# SunZia Transmission

Board of Supervisors, Pinal County, AZ
January 25, 2023

Pattern | SunZia

# America’s Largest Clean Energy Project

**3,500+ MW**

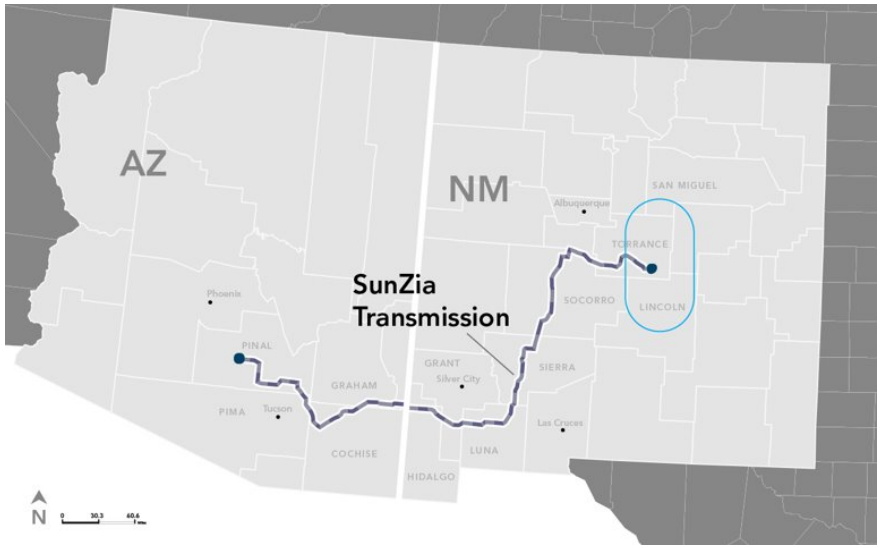
American wind energy

**~550 miles**

HVDC transmission infrastructure

**>$8 billion**

Private investment




**2,000**

Clean energy construction jobs

**3+ million**

Americans’ electricity needs served

# Pinal County Applications

## Applications Submitted:

**Non-Major Comprehensive Plan Amendment (CPA)**

- Change the land use designation in the Pinal County Comprehensive Plan

Moderate Low Density Residential to General Public Facilities/Services

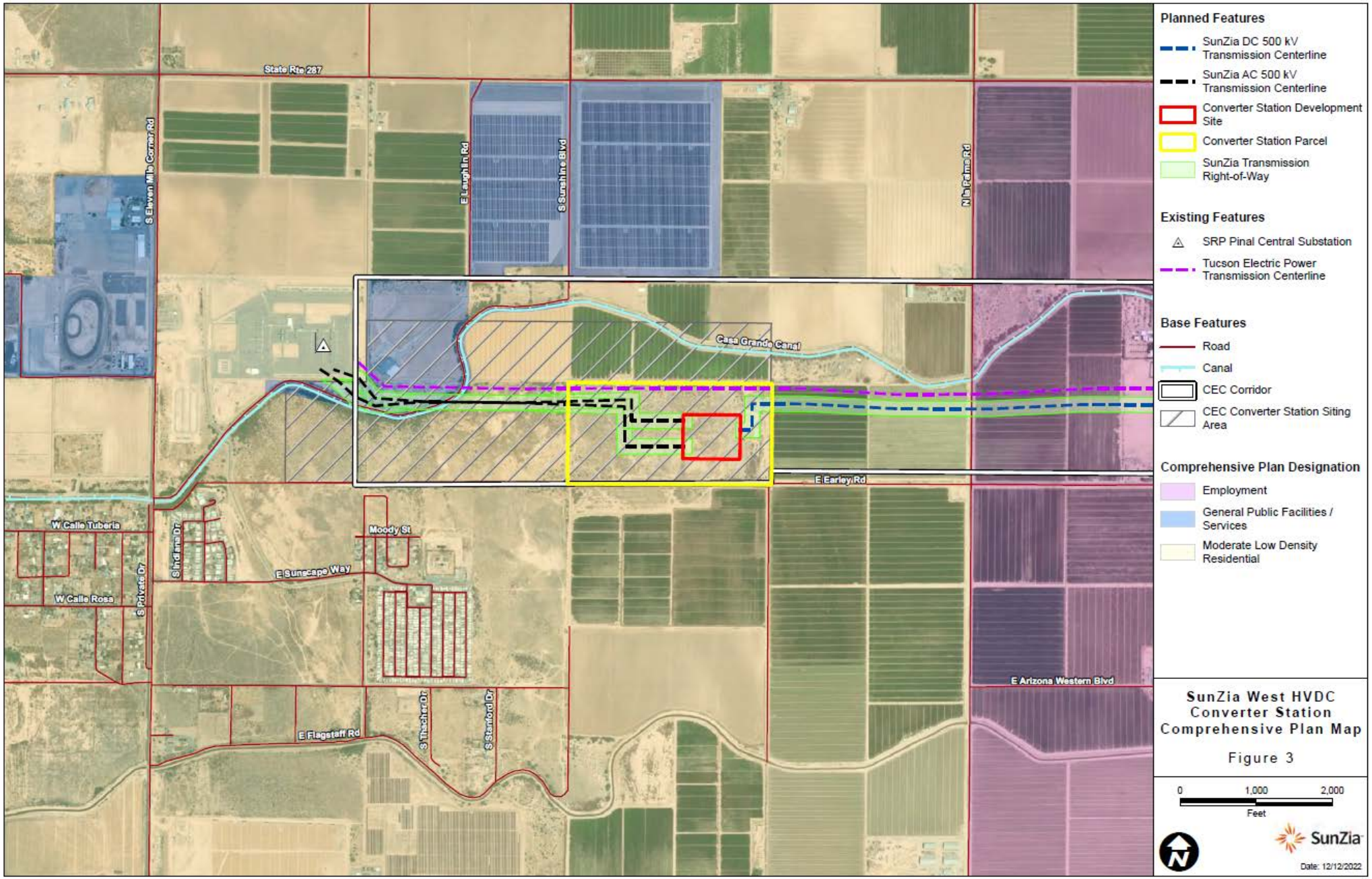
**Planned Area Development (PAD) Overlay District application**

- Allow service buildings to be 40-feet tall and valve-hall buildings to be 80-feet tall
  - needed and necessary at this location and time.
  - will not negatively impact adjacent properties
  - will promote orderly growth and development of the County

*The CPA and PAD will be compatible and consistent with the applicable goals and policies of the Pinal County Comprehensive Plan*

# Non-Major Comprehensive Plan Amendment (CPA)

- Change the Land Use Designation in the Pinal County Comprehensive Plan from Moderate Low Density Residential to General Public Facilities/Services.
- The proposed Comprehensive Plan Amendment is needed and necessary at this time because even though the Arizona Corporation Commission approved the Transmission Line Corridor and the CEC, the majority of the land within those corridors remains designated as Moderate Low Density Residential as a place holder category until a Private Utility company like SunZia applies to change the Residential category to the General Public Facilities/Services category and utilize some of the land in those corridors and bring renewable energy to the Pinal Central Substation.
- The expectation that transmission lines and converter stations would be allowed in this area is thoughtfully described in the "Energy" section of the Pinal County Comprehensive Plan (PCCP) pages 282-286 and specific policy numbers 7.6.1.6; 7.6.2.2; 7.7.1 and 7.7.1.3.


State Rte 287
S Ellsworth Rd
E Laughlin Rd
S Sunshine Blvd
N Ironwood Rd
Casa Grande Canal
E Earley Rd
W Calle Tuberia
W Calle Rosa
S Private Dr
S Indiana Dr
E Suncape Way
Moody St
E Flagstaff Rd
S Thatcher Dr
S Stanford Dr
E Arizona Western Blvd
Planned Features
SunZia DC 500 kV Transmission Centerline
SunZia AC 500 kV Transmission Centerline
Converter Station Development Site
Converter Station Parcel
SunZia Transmission Right-of-Way
Existing Features
SRP Pinal Central Substation
Tucson Electric Power Transmission Centerline
Base Features
Road
Canal
CEC Corridor
CEC Converter Station Siting Area
Comprehensive Plan Designation
Employment
General Public Facilities / Services
Moderate Low Density Residential
SunZia West HVDC Converter Station Comprehensive Plan Map
Figure 3
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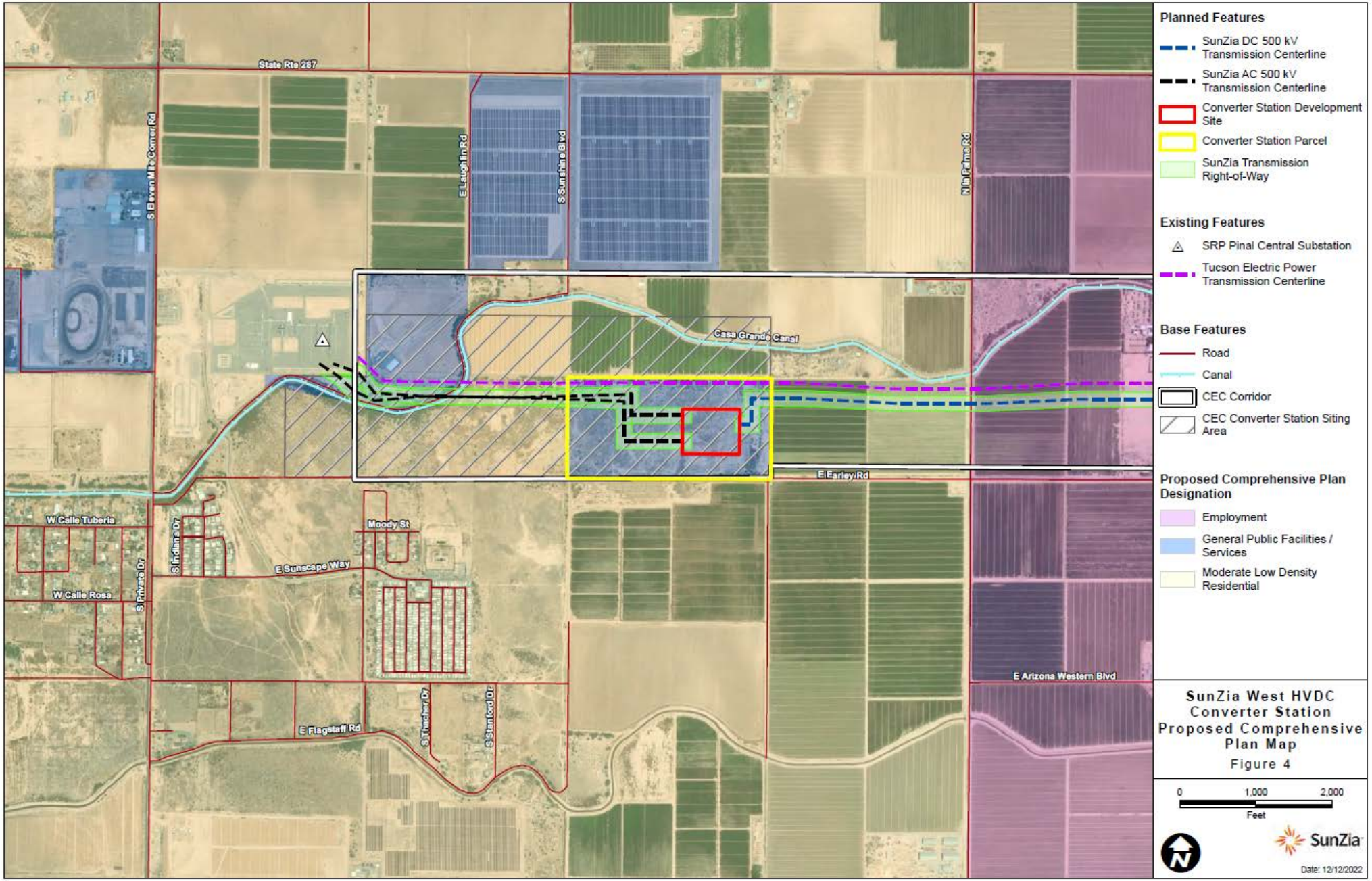
SunZia
Date: 12/12/2022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Road
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CEC Converter Station Siting Area
Proposed Comprehensive Plan Designation
Employment
General Public Facilities / Services
Moderate Low Density Residential
SunZia West HVDC Converter Station
Proposed Comprehensive Plan Map
Figure 4
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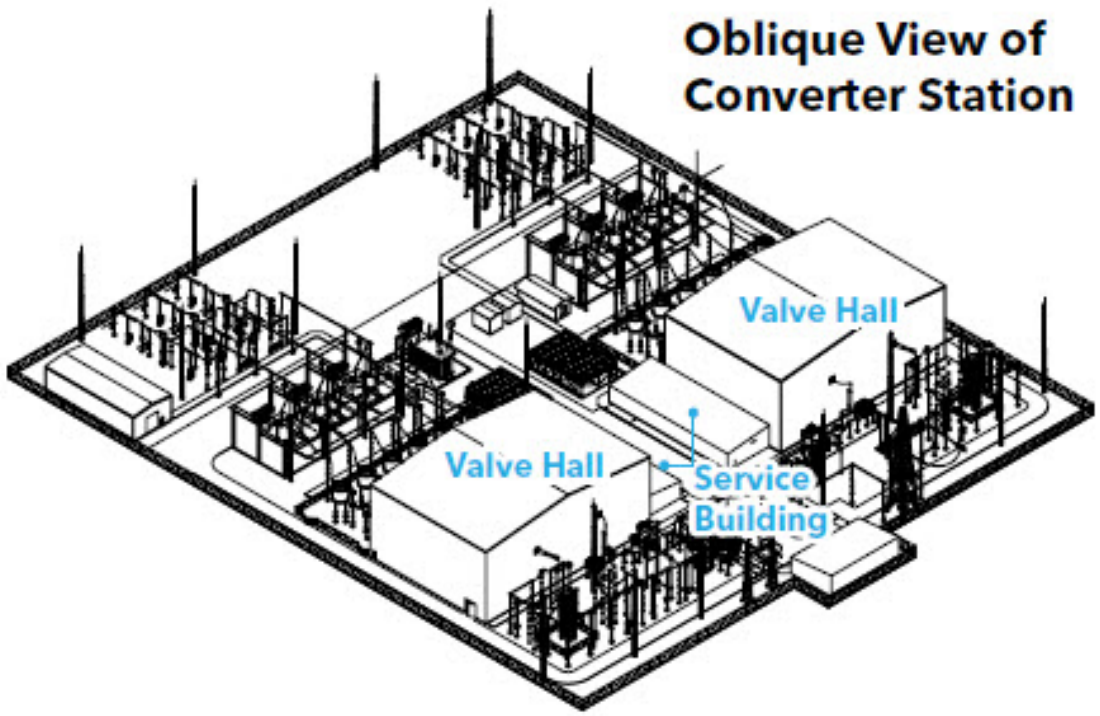
SunZia
Date: 12/12/2022

# HVDC Converter Station



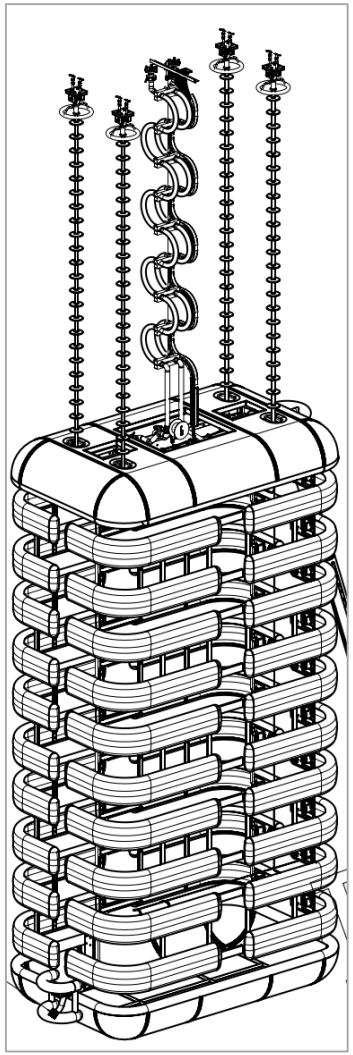

## What is an HVDC Converter Station?

- Type of substation - converts electricity between Alternating Current (AC) and Direct Current (DC).
- DC current is the most efficient way to transmit electricity over long distances.
- DC current must be converted to AC current to integrate into the power transmission network for local distribution.

## The converter station includes:

- Two valve hall buildings approximately 80 feet tall
- Two service buildings approximately 40 feet tall
- Other associated equipment
- One set of new DC Transmission line structures will enter the Converter Station from the east with up to sets of 2 AC Transmission line structures exiting to the Pinal Central Substation to the west.  Pole structures are consistent with existing transmission line.

# Planned Area Development Overlay



The maximum height for any structure in the General Rural (GR) zoning category is 30-feet.

The PAD overlay application is to allow service buildings to be 40-feet tall and valve-hall buildings to be 80-feet tall.

The buildings must be these heights to accommodate the necessary equipment and functions of the converter station.

The Valve Hall is the building where the filtering and conversion of the incoming direct current (DC) electricity is changed (converted) to alternating current (AC) that is used by residential and commercial customers.

The specialized equipment (converter valves) that perform this operation need protection from harsh weather and pollution.

# Valve Hall and Building Characteristics

- The height of a valve structure is approximately 27-feet tall.
- To maintain the electrical insulation and clearance requirements, the valve structures hang in electrical insulators as illustrated by the drawing on this slide. The insulators, in turn, are suspended from the ceiling of the valve hall.
- The length of the electrical insulators are approximately 17-feet. At the bottom of the valve structures, the minimum electrical clearance requirement is approximately 13-feet above the floor of the valve hall.
- The converter valves (consisting of/ metal/ ceramic/ glass) are arranged in a configuration that allows the handling of the high voltage the most efficiently and requires a tall building to accommodate the capacity of the SunZia Transmission project.

# Purpose & Need

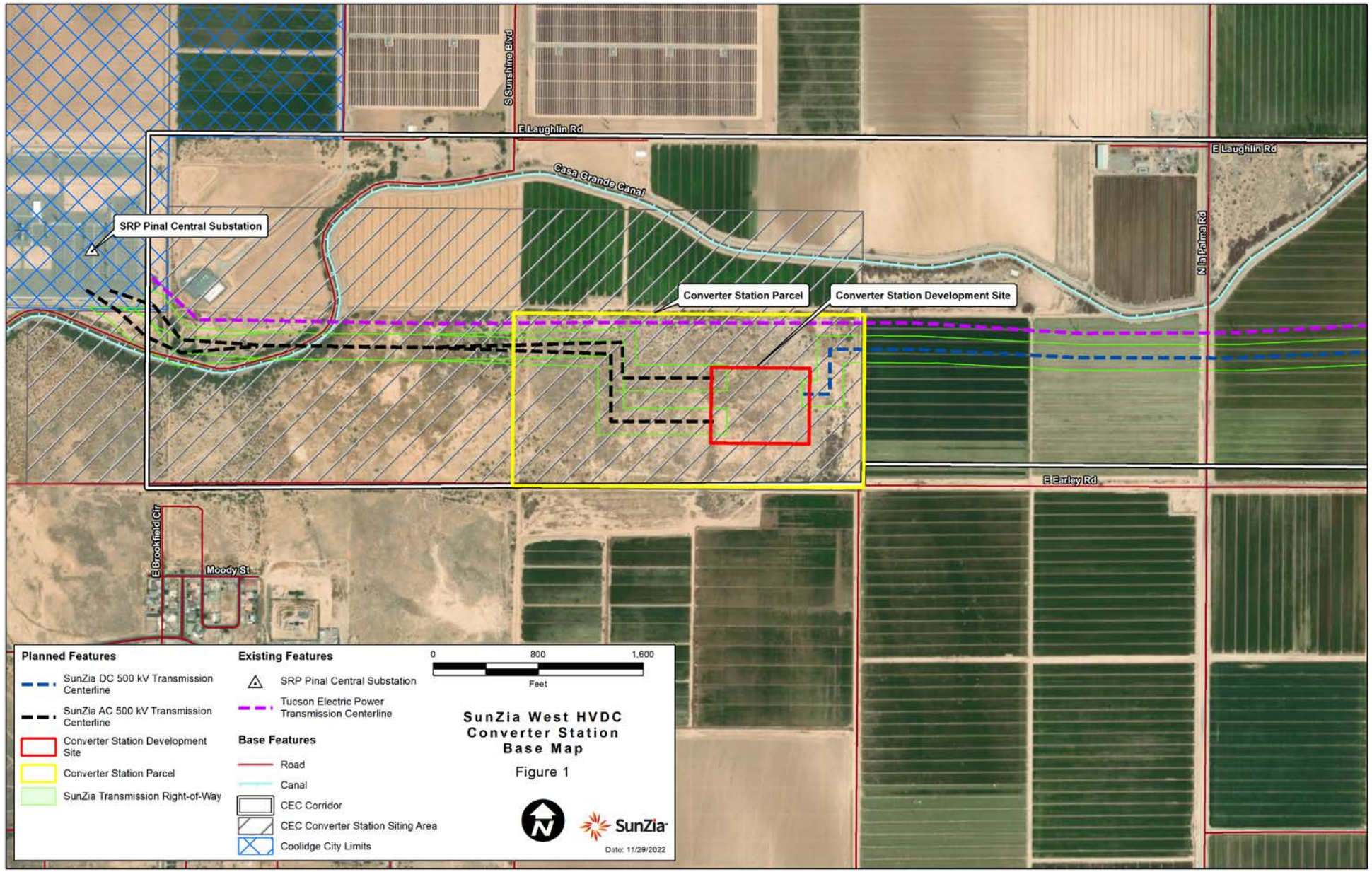
## HVDC Converter

- Electricity is wind-generated in central New Mexico, approximately 550 miles away.
- Energy from the wind turbines is converted from AC to DC at a converter station in New Mexico, then the DC power is delivered via the long-distance transmission lines to Arizona
- The SunZia West HVDC Converter Station in Pinal County is needed to convert the DC electricity back to AC current before connecting into the AC electric grid at the Pinal Central Substation
- This energy will be used to meet areas of emerging demand.

# Major Project Approvals

## Arizona Corporation Commission (ACC)

- Certificate Environmental (CEC) Compatibility Issued in 2015
- Amended CEC issued in November 2022
- HVDC Converter Station  is being built within the approved ACC siting facility corridor.
- All State Permits have been acquired.
- Original federal permit acquired in 2016; amended permit on track to be approved in April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Base Features
Road
Canal
CEC Corridor
CEC Converter Station Siting Area
Coolidge City Limits
0
800
1,600
Feet
SunZia West HVDC Converter Station Base Map
Figure 1
SunZia
Date: 11/29/2022

# Visual Simulations

- The Converter Station is visually similar and compatible with other electrical facilities in the area (Pinal Central Substation, Solar Plant, etc.).

- While the buildings are taller than those in the other electrical facilities, the other steel structures and transmission lines are very similar to those occurring in the existing landscape and the existing rural and agricultural character will not be substantially altered due to the presence of the existing infrastructure in the area.

- The buildings will be painted a desert tan to blend in with the landscape and the significant setback will minimize visual impact of the facility.

- The parcel on which the Converter Station will be located is 80 acres and the Converter Station development site is about 10 acres. This will provide buffers of 350 feet or more around the entire Converter Station development and significant setbacks from the property lines to reduce potential visual impacts on surrounding properties.

**SunZia**
TRANSMISSION LINE PROJECT

**SunZia West HVDC Converter Station**
Simulations Map

- PROPOSED 500 kV TRANSMISSION LINE
- VIEWPOINT LOCATION
- PROPOSED CONVERTER STATION

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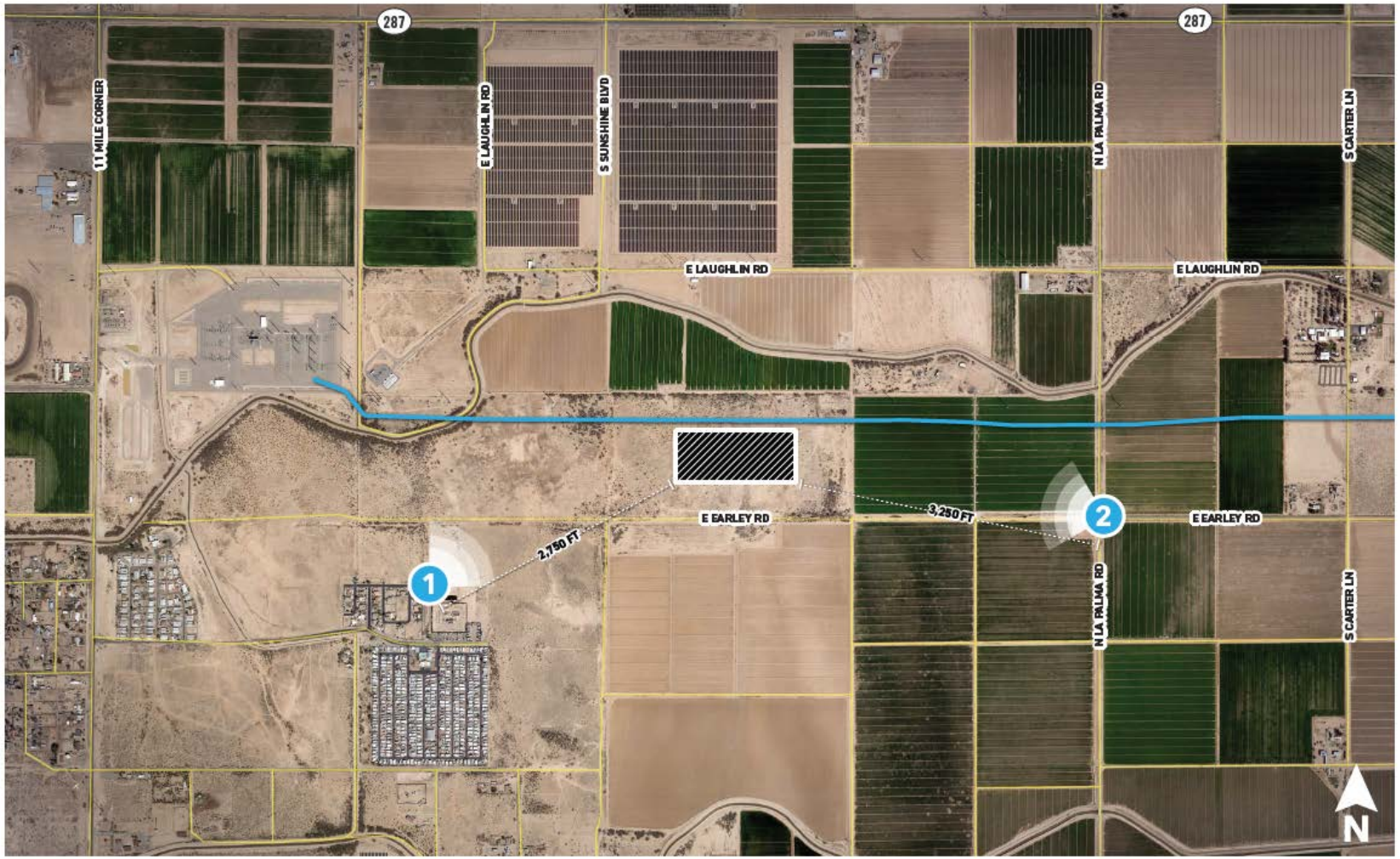


# Visual Simulation **Date:** September 20, 2022 **Time:** 11:16 AM **Direction:** Northeast **Distance to Station:** 2,750 Feet


# Visual Simulation

**Date:** July 26, 2022 **Time:** 3:43 PM **Direction:** West **Distance to Station:** 3,250 Feet


# Visual Simulation **Date:** July 26, 2022 **Time:** 3:43 PM **Direction:** West **Distance to Station:** 3,250 Feet (With 10-foot wall option shown.)


# Other Environmental Considerations

## Sound

- Sound levels from the Converter Station will be in compliance with Pinal County zoning ordinance requirements.
- County requirement is limited to 60 dBA at the north, east, and south property lines and 55 dBA at the west property line. The SunZia West Converter Station will meet these requirements within the 80-acre Converter station parcel.

## Lighting

- Typical yard lighting is low-voltage LED and targeted only where needed. Yard lighting fixtures will be top-hooded/shielded to direct light downward and limit upward illumination. The security lighting will be controlled by motion detectors.

## Biological & Cultural Surveys

- Completed with no significant findings.

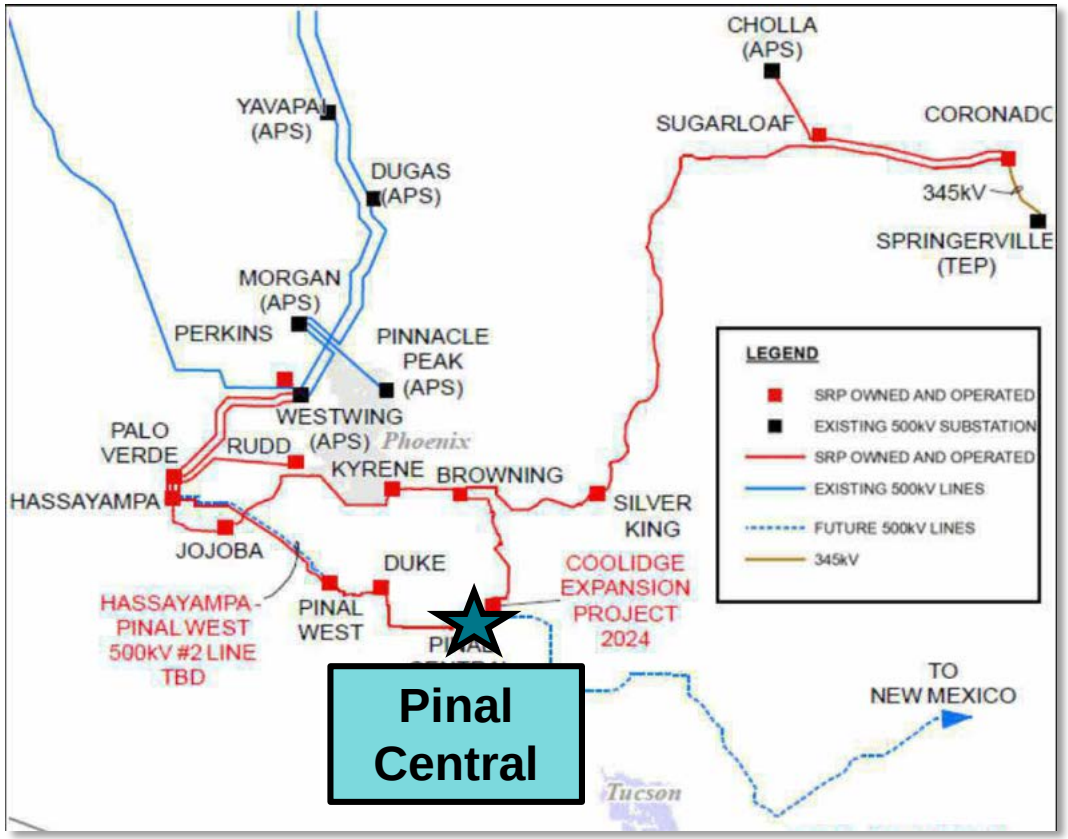
# Why Pinal County?

- SunZia has an Interconnection Agreement at Pinal Central, a major transmission hub in Arizona
- The SunZia West converter station to be located less than 1 mile from Pinal Central converts the DC energy into AC energy to allow it to be injected into the AC grid.
- Pinal Central was envisioned as a terminal for large transmission lines to bolster the system in Pinal County and provide for delivery of energy to local entities.
- SunZia helps realize this stated vision

## Potential AZ customer networks include:

- Salt River Project (SRP)
- Tucson Electric Power (TEP)
- Western Area Power Administration (WAPA),
- Arizona Electric Power Cooperative (AEPCO)
- Three local Electric Districts (EDs)
- Commercial and Industrial customers that utilize these utility networks

## SRP 500kV System Map



# Pattern Energy

Pattern Energy is a leading renewable energy company that develops, constructs, owns, and operates high-quality wind and solar generation, transmission, and energy storage facilities.

Pattern Energy  formally acquired the SunZia Transmission Line project in 2022 but co-developed the project with SouthWestern Power Group for many years prior.

Pattern considers it our responsibility to produce and transport renewable energy to consumers in a way that respects the integrity of our environment.

Pattern is committed to the safety and health of the public, our employees, and everyone who works with us.

Pattern  intends to be involved in community giving throughout the life of our projects. We believe that acting as a good neighbor and as part of the community results in benefits for both the communities where we develop and for the long-term success of our projects.