The World’s Largest Solar Thermal Plant

- 3 x 130 MWe
- Direct steam @ 160 bar, 560°C
- 140m towers
- 173,500 heliostats, each 15m²
Environmental Design

Dry Cooling

Low Impact Development
Construction Complete – December 2013

Screenshot from www.vegashelicam.us/Pano_Tours/Ivanpah%20Solar%20Facility/IvanpahSolarFacility.html
Copyright © 2014 Vegas Helicam - Remote Piloted Aerial Photography.
Technology choice is market-driven

Afternoon peak in California PPAs devalued storage

Direct steam chosen for shorter time to market, proven technology

Molten salt receivers more attractive in markets which require large storage capacity
Heliostat Technology

- Lowest installed cost/m$^2$
- Mass production
- Low environmental impact
- New generation: wireless/autonomous

Photo taken April 2013
Algorithmic optimization to maximize annual output/revenue

- Receiver sees ‘maximum glass, minimum dirt’
- optimized use of available land
- complete adaptation of technology to site constraints
- low environmental impacts
Solar Field Layout Optimization

Photo taken October 2012
Control Systems Based on Real-time Dynamic Optimization

Solar Boiler Management System

Morning (8:30)  
Evening (16:00)

Flux Limits

- Receiver Height
  - SH 300
  - Steam generator 600
  - RH 150

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**
And what about storage and DSG

- No storage => best direct
- CSP storage advantageous
- Storage => best receiver with storage medium as HTF
- Direct 10 hours average sun + storage hours
- Ultimate – 400MW DSG tower + second tower with storage media
Thank you

Photos on Slides 1-3, 5-6, 8-10 courtesy of Bechtel