Concentrating Solar Power (CSP)

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Presented by:
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Acciona Solar Power, Inc.

About Acciona Solar Power

- **Industry Leader in the Development, Construction, Operation and Maintenance of Parabolic Trough Concentrating Solar Power Plants.**

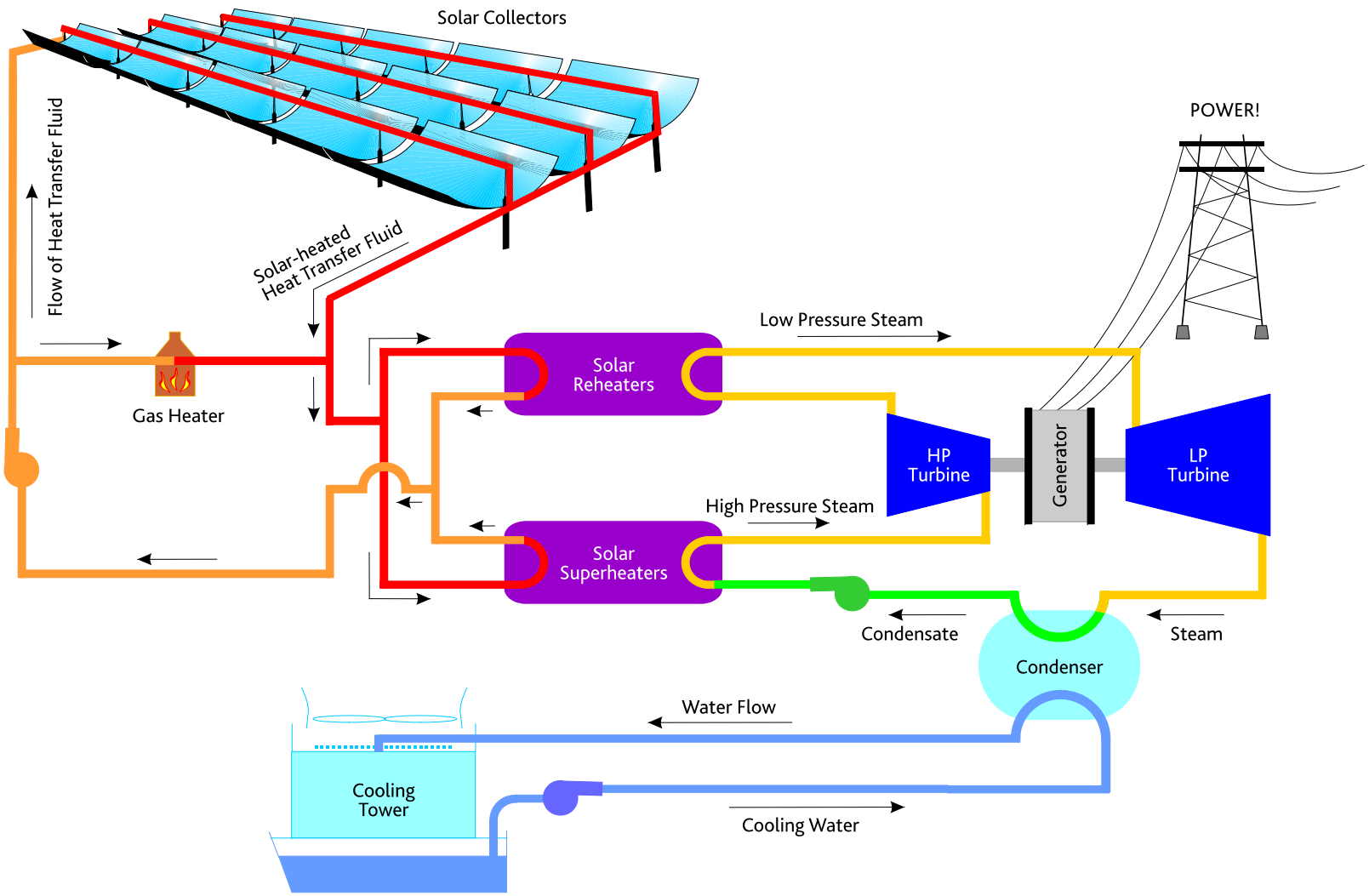
- **55% owned by Acciona Energy and 45% owned by Solargenix Energy, LLC**
  - **Established in June 1997 as Duke Solar Energy, LLC**
  - **March 2003 became Solargenix Energy, LLC**
  - **Renamed Acciona Solar Power in 2006**

- **Designed, developed, built and operates Nevada Solar One.**
  - **First concentrating solar power plant built in the last 19 years**
  - **The 3rd largest plant of its kind in the world.**

Nevada Solar One (NSO)

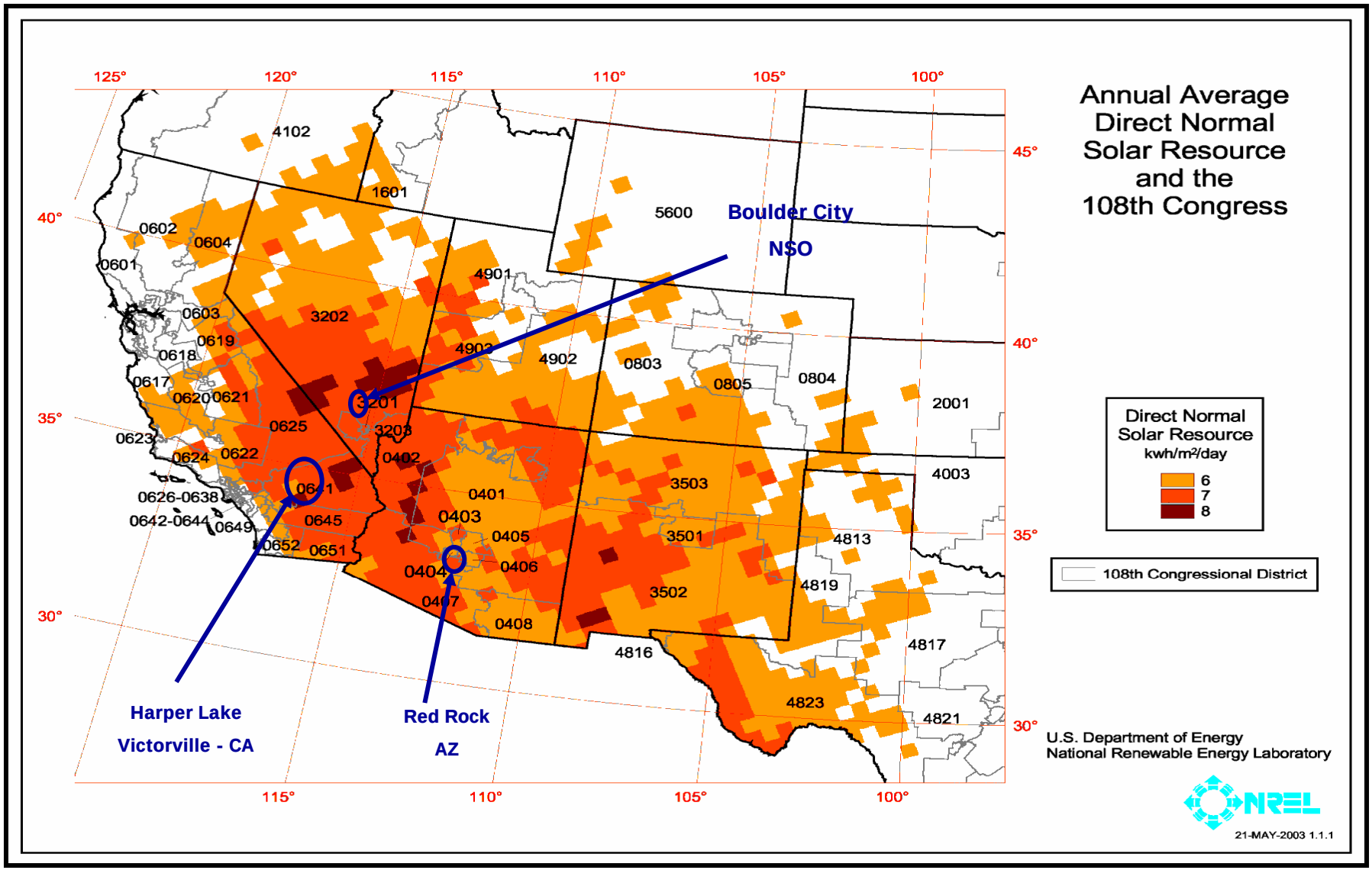
PLANT	MWe	FIRST YEAR IN OPERATION
SEGS I	13.8	1985
SEGS II	30	1986
SEGS III	30	1987
SEGS IV	30	1987
SEGS V	30	1988
SEGS VI	30	1989
SEGS VII	30	1989
SEGS VIII	80	1990
SEGS IX	80	1991
NSO	**64**	**2007**

Solar Thermal Process



NSO Direct Normal Radiation

7.141 KWh/m²/day – 2606 KWh/m²/year



Site Criteria

Essential items to consider in developing a CSP Project

- **Good Solar Radiation (> 7.0 KWh/M²/Day)**
- **Transmission Proximity (High Voltage) and interconnection availability and timeline**
- **Freeze Protection**
- **Land – 5 to 6 Acres per MW (Depends on Solar Radiation)**
- **Flat to Moderate Slope (> 1% is Ideal – Greater requires grading and terracing**)

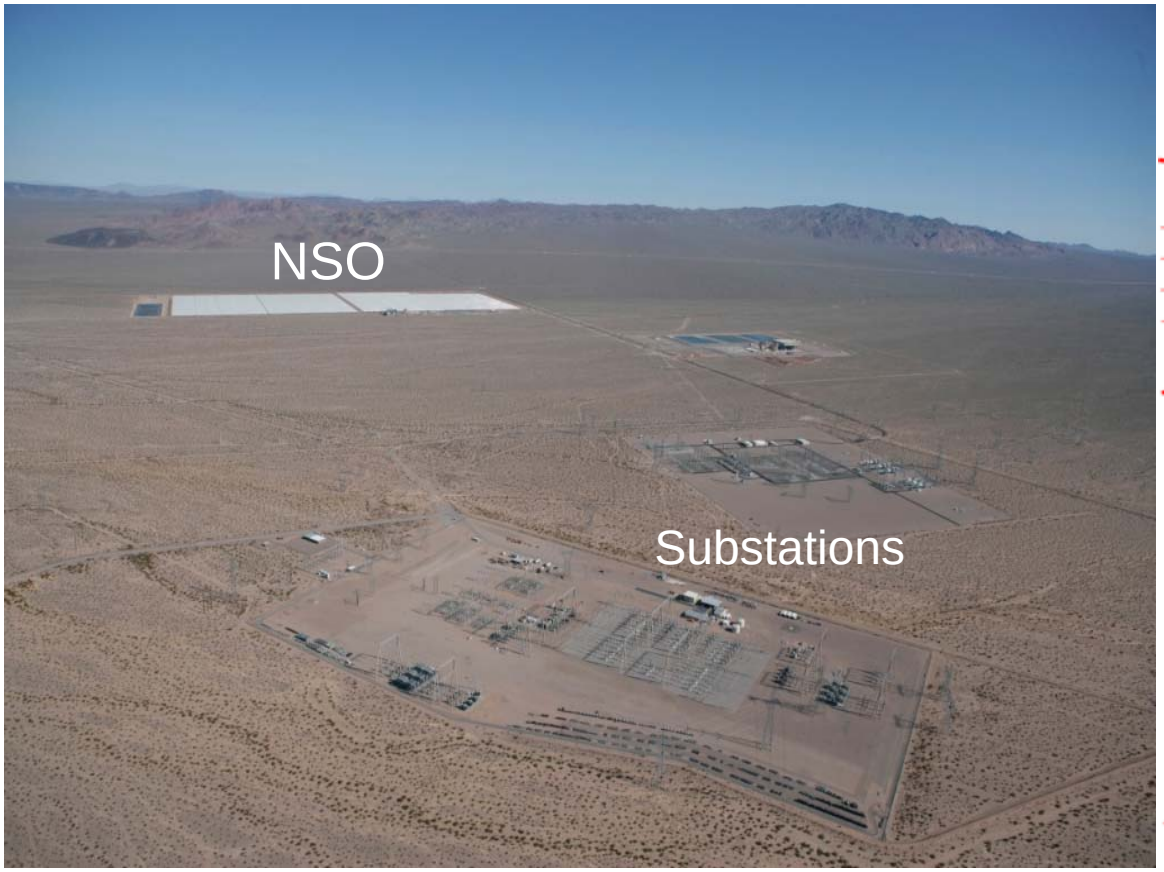
Nevada Solar One Highlights

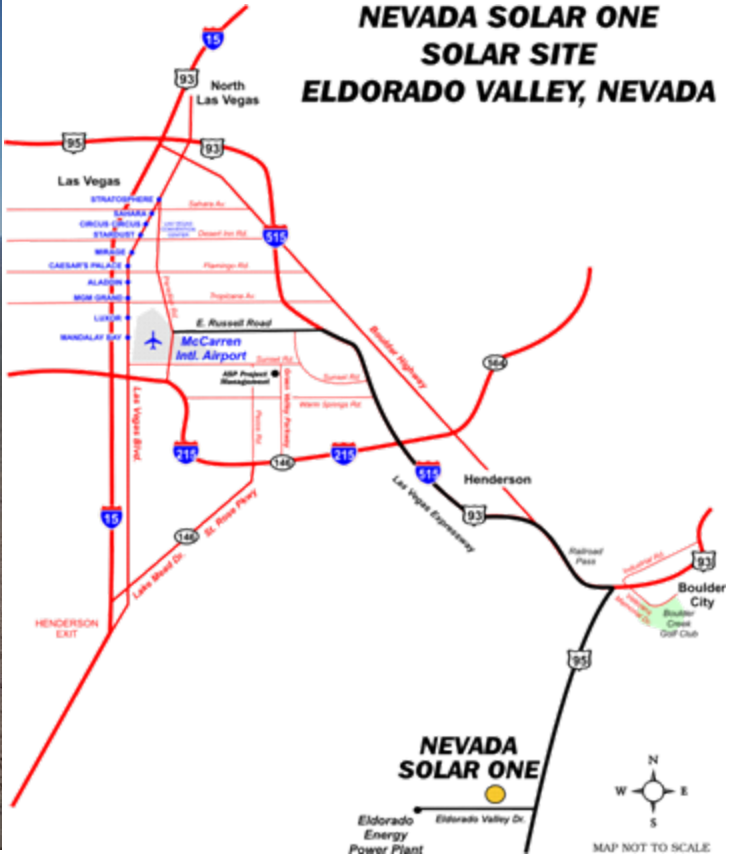
- **Constructed over 16 months**
- **Cost $266 million USD to build**
- **Created 800 construction positions**
- **Largest plant of its kind to be built in more than 17 years**
- **Began operation in June 2007**
- **Solar field is approximately 300 acres**
- **Generates 64 MW which provides energy to more than 40K - 50K homes in Nevada during summer peak**
- **Output 100% dedicated to Nevada Power/ Sierra Pacific**
- **Reduces Carbon Emissions by ~200,000 lbs per year (the equivalent of removing more than 19,000 cars from the nation's roads)**

Projects

- Nevada Solar One: **64 MW** – *Operating 26 months*
- Alvarado: **50 MW** – *Under Construction*
- Palma Del Rio (2): **50 MW** – *Under Construction*
- Majadas: **50 MW** – *Under Contract*
- Spain (4): **50 MW** – *In Development*
- Spain (5): **50 MW** – *In Development*
- USA (2): *In Development*
- USA (3): *In Development*
- USA (4): *In Development*

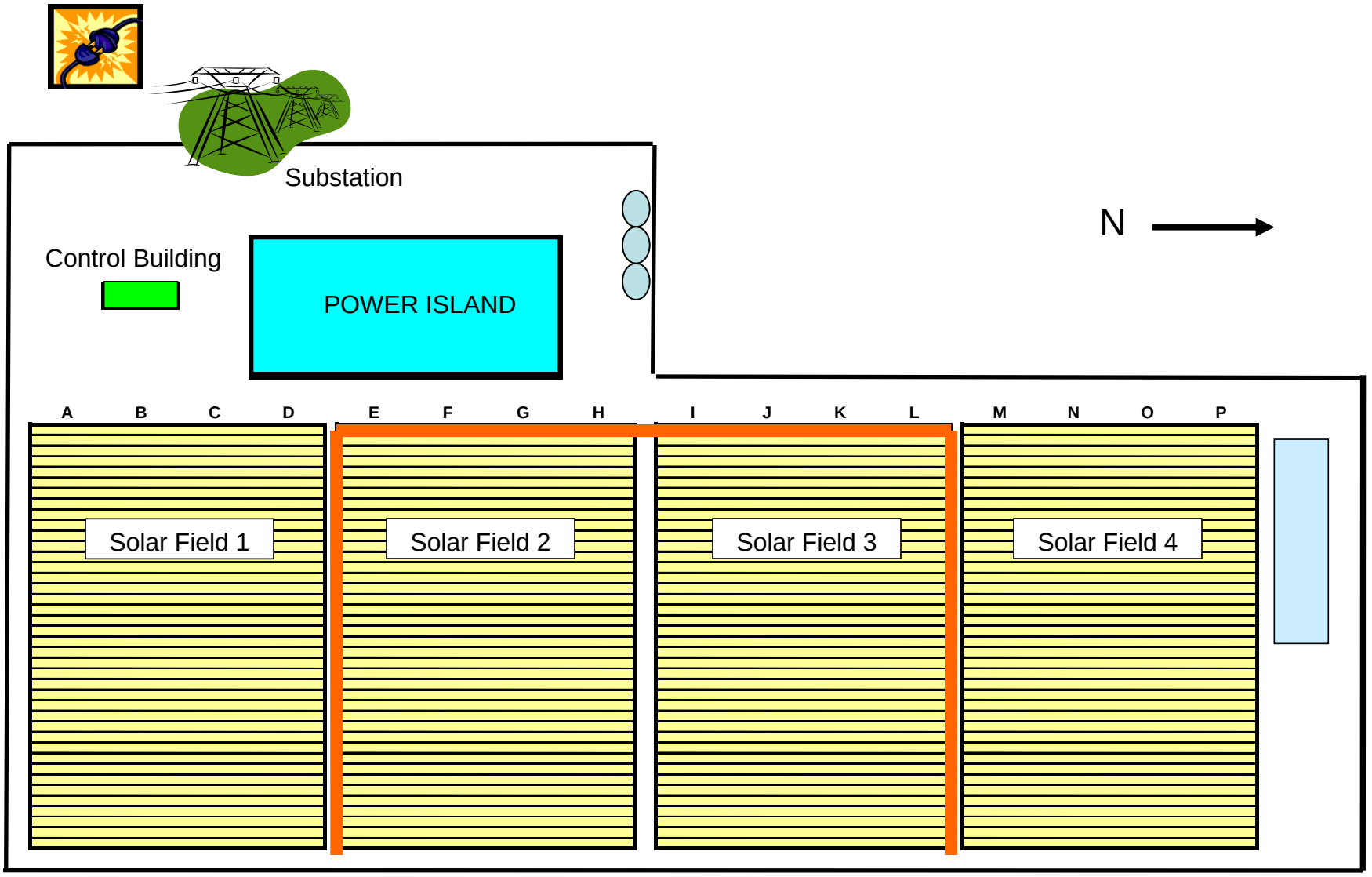
NSO Project Location





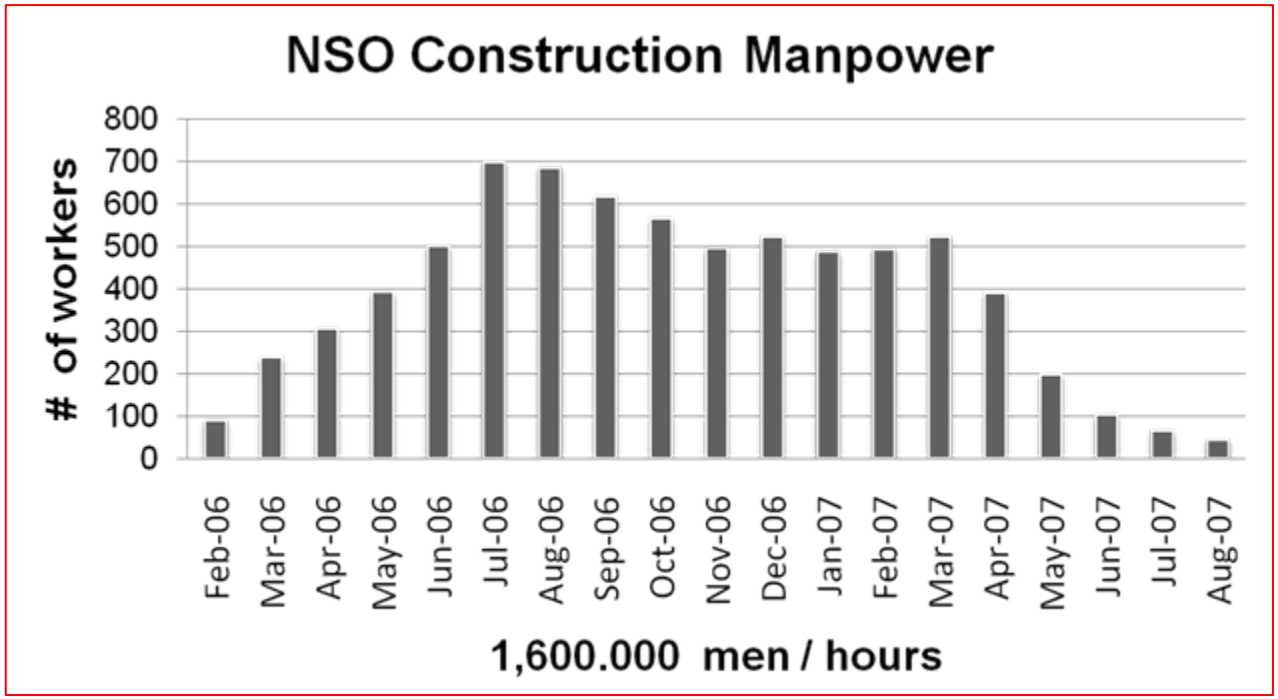
Nevada Solar One is located in the Eldorado Valley approximately 35 miles southeast of Las Vegas, Nevada

NSO Layout


Substation
Control Building
POWER ISLAND
N
A B C D E F G H I J K L M N O P
Solar Field 1
Solar Field 2
Solar Field 3
Solar Field 4

NSO Construction

- **Construction Completed in Less than 18 Months**
- **1,600.000 Man hours (an average of 400 jobs created for 18 months + 28 jobs for 20+ years for O&M)**
- **Excellent Safety Record**



NSO Construction Timeline

March 2003 Long-Term Power Purchase Agreement signed with Nevada Power and Sierra Pacific

June 5, 2005 Amendment for Expansion to 64 MW Approved

February 2006 Nevada Solar One Groundbreaking

November 2006 Turbine Delivered On Site

November 2006 Utility Interconnection Completed

March 29, 2007 Solar Field 100% Completed

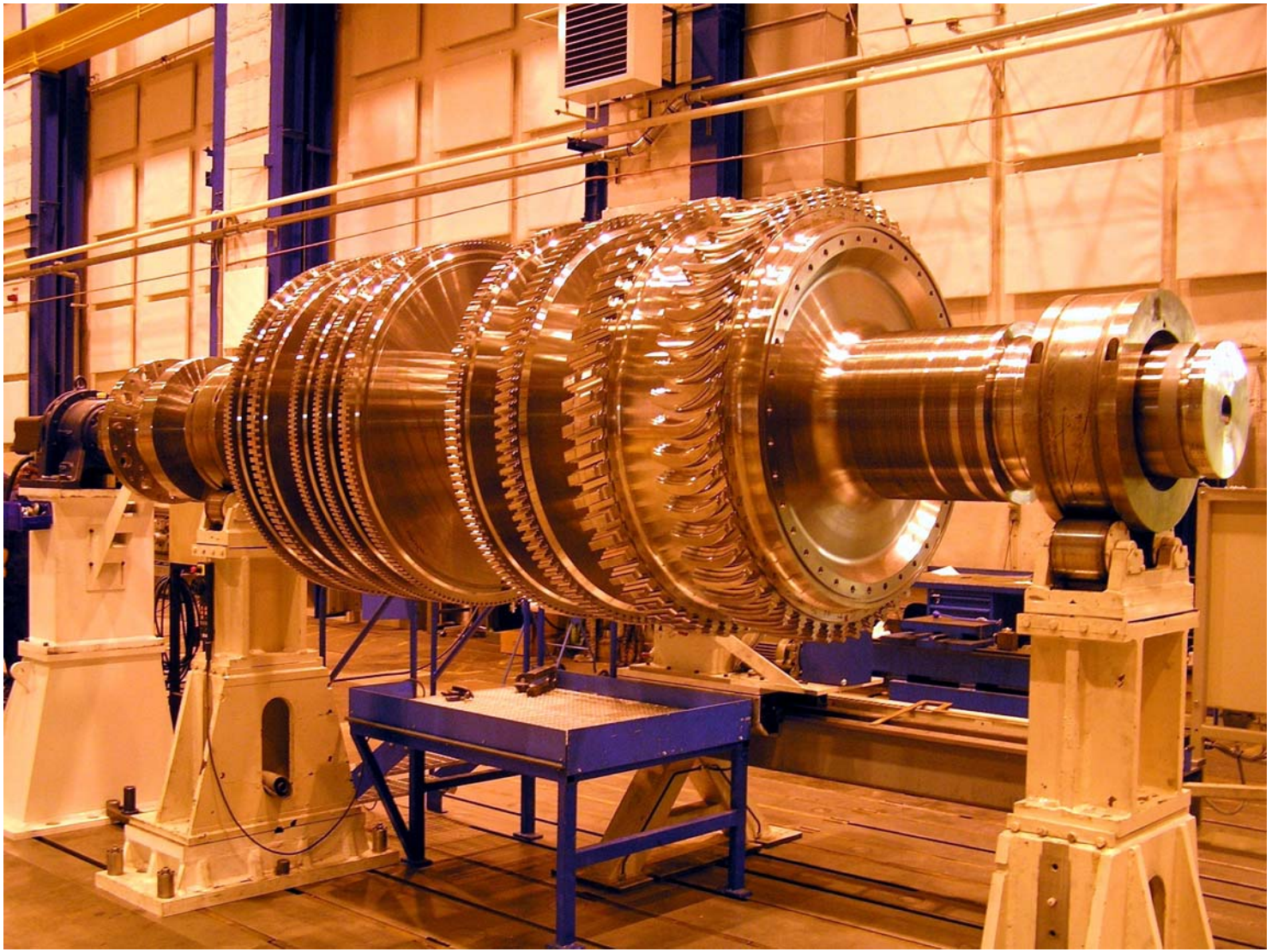
May 18, 2007 Utility Electrical Testing

May 30, 2007 Steam Quality Achieved

June 2, 2007 First Synchronization

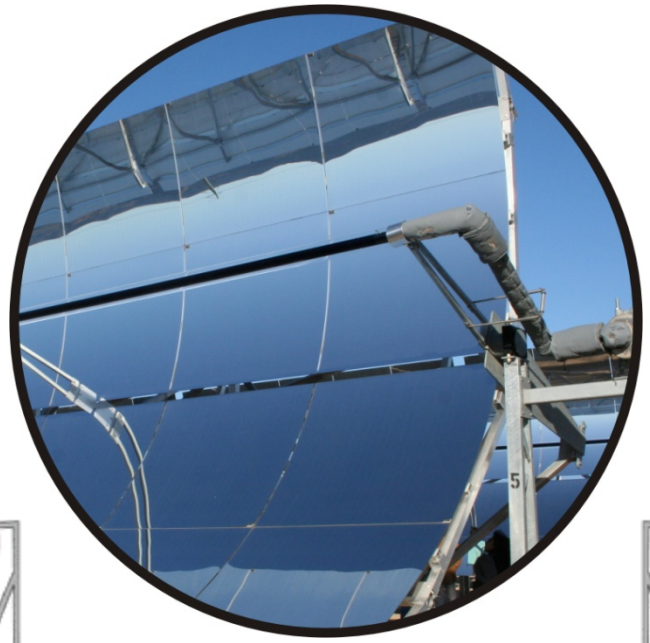
June 22, 2007 Commercial Operation

NSO Turbine Rotor

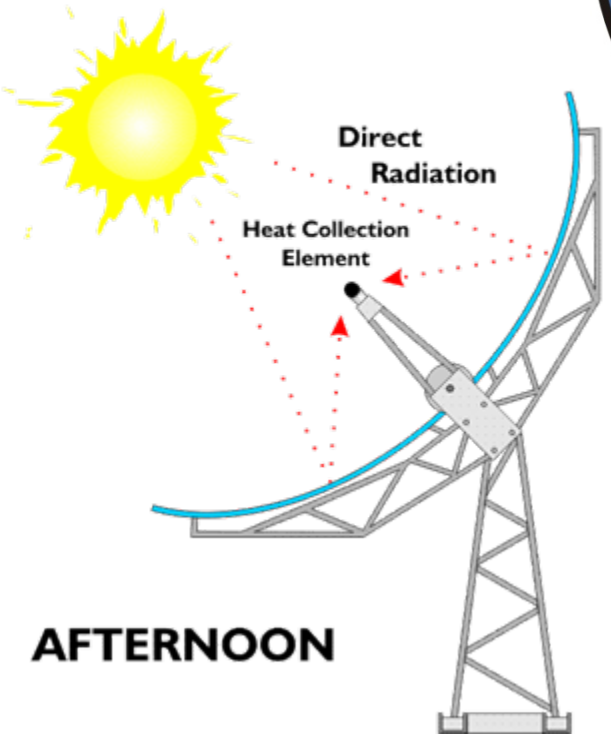


Simple Schematic of Parabolic Trough Operation North-South Axis

NSO utilize Parabolic Trough Collectors which is a Concentrating Solar Power (CSP) Technology

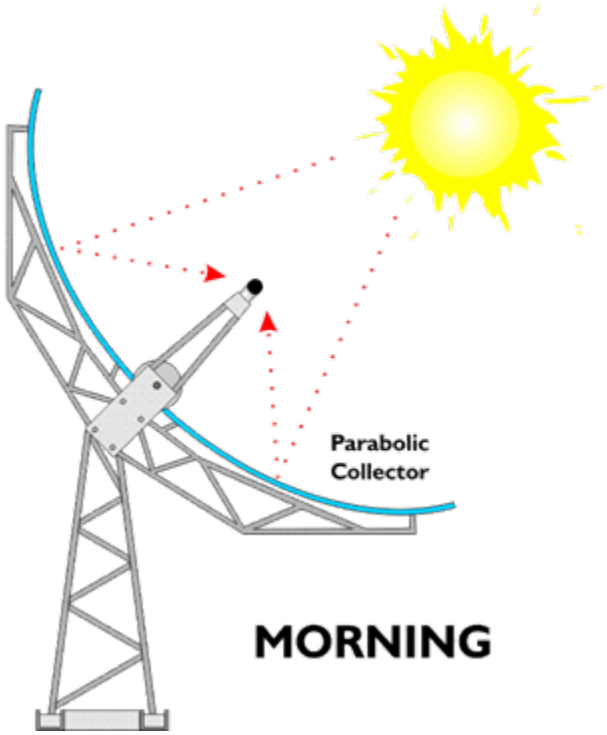


CSP Technologies utilize Direct Normal Radiation (DNR) which is measured in terms of Watts per Square Meter



Concentration Ratio

71:1 (71 Suns)



Nevada Solar One

NSO – Parabolic Trough Collectors

NSO Parabolic Trough Collectors

NSO Power Plant

Questions?

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Thank You!