



• August 15-18, 2010 • Dallas, Texas •
• Dallas Convention Center •



“Sun Like it Hot”
Concentrating Solar Thermal

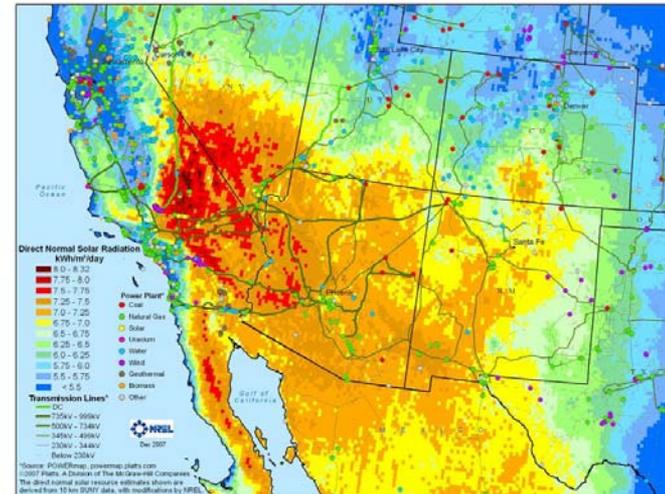
Overview

- GIS Screening for Concentrating Solar Power (CSP) and Thermal Potential
- Concentrating Solar Power/Thermal Technologies
- Financial Incentives for Solar Projects
- Federal Government Applications

GIS Screening Analysis for CSP

Screening Approach

- Initial GIS screening analysis used to identify regions most economically favorable to construction of large-scale CSP or PV systems.
- GIS analysis used in conjunction with transmission and market analysis to identify favorable regions in the southwest



Solar Resource Screening Analysis

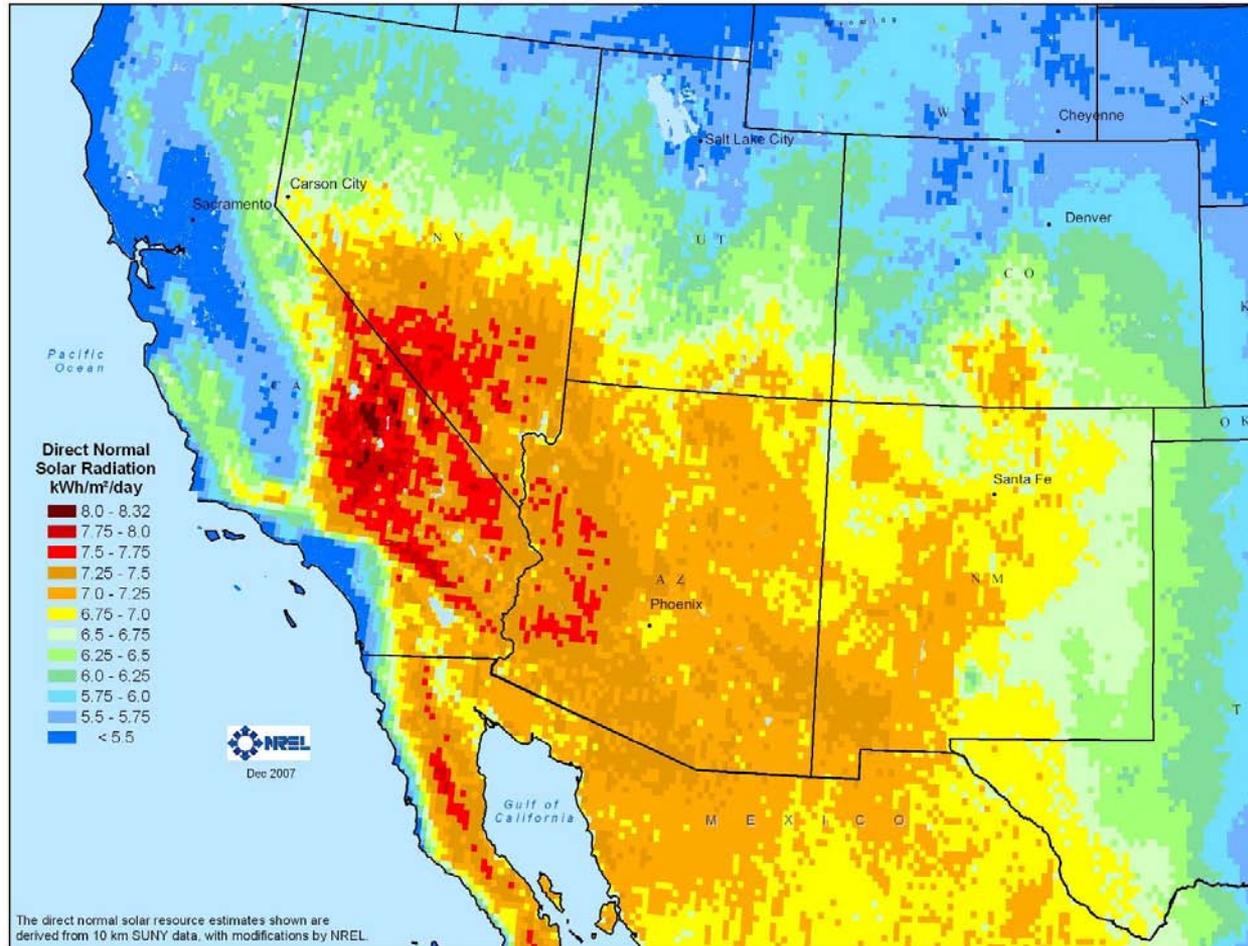
All Solar Resources



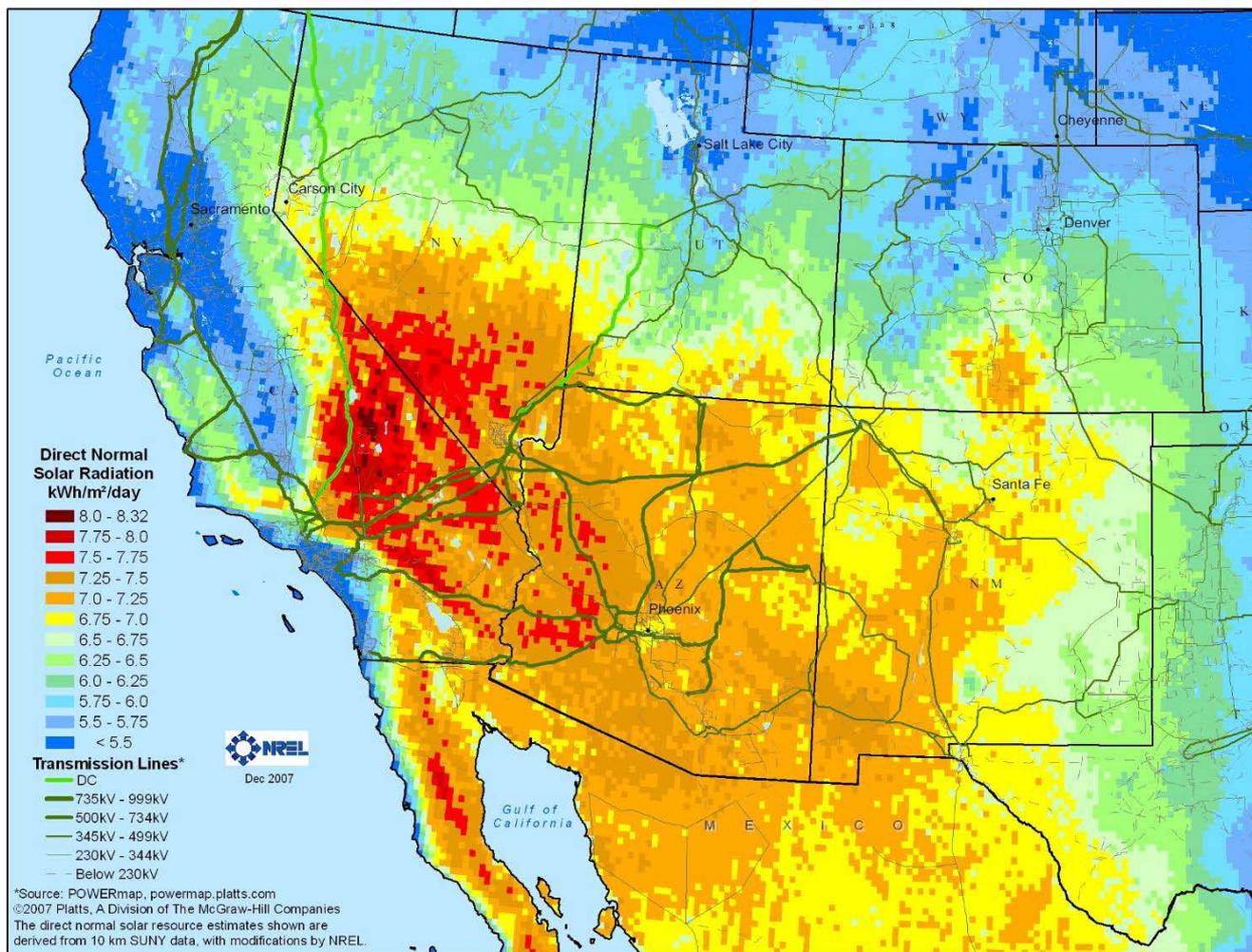
Locations Suitable for
Development

1. Start with direct normal solar resource estimates derived from 10 km satellite data.
2. Eliminate locations with less than 6.0 kWh/m²/day.
3. Exclude environmentally sensitive lands, major urban areas, and water features.
4. Remove land areas with greater than 1% (and 3%) average land slope.
5. Eliminate areas with a minimum contiguous area of less than 1 square kilometers.

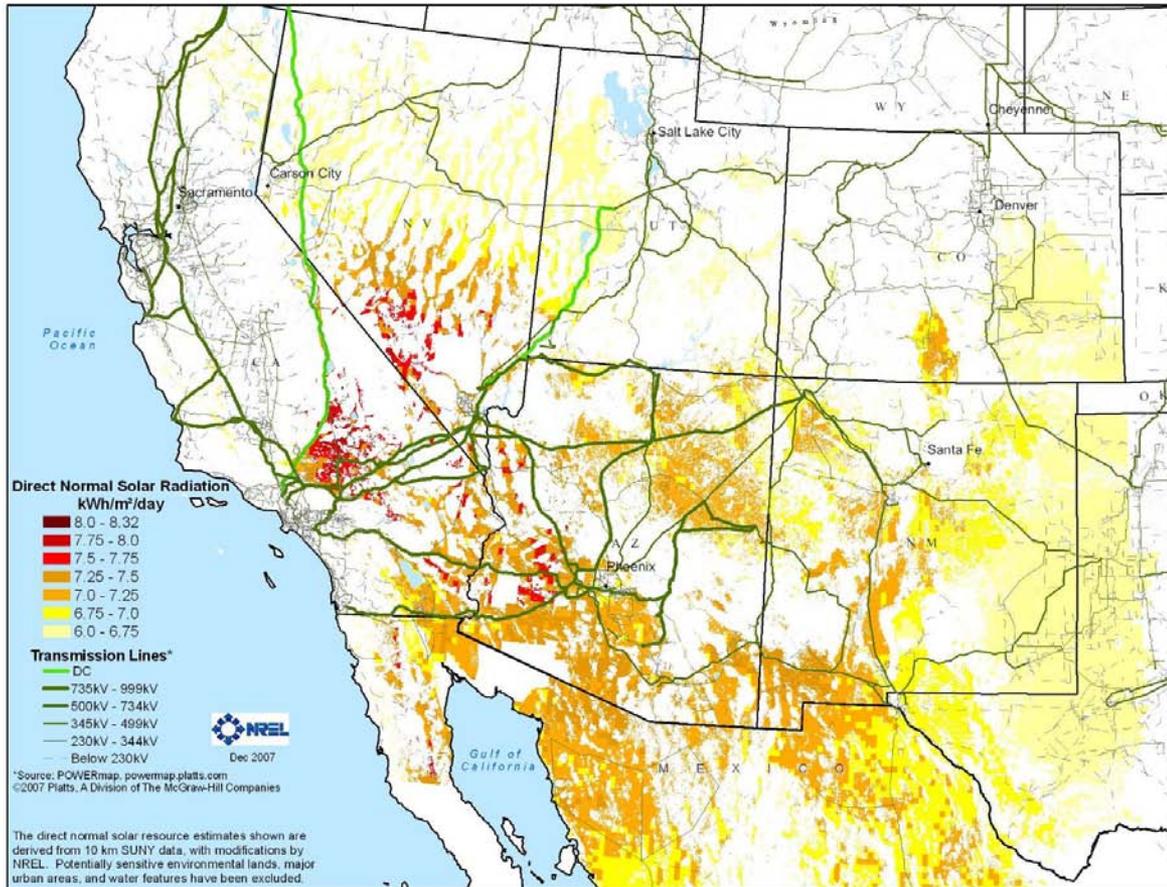
Southwest "Direct Normal" Solar Resource - Unfiltered Data



Transmission Overlay



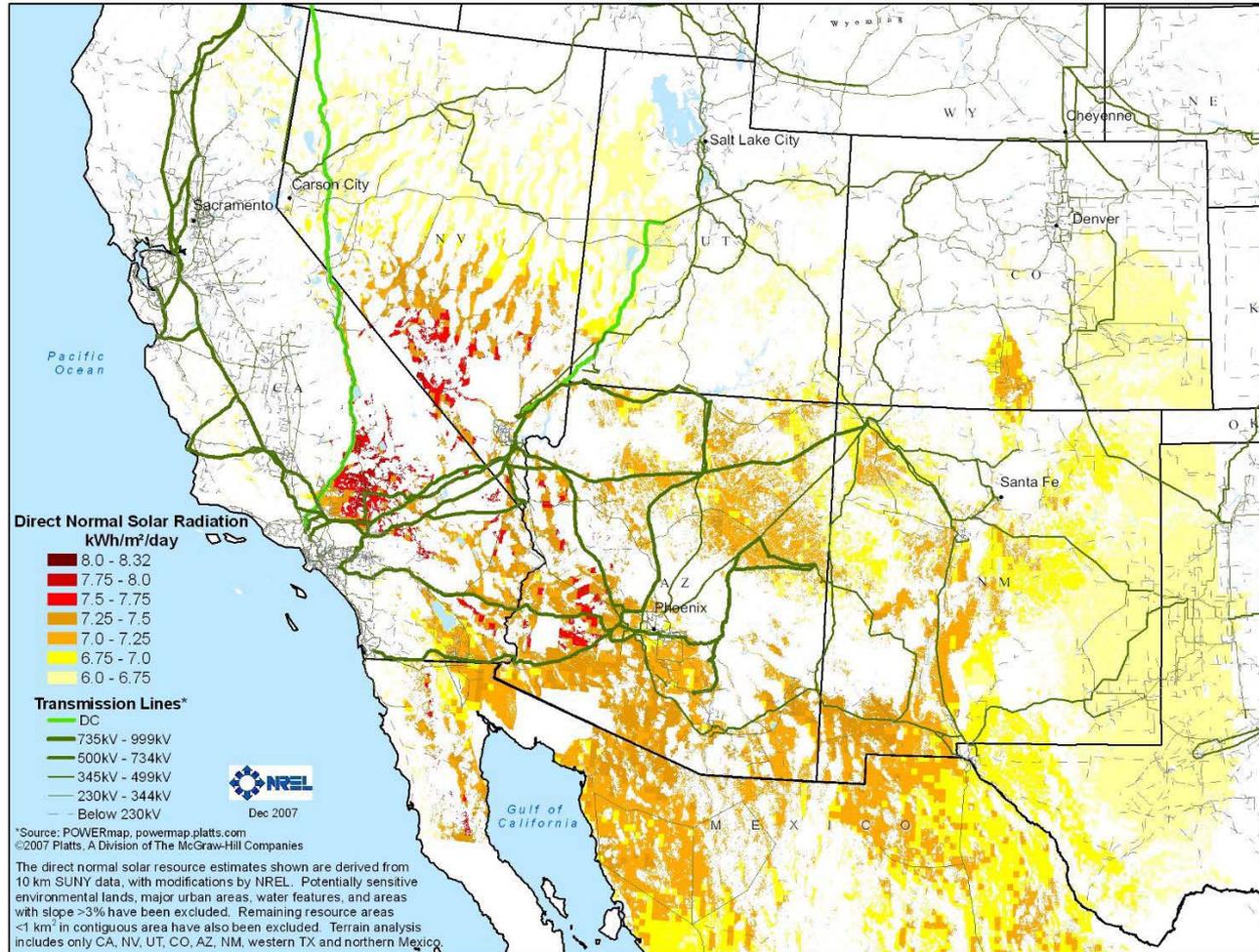
Environmental and Land Use Exclusions



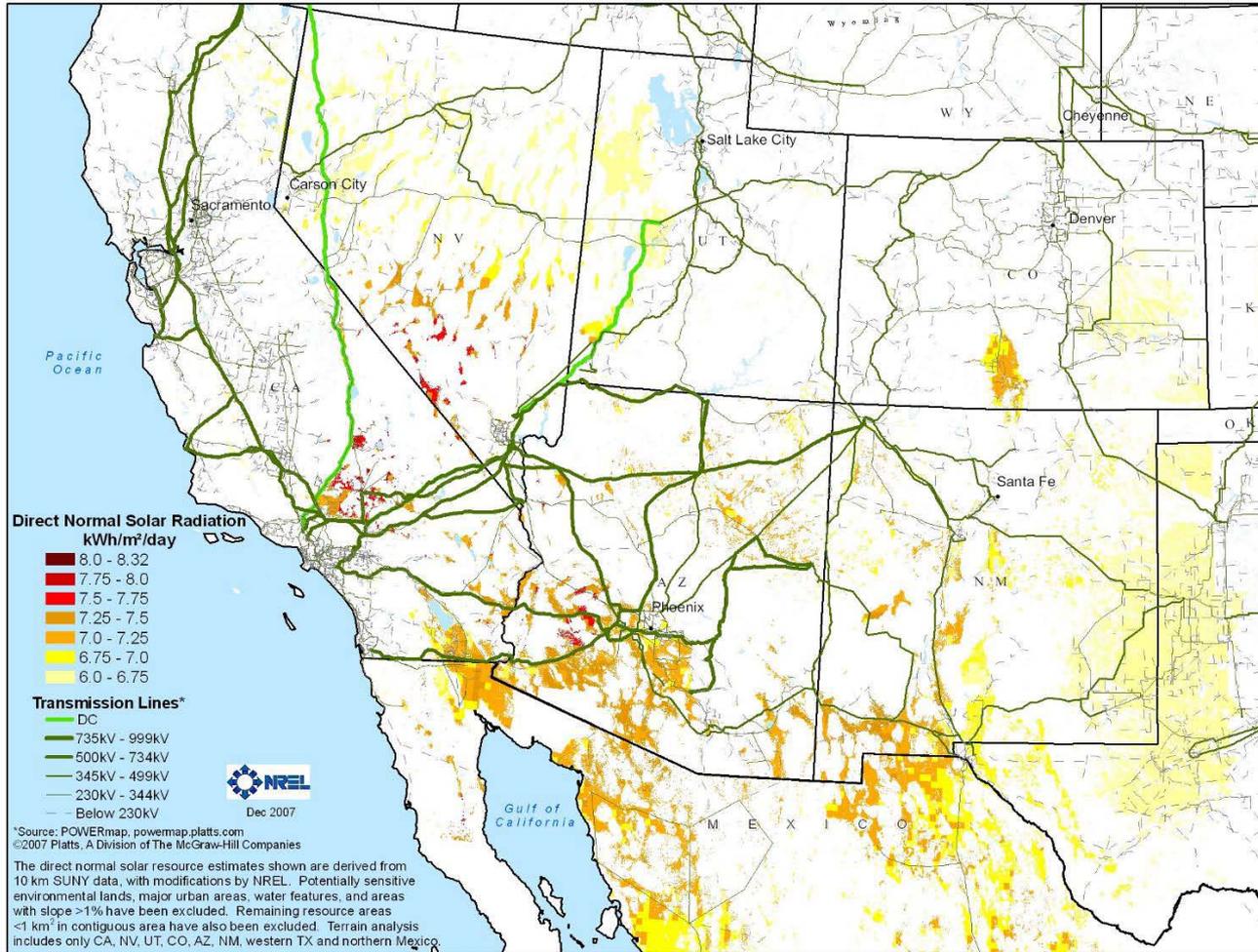
EXCLUSIONS (examples)

- National Parks
- Wilderness Areas
- Areas of Critical Environmental Concern
- Urban Limitations
- Visual Resource Management

Slope < 3%



Slope < 1%



Concentrating Solar Power/Thermal Technologies



Parabolic trough



Linear Fresnel

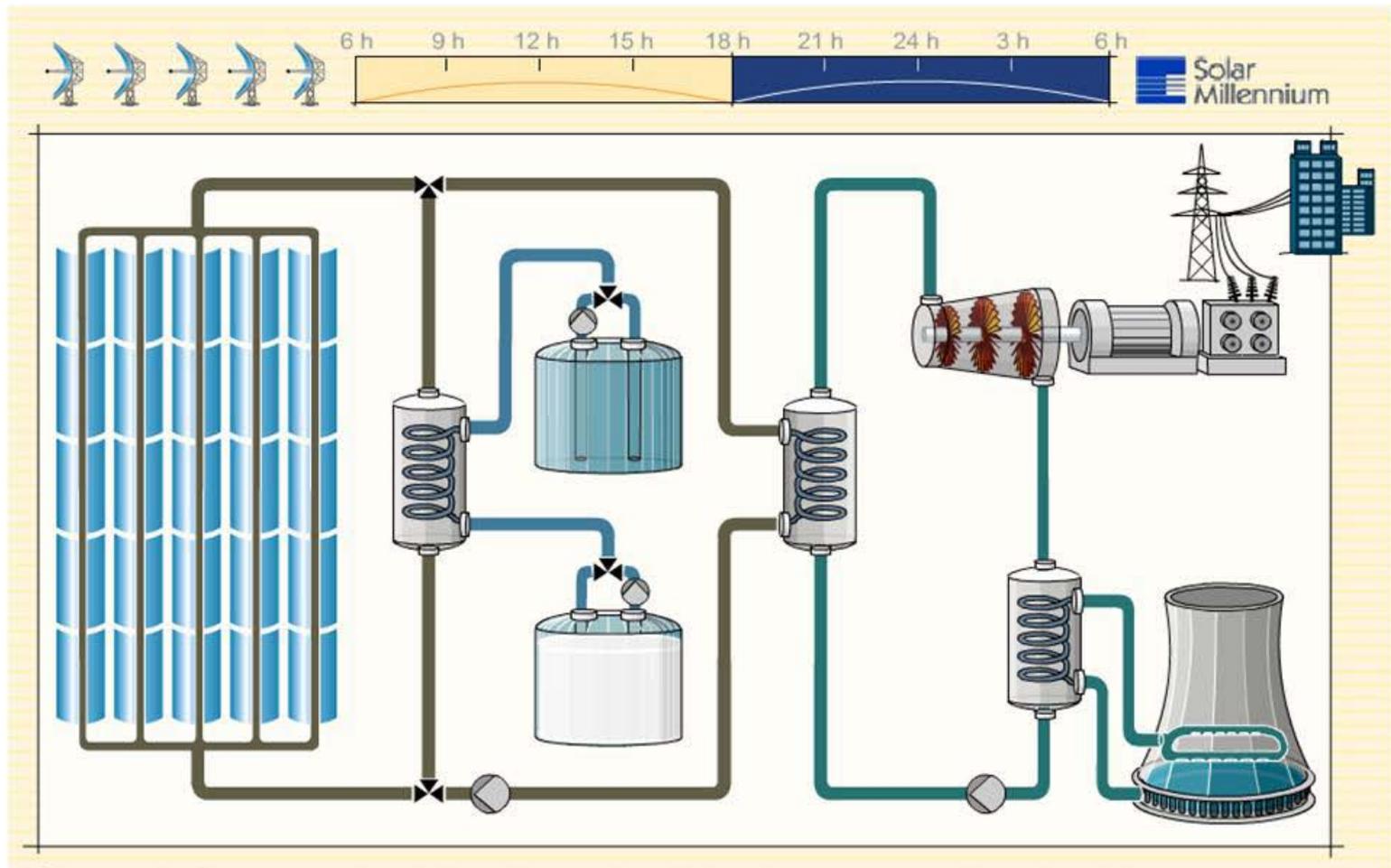


Power tower



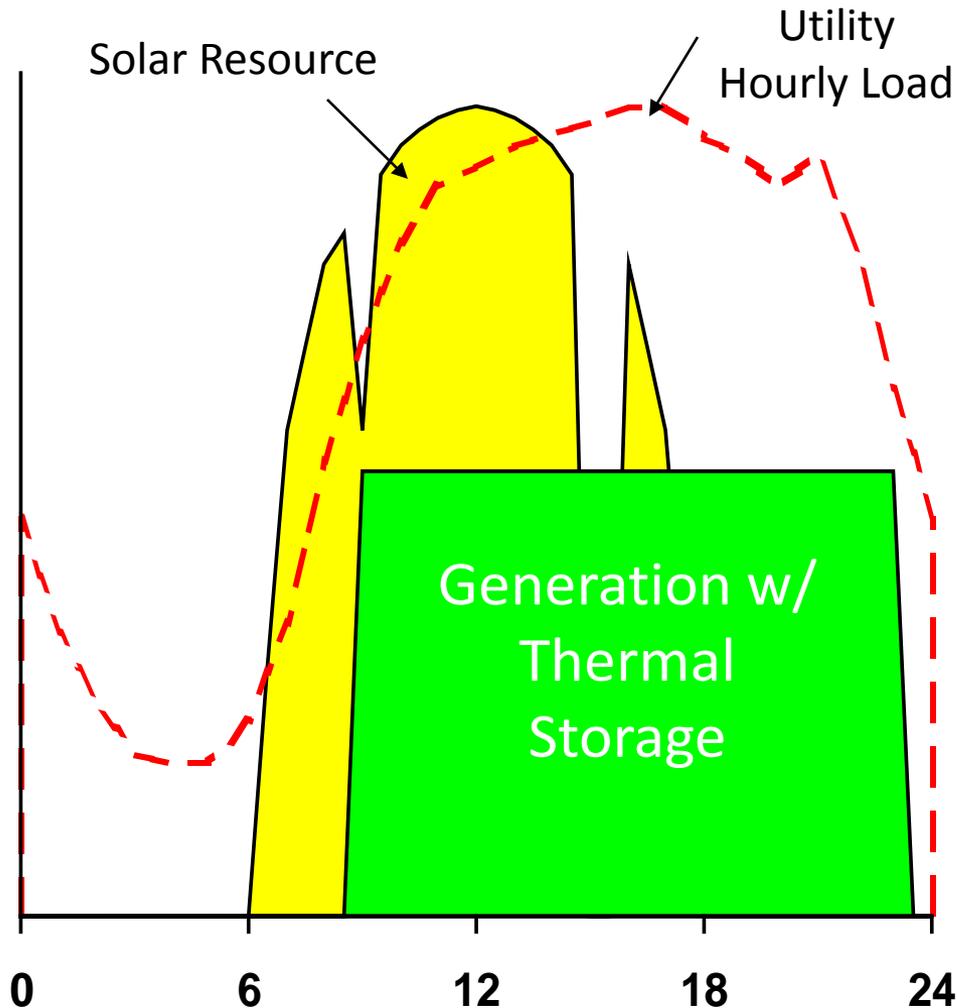
Dish/Stirling **GovEnergy 2010**

Parabolic Trough Plant with Thermal Energy Storage



http://www.solarmillennium.de/upload/Animationen/andasol_blue_engl.swf

High Value of Dispatchable Power Meeting Utility Power Demands



- Storage provides
 - **higher value** because power production can match utility needs
 - **lower costs** because storage is cheaper than incremental turbine costs

Advantages of CSP Technologies

- **Trough Systems**
- Commercially-proven, more financeable technology
- Modular, easier to scale to different size plants
- Multiple receivers lead to higher plant availability
- Opportunity for low-risk integration with fossil plants

- **Tower Systems**
- Simpler plumbing network
- Lower-cost, higher efficiency thermal storage
- Capable of higher capacity factors
- Higher efficiency power block operation

- **Dish Stirling Systems**
- Modular 25 kW Units
- Large CA project (1000kW) - reduce manufacturing cost
- Low Water use

Concentrating Solar Thermal (CST) Technology



Solar Trough Thermal Systems can heat water
to 120 – 180 °F

Financial Incentives for Solar

- If Private Ownership
 - Federal
 - 30% Federal Investment Tax Credit
 - 5 year Accelerated Depreciation
 - State - Production Tax Credits (e.g. NM 10 yr)
- Private or Government
 - Utility Production Incentives
 - RE Rebates
 - SRECS

Federal CSP Applications

400 MW Power Tower – Under Construction
BLM Southeast CA



Federal CSP Applications

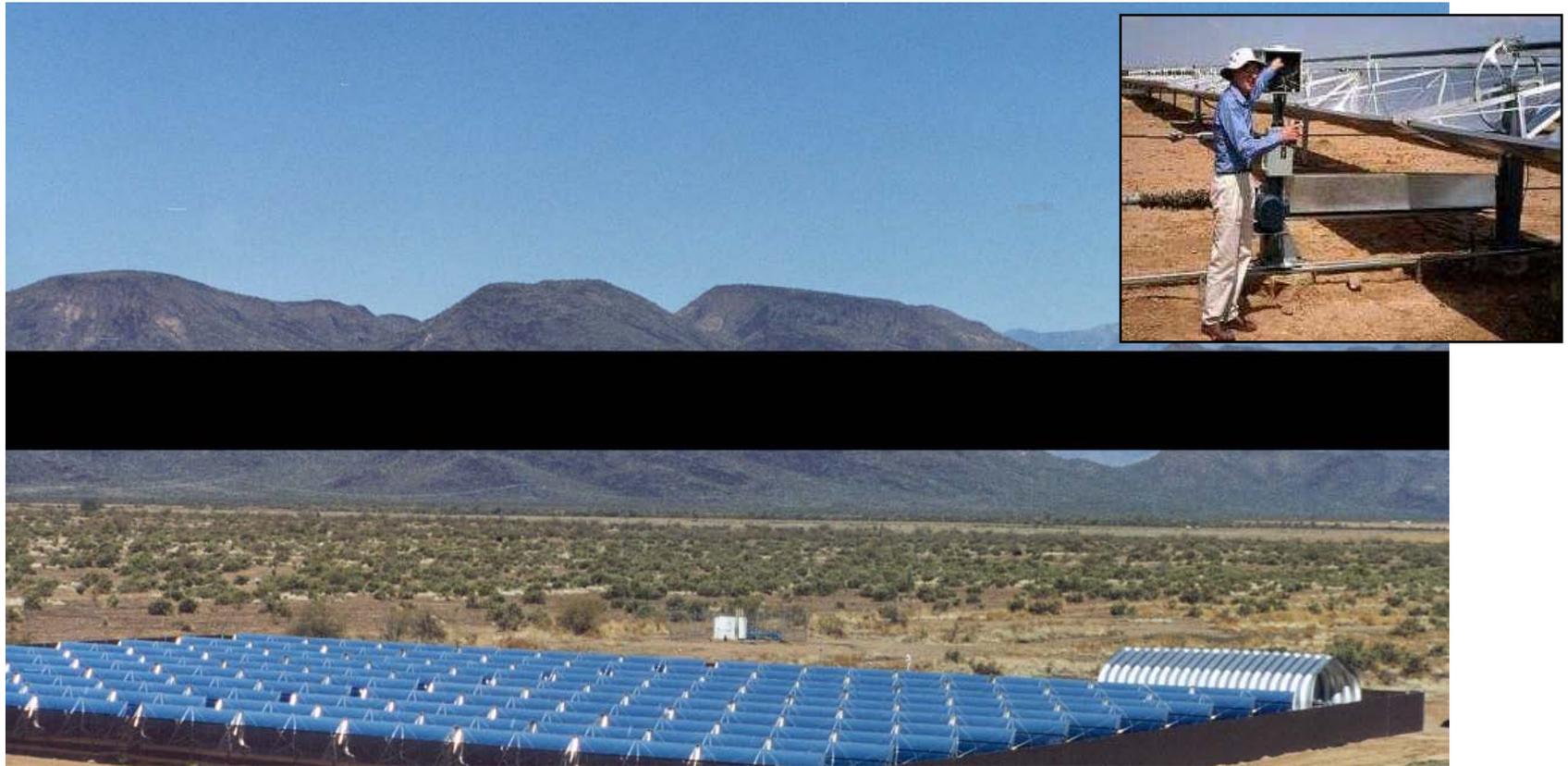
1.5 Stirling Dish Demo for 1000MW Development
BLM Mojave Desert and Imperial Valley, CA



Federal CST Applications

Solar Thermal Plant

Federal Correction Institute Phoenix, AZ



Thank You – Questions?

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