

Challenges & Opportunities for Utility-Scale Solar in Arizona

ROCKY MOUNTAIN LAND USE INSTITUTE

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The Sonoran Institute

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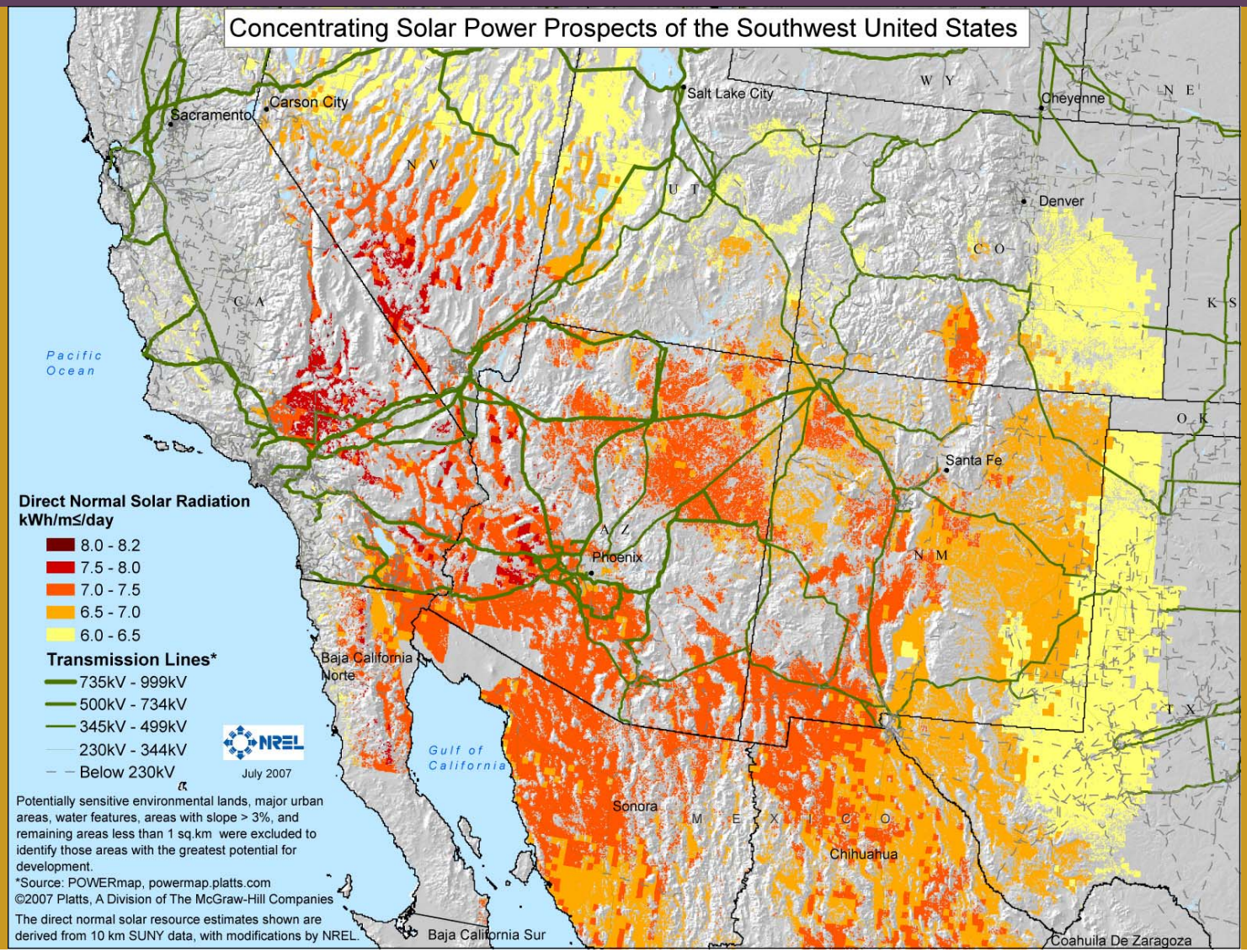
Why is Arizona Well-Positioned for Solar?

- Outstanding solar resources
- Proximity to major markets
- Existing transmission infrastructure
- Diversity of land ownership
- State renewable energy standard

Outstanding Solar Resources of the Southwest



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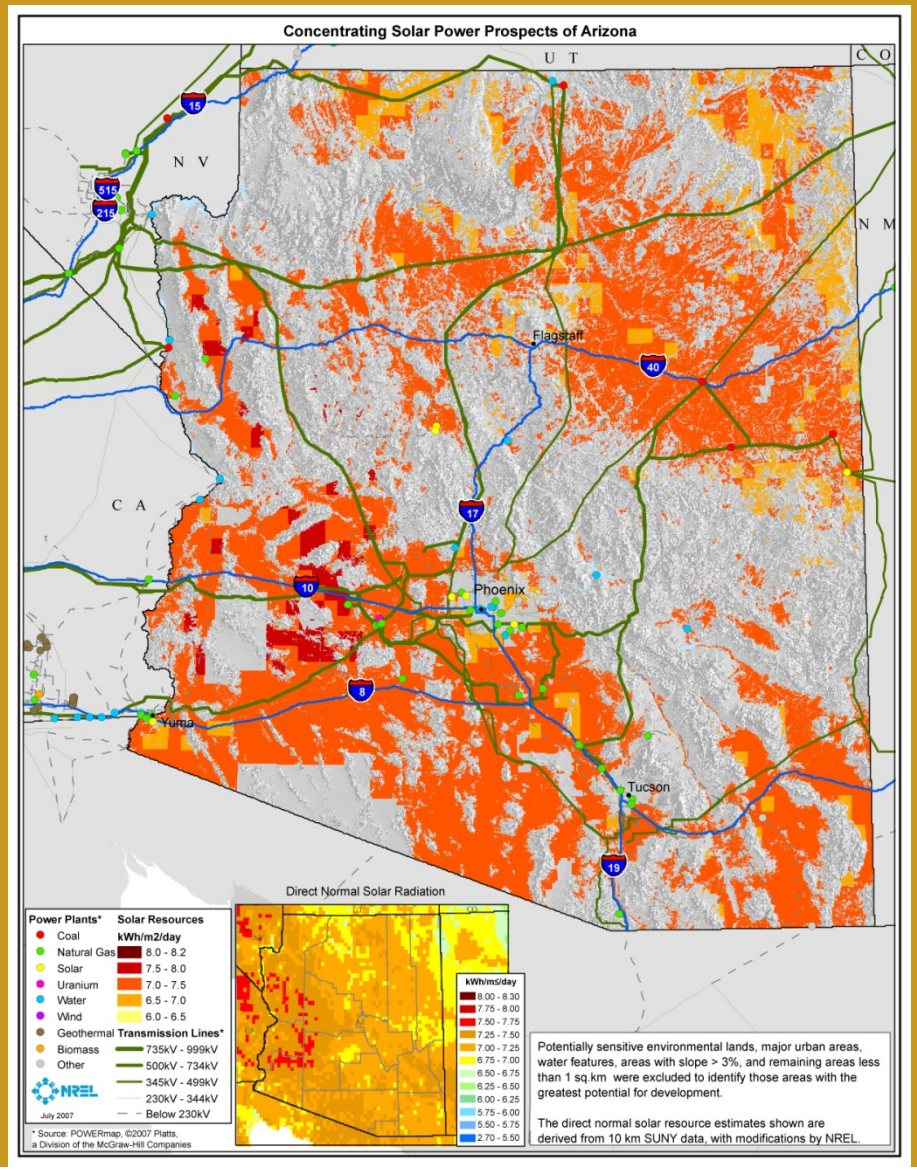
Arizona's Own Solar Resources



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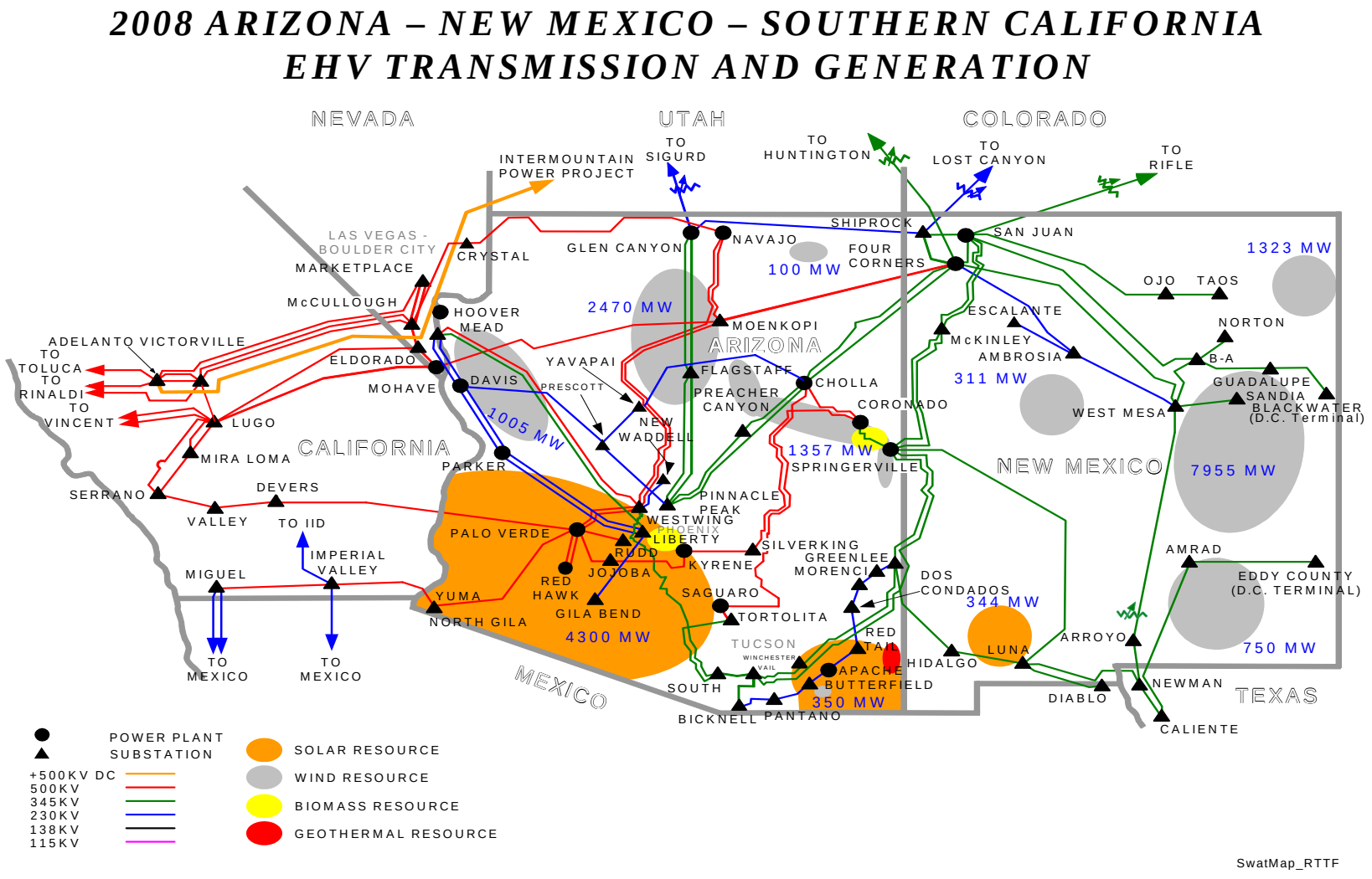
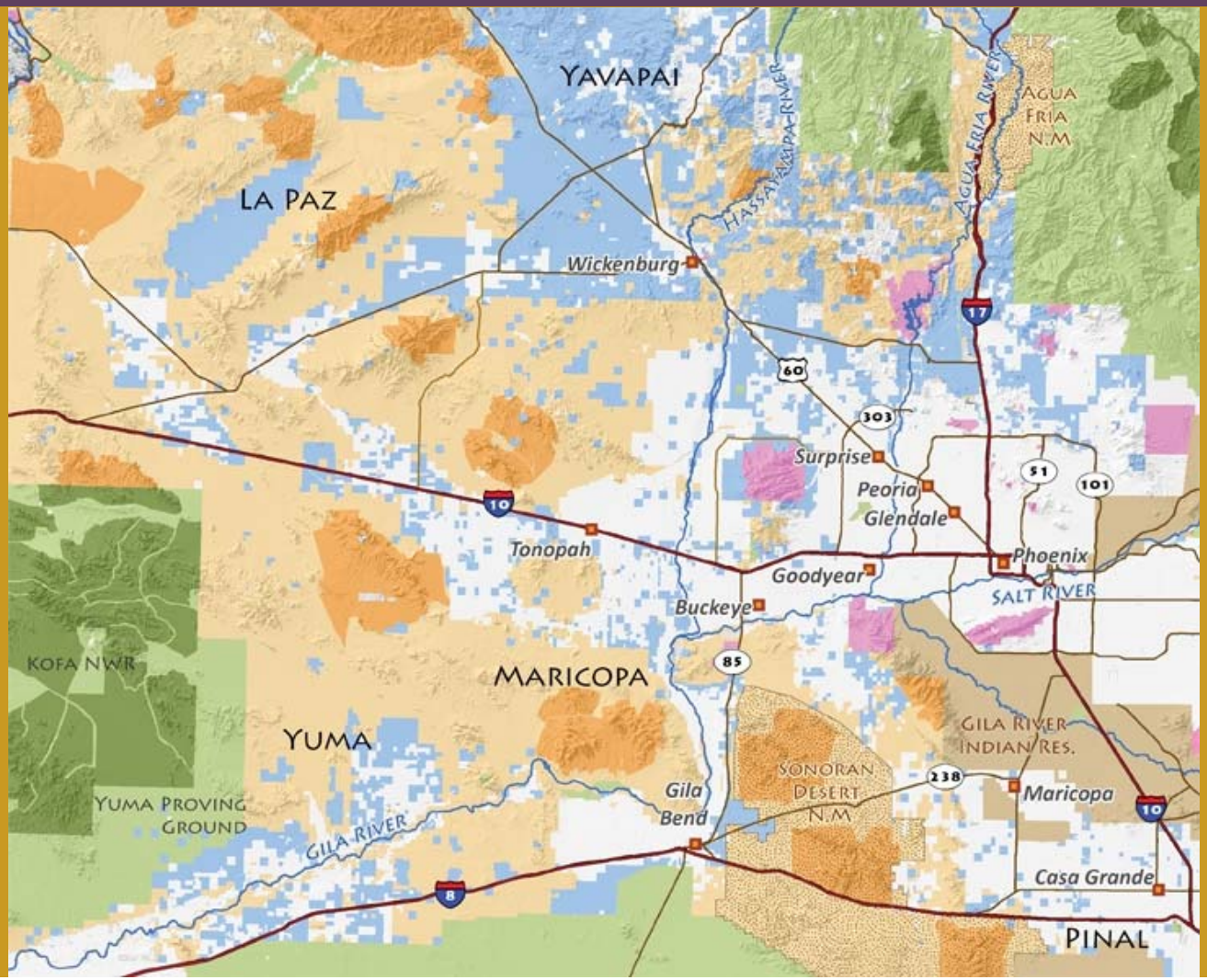
Arizona's Excellent Transmission Infrastructure & California Connections

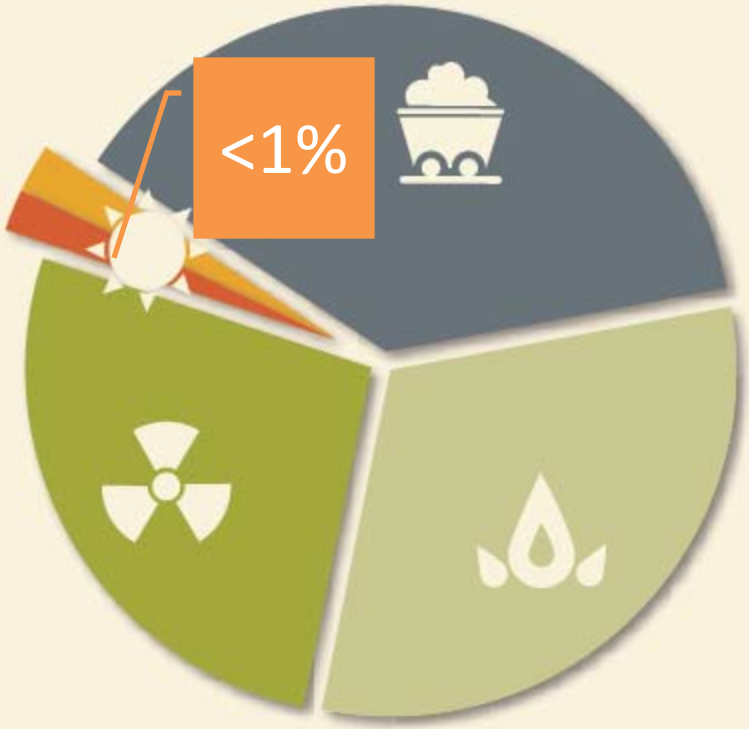


Diversity of Land Ownership Provides Solar Opportunities



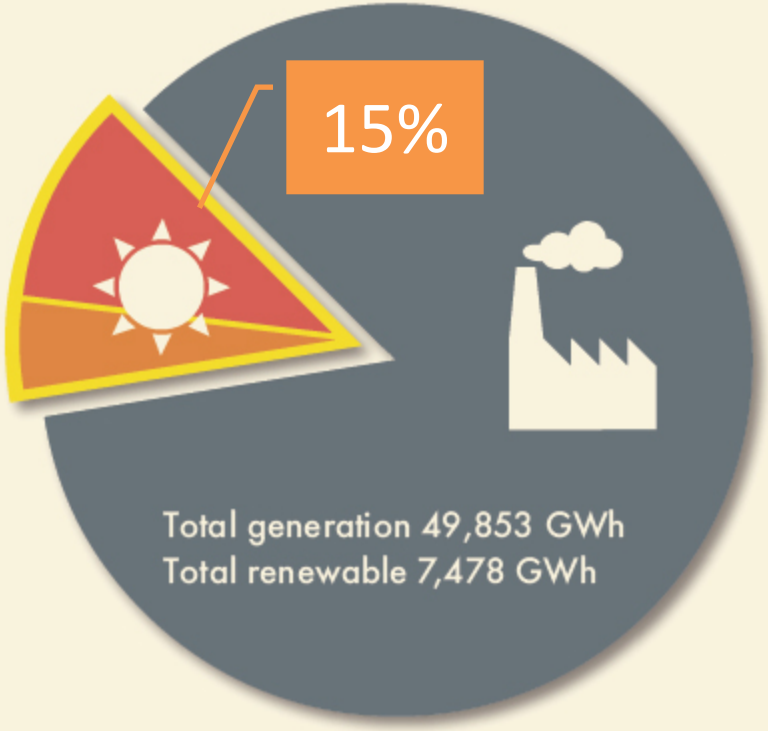
Carbon-Based Energy Generation Dominates Arizona, but by 2025…

Generation Mix in 2007



*Based on Projected Energy Mix for 2009.

Generation Mix in 2025

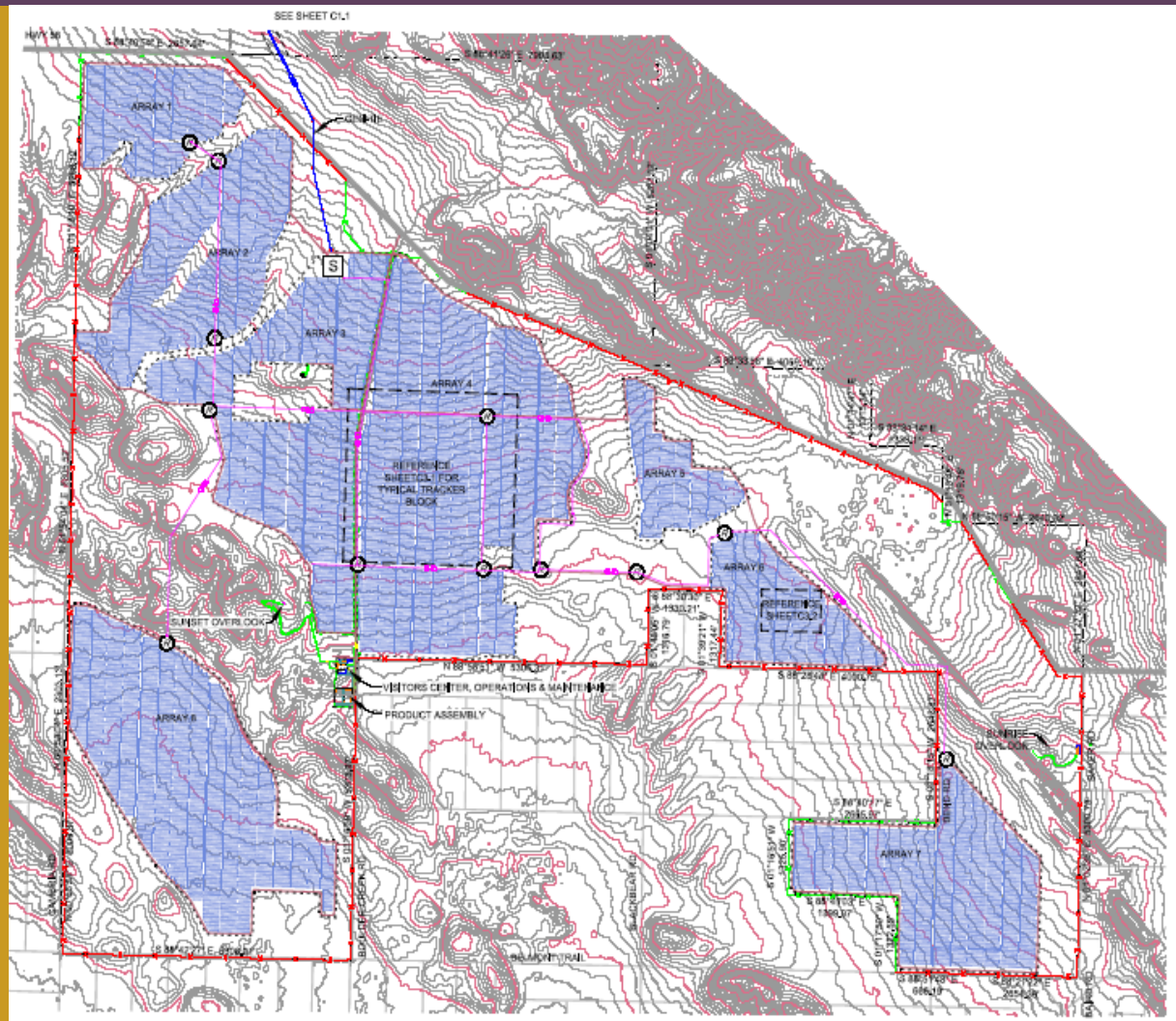


*Based on retail electric sales from the state's regulated utilities.

Planning for Utility-Scale Solar: General Site Requirements

- 2,000 to 4,000 acres (5-10 acres/MW)
- 2% to 5% slope
- Access to water
- Access to transmission and roads
- Compatibility with adjacent land uses

Planning for Utility-Scale Solar: Parcel Configuration



California Valley Sunpower Solar Ranch Project – Carizzo Plain

Planning for Utility-Scale Solar: Wildlife & Habitat Impacts

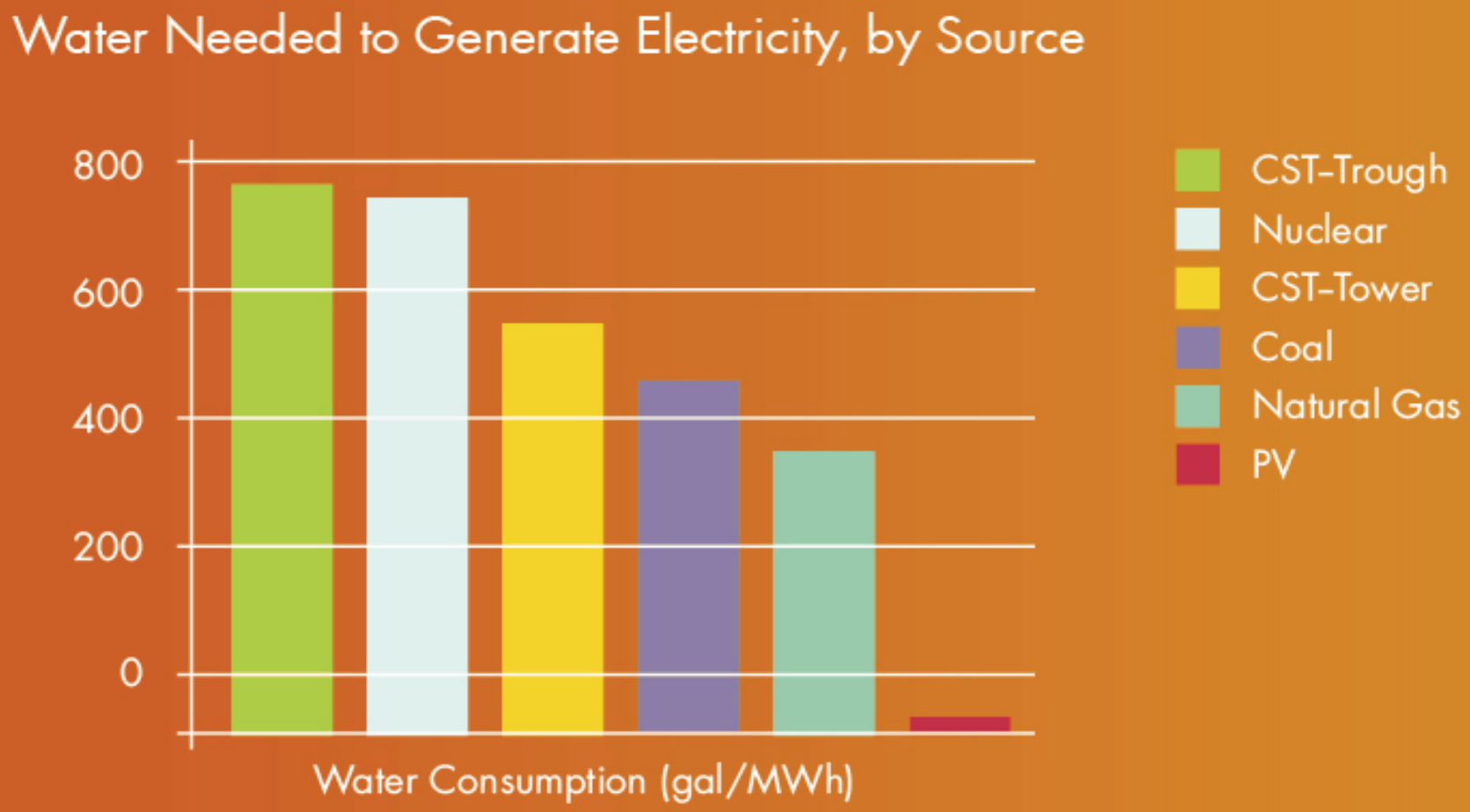
- Grading
- Vegetation removal
- Fencing
- Adjacent impacts?

Planning for Utility-Scale Solar: Water Usage

"With all the buzz about renewables, we better be careful that the solar energy we produce is not the sort that requires a great deal of water, because that is not a renewable resource."

John Kyl, U.S. Senator, Arizona

Planning for Utility-Scale Solar: Water Usage



Planning for Utility-Scale Solar: Cultural Resources

- Ongoing inventory and mapping
- Conflicts in valley bottoms and riparian areas

Planning for Utility-Scale Solar: Other Impacts

- Reflection/glare
- Dark skies
- Tower heights
- Noise
- Air quality

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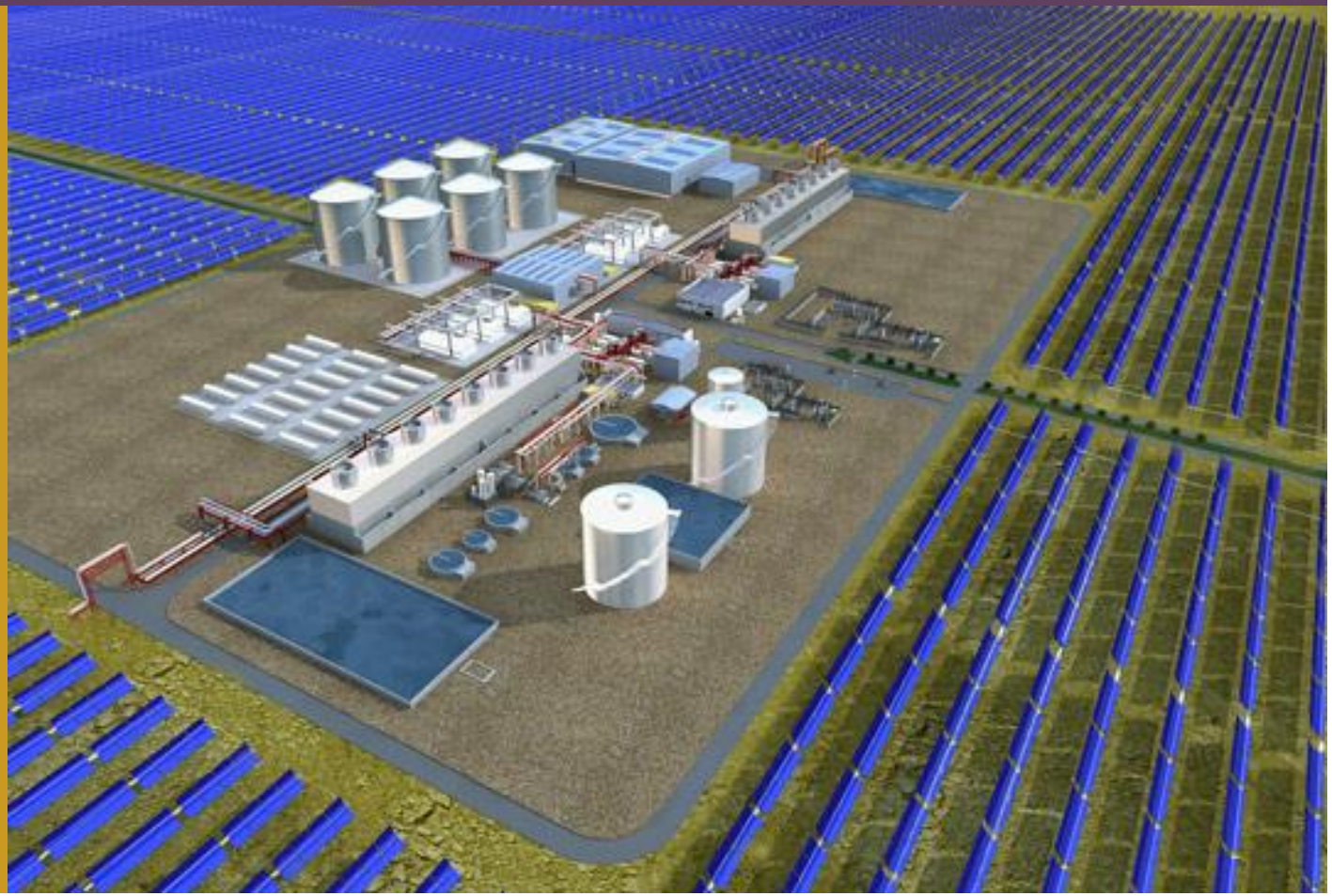
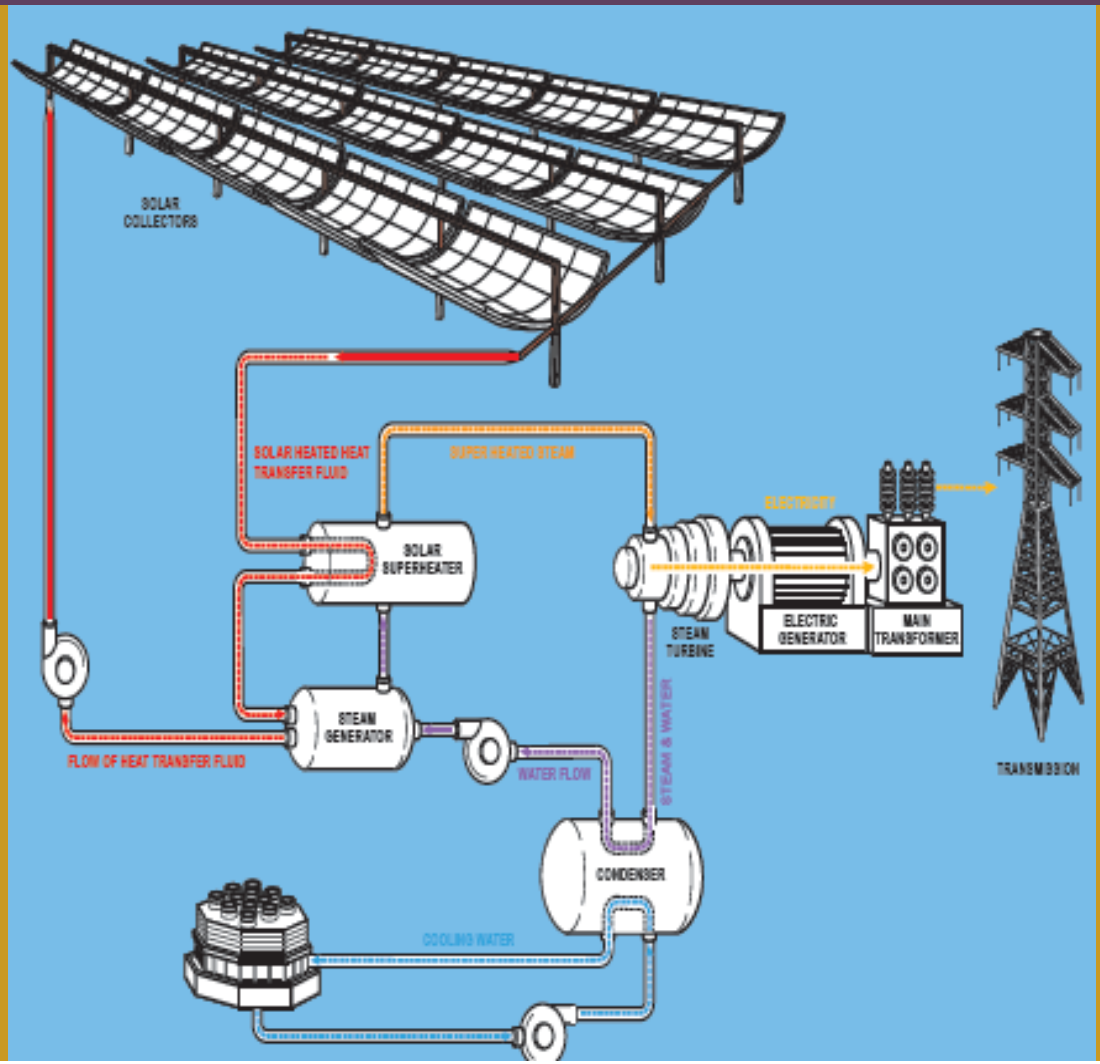
Arizona Solar Case Studies: Abengoa's Solana Project

- On private land
- 280 MW, CST Trough
- Wet-cooled
- Storage

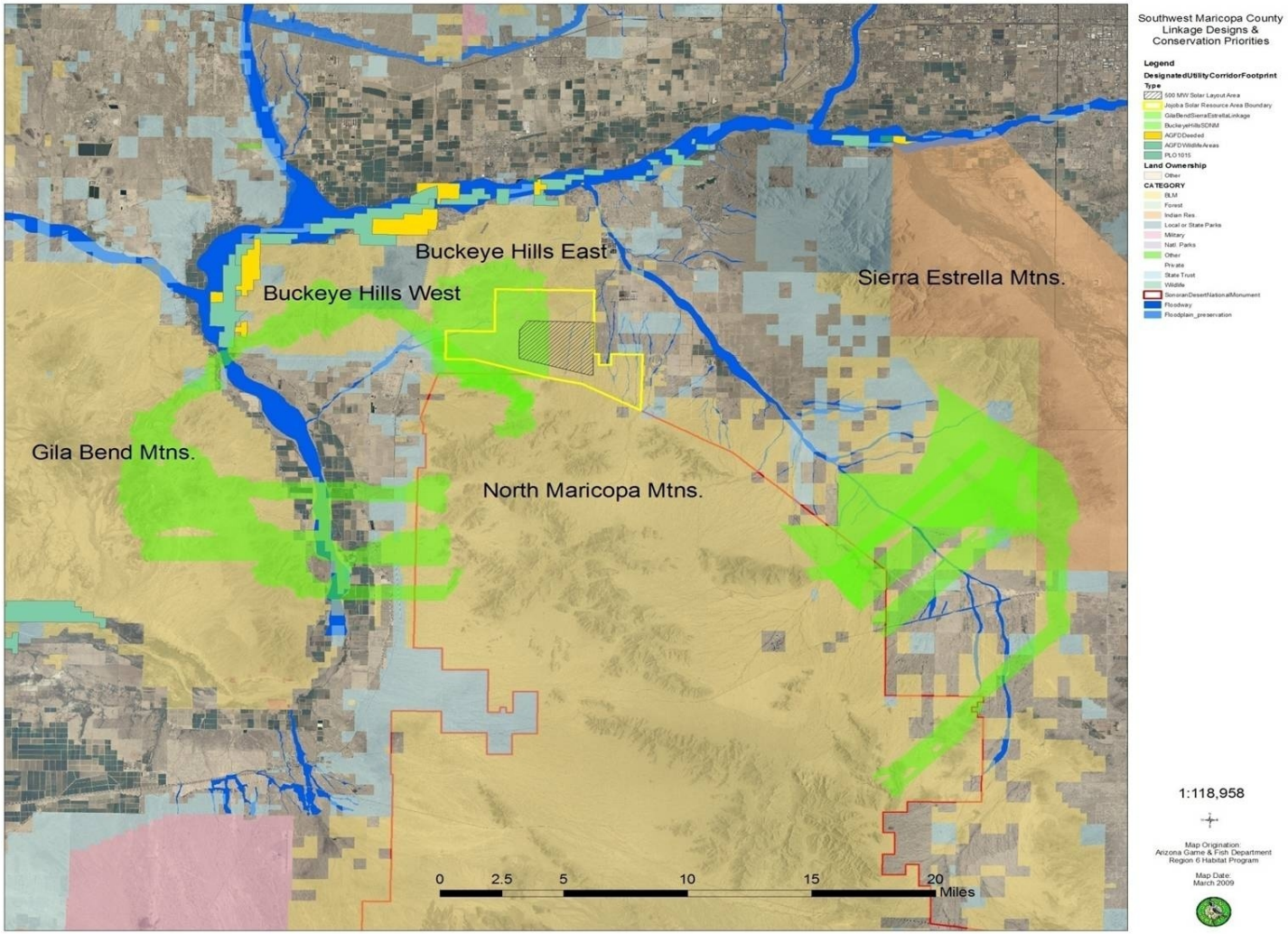


Arizona Solar Case Studies: NextEra's Sonoran Solar Project

- On BLM land
- 350 MW, CST Trough
- Wet-cooled
- Designed for storage or gas back-up



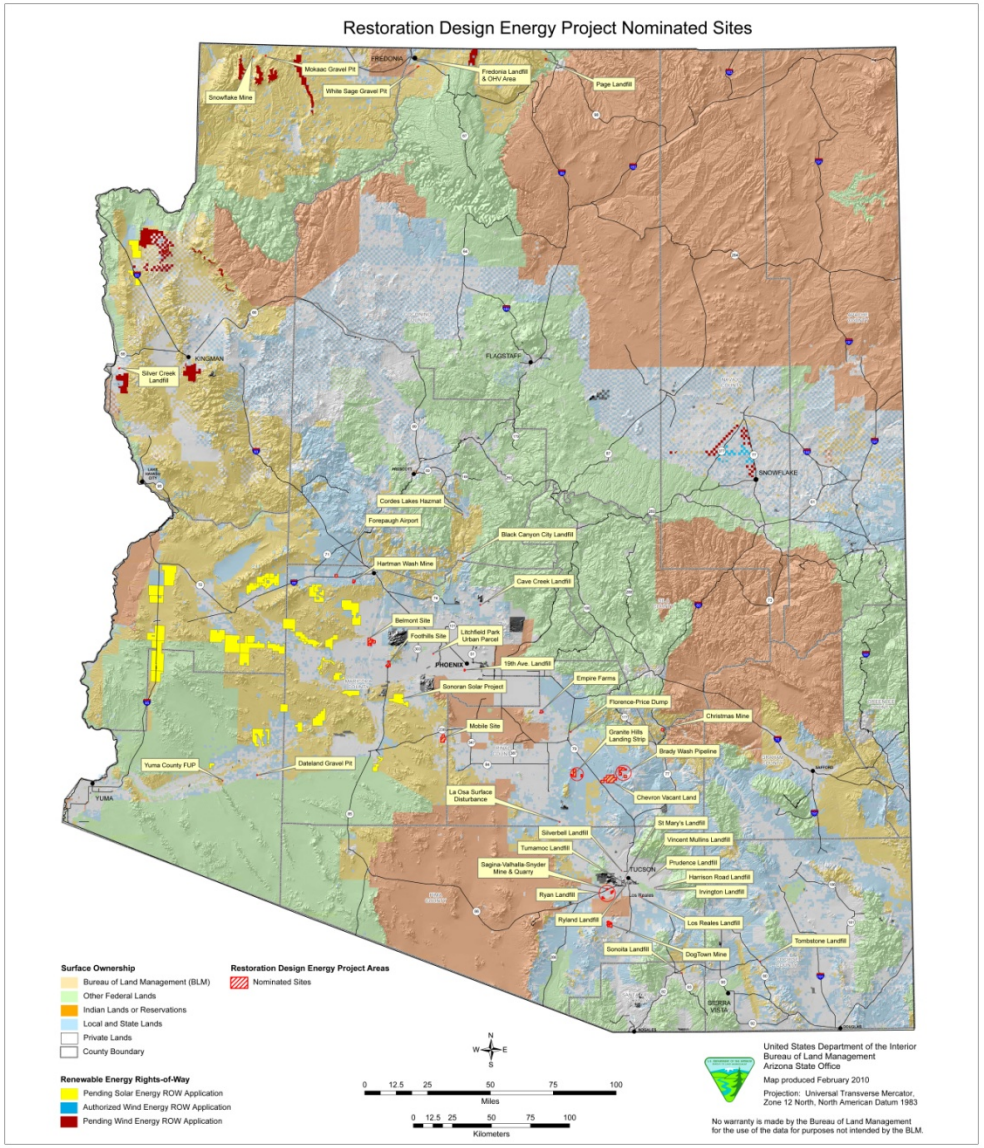
NextEra's Sonoran Solar Project



Opportunities for Mitigation

- Research & monitoring
- Habitat/riparian restoration
- Land/water acquisition
- Mitigation banking

Arizona Solar Case Studies: Restoration Design Energy Project



- Restoring disturbed sites for renewable energy development
- Statewide; covering all land ownerships
- 45 sites nominated by public, totaling 27,600 acres
- Potential for technologies at various scales

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Lessons Learned on Planning For Utility-Scale Solar

Be pro-active in identifying suitable locations and provide incentives for siting in those locations:

- Redefine what constitutes a major General Plan amendment
- Establish Energy Overlay Zones by type of renewable energy
- Create Renewable Energy Zone Performance Standards (grading, setbacks, noise, light, roads)

Lessons Learned…Continued

- Meet with large landowners to discuss re-zoning their properties for renewable energy:
  - Pinal County – 150,000 acres of undeveloped lots
  - Town of Buckeye, Maricopa County – 60,000 acres of undeveloped lots

Lessons Learned…Continued

- Engage in larger site and transmission planning processes:
  - Western Area Power Administration's Sonoran-Mojave Renewable Transmission Project
  - Southwest Area Transmission Sub-Regional Planning Group
  - Sunzia Southwest Transmission Project

Parting Thought

"Take a deep breath. It's only the future of our planet that's at stake.".

One Participant to Another
At a Renewable Transmission
Planning Roundtable

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