



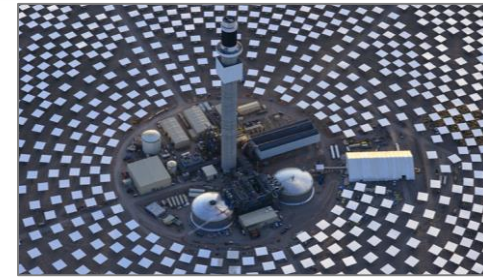
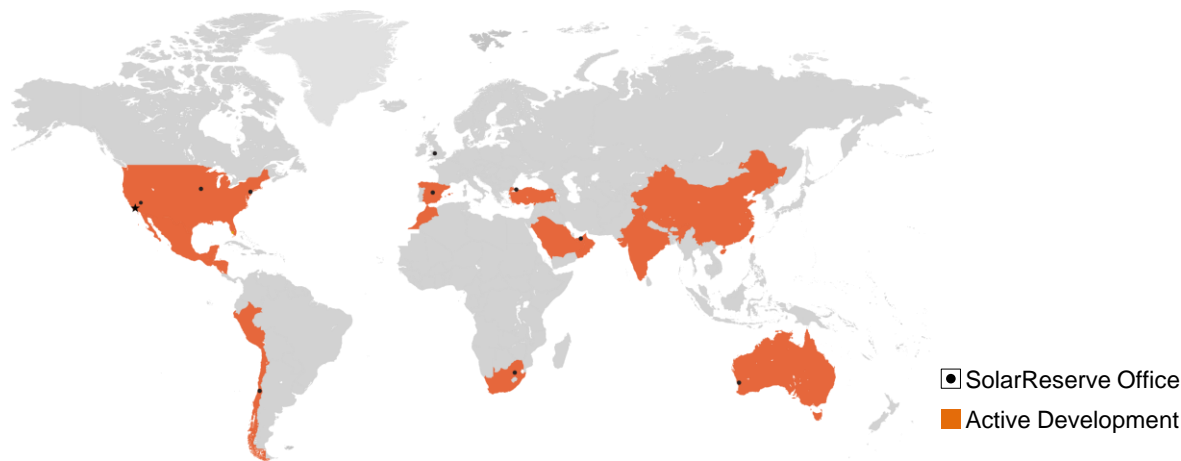
**RENEWABLES & MINING  
SUMMIT AND EXHIBITION:**

**MEETING MINING'S NEED FOR BASELOAD POWER WITH SOLAR THERMAL WITH STORAGE**

**TORONTO OCTOBER 2014**

# SOLARRESERVE – PROVIDING BASELOAD SOLAR TO MINES

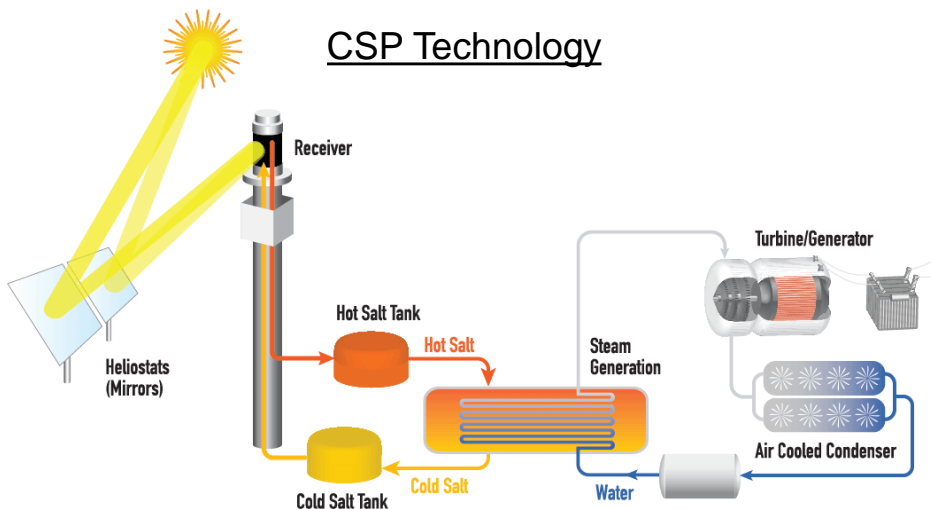
- **Global developer** of large-scale solar power projects
- Commercialized the world's leading Concentrating Solar Power (CSP) technology with integrated energy storage, capable of providing **baseload solar energy**
- More than **\$1.8 billion of projects** in construction and operations, both CSP and Photovoltaic (PV)
- Active in **key mining regions** around the world



# SOLARRESERVE HAS BUILT THE WORLD'S FIRST LARGE-SCALE MOLTEN SALT POWER TOWER



## CSP Technology



## Flagship: The Crescent Dunes Solar Energy Plant

- Located near Tonopah, Nevada
- 110 MW facility output with 10 hours full load storage
- Produce more than 500,000 MW-hours annually
- 25-year power purchase agreement with NV Energy

# THE BASELOAD SOLAR SOLUTION FOR MINING COMPANIES

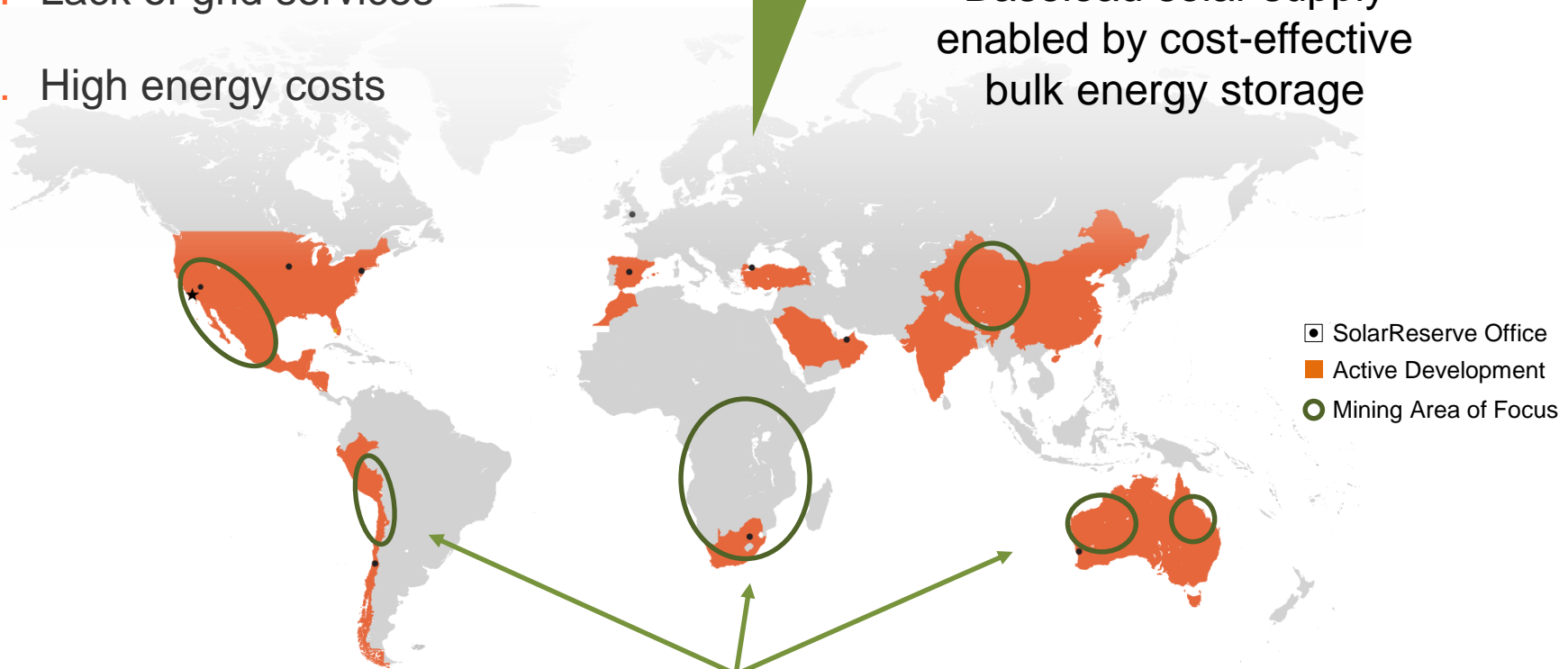
## Energy Issues for Remote Mines

1. Need for reliable 24-hour supply
2. Lack of grid services
3. High energy costs

## The Only Renewable Solution

**SOLARRESERVE**

Baseload solar supply  
enabled by cost-effective  
bulk energy storage

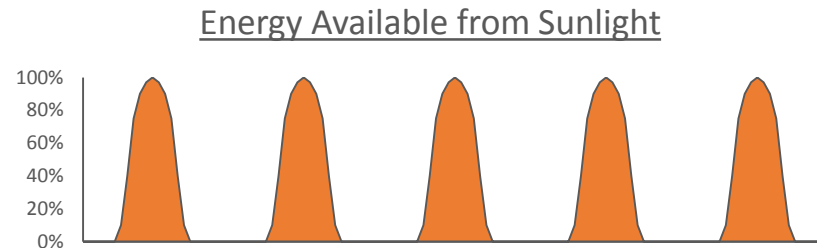


SolarReserve is developing projects for remote mines with strong solar resources

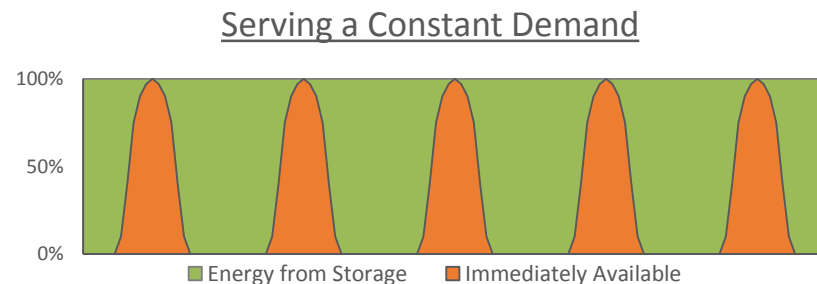
# BULK STORAGE IS NEEDED FOR COMPLETE SOLAR INTEGRATION

CONCEPTUAL

Solar energy is inherently **variable** – not a natural fit for baseload needs.



Without energy storage, **solar is limited** to serving roughly 30% of a constant demand.



**Bulk energy storage** is needed to shift the majority of daytime energy for a 100% solar supply.

# CASE STUDIES HAVE SHOWN HOW SOLARRESERVE DELIVERS ACTUAL HOURLY ENERGY REQUIREMENTS TO MINES

Actual Mine Load



Sunlight (PV Output and CSP Collection)



CSP Output Dispatched



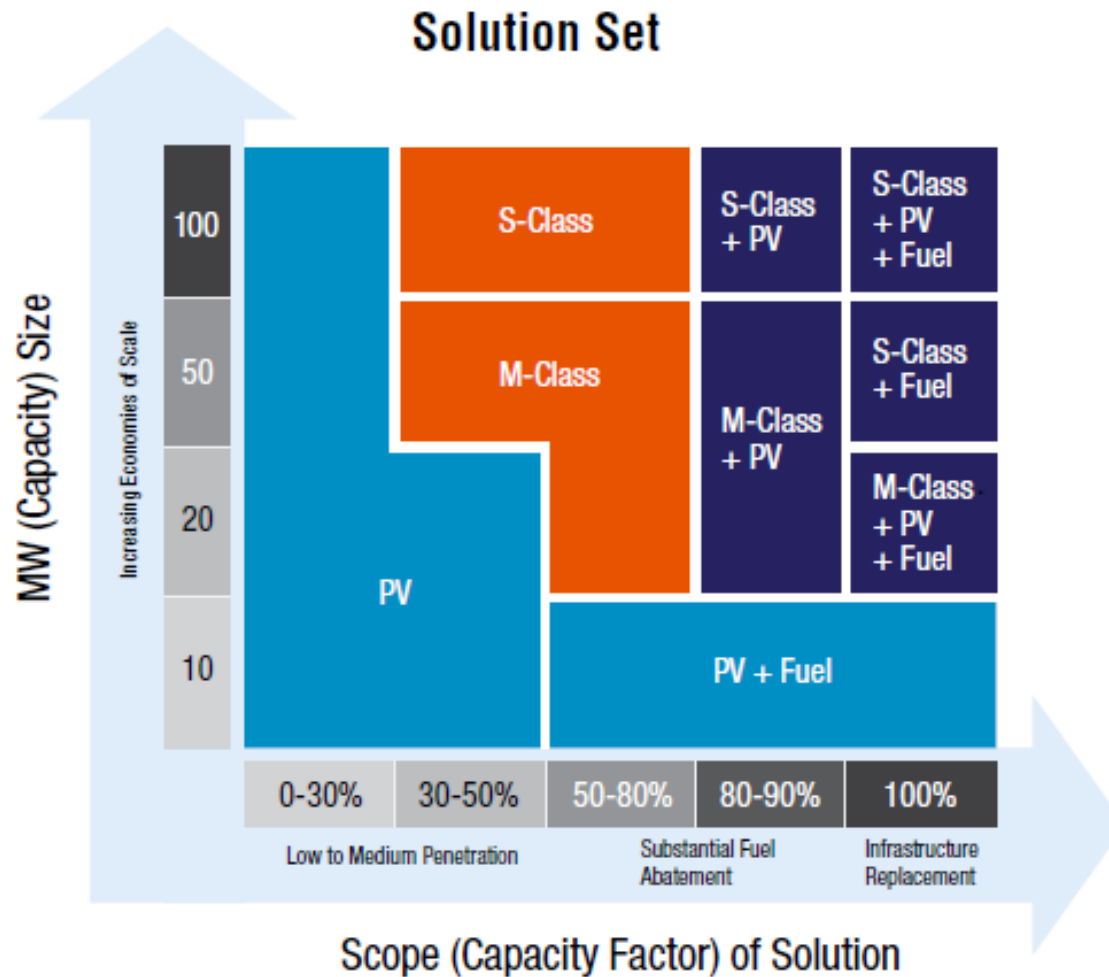
Molten Salt Storage Level



Hybrid System Output Matching Mine Load

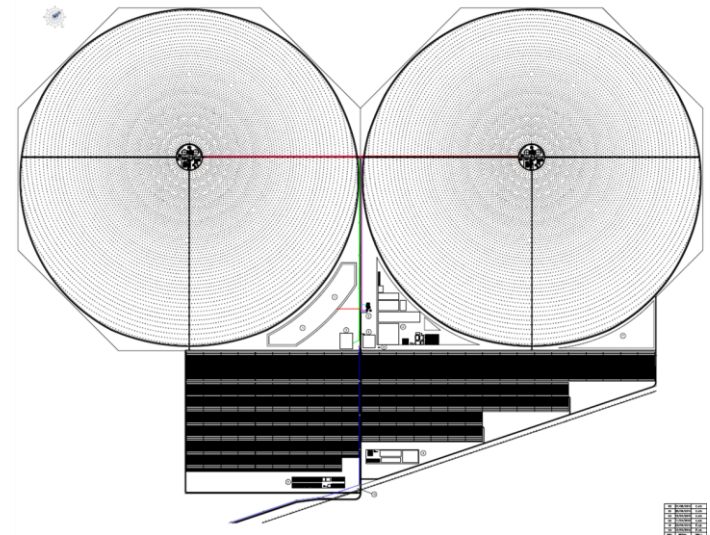


# SOLARRESERVE OFFERS A RANGE OF SOLAR PRODUCTS



# CASE STUDY: COPIAPÓ SOLAR PROJECT, CHILE'S ATACAMA DESERT

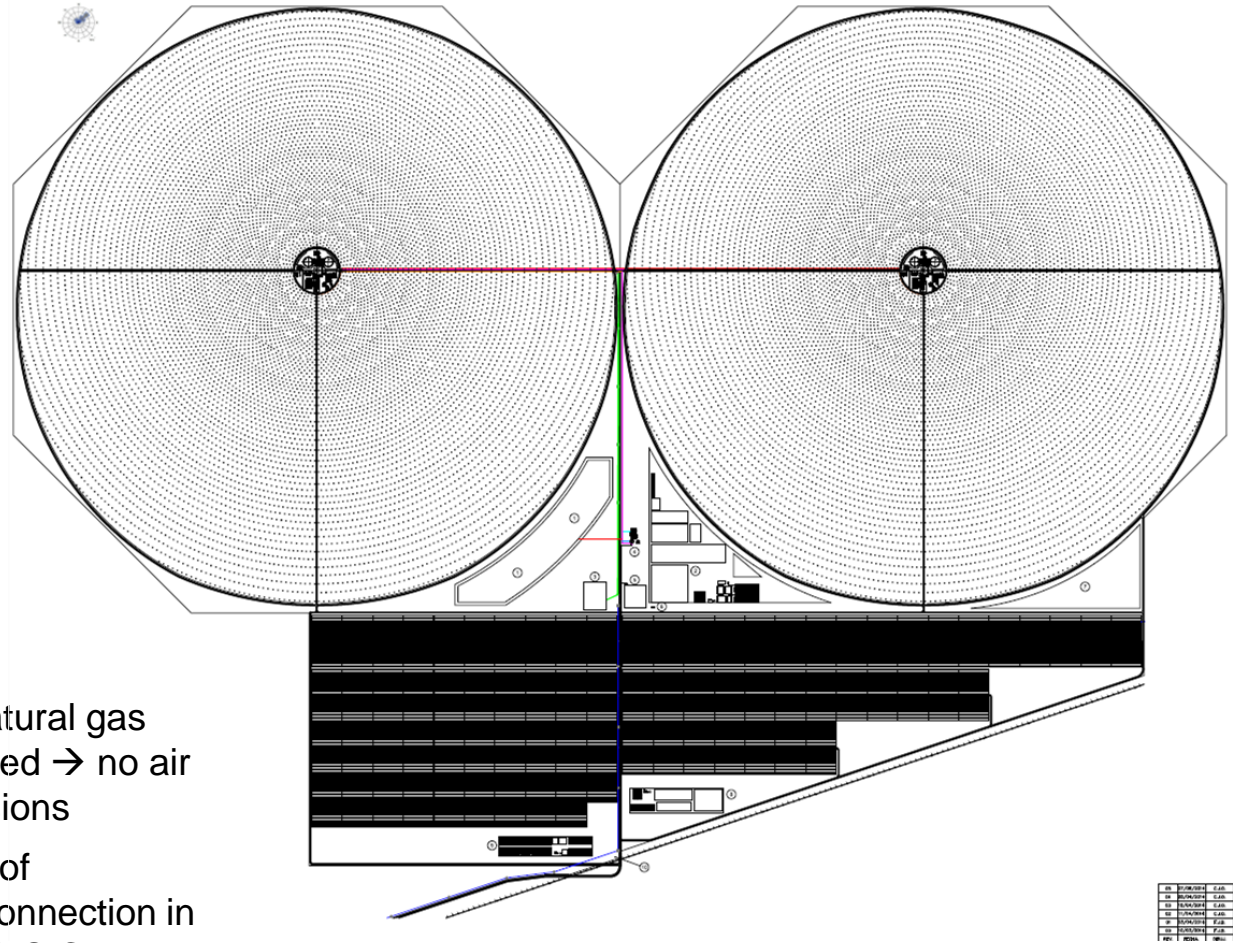
- Premier opportunity for baseload solar
  - World-class solar resource
  - High and volatile spot market energy prices
  - Large mines with 24-hour demand
- Hybrid configuration optimized for grid-tied baseload solar product
  - Two 130 MW (net) CSP plants
  - Integrated with 150 MW of PV
  - 24-hour operation, 1,700+ GWh annual output
- Dispatchability and PV integration supported by 14 hours of storage at each CSP plant
- Low water use and zero fuel use
- Energy available for delivery along Chile's SIC electrical grid
- Baseload energy at **below spot market prices**



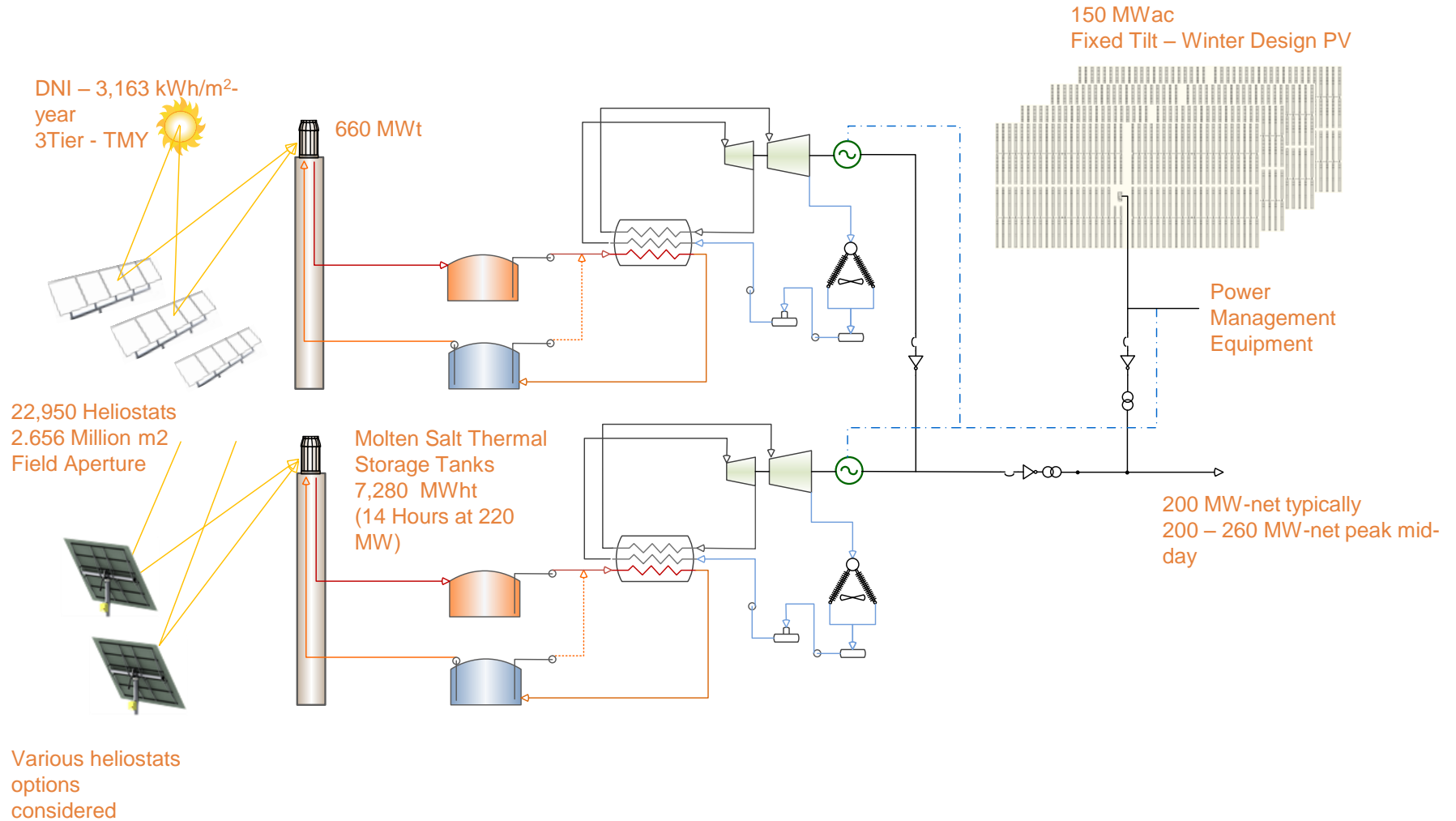


# COPIAPÓ CONFIGURATION

- 2 x 130 MW CSP (net)
- 150 MW PV
- 24 hours daily operation
- Inherent storage → 100% dispatchable
- 1,700+ GWh annual output
- Field diameter of 3,200 m per tower
- Dry cooled
- Water Use - 220,000 m<sup>3</sup>/yr
- 30 month construction
- 20,000-35,000 heliostats pending final design
- No natural gas required → no air emissions
- Point of interconnection in CDEC-SIC at 220 kV

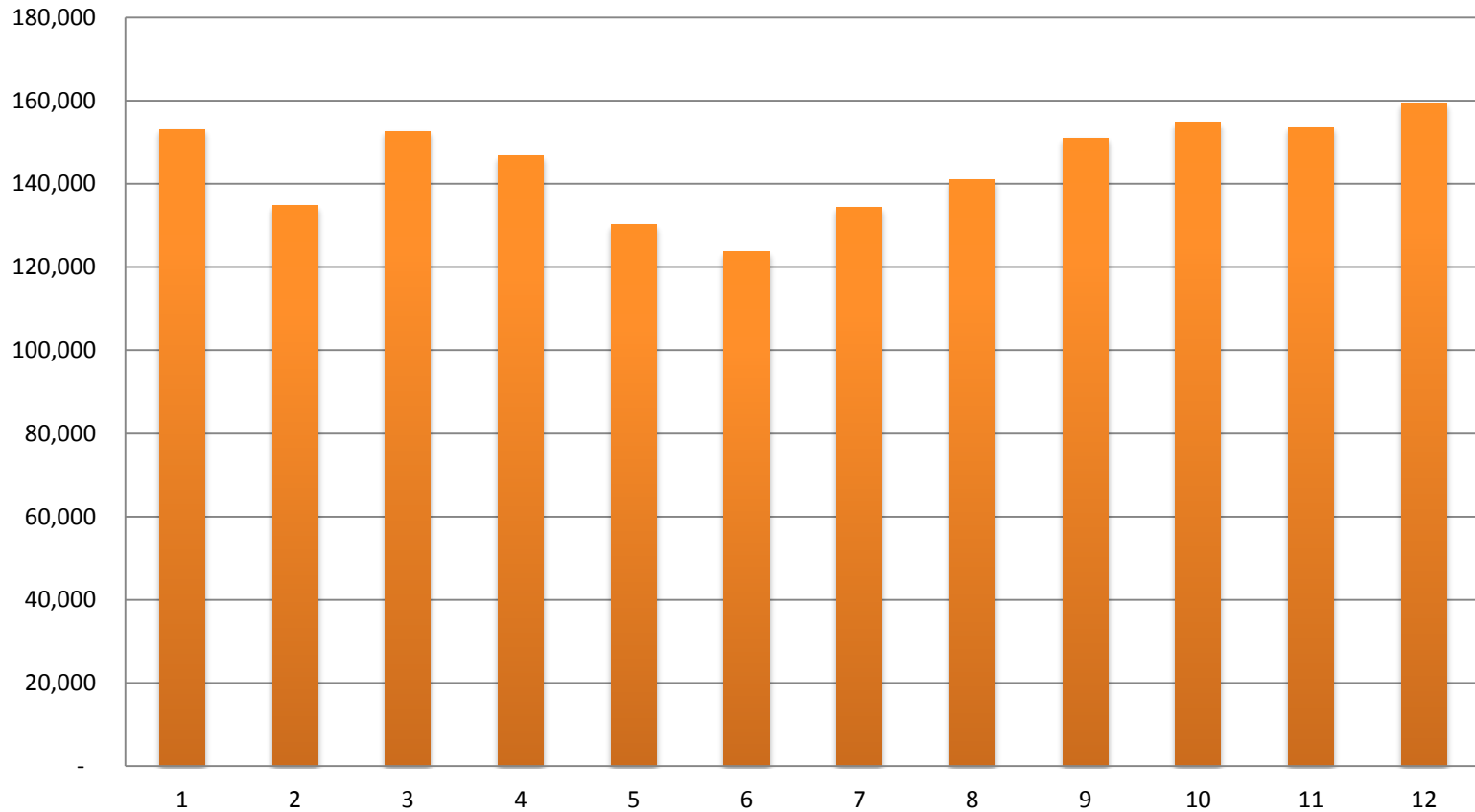


# COPIAPÓ SOLAR HYBRID FACILITY CONFIGURATION

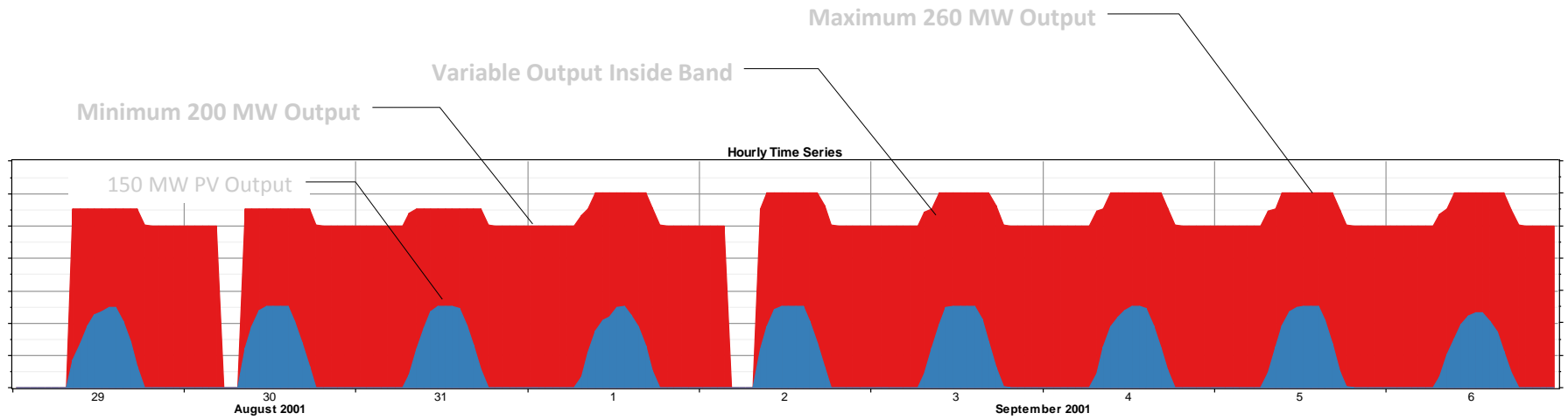


# COPIAPÓ TYPICAL EXPECTED (P50) ANNUAL OUTPUT

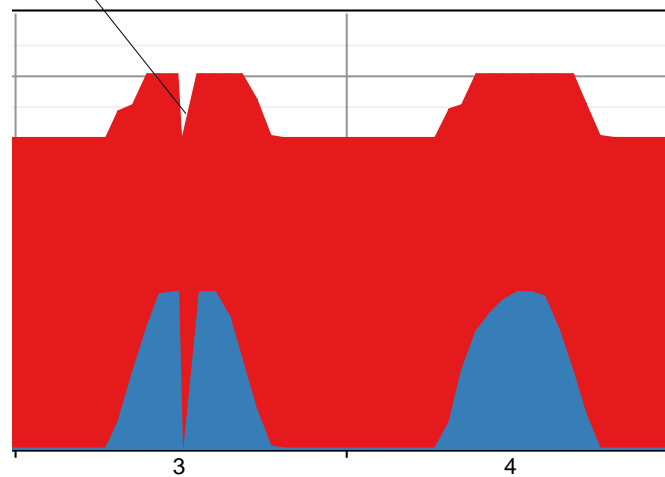
## MWh per Month



# COPIAPÓ VARIABLE OUTPUT PROFILE WITHIN MID-DAY BAND



Potential Drop in PV output



## Key Dispatch Features:

- 220 MW Typically
- 260 MW Mid-day
- Potential drop to 200 MW

# LARGE-SCALE SOLAR SOLUTIONS FOR MINES



- On-grid, micro-grid, or off-grid
- From partial fuel savings to full substitution of conventional generators
- Solar capacity factors up to 90%
- Seamless integration of fossil fuels for full off-grid availability
- Customizable systems positioned to address the mining industry's needs

# CONTACT

## CONTACT INFORMATION

Corporate Headquarters (US):  
2425 Olympic Blvd.  
Suite 500 East  
Santa Monica, CA 90404

Phone: (310) 315-2200  
Toll-Free: (866) 622-2778  
Fax: (310) 315-2201

[www.SolarReserve.com](http://www.SolarReserve.com)

Joel M. Link  
Global Head of Mining  
[joel.link@solarreserve.com](mailto:joel.link@solarreserve.com)

For more information, please email:  
[mining@solarreserve.com](mailto:mining@solarreserve.com)

