015/5 — Delingha JV contract signing Witnessed by Ambassador Baucus and Qinghai Governor, Mr Haopeng

2015/6 — Delingha FSR Project Approval Obtained

2015/10 — Delingha 2x135 MW submission for China 1GW CSP Pilot Project

China JV

Customer

Joint Venture

Solar Field Materials and Execution

- Design
- Solar field materials and equipment;
- Mirror washing machines;
- On-site installation and commissioning;
- Thermal energy storage system and DCS
- O&M services
- BSE's and SEC'S Scope of Supply

BrightSource

Software and Services

- Solar field control system, integrated motors, receiver coating material, performance model
- Solar field engineering, solar field layout and plant configuration engineering
- Commissioning and commissioning support activities

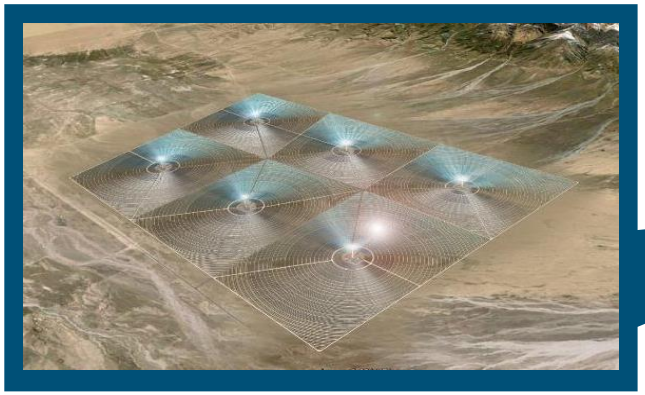
上海电气 SHANGHAI ELECTRIC

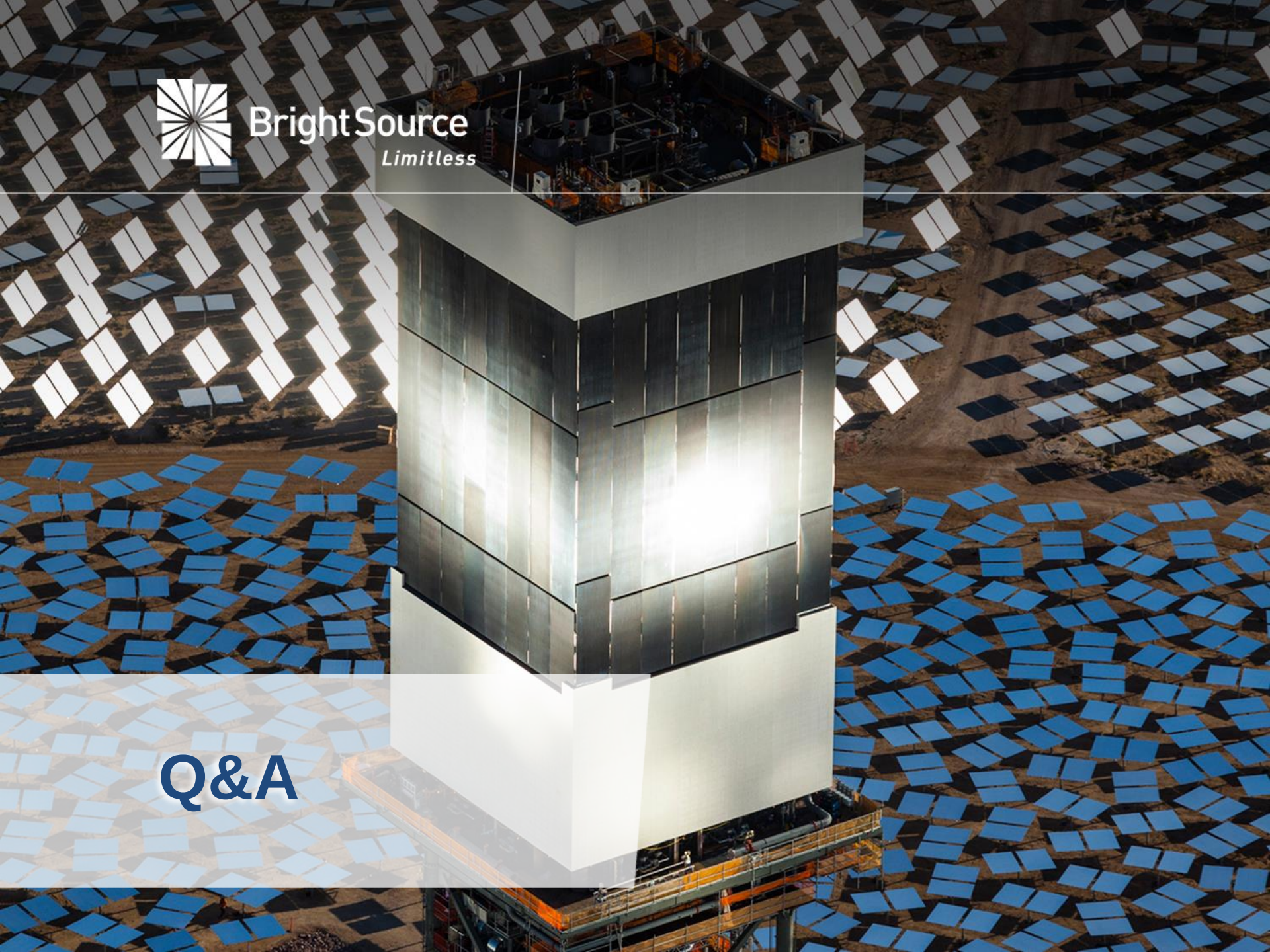
Balance of Plant

- Balance of plant equipment and services
- Generator
- Solar receiver, thermal storage and heat exchange equipment
- Receiver system, storage system and tower and steam turbine system design

Single customer facing entity providing a full sun-to-steam performance guarantee

BrightSource, SPI Huanghe, and Shanghai Electric JV invests in China's First Commercial CSP Pilot Project

Location	Delingha City, Haxi Prefecture, Qinghai Province
Geography	 
Project Status	Feasibility study approved by Qinghai DRC. Expected to be listed as NEA 1 GW Pilot Program in Q1 2016 and tariff given; Expected NTP in Q2 2016
Project Investors	State Power Investment Huanghe Shanghai Electric BrightSource Energy
Project Size	Project construction split in 2 phases, total 810 MW (6 x 135 MW) Phase 1: 2 x 135 MW, each unit with 3.5 hours thermal storage Annual gross output: ~6.9 GWh, ~2,553 full load operating hours
Tariff	Expected Tariff: RMB 1.2/kWh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