



Agrivoltaics: A Nexus of Energy, Agriculture, and Water Conservation

CT NOFA Winter Conference
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4-08-16 11:35am



About Scott



AGENDA

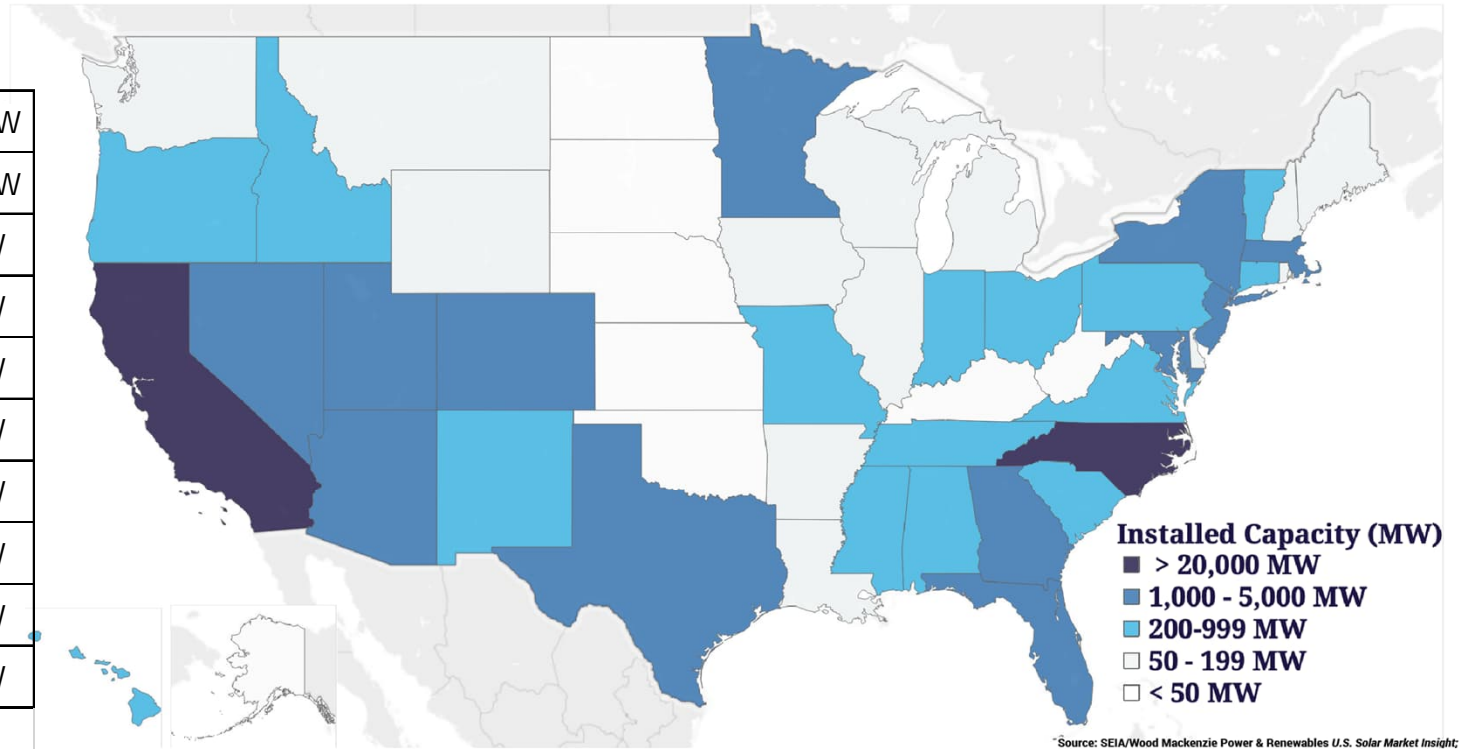
- ❑ OVERVIEW OF SOLAR ENERGY
- ❑ PHOTOVOLTAIC (PV) GENERATING PLANT DESIGN
- ❑ CHALLENGES FOR SCALING PV
- ❑ AGRIVOLTATICS: DEFINITION, STATE OF PRACTICE, AND CHALLENGES
- ❑ AGRIVOLTAICS EMERGING PRACTICES AND FUTURE OPPORTUNITIES
- ❑ WRAP-UP / QUESTIONS



Existing Solar Power Capacity

Top 10 States

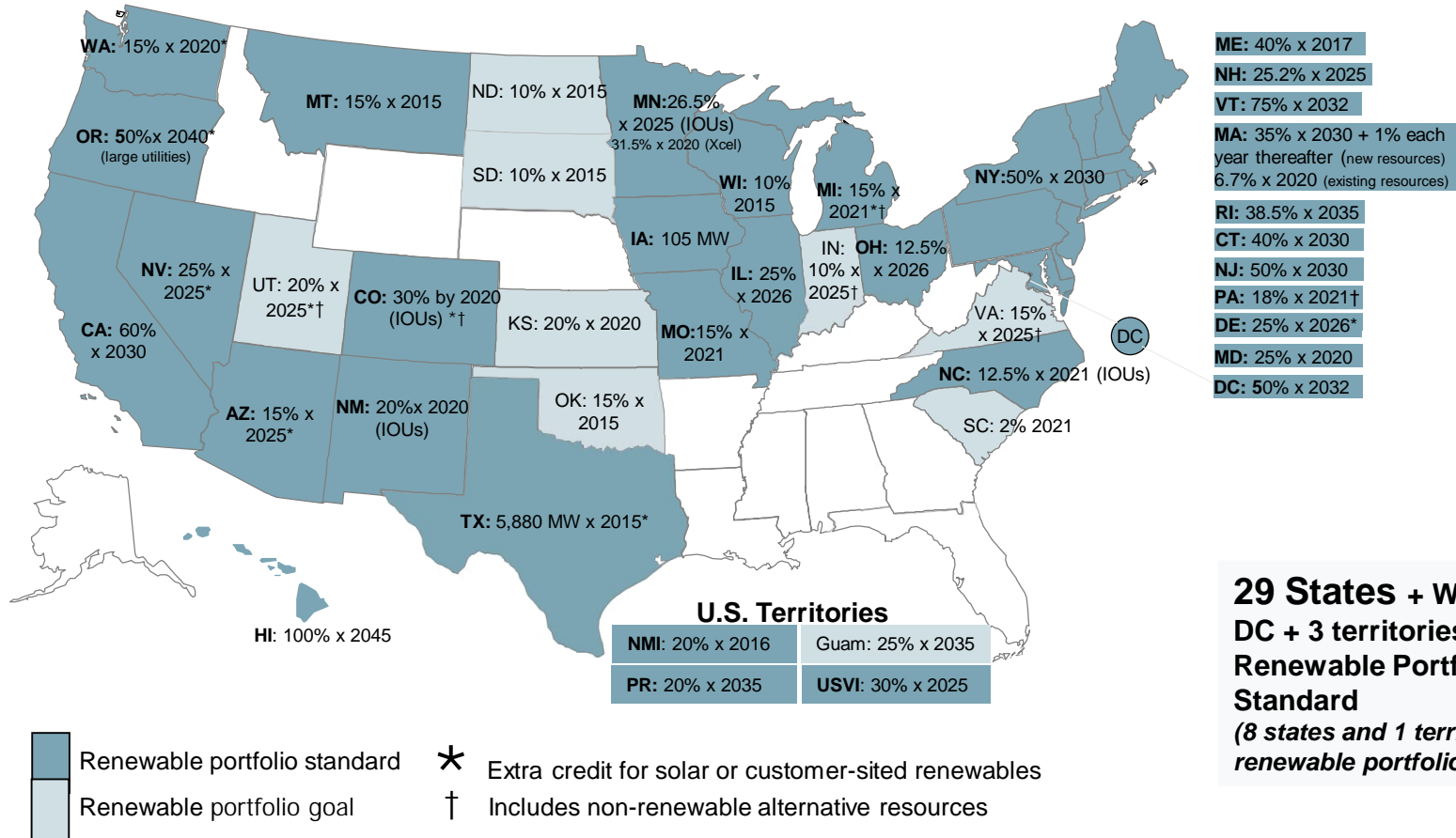
1. California	34,950 MW
2. Texas	13,845 MW
3. Florida	8,206 MW
4. North Carolina	7,811 MW
5. Arizona	5,644 MW
6. Nevada	4,511 MW
7. Georgia	4,268 MW
8. New Jersey	3,854 MW
9. Virginia	3,761 MW
10. Massachusetts	3,607 MW
SEIA 2021	



Source: Wood Mackenzie and SEIA

Renewable Portfolio Standard Policies

Plus:
Puerto Rico to 100%
California to 100%



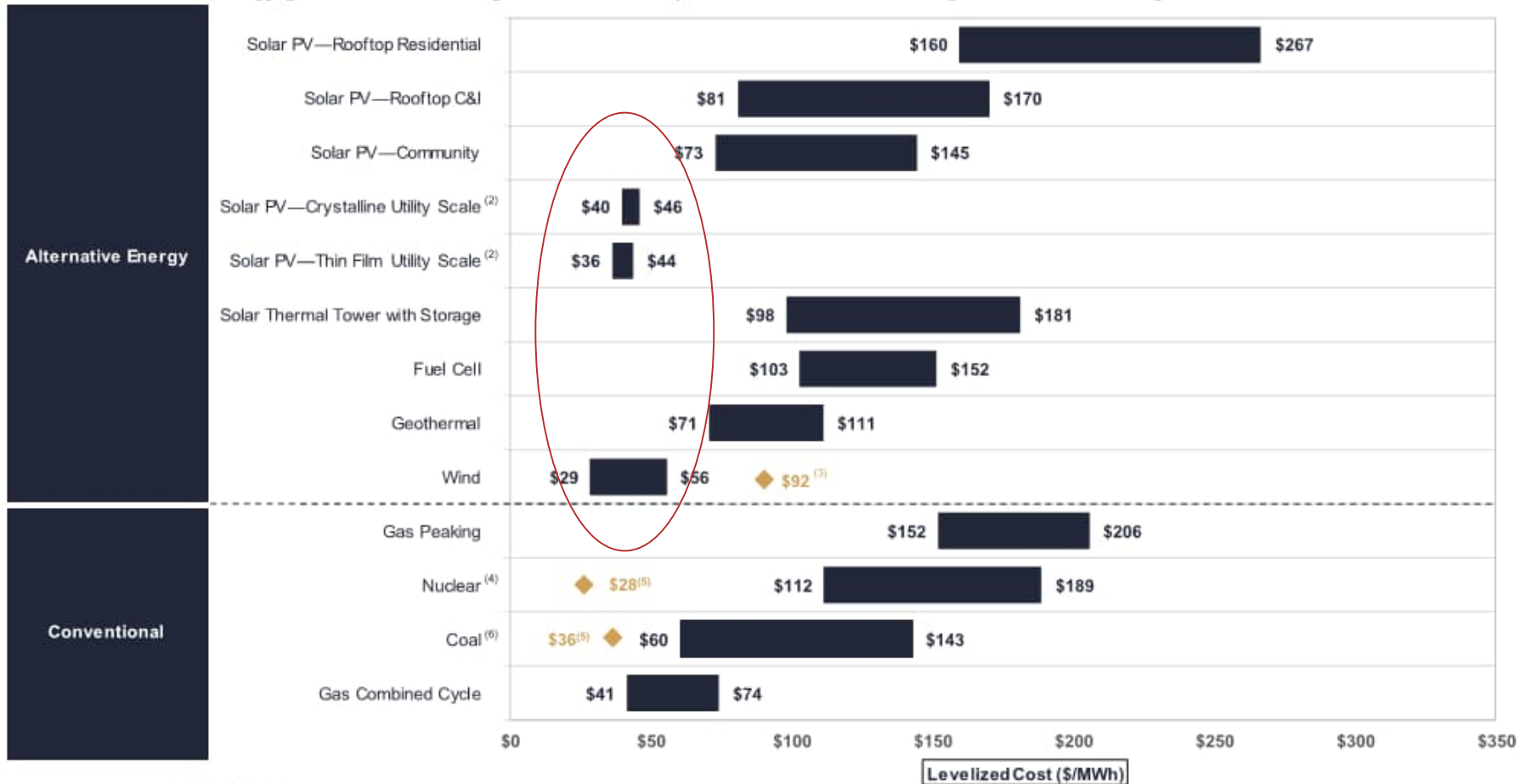
Source: www.dsireusa.org / October 2018



Levelized Cost of Energy Comparison—Unsubsidized Analysis

Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies under certain circumstances⁽¹⁾

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Source: Lazard estimates.

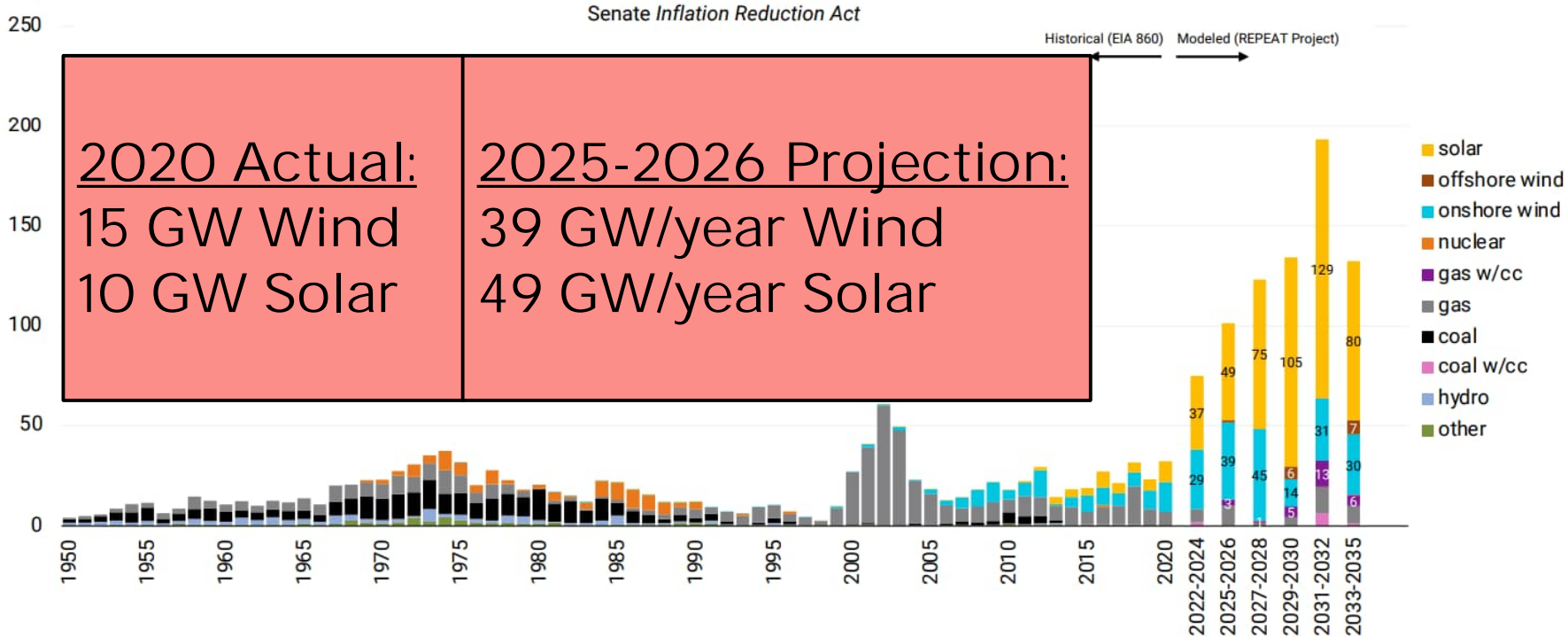
Note: LCOE and Range based on this presentation unless otherwise indicated. The analysis assumes 50% debt at 8% interest rate and 40% equity at 10% cost. Please see page 10 of 12 Levelized Cost of Energy Comparison—Sensitivity to



Electric Power Grid Projections - IRA

Historical Annual Capacity Additions vs. Modeled Annual Average Capacity Additions

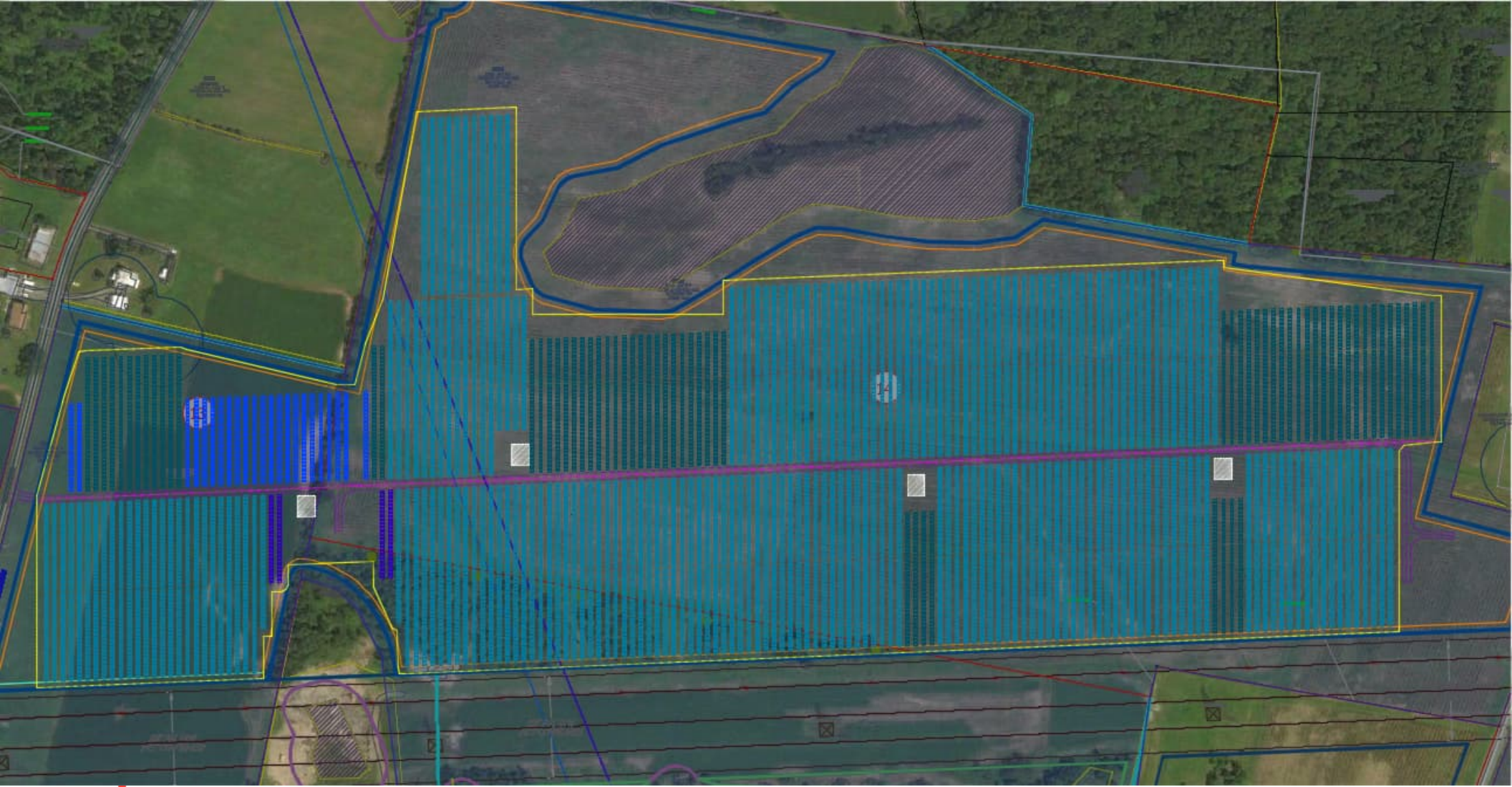
gigawatts/year

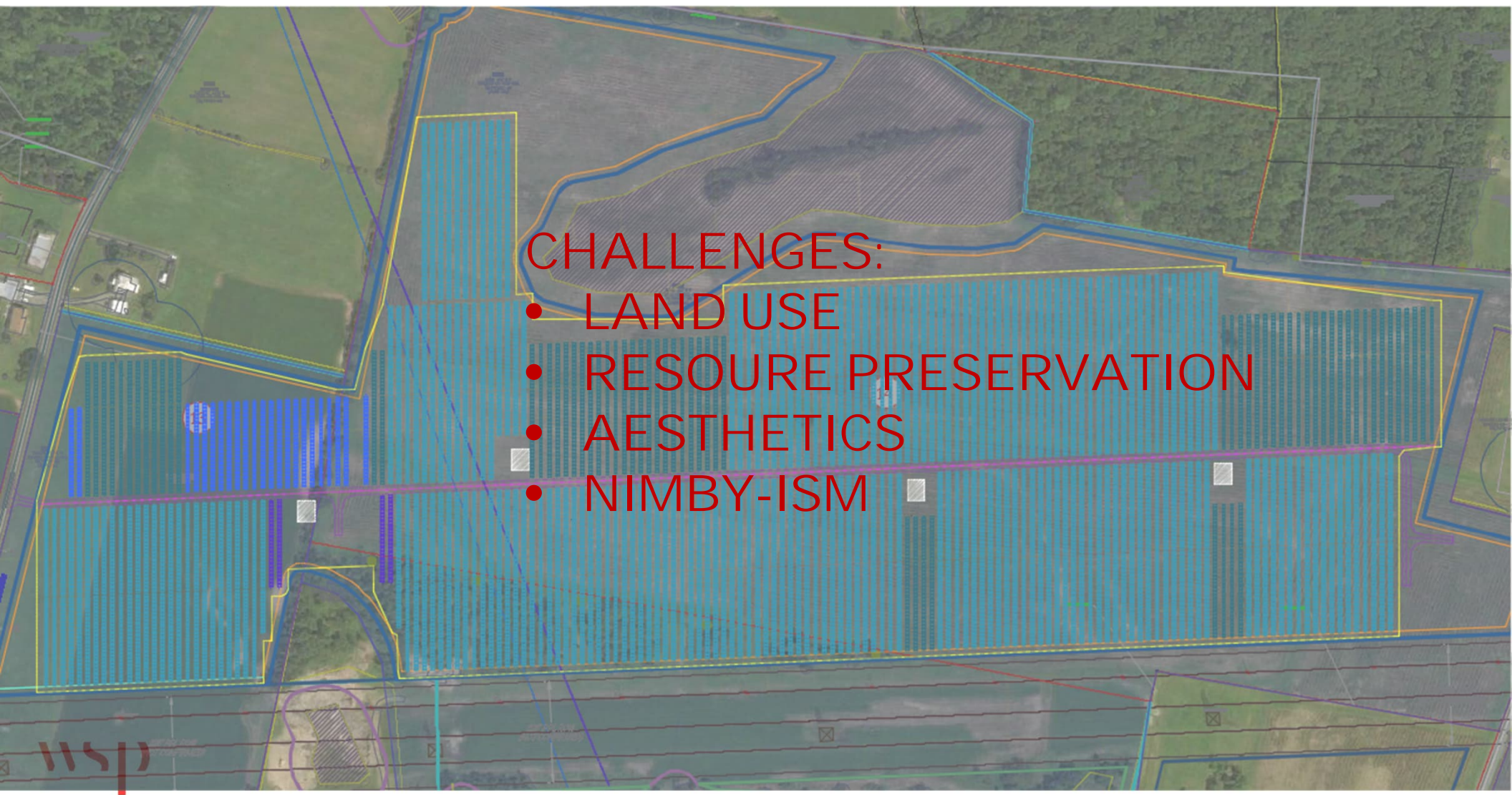


At a glance

Anatomy of a Solar Plant







CHALLENGES:

- LAND USE
- RESOURCE PRESERVATION
- AESTHETICS
- NIMBY-ISM

Introduction

AGRIVOLTAICS



Challenges & Current State of Practice



Photo source: powerflex.com

Emerging Practices

WSP



2010: Solar Greenhouse & Mushroom Farm



Photo source: WSP ([Instalación Agroenergética El Coronil](#))




Photo source:
pv-magazine.com

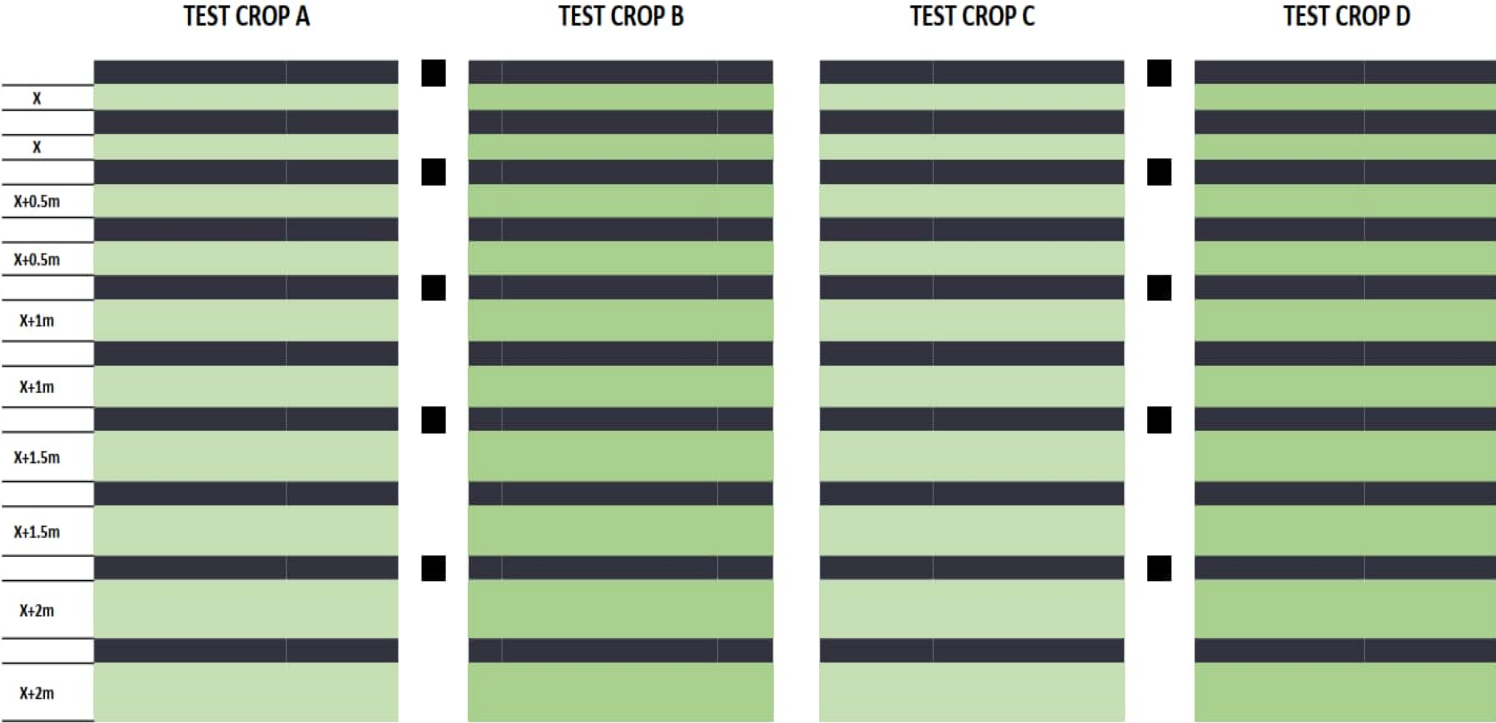


NREL - Colorado State - University of Arizona Boulder County Agrivoltaics Research



 Photo source: <https://www.renewableenergyworld.com/solar/largest-agrivoltaic-research-project-underway-in-colorado/#gref>

Proposed DOE Concept



X Energy Optimized Row spacing
 ■ Inverter (e.g. 150 kW)

Market Gardening Compatibility?



SUMMARY

State of Practice: Leading companies are going full scale:

- *Sheep farming*
- *Pollinator gardens*
- *Farmer benefits*

Business Case:

- Improved public perception
- Faster regulatory approvals
- Meets CSR goals

Where we are headed:

- Carbon benefits
- Productive agriculture
- Water conservation
- Add farming to operating PV plants





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