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Joint Agency Workshop: Next Steps to Plan for Senate Bill 100 Resource Build - Transmission

Session 1

July 22, 2021

Planning Background and Updates on Potential Transmission to Support SB 100

- Recap of Key Takeaways from June 2, 2021, SB 100 Resource Build Workshop
  - ✓ **Jim Bartridge**, CEC
- How 10-year Resource Planning and Near to Medium-Term Procurement Decisions Relate to Longer Term SB 100 Goals
  - ✓ **Karolina Maslanka**, CPUC
- Approach to Using SB 100 Resource Portfolios and the CAISO Conceptual Transmission Plan
  - ✓ **Jeff Billinton**, CAISO
  - ✓ **Scott Flint**, CEC

In and Out of State Transmission Projects

- Pacific Transmission Expansion Project – Jim Avery
- North Gila Imperial Valley #2 Transmission Project– Randy Schroeder
- TransWest Express Transmission Project – David Smith
- Southwest Intertie Project (SWIP) North – Sandeep Arora
- Cross Tie Project – Jason Smith and Bob Smith
- Sunzia Southwest Transmission Project – David Getts
- Starwood Energy – Ali Amirali and Jason Crew
- Southline Transmission Project – Doug Patterson
- Lucky Corridor Transmission Project – Sean Black
- GridLiance West -- Michael Landgraf

Public Comment Instructions

Rules
- 3 minutes per person
- 1 person per organization

Zoom
- Click "raise hand"

Telephone
- Press *9 to raise hand
- Press *6 to (un)mute

When called upon
- Unmute, spell name, state affiliation, if any

Written Comments:
- Due: 8/11/2021 by 5:00 p.m.
- Docket: 21-SIT-01
- Submit at: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=21-SIT-01

3-MINUTE TIMER

Agency Leadership Remarks

- **Karen Douglas**, CEC Commissioner
- **Siva Gunda,** CEC Commissioner
- **Marybel Batjer**, CPUC President
- **Cliff Rechtshaffen,** CPUC Commissioner
- **Darcie Houck,** CPUC Commissioner
- **Elliot Mainzer**, President and CEO, CAISO
- **Neil Millar,** Vice President, Transmission Planning & Infrastructure Development, CAISO

California Public Utilities Commission
Karolina Maslanka

California's Integrated Resource Planning + Transmission Planning

July 22, 2021

California Public Utilities Commission

Outline

- What is Integrated Resource Planning (IRP)?
- How does IRP inform transmission planning?

What is Integrated resource planning?

Integrated Resource Planning (IRP) in California Today

- The objective of integrated resource planning is to reduce the cost of achieving GHG reductions and other policy goals by looking across individual LSE boundaries and resource types to identify solutions to reliability, cost, or other concerns that might not otherwise be found.
- Goal of current IRP cycle is to ensure that the electric sector is on track to help California reduce economy-wide GHG emissions 40% from 1990 levels by 2030, per SB 32, and to explore how achievement of SB 100 2045 goals could inform IRP resource planning in the 2020 to 2030 timeframe.
- The IRP process has two parts:
  - First, it identifies an optimal portfolio for meeting state policy objectives and encourages the LSEs to procure towards that future.
  - Second, it collects and aggregates the LSEs collective efforts for planned and contracted resources to compare the expected system to the identified optimal system. The CPUC considers a variety of interventions to ensure LSEs are progressing towards an optimal future.

Two Models Used in IRP Analysis

- Objective of IRP modeling: To develop an optimal portfolio of new resources to add to the existing fleet in the CAISO area to plan for:
  - Achievement of long-term GHG reduction targets and other policy goals
  - Maintaining reliability
  - Keeping costs reasonable
  - Accounting for uncertainty and expected energy market conditions (i.e., "real world" conditions)
- The role of the capacity expansion model (RESOLVE) in IRP is to select portfolios of new resources that are expected to meet our policy goals at least cost while ensuring reliability
- The role of the production cost model (SERVM) in IRP is to validate the reliability, operability, and emissions of resource portfolios generated by RESOLVE

How does IRP inform transmission planning?

Information Flow Between the Two Planning Process

CPUC IRP produces resource portfolios

- In accordance with a May 2010 MOU between the CAISO and the CPUC, and in coordination with the CEC, the CPUC develops resource portfolios used by the CAISO in its annual Transmission Planning Process (TPP)
- The CPUC typically transmits multiple distinct portfolios developed in the IRP process:
  - Reliability and Policy-Driven Base Case portfolio
  - Policy-Driven Sensitivity portfolio(s)

Annual

CAISO conducts TPP assessments

- Reliability and Policy-Driven Base Case portfolio
  - Identified transmission solutions go to the CAISO Board of Governors for approval
- Policy-Driven Sensitivity portfolio(s)
  - Identified transmission solutions are considered Category 2 and typically do not go to the CAISO Board of Governors for approval
  - Results often provide useful information for future IRP work

CAISO updates Transmission inputs for IRP

- CAISO produces transmission capability limits and upgrade cost estimates
  - These serve as an inputs to RESOLVE and as criteria for mapping resources to specific busbars.

- CAISO TPP is informed by IRP resource planning assumptions and LSE procurement decisions that drive generator interconnection transmission upgrades

Process Begins with the Incorporation of Transmission Inputs into RESOLVE

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RESOLVE Transmission Inputs and Assumptions

- RESOLVE accounts for the cost of new transmission when optimizing for a least-cost portfolio. Typically, if candidate resources can fit on the existing transmission system, RESOLVE will select to do so because it will be the least-cost option.
- CAISO produced for use in IRP modeling:
  - transmission capability estimates of the existing transmission system, and
  - cost and capacity estimates of potential upgrades.
    - CAISO's May 2019 Whitepaper available here: https://www.caiso.com/Documents/WhitePaper-TransmissionCapabilityEstimates-InputtoCPUCIntegratedResourcePlanPortfolioDevelopment.pdf

RESOLVE Transmission Inputs and Assumptions

- CPUC and CAISO staff are collaborating to improve transmission capability estimates and their incorporation into RESOLVE for future modeling
  - The May 2019 estimates were expressed based on installed capacity (solar-based) and did not differentiate transmission capacity headroom available by different types of resource.
  - The transmission zones defined by CAISO did not cover all areas of the state that have high quality renewable resources.
  - No information available about the cost of transmission upgrades beyond column "B"

	Transmission capability estimates to support CPUC's IRP process								
	Estimated FCDS Capability (MW)				Incremental Upgrade Cost Estimate ($million)				Estimated EODS Capability** (MW)
	A		B		C				D
Transmission zones and sub-zones	Existing System	Minor Upgrades	Major Upgrade #1	Major Upgrade #2	Existing System	Minor Upgrades	Major Upgrade #1	Major Upgrade #2	Existing System
Northern CA	**2,000**		**2,000**				**$ 285**		**3,900**
- Round mountain	500								2,100
- Humboldt	-								100
- Sacramento River	2,000								4,600
- Solano	600		2,000				$ 322		1,300
Southern PG&E	**1,100**		**1,000**				**$ 55**		**TBD**
- Westlands	1,100		1,000				$ 55		TBD
- Kern and Greater Carrizo	1,000		1,500				$ 241		TBD
- Carrizo	400		700				$ 53		400
- Central Valley North & Los Banos	1,000		1,000				$ 274		TBD
Tehachapi	**4,300**	**1,000**				**$ 100**			**5,100**
Greater Kramer (North of Lugo)	600		400				**$ 146**		**600**
- North of Victor	300		400				$ 485		300
- Inyokern and North of Kramer	100		400				$ 485		100
- Pisgah	400		400				$ 261		400
Southern CA Desert and Southern NV	**3,000**		**2,800**				**$ 2,156**		**9,600**
- Eldorado/Mtn Pass (230 kV)	250		1,400				$ 76		2,400
- Southern NV (GLW-VEA)	700		1,400				$ 150		700
- Greater Imperial*	1,200		1,400				$ 2,334		3,100
- Riverside East & Palm Springs	2,950		1,500				$ 2,156		5,500

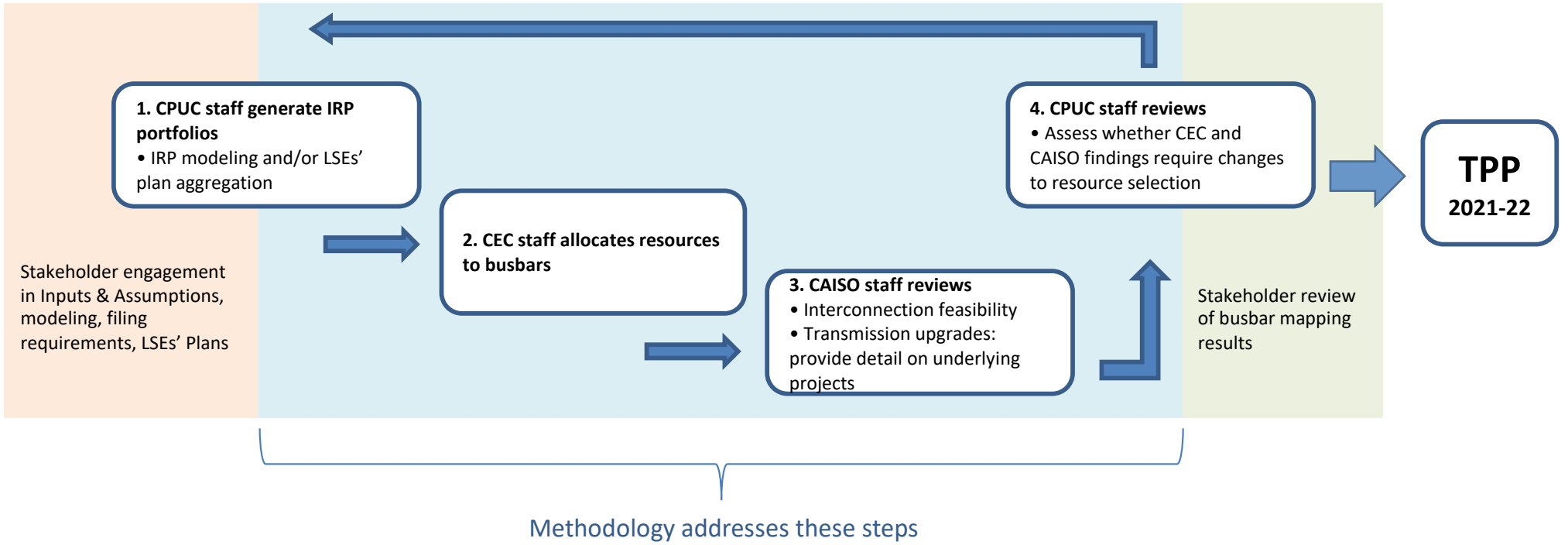
Upgrade MW information used to create levelized $/MW-yr costs

https://www.caiso.com/Documents/WhitePaper-TransmissionCapabilityEstimates-InputtoCPUCIntegratedResourcePlanPortfolioDevelopment.pdf

Role of RESOLVE in IRP and TPP Analysis

- Considering the limitations of transmission inputs, RESOLVE transmission results beyond the 10-year planning horizon have been information only and not used directly for decision-making
- RESOLVE results 10 years out serve as an indication of where transmission upgrades may be needed to accommodate resource needs
  - However, the indicative transmission upgrade information requires additional analysis to determine if the indicated transmission upgrades are necessary
  - This analysis is done via:
    - The mapping of all selected resources to specific busbars (substations)
    - The CAISO's TPP process

Methodology for Busbar Mapping Resource Portfolios



- Resource-to-busbar mapping ("busbar mapping"): process for translating geographically-coarse portfolios to plausible network locations for Transmission Planning Process (TPP) modeling
- Busbar mapping scope: utility-scale generation and storage resources that are not already in the baseline

Geographic Granularity of RESOLVE Transmission Zones

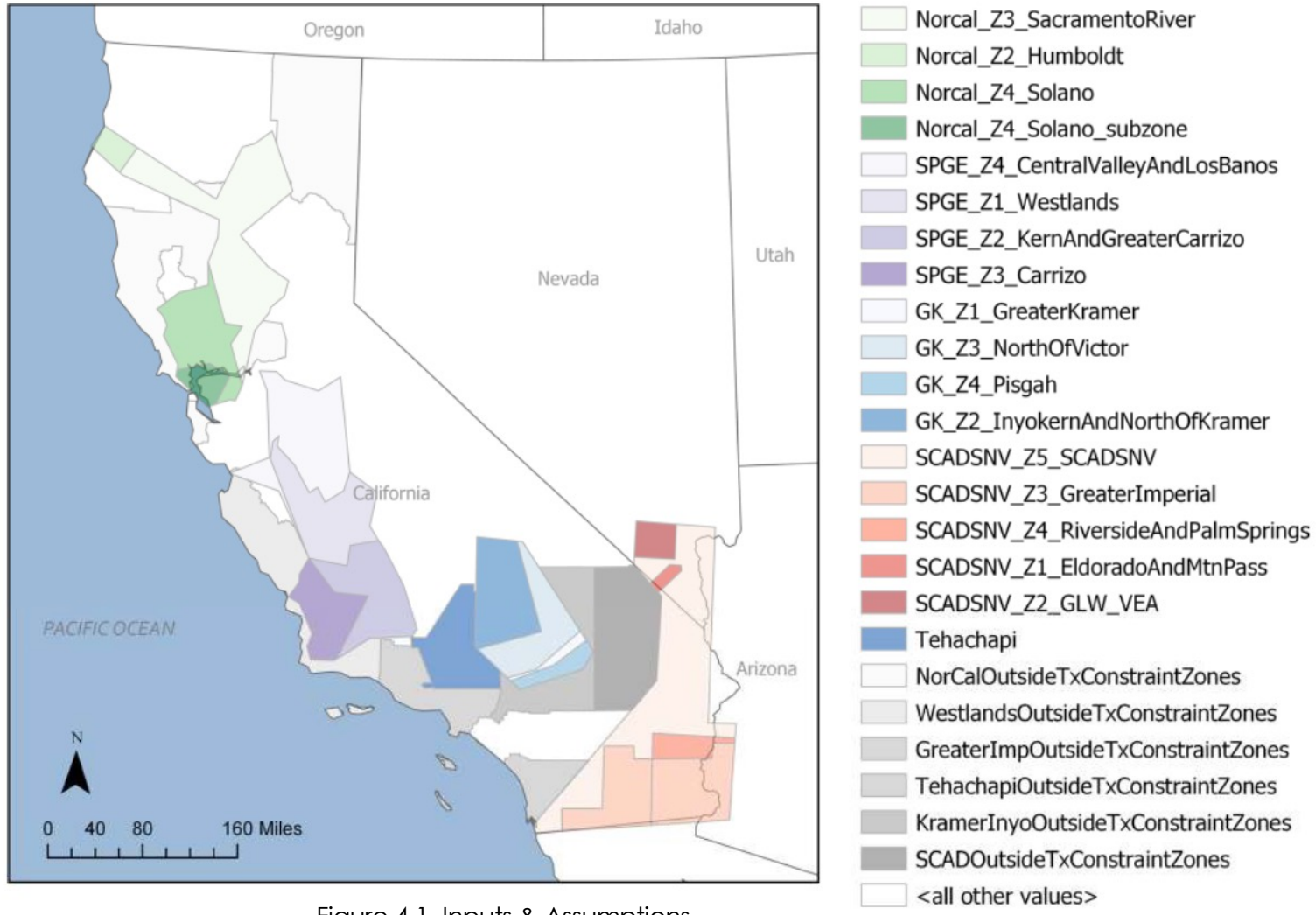
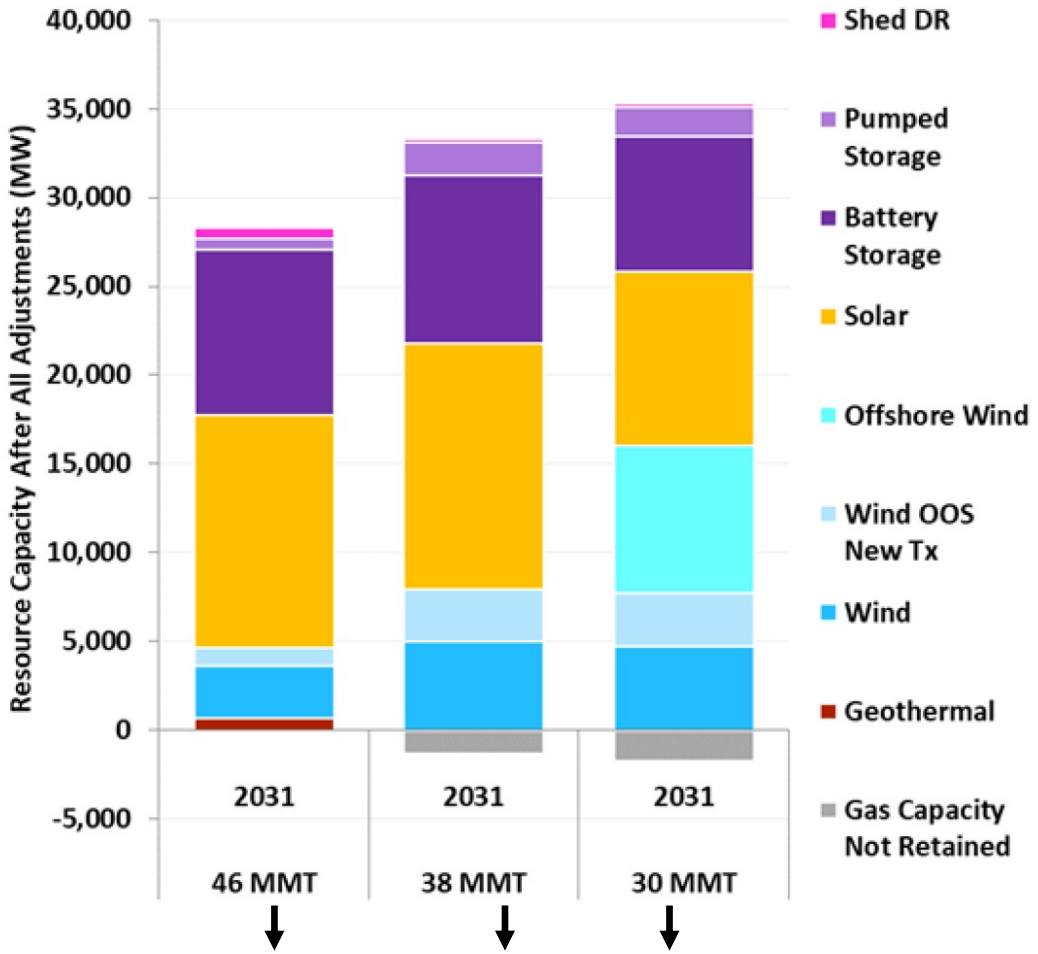


Figure 4.1, Inputs & Assumptions
ftp://ftp.cpuc.ca.gov/energy/modeling/Inputs%20%20Assumptions%202019-2020%20CPUC%20IRP%202020-02-27.pdf

Resource Composition of IRP Portfolios Transmitted to CAISO for the 2021-2022 TPP

		2031		
Resource Category	*Unit*	46 MMT	36 MMT	30 MMT
Gas	*MW*	-	-	-
Biomass	*MW*	-	-	-
Geothermal	*MW*	651	-	-
Hydro (Small)	*MW*	-	-	-
Wind	*MW*	2,943	4,955	4,689
Wind OOS New Tx	*MW*	1,062	3,000	3,000
Offshore Wind	*MW*	-	-	8,351
Solar	*MW*	13,043	13,816	9,807
Customer Solar	*MW*	-	-	-
Battery Storage	*MW*	9,368	9,447	7,604
Pumped Storage	*MW*	627	1,843	1,613
Shed DR	*MW*	608	222	222
Gas Capacity Not Retained	*MW*	-	(1,319)	(1,718)
In-State Renewables	*MW*	**16,638**	**18,876**	**22,847**
Out-Of-State Renewables	*MW*	**1,062**	**3,000**	**3,000**

Source: *Modeling Assumptions for the 2021-2022 Transmission Planning Process (February 2021)*

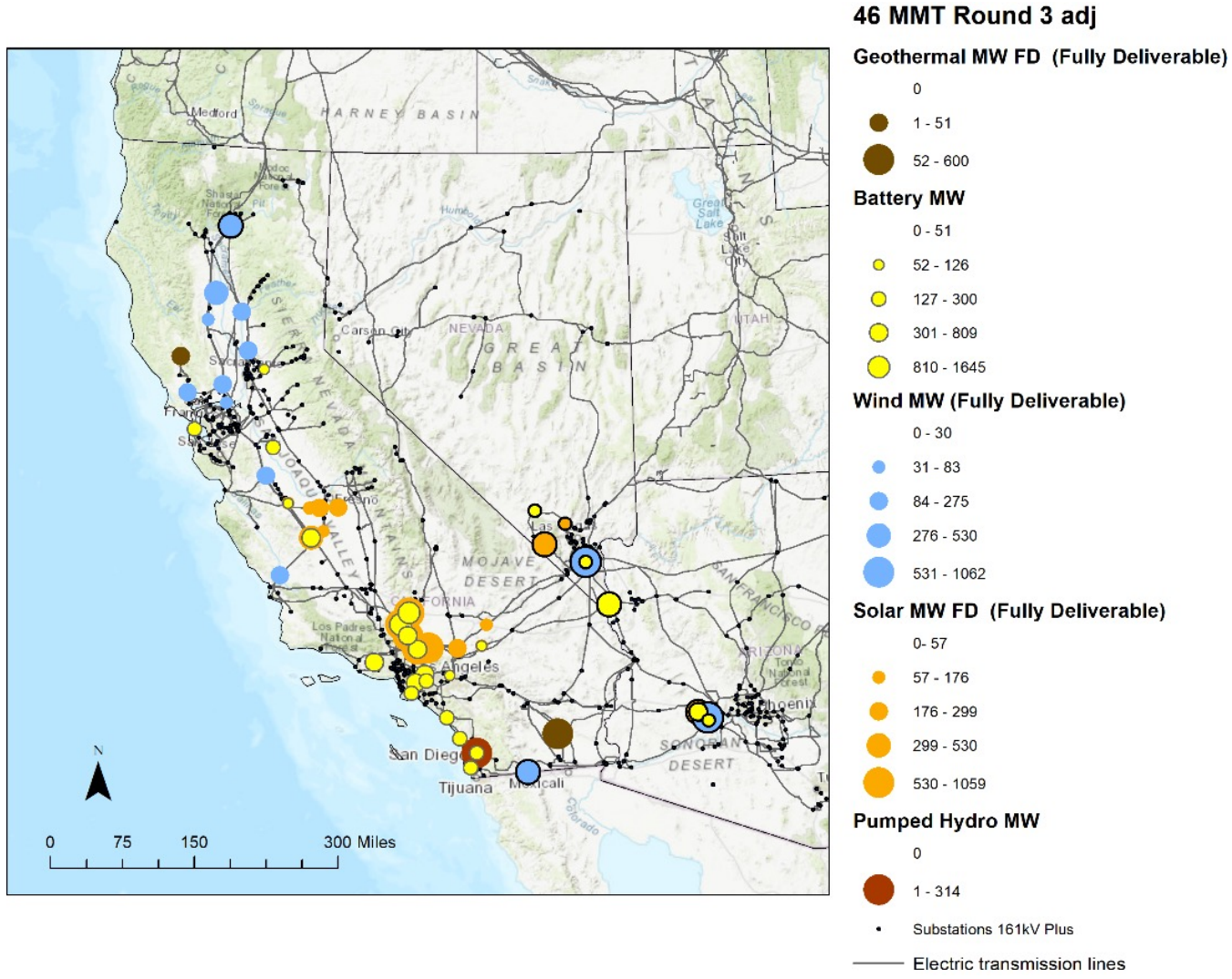


Base Case Portfolio (CAISO Board of Governors approves transmission based on TPP assessments that use this portfolio

Policy-Driven Sensitivity Portfolios (Do not inform transmission approval)

Map of Final Busbar Mapping Results for 46 MMT Base Case Portfolio for 21-22 TPP

Source: *Modeling Assumptions for the 2021-2022 Transmission Planning Process (February 2021)*



46 MMT Round 3 adj

Geothermal MW FD (Fully Deliverable)
- 0
- 1 - 51
- 52 - 600

Battery MW
- 0 - 51
- 52 - 126
- 127 - 300
- 301 - 809
- 810 - 1645

Wind MW (Fully Deliverable)
- 0 - 30
- 31 - 83
- 84 - 275
- 276 - 530
- 531 - 1062

Solar MW FD (Fully Deliverable)
- 0- 57
- 57 - 176
- 176 - 299
- 299 - 530
- 530 - 1059

Pumped Hydro MW
- 0
- 1 - 314

- Substations 161kV Plus
- Electric transmission lines

The Resource Portfolios are then Transmitted to CAISO

CPUC IRP produces resource portfolios

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Aperiodic

CAISO updates Transmission inputs for IRP

- CAISO produces transmission capability limits and upgrade cost estimates
  - These serve as an inputs to RESOLVE and as criteria for mapping resources to specific busbars.

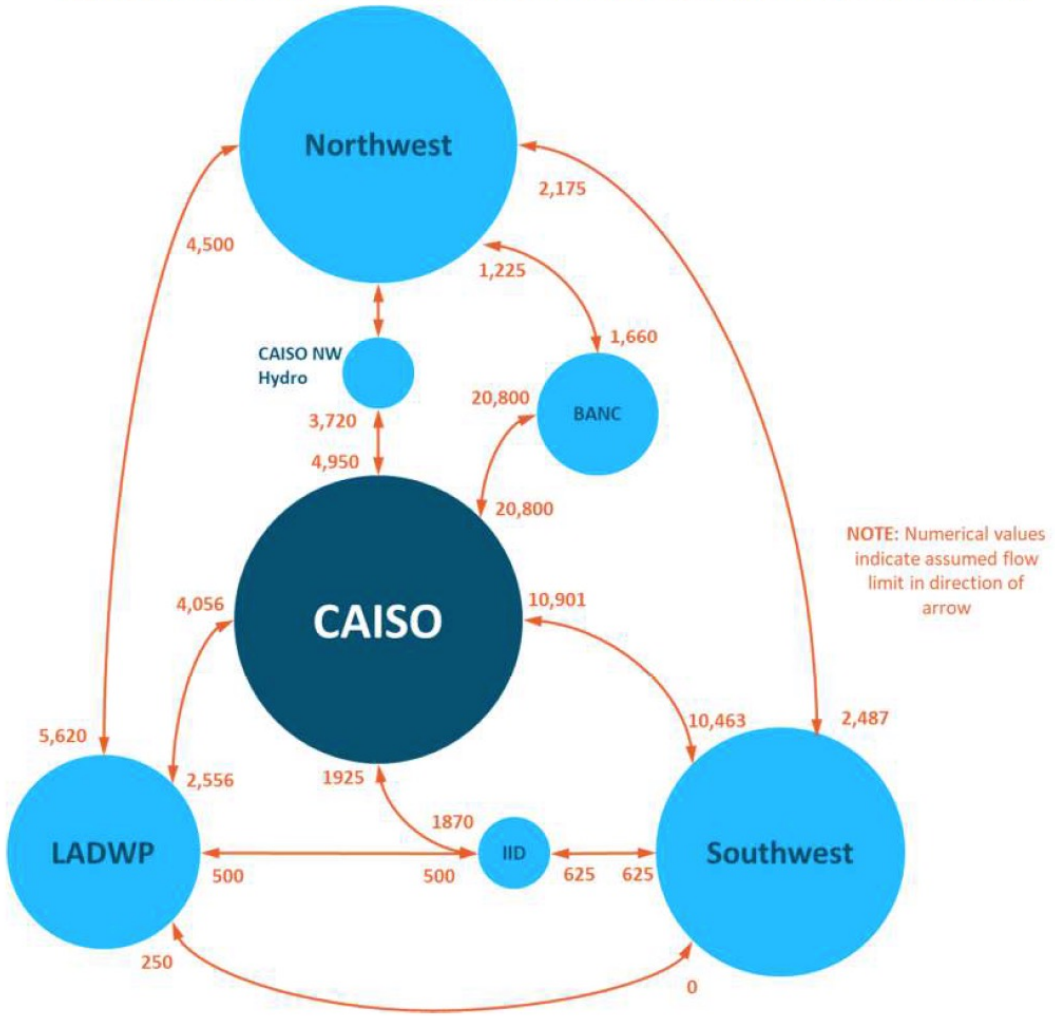
Identified Transmission Limit Exceedances – 46 MMT Portfolio for the 21-22 TPP

- The 46 MMT portfolio, when mapped, exceeded estimates of the existing transmission limits (provided by CAISO in May 2019) in three zones. CAISO's TPP will more rigorously assess whether any transmission upgrades are required to accommodate the resources in this portfolio.
  - Southern PG&E: The transmission limit exceedance in this area could be resolved by a transmission upgrade with a CAISO estimated cost of $55 million, which would increase the estimated transmission capability by 1,000 MW.
  - Tehachapi: The transmission limit exceedance in this area could be resolved by a transmission upgrade with a CAISO estimated cost of $100 million, which would increase the estimated transmission capability by 1,000 MW.
  - GLW-VEA transmission zone (Southern Nevada): The energy only transmission limit exceedance in this area could be resolved by a combination of two transmission upgrades with a CAISO-estimated cost of $138-145 million, which would increase estimated EO transmission capability by at least 1,500 MW.

Transmission Expansion to Access Out-of-State Resources

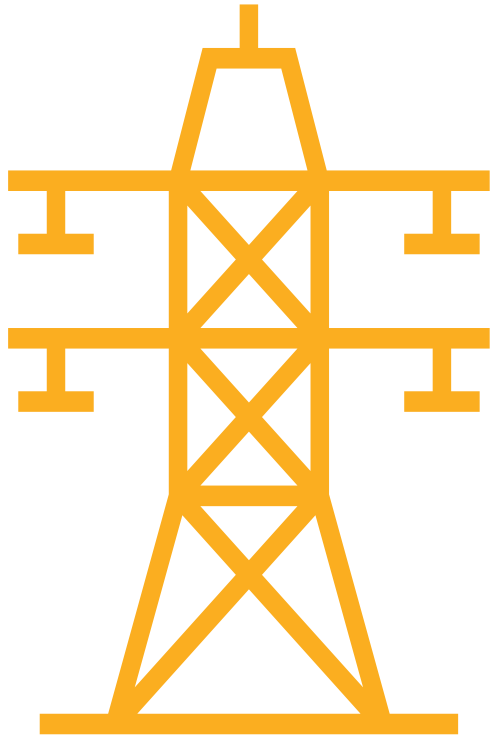
- The figure to the right depicts CAISO import/export transfer capabilities assumed in RESOLVE
  - Source: *Inputs & Assumptions: 2019-2020 Integrated Resource Planning*
- The 46 MMT base case portfolio included over 1000 MW of out-of-state resources (NM, WY, or ID) that would require transmission expansion to bring the power to the current CAISO system border.

Figure 6.2. Transmission topology used in RESOLVE (transfer limits shown in MW)



Key Takeaways

- Developers can always pursue transmission upgrades through the TPP or the GIDAP process
- IRP long-term resource planning and procurement decisions inform CAISO's TPP and can result in policy-driven transmission approval – a proactive approach to ensure large amounts of renewable and zero-emitting resources can come online in a timely manner
- Beginning to see a shift from an era of available transmission headroom to one where transmission development will be necessary to accommodate the large amounts of resources expected to come online in the next 10-20 years to meet state goals



For more information:

Karolina.maslanka@cpuc.ca.gov

California Independent System Operator
Jeff Billinton

Joint Agency Workshop on Next Steps to Plan for Senate Bill 100 Resource Build - Transmission

Scott Flint, Manager
Energy Infrastructure Planning and Policy Office
Siting, Transmission and Environmental Protection Division

SB 100 Implementation – Next Steps

- Agencies are examining the potential renewable energy builds needed to achieve SB 100 Energy Goals
- Assembling/updating statewide environmental and land use datasets for high level screen potential resource footprints:
  - ✓ Exclusion areas
  - ✓ Biodiversity
  - ✓ Essential landscape blocks and connectivity
  - ✓ Terrestrial Intactness
  - ✓ Agricultural Value
- Reviewing Landscape Planning results:
  - ✓ RETI
  - ✓ DRECP – Development Focus Areas
  - ✓ San Joaquin Least Conflict Solar

SB 100 Implementation Environmental and Land Use

- Estimating potential renewable energy development footprint by technology
- Identifying coarse geographic locations of resources within transmission zones used in the RESOLVE modeling
- Screening with identified statewide environmental and land use land use datasets
- Calculating available acreage of potential renewable energy resource by transmission zone
- Creating a "Starting Point" Resource Map to:
  - inform CAISO 20 Year Transmission Look
  - iterate in ongoing SB 100 implementation work

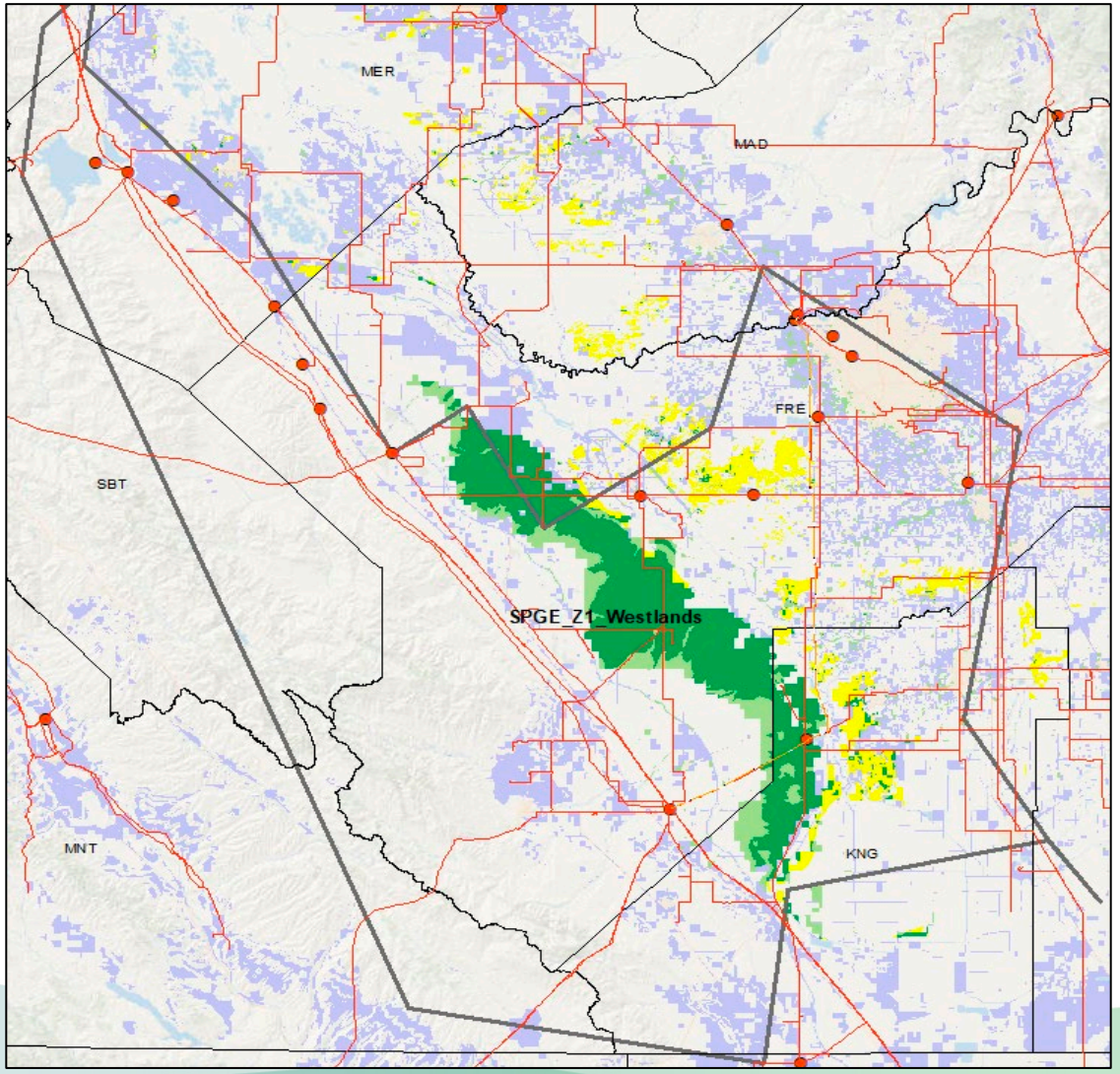
Example Map Wetlands Tx Zone Solar Resource

Least Conflict Solar Areas (green and yellow)

Suitable Areas for Solar (light purple)

Next Steps:

- Iterate Environmental and Land Use Screens
- Calculate Range of Available Resource Acres
- Assign RESOLVE MW by Transmission Zone
- Adjust MW if Necessary
- Share w/Stakeholders
- Inform CAISO Tx Work



Transmission Planning
20 Year Transmission Outlook - Update

Jeff Billinton

Director, Transmission Infrastructure Planning

June 22, 2021

Joint Agency Workshop on Next Steps to Plan for Senate Bill 100 Resource Build - Transmission

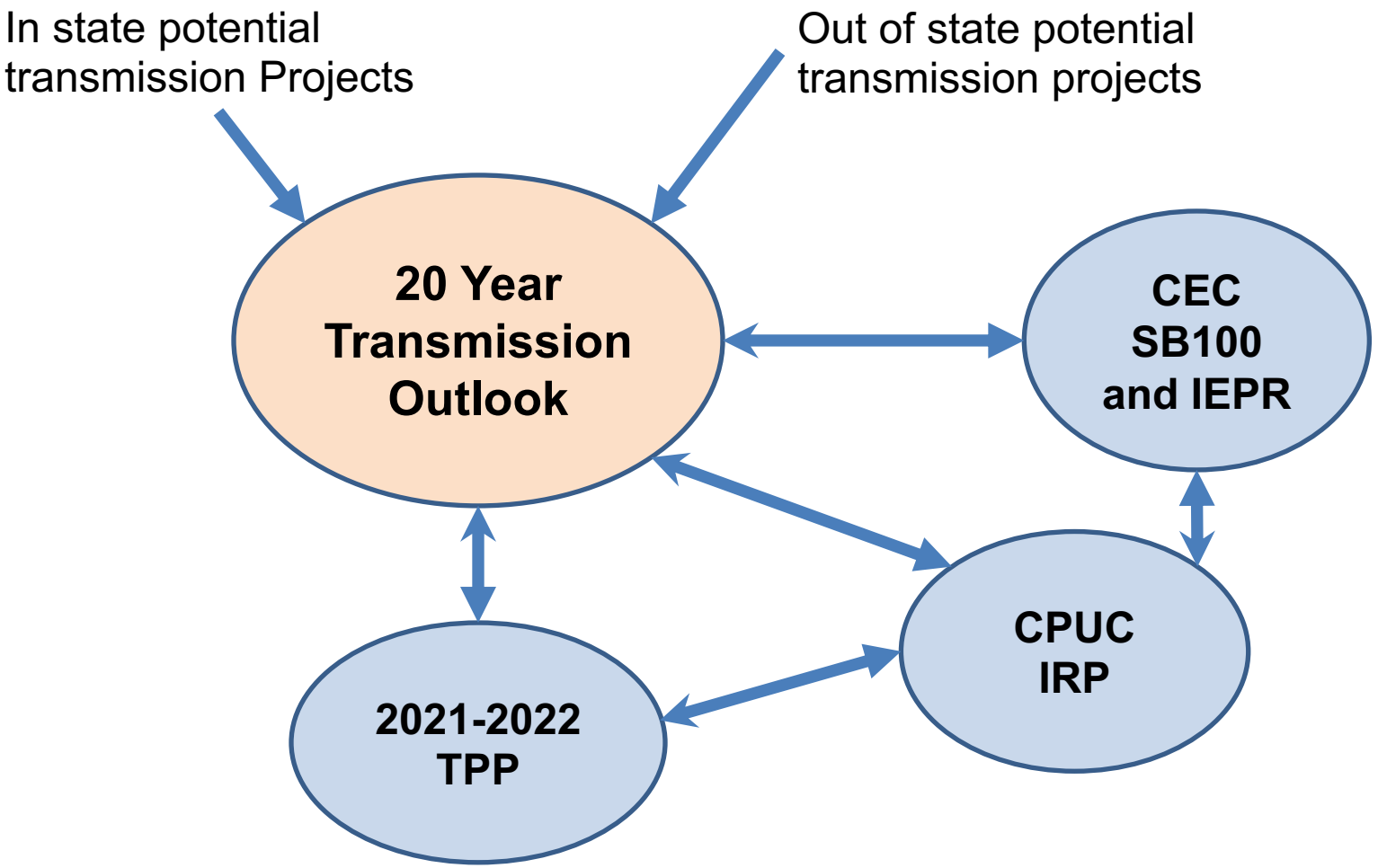
The 20-year transmission outlook initiative will be coordinated with 2021-2022 transmission planning process

- The Outlook will include higher level technical studies to test feasibility of alternatives, and not the detailed level of comprehensive analysis that underpins the 10-Year Transmission Plan
- Accordingly the Outlook will coordinate with currently scheduled 10-Year Transmission Plan stakeholder sessions to the extent possible, and hold separate stakeholder sessions as appropriate.
- The process welcomes and will incorporate stakeholder input and consultation.

Assumptions for Outlook technical studies coordinated with CEC SB100 and CPUC IRP

- Utilize SB100 No Combustion Scenario for Year 2040
- Continued coordination for the mapping of resources:
  - Solar mapping - *currently under way*
  - Storage mapping
  - Wind
    - On shore, Off shore and out of state
  - Gas retirement
    - Criteria being developed
      - Age, disadvantaged communities, etc.

Primary Paths for Coordination with Other Initiatives

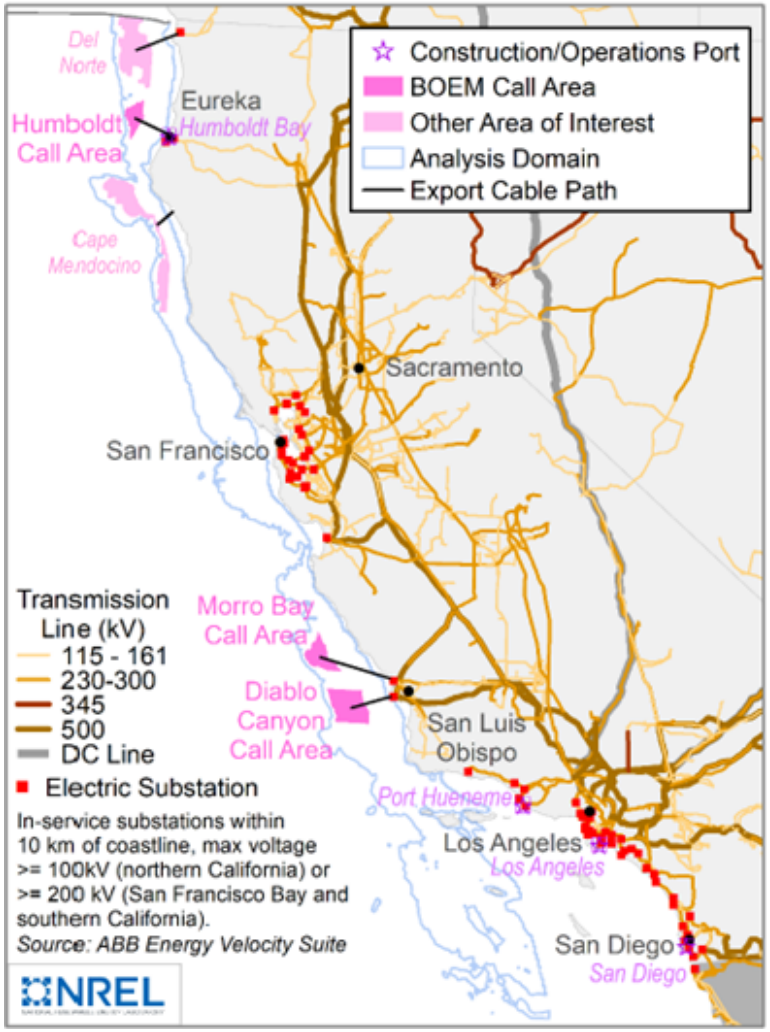


Coordination with 2021-2022 TPP Policy Sensitivity 2 on Offshore Wind Portfolio

- Sensitivity 2 includes the following OSW resources:
  - Humboldt: 1.6 GW
  - Diablo Canyon: 4.3 GW
  - Morro Bay: 2.4 GW

- Detailed studies will be performed to identify the transmission needs for the above 8.3 GW

- In addition, an outlook assessment will be performed to accommodate an additional 12.8 GW of offshore wind (totaling 21.1 GW)
  - Del Norte: 6.6 GW
  - Cape Mendocino: 6.2 GW



Source: [The Cost of Floating Offshore Wind Energy in California Between 2019 and 2032 (nrel.gov)](#) (Page 39)

20 Year Transmission Outlook Milestones

- Stakeholder call initiating Outlook on May 14
  - Comments to be submitted by May 28
- Coordination with CEC workshops on SB100
  - SB 100 Workshop on June 2
  - SB100 Workshop – Transmission Projects on July 22
  - SB100 Workshop – Land use / Resource Mapping in August
- Stakeholder call – Transmission Planning Update on July 27
  - Comments to be submitted by August 1
- Update at 2021-2022 TPP Stakeholder call on September 27 and 28
  - Comments to be submitted by October 12
- Update at 2021-2022 TPP Stakeholder call on November 18
  - Comments to be submitted by December 6
- Draft 20 Year Transmission Outlook as standalone document together with draft 2021-2022 Transmission Plan to be posted on January 31, 2022
- Stakeholder meeting in February

In and Out of State Transmission Projects

Pacific Transmission Expansion Project
Jim Avery


Diablo Canyon
Power Plant
PTEP is a 2,000 MW transmission circuit (500kV HVDC) (approx. 230 miles) that provides a direct path between the Diablo Canyon substation and the Big Creek / Ventura Area and the LA Basin
TEP has the capability to deliver 2000 MW of renewable energy into the LA Basin - bypassing congestion along the way
2000 MW
HVDC
Power
Cable
Big Creek / Ventura Area
West LA Basin
Bakersfield
Lancaster
Victorville
Santa Clarita
Oxnard
Thousand Oaks
Los Angeles
Pomona
Riverside
Long Beach
Irvine
Santa Barbara Basin
San Miguel Island
Santa Cruz Island
Santa Rosa Island
Anacapa Island
Santa Monica Basin
San Gabriel Canyon
Arguello Terrace
Arguello Canyon
Davis Knoll
San Miguel Gap
Trask Knoll
Patton Ridge

North Gila Imperial Valley #2 Transmission Project
Randy Schroeder

NORTH GILA IMPERIAL VALLEY #2

500 kV TRANSMISSION PROJECT (NGIV2 Project)

North Gila Imperial Valley #2 TRANSMISSION LINE

Joint Agency Transmission Workshop

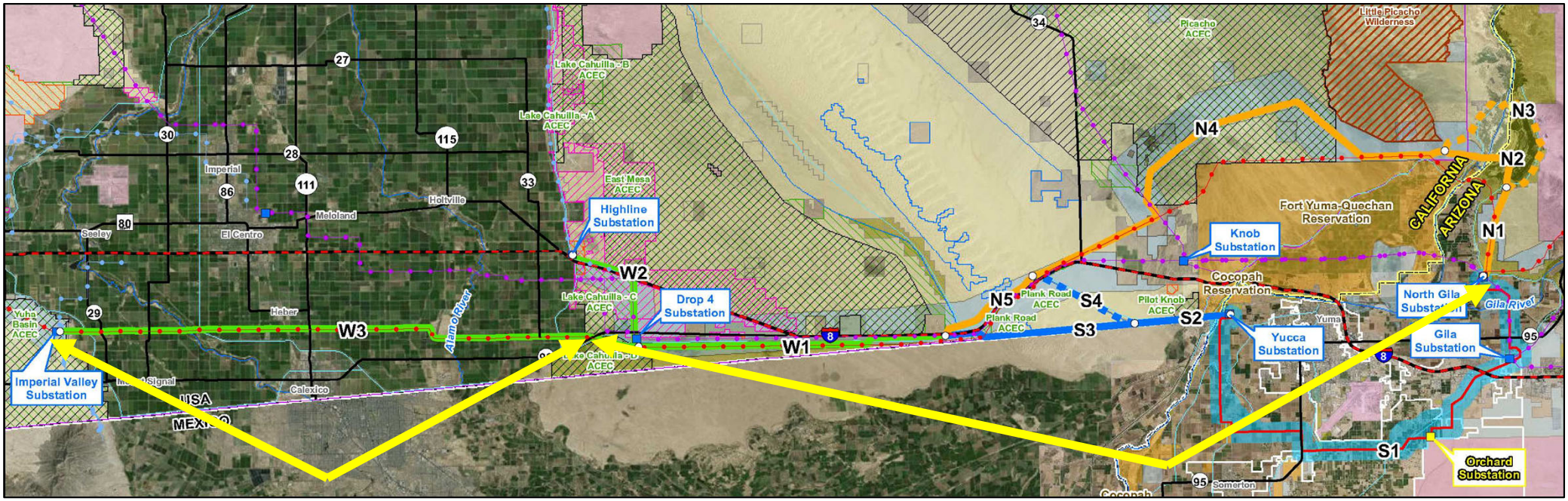
July 22, 2021

PROJECT OVERVIEW

North Gila Imperial Valley #2 TRANSMISSION LINE

- Proposed as a single circuit 500kV line from the North Gila 500kV substation (near Yuma, Arizona) to the existing Imperial Valley 500kV substation (near El Centro, California), approximately 90 miles in length.
- Proposed to loop into the existing IID Highline 230kV substation and establish a new 500/230kV (Dunes substation) and a reliable outlet for IID to export up to 1250MW of renewables as a new regional delivery point.
- Permitting is still anticipated to include up to a double circuit (e.g. 500/230kV same structure) depending on regional need for added capacity
- Will be submitted as a Interregional Transmission Project to WestConnect and CAISO, March 2022
- Open Houses were held Late March 2018 in Yuma and El Centro (Project Sponsored)
- Initial permitting review by the BLM and potential Cooperating Agencies provided input on route alternatives
  - Completed routing study, Plan of Development, and environmental field surveys
- Anticipated In-Service Date – Q4 2025

NGIV2 PROJECT ROUTING OVERVIEW



Imperial County

- ~35 miles
- Private / Agricultural lands

BLM Land

- ~55 miles, all within designated corridor (Proposed Route)
- Also at IV Sub

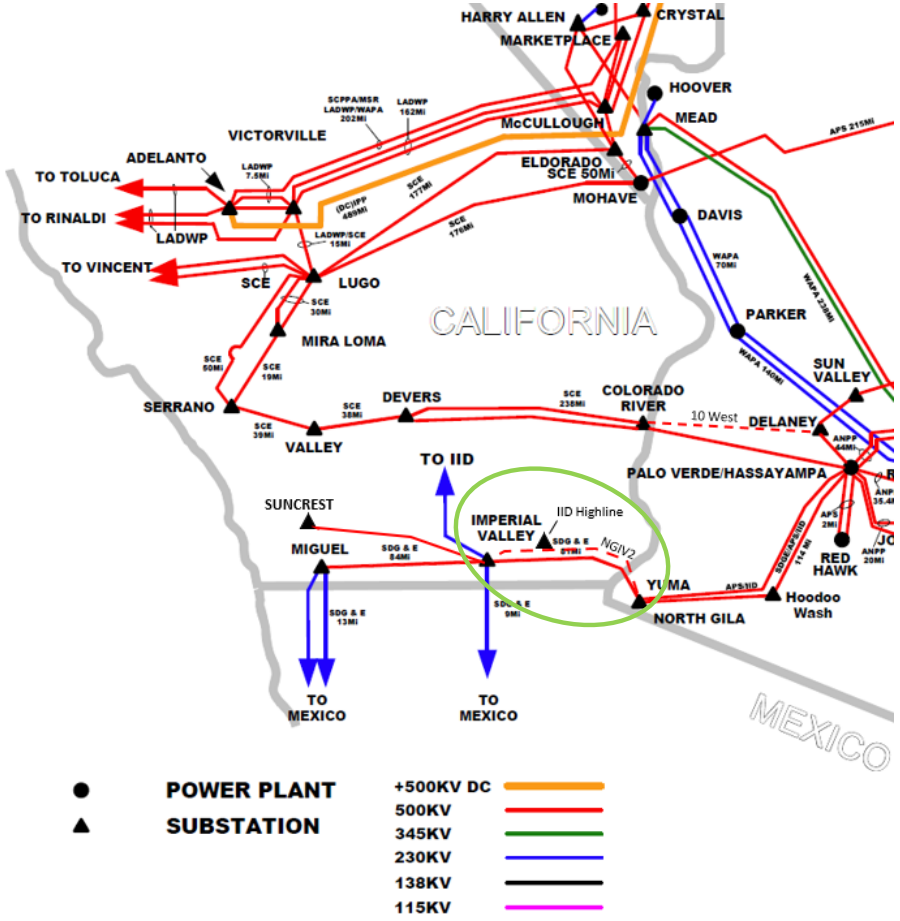
NG-IV#2 PROJECT NEED & BENEFIT

North Gila Imperial Valley #2 TRANSMISSION LINE

Population growth and increasing energy demands in the Southwest require additional transmission grid capacity.

NG-IV#2 Transmission Line will:

- Provide additional import/export access from generation resource zones where transmission access currently is limited (two lines east of North Gila towards Palo Verde and two lines west of Imperial Valley towards San Diego)
- Reliable outlet for export up to 1,250 MW of renewables
- Increase diversity, reliability and efficiency of the regional grid
- Enable more energy developers to tap into the regional grid
- Provide support to greenhouse gas (GHG) reduction targets



NG-IV#2 500kV Transmission Project

REGIONAL TRANSMISSION PLANNING

WECC Three-Phase Rating Process

- Accepted WECC Path Rating September 2019 for **1250MW** increase to Path 46

Participative with Regional Planning Organizations

- WestConnect/Southwest Area Transmission (SWAT) and CAISO planning efforts
  - Will be Submitted into 2022-2023 Western Interconnection Interregional Transmission Coordination process
  - Submitted into CAISO Transmission Planning Process, noted LCR reductions but overall below 1.0 Benefit/Cost ratio
- **Contact information on www.ngiv2.com**

TransWest Express Transmission Project
David Smith

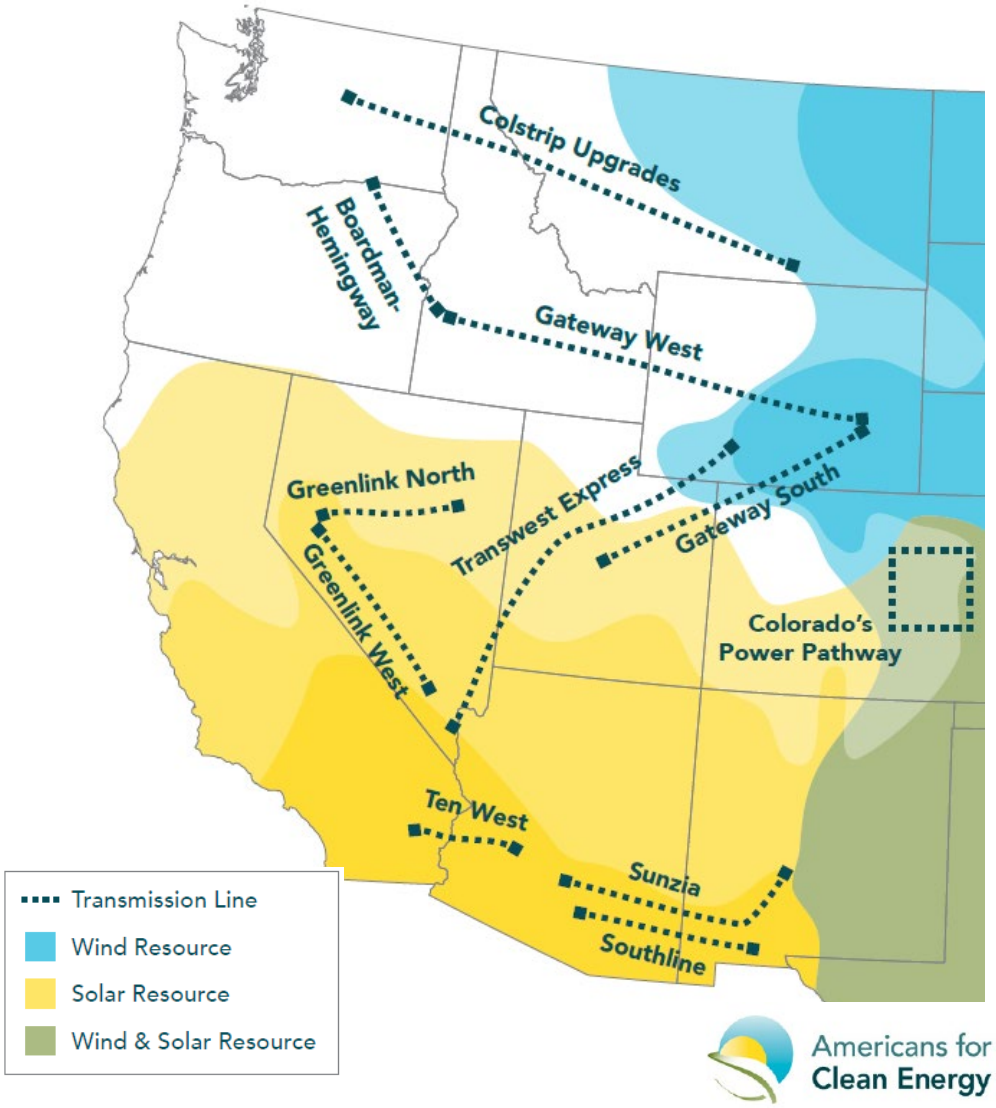
TRANSWEST EXPRESS LLC

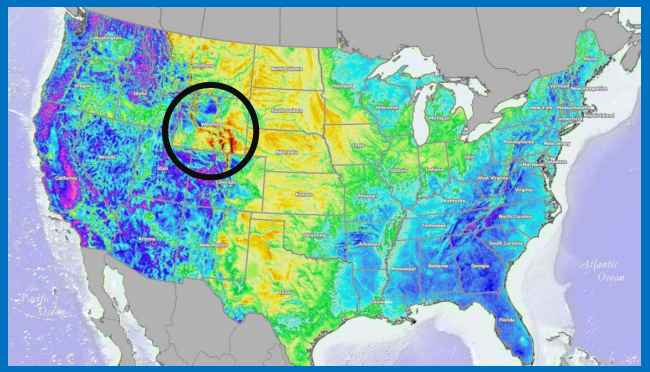
TransWest Express Transmission Project

New Interregional Transmission To Connect the West

Joint Agency Workshop on Next Steps To Plan For
Senate Bill 100 Resource Build: Transmission
July 22, 2021

Near Term Transmission Projects to Access Resource Areas

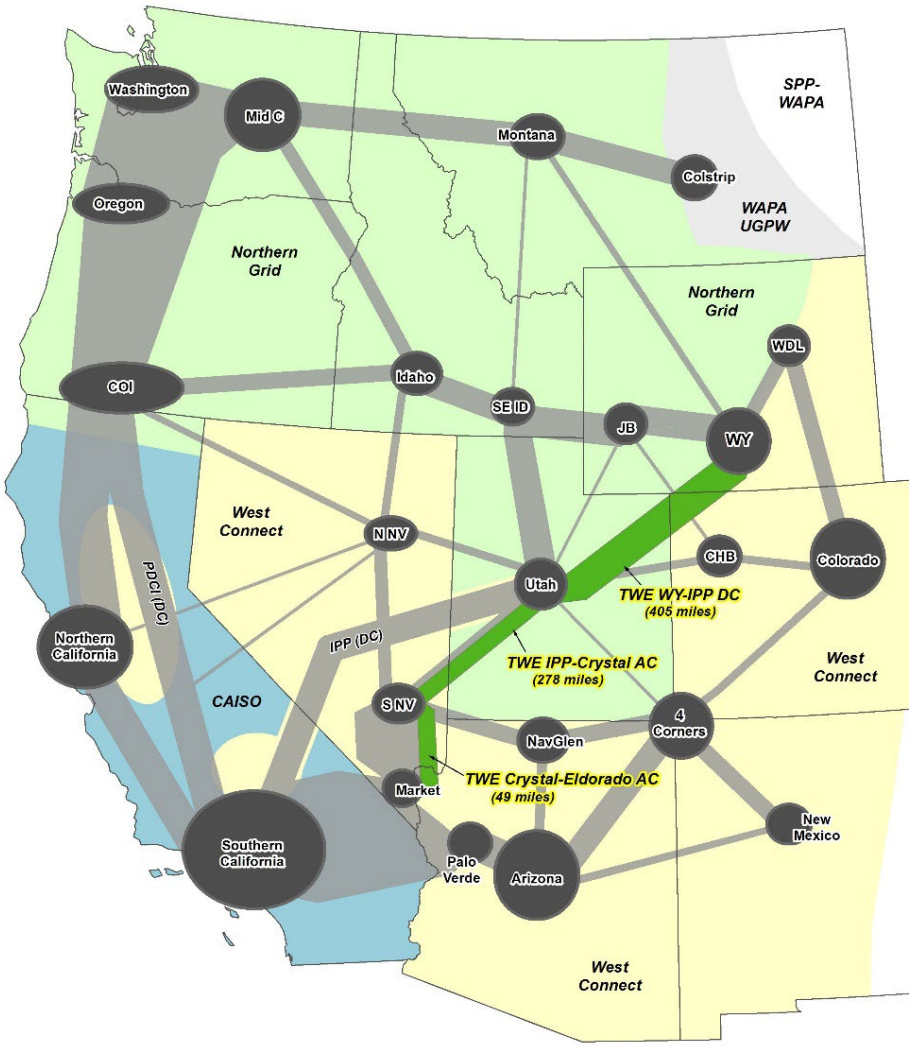




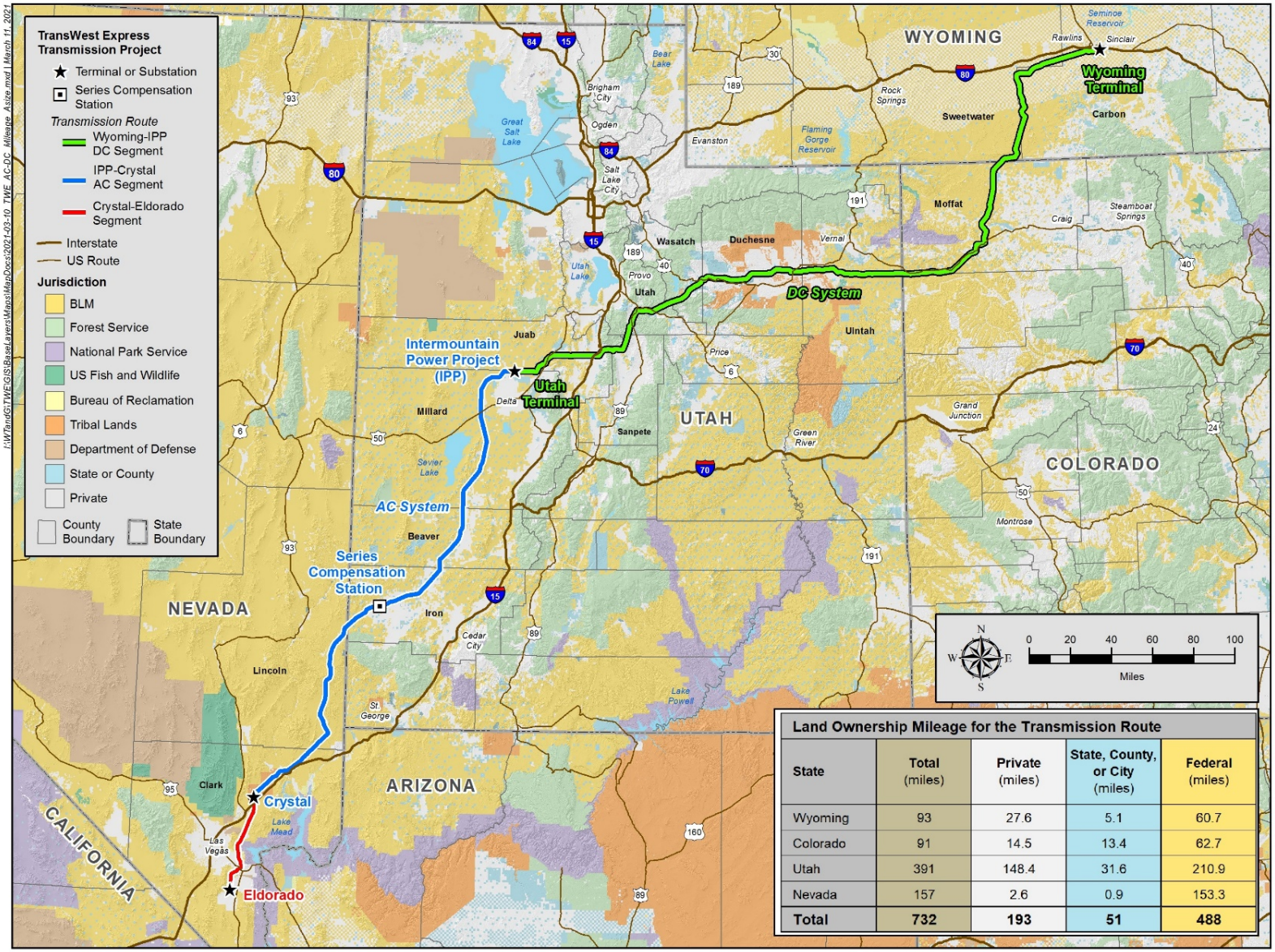
- **Highest-quality wind resources** in the U.S. are located in the Rocky Mountain Region in **Wyoming**
- Transmission studies have identified a **lack of transmission** to connect Nevada/ Arizona/ California to this resource
- Economic studies have shown wind resources plus the cost of transmission **provides diversity and cost benefits** when added to regional RPS portfolios

TransWest Express Transmission Project Overview

- 732-Mile Transmission System
- Direct interconnection between CAISO, WestConnect (LADWP, NVE, others) and Northern Grid (PAC East)
- Wyoming to Utah HVDC Segment
  - 3,000 MW capacity
  - Connects to existing Intermountain Power Project (IPP) 2,400 HVDC Transmission operated by LADWP
  - Connects to 1,500 MW AC Segment
- Utah to Nevada 500 kV AC Segments
  - 1,500 MW capacity
  - Connects to CAISO, Nevada and Arizona utilities at Crystal/Harry Allen and Eldorado
- 2025 In-Service Date



TransWest Express Project Route



TWE Project is essentially shovel-ready

- Secured all key federal and state permits
- Secured all 14 county authorizations
- Secured 95+% of total land rights, including all private land easements in Wyoming
- Engineering design substantially complete
- Environmental conditions substantially satisfied
- Open Solicitation for initial transmission capacity commences June 2021

Steps remaining:

- Complete ROW acquisition
- Interconnection agreements
- Construction and commercial contracts
- BLM Notice to Proceed, anticipated late 2021
- Construction start in 2022

Transmission Planning and Capacity Allocation

- TransWest participates in California and regional transmission planning processes
  - WECC - Ensure TWE Project meets NERC Transmission Planning Reliability Standards
  - RETI 2.0, IRP, TPP, FERC Order 1000 Interregional Transmission Project submittals
  - Northern Grid, WestConnect > single Local Transmission Owner needs

- TransWest's Open Solicitation
  - Public Notice provided on June 7, 2021
  - Statements of Interest due August 6, 2021
  - Offering long-term point-to-point service
    - Up to 1,500 MW from Wyoming to Utah
    - Up to 1,500 MW from Wyoming to Nevada
  - www.transwestexpress-os.com

174 FERC ¶ 61,160
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Richard Glick, Chairman;
Neil Chatterjee, James P. Danly,
Allison Clements, and Mark C. Christie.

TransWest Express LLC Docket No. ER21-645-000

ORDER GRANTING APPLICATION FOR AUTHORIZATION TO CHARGE NEGOTIATED RATES, SUBJECT TO CONDITION, AND GRANTING WAIVERS

(Issued February 26, 2021)

For More Information

www.transwestexpress.net

TRANSWEST EXPRESS LLC

Southwest Intertie Project (SWIP) North
Sandeep Arora

Southwest Intertie Project (SWIP)-North

Joint Agency Workshop On SB 100 Resource Build: Transmission

July 22, 2021

LS Power

Power generation and transmission company formed in 1990

40,000+ MW

Power generation development, construction or operations experience

$1+ billion

High voltage transmission placed into operations since 2013

$45+ billion

Capital raised to finance and support investments in energy

$1+ billion

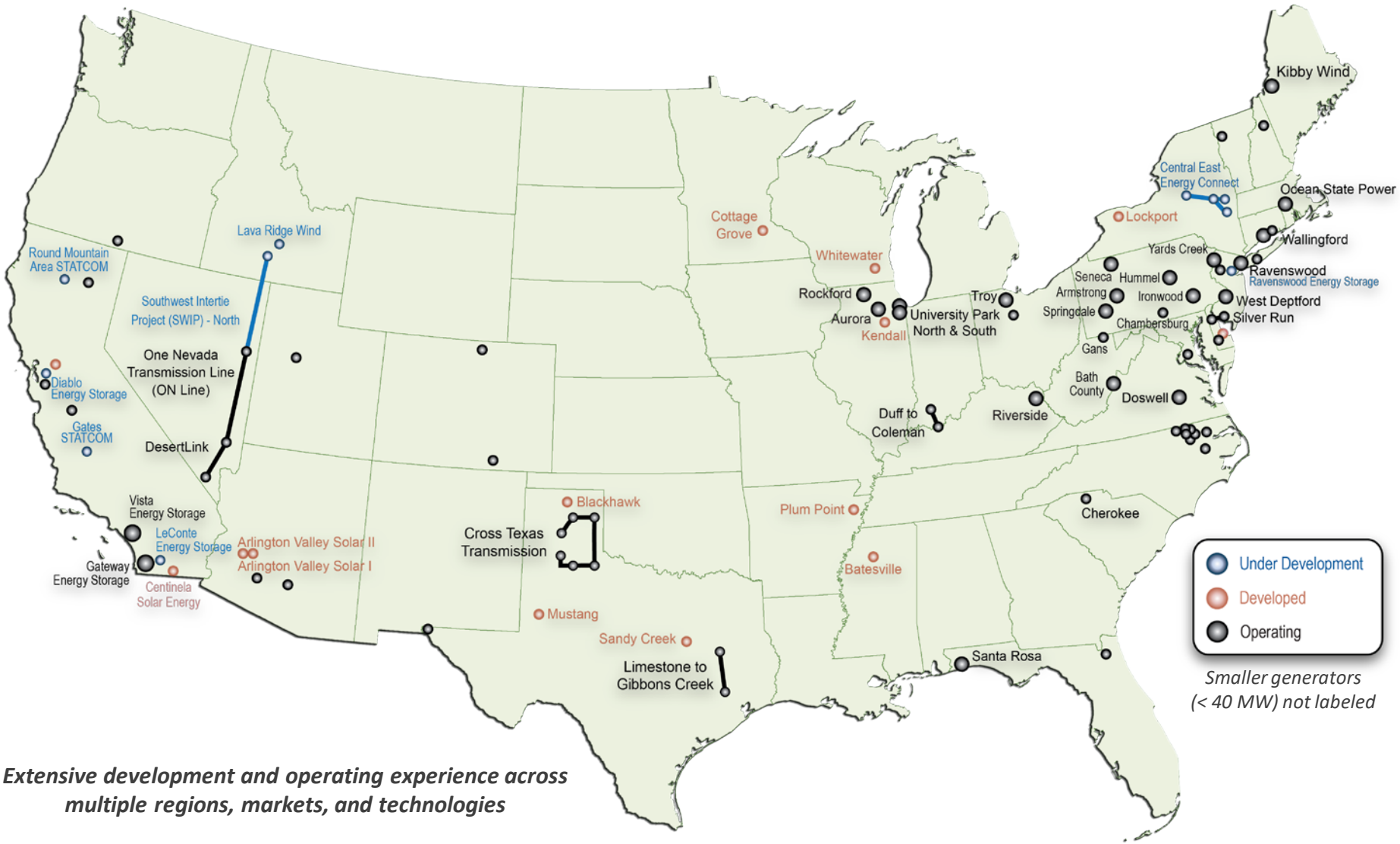
High voltage transmission in permitting or construction

CAISO, ERCOT, MISO, NYISO, PJM

Transmission competitively awarded to LS Power

LS POWER

Project Portfolio

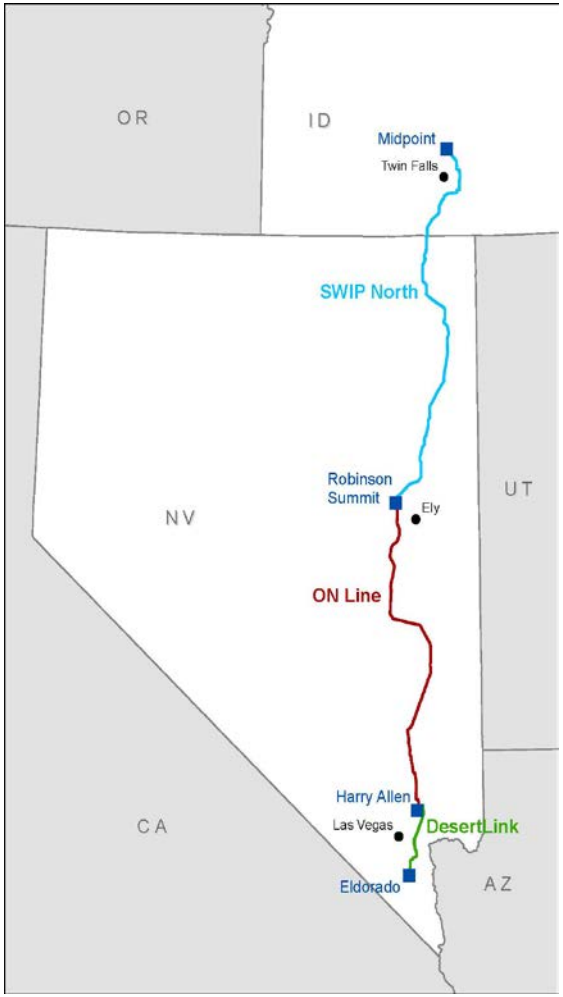


Smaller generators (< 40 MW) not labeled

Extensive development and operating experience across multiple regions, markets, and technologies

LS POWER

Southwest Intertie Project (SWIP)



SWIP North is the final link of a transmission project that would create ~1,050 MW of firm transmission rights from Idaho to California for CAISO, with a planned in service date of 2024

Phase I - ON Line (Robinson to Harry Allen) – Operating

- 231-mile, ~1000 MW, 500 kV transmission line in Nevada
- Paid for by Nevada. Began commercial operations in January 2014
- First connection between Nevada Power Company and Sierra Pacific Power Company

Phase II - DesertLink (Harry Allen to Eldorado) – Operating

- 60-mile 500 kV transmission line near Las Vegas (~3400 MW transfer capability for CAISO use).
- Extends CAISO footprint up to Harry Allen.
- LS Power selected by CAISO via competitive solicitation pursuant to FERC Order 1000
- Robust cost containment package including caps on construction costs, capital structure and ROE
- Operating since August 2020

Phase III – SWIP North (Midpoint to Robinson)

- 275-mile, ~2050 MW, 500 kV bidirectional transmission line between Midpoint (ID) and Robinson Summit (NV)
- Project scope also entails upgrading ON Line from ~1000 MW to ~2300 MW
- Unique capacity exchange with NVE entitles LS Power to ~1050 MW hurdle free from Midpoint to Harry Allen once SWIP North completed; all of which is being offered to CAISO
- Links PacifiCorp (East and West) and Idaho Power to CAISO
- Construction ready 2022, In service 2024

- Interregional cost allocation is already complete
  - Nevada paid 100% of the ON Line portion, which is nearly half of the entire SWIP path. California would get free access across ON Line (no wheeling charges) if it pays for SWIP North, and benefits from integration with broader transmission system.
- WECC Path Rating study underway, expected to be complete in 2022
- Federal NEPA process complete
  - BLM Rights-of-Way secured
  - Construction/O&M Plan approved
  - Conditional Notice to Proceed with Construction issued
- Transmission Interconnection studies with NVE and Idaho Power underway

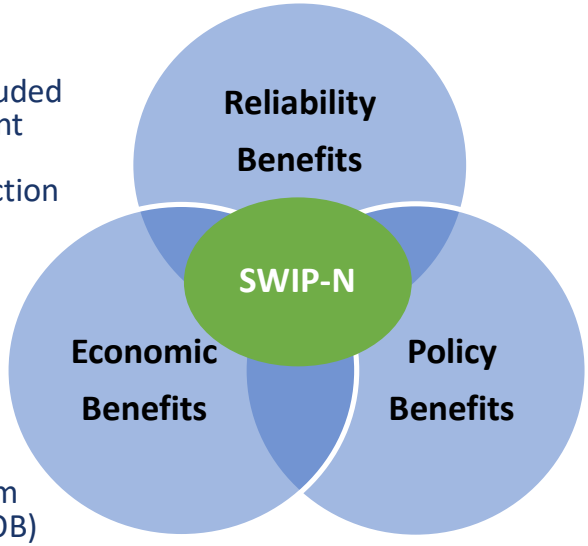
SWIP-N – a "no regrets" transmission project

Reliability Benefits

- Access to ~1050 MW increased firm capacity to improve reliability and RA in time for retirement of Diablo Canyon Power Plant and OTC plants in 2024.
- Integrated new line for AC transmission system that directly resolves certain constraints on the parallel import paths (e.g., COI, PG&E-Sierra, SDG&E Double Tap-Friars).
- Creates alternate path for Pacific NW resources during wildfire or extreme weather events, such as when COI and PDCI paths were de-rated by ~650 MW during the August 2020 heat wave and 5500 MW during the 2021 Bootleg fire.
- Load diversity benefits between CAISO and Pacific NW (e.g. ID Power and PacifiCorp East).

Policy Benefits

- Provides access to significant amount of Idaho wind. The CPUC Base Case Portfolio included 1062MW and Sensitivity included 3GW of out-of-state (OOS) wind. According to a recent Brattle Group study, net public policy-related costs of ID wind to CA customers are $20/MWh lower than CA solar due to higher energy and capacity value, and GHG reduction benefits.
- Enables access to other OOS diverse renewables (e.g. NV geothermal) that can provide supply at net peak demand of evening peak hours and during multi-day low renewable production events.



Economic Benefits

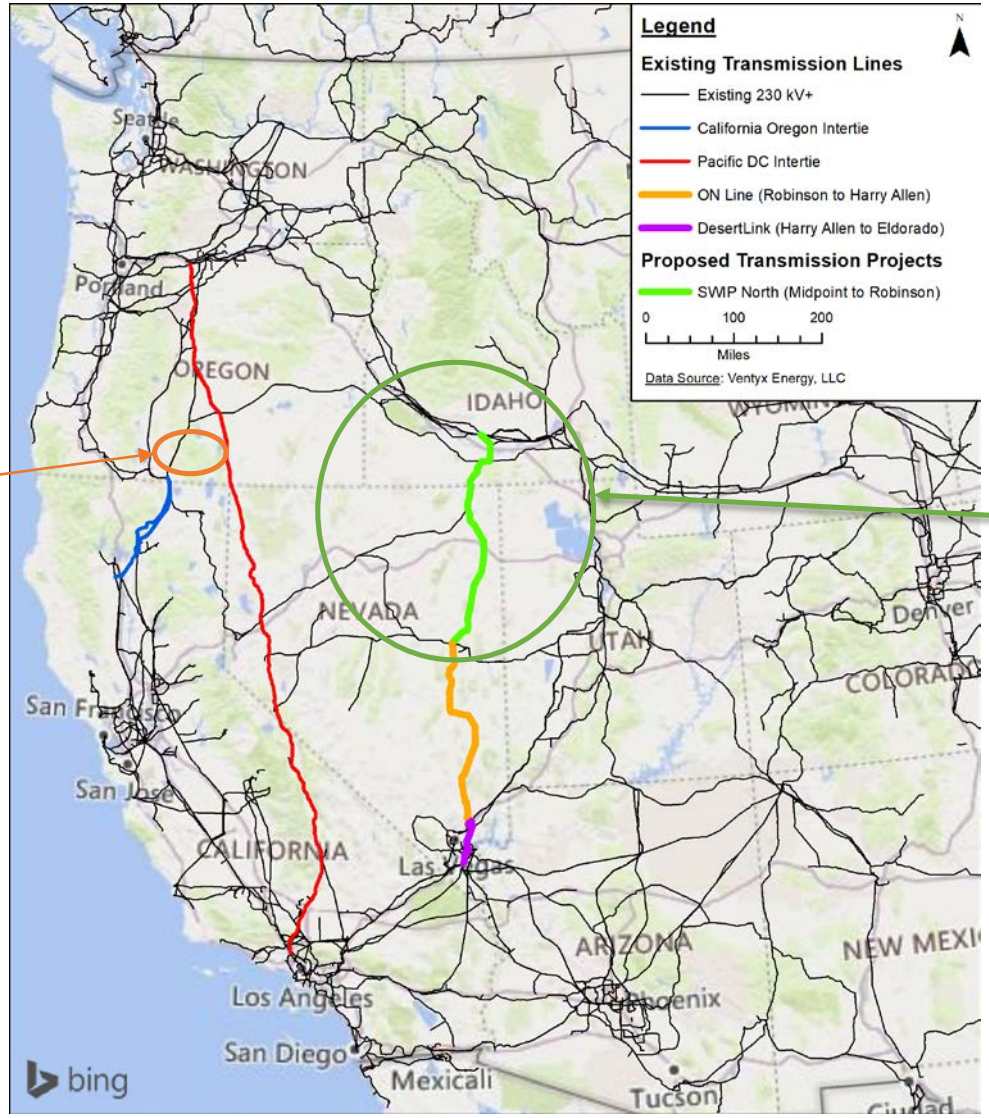
- A Brattle Group study shows up to $105 million annually of production cost savings from increased market transfers by offering a parallel path to Northern CA interties (PACI, NOB) economic congestion. Study does not include analysis of benefits if SWIP North would have been in service during recent events such as the Bootleg fire.
- Provides pathway to deliver excess CA solar to Pacific NW and reduce renewable curtailments, which offers capital cost savings.
- Provides Capacity savings and enhances EIM and future EDAM benefits.

LS POWER

Integrated nature of SWIP North provides alternate path to COI/PDCI and access to diverse renewable energy resources

Bootleg Fire July 2021

Greater imports from Pacific NW could have been achieved with SWIP North during COI/PDCI derate, providing reliability and economic benefits.



Thousands of MW of new and existing wind, solar, geothermal and hydro from northern WECC can be imported to California, and excess California solar can be exported through SWIP North.

LS POWER

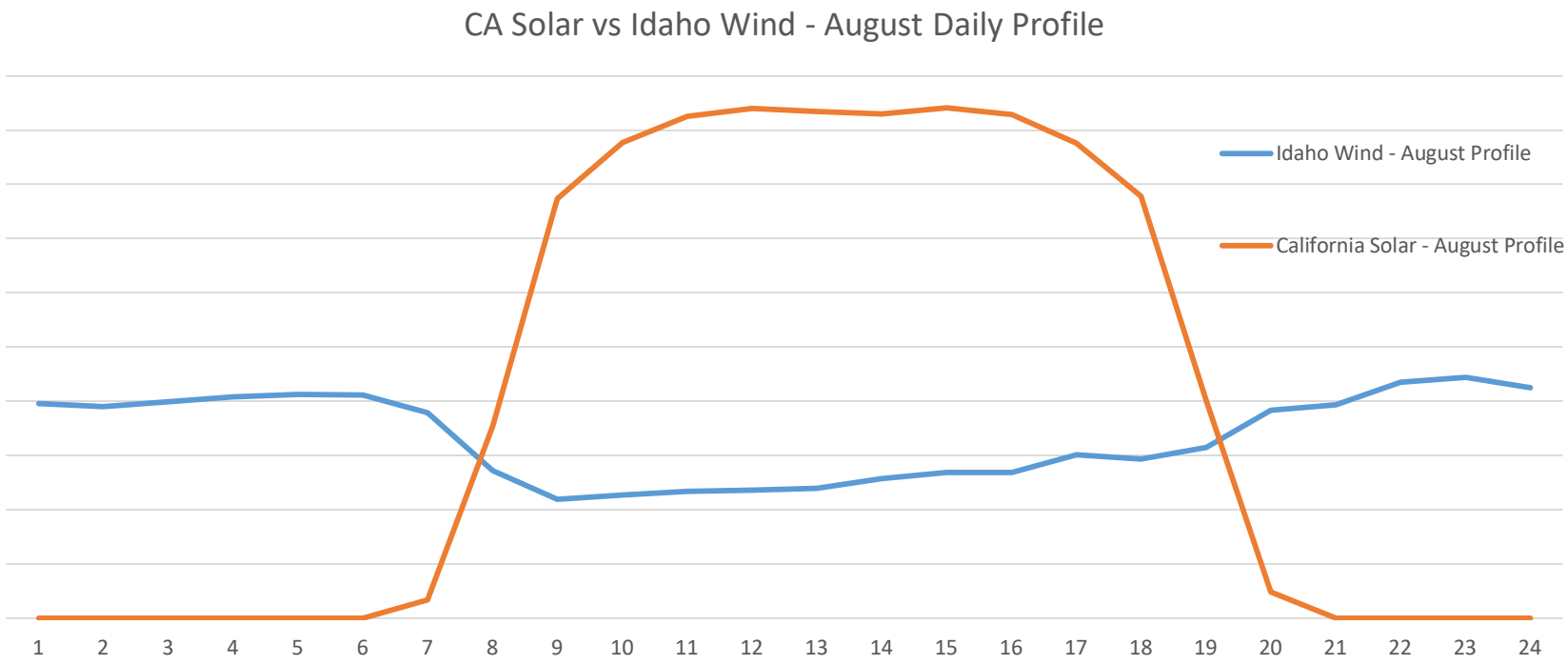
CAISO should conduct a robust OOS transmission study in current TPP and allow decision making by March 2022

- **CAISO is currently launching a study in its 2021-22 Transmission Planning Process (TPP) to evaluate transmission alternatives to deliver out-of-state (OOS) wind.**
  - We applaud CAISO for taking on this study, and recommend studying all benefits (Reliability, Economic and Policy) of OOS transmission projects such as SWIP North. A robust combined benefits analysis for the CPUC IRP 46 MMT Base Case portfolio (1062 MW OOS wind) and 38 MMT Sensitivity portfolio (3 GW OOS wind) can help inform stakeholders and policy makers on the project recommendations in this 2021-22 TPP cycle.

- **LS Power recommends that the 2021-22 TPP must capture all benefits of SWIP North.**
  - According to the Brattle Group study, SWIP North could provide benefits of ~$105 million annually. This results in a BCR > 1.0, which suggest SWIP North pays for itself based on economic benefits alone. CAISO ratepayers would receive policy and reliability benefits with an economic project that pays for itself; an overall win for CAISO TPP and CPUC IRP processes.
  - Given the increased frequency of extreme weather events such as the August 2020 heatwave and 2021 Bootleg fire that can lead to grid emergencies, CAISO's study should value the benefits that transmission like SWIP North can provide in mitigating these situations.
  - No wheeling charge for transfer across SWIP path from Midpoint to Harry Allen should be assumed for study, pursuant to the TUA in place between LS Power affiliate and NV Energy.
- **California needs 11.5 GW new resources by mid-decade, and diverse renewable resources can be brought online to help meet resource needs and clean energy goals, if new OOS transmission is approved in time by CAISO.**
  - OOS renewables can help improve reliability and provide resource diversity in time for Once-Through Cooling and Diablo Canyon retirements in 2024. A robust OOS transmission analysis in this year's TPP cycle can inform policy makers and, if new transmission is approved by CAISO Board in March 2022, shovel-ready projects such as SWIP North can be built in time.

Resource Diversity to Support Net Demand Peak

SWIP-North Access to Idaho Wind Offers Complimentary Profile to California Solar to Meet Summer Evening Peak Load, and During Multi-Day Low Renewable Energy Production Events



LS Power developed Figure 1 using California solar using PVsys based on generic Fresno County solar data, Idaho wind data based on meteorological site data from Idaho wind. Both data represent average production during the month of August and displays all hours of the day.

Questions?

Sandeep Arora

SVP, Transmission and Interconnection

sarora@lspower.com

Cross Tie Project
Jason Smith and Bob Smith

Cross-Tie Transmission Line

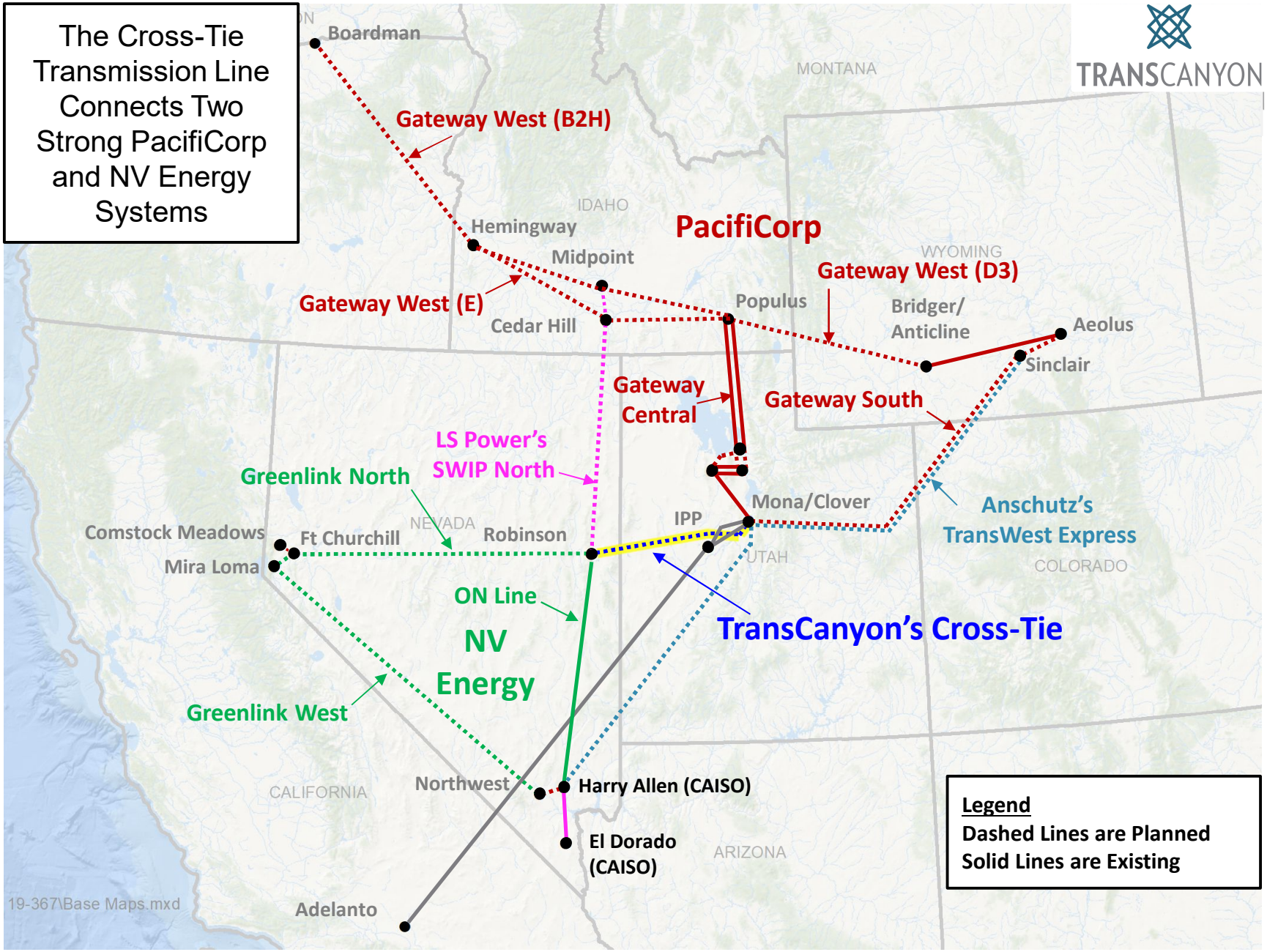
Joint Agency Workshop on Next Steps To Plan for Senate Bill 100 Resource Build: Transmission

Jason Smith, President
Bob Smith, Transmission Planning Consultant

July 22, 2021

TRANSCANYON

The Cross-Tie Transmission Line Connects Two Strong PacifiCorp and NV Energy Systems



Cross-Tie Regional Benefits

TRANSCANYON

- Macro Benefits: Cross-Tie is a 214-mile 500kV AC network element that provides a portfolio of benefits to the regional transmission system
  - Cross-Tie will increase transmission capacity between the PacifiCorp, NV Energy, CAISO and Idaho Power Balancing Areas
- Policy Benefits
  - Facilitates import of complementary renewable resources including Wyoming wind
  - Facilitates export of renewable resources from California to diverse load centers throughout the West
- Reliability Benefits
  - Low-cost investment to leverage existing system and increase regional reliability benefits
  - Improves contingency response during system disturbances (weather, fire, natural disasters)
  - Relieves congestion on the California-Oregon Intertie by providing flow relief and alternate transmission paths
- Economic Benefits
  - Regional economic benefits from more efficient resource procurement and dispatch
  - EIM participants enjoy benefits of more transmission capacity to bid resources into neighboring markets

Cross-Tie Timeline

TRANSCANYON

2019	2020	2021	2022	2023	2024	2025	2026	2027

✓ TransCanyon filed Advisory Notice to PUCN and SF-299 to BLM

Regional Transmission Planning and Path Rating Studies

Permitting (NEPA / State Permits)

Preliminary Engineering

ROW Acquisition

Procurement & Construction

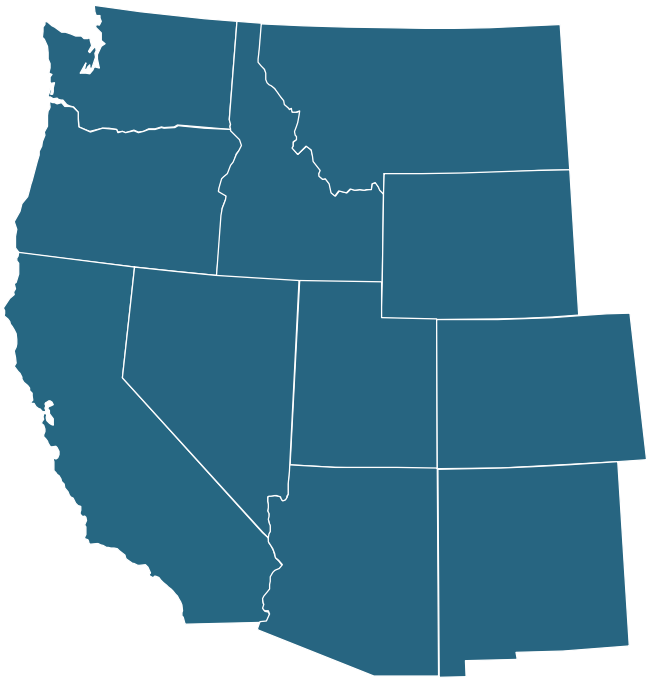
Operations

Who We Are

TRANSCANYON

TransCanyon is an independent developer of electric transmission infrastructure for the western United States

- Independent well-positioned to drive creative solutions
- Leverage the combined energy expertise and financial strength of Berkshire Hathaway Energy and Pinnacle West
- Focused on all phases – development through ongoing operation
- Long-term stewards of the environment
- Value collaboration to achieve success



TRANSCANYON

Sunzia Southwest Transmission Project
David Getts

SunZia™

Delivering Clean Energy

Joint Agency Workshop on Next Steps to Plan for SB100 Resource Build: Transmission

July 22, 2021

SunZia Project Participants

Southwestern Power Group (SWPG) is an independent developer of utility-scale generation and transmission assets, with a market focus in the desert Southwest. Since 2000, company has distinguished itself as a leading force in evolving energy markets, including renewable energy, storage and smart electrical grids. SWPG is comprised of a select, experienced group of individuals with decades of experience in finance, permitting, licensing, real estate, construction and operations. www.southwesternpower.com

Pattern Energy is one of the world's largest privately-owned developers and operators of wind, solar, transmission, and energy storage projects. Its operational portfolio includes 28 renewable energy facilities that use proven, best-in-class technology with an operating capacity of 4.4 GW in the United States, Canada and Japan. Pattern is New Mexico's largest clean power company and has a long-term commitment to protect the environment and strengthen communities. www.patternenergy.com.

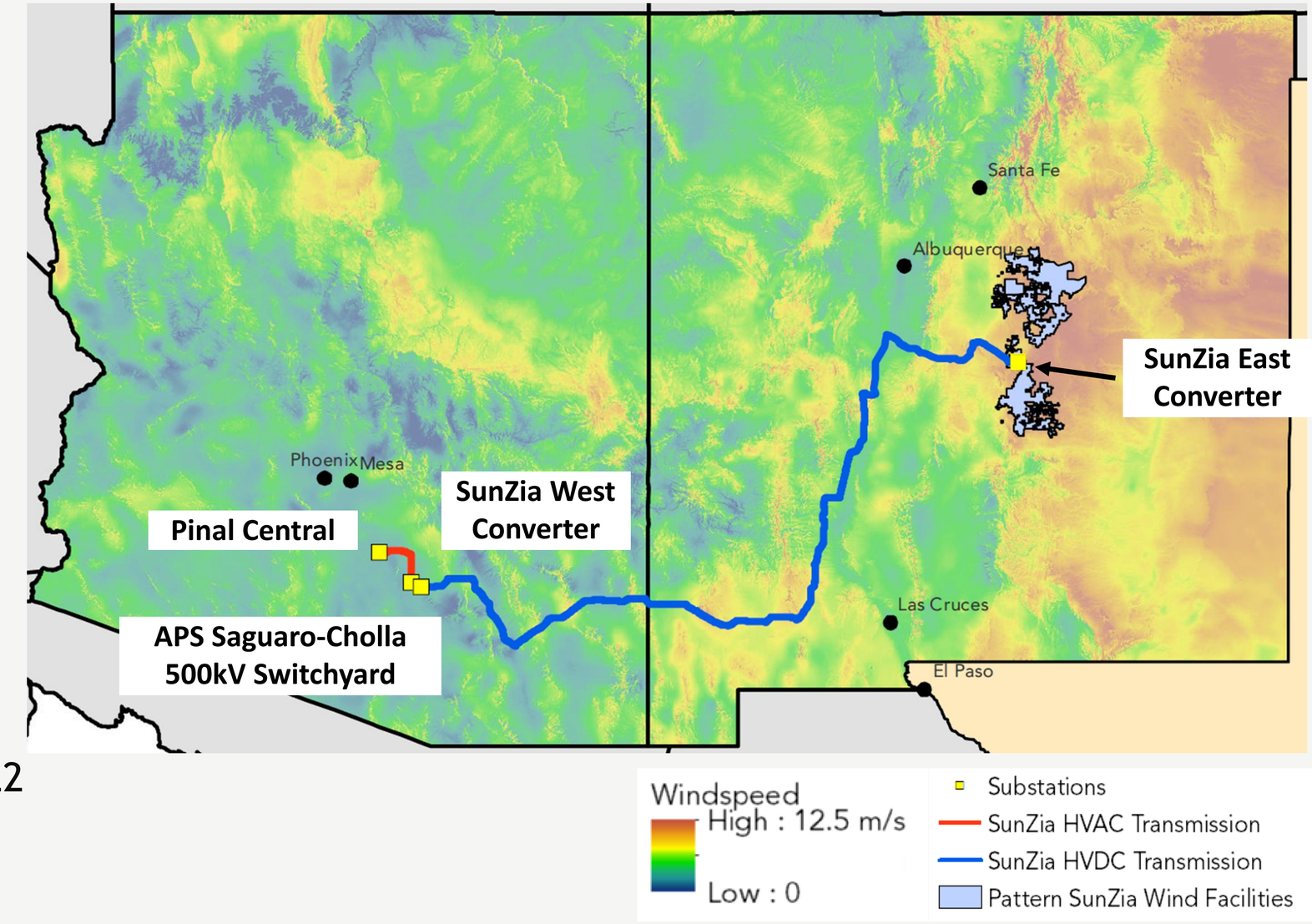
MMR is a global infrastructure firm with more than 4,000 full-time employees in the U.S. and a reputation for completing domestic and global projects within budget, on time and with unwavering consideration for safety. Across the globe, MMR has served clients in the renewable energy, chemical and petrochemical, oil and gas, industrial manufacturing, power generation and power development markets. www.mmrgrp.com

The New Mexico Renewable Transmission Authority (RETA) is a state government entity established to identify and develop transmission and to enable renewable energy in New Mexico. RETA partnered with MMR and SWPG to facilitate SunZia as a benefit to the grid, and the is now a co-developer of the project. RETA has also worked with Pattern Energy to develop and construct the Western Spirit line. www.nmreta.com

SunZia Transmission Project Overview

	TRANSMISSION	WIND
SunZia I	500+ mi DC 3 GW Transfer Capacity	3,200 MW In Service by 2025
SunZia II	500+ mi AC 1.5 GW Transfer Capacity	1,850 MW In Service after 2025

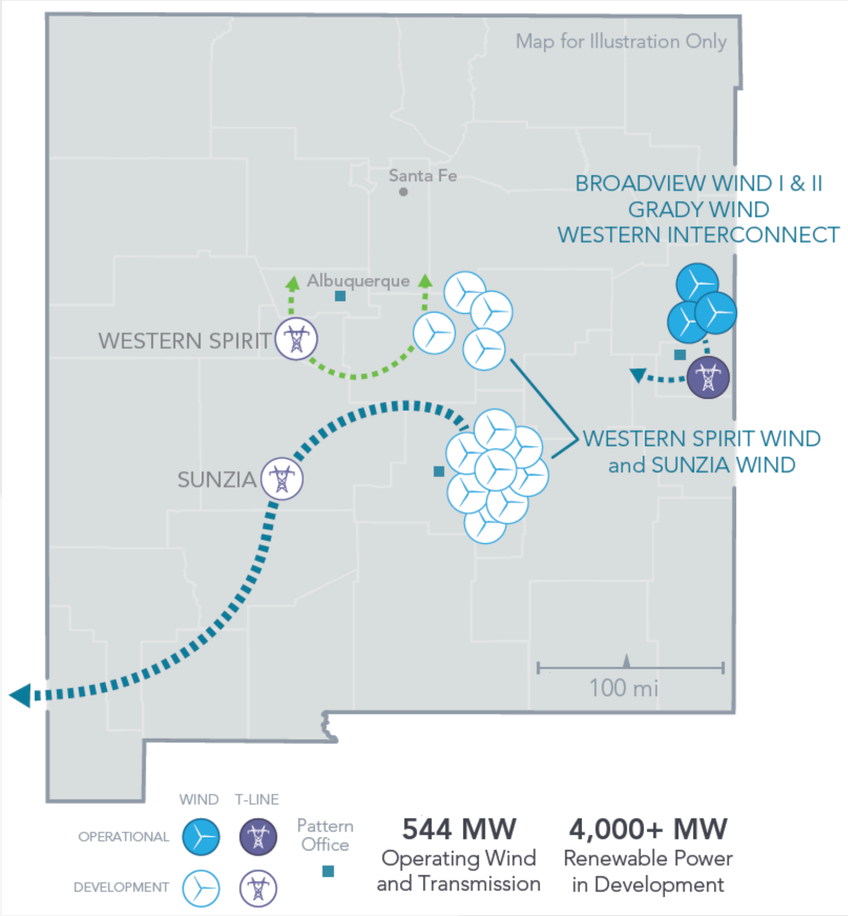
- 3,000 MW SunZia I line rating
- ~530 miles 525kV DC line
- ~35 miles 500kV AC line
- Two AC/DC Converter Stations
- Physical delivery:
  - Pinal Central substation
  - Saguaro-Cholla 500kV line
- Transmission service to Palo Verde CAISO scheduling point
- Schedule:
  - Final Notice to Proceed end-2022
  - In-Service date 2025



Pattern Energy NM Wind Portfolio

Pattern Energy has successfully developed and financed ~1,600MW of New Mexico wind + transmission projects

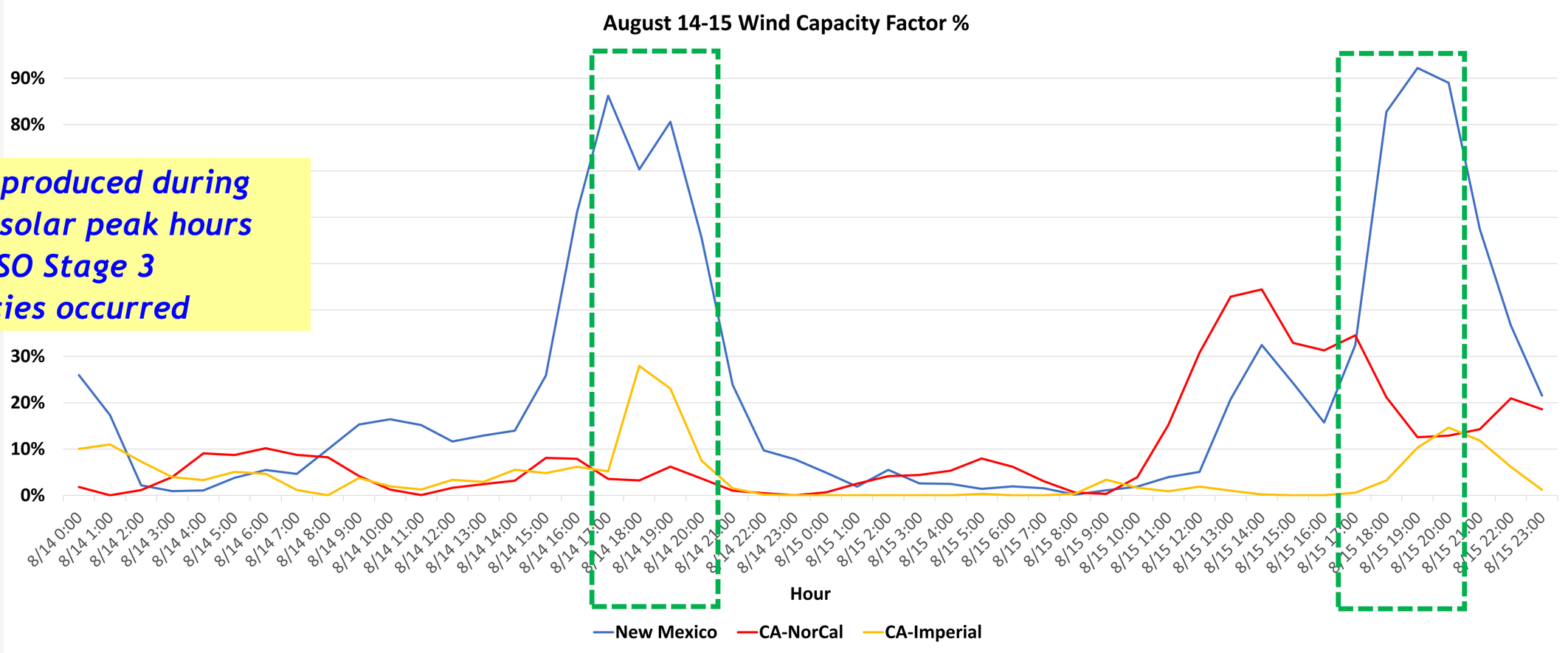
	OPERATING		CONSTRUCTION	DEVELOPMENT
	Broadview Wind	**Grady Wind**	**Western Spirit Wind**	**SunZia Wind**
Size	324 MW	220 MW	1,050 MW	~3,200 MW
County	Curry, NM Deaf Smith, TX	Curry, NM	Guadalupe, Lincoln, and Torrance, NM	Guadalupe, Lincoln, and Torrance, NM
Status	COD 2017	COD 2019	Expected COD 2021	Expected construction 2022, COD 2025
POI	Western Interconnect; Developed & constructed by Pattern, owned & operated by Pattern		Western Spirit Transmission; Developed & constructed by Pattern, to be sold to PNM	SunZia Transmission Project; Developed by SWPG
POD	CAISO Willow Beach	CAISO Willow Beach	CAISO Palo Verde / Willow Beach / Four Corners LADWP Navajo	CAISO Various PODs
Offtaker	SCE	SMUD	LADWP, SJCE	TBD



** Pattern became the anchor tenant for 1,500 MW of SunZia transmission capacity in August 2016 pursuant to SunZia's FERC order. SunZia expects to hold an additional capacity allocation process in 2021 for the remaining 1,500 MWs of transmission capacity.*

August 2020 Wind Output (1 of 2)

NM Wind produced during key post-solar peak hours when CAISO Stage 3 emergencies occurred



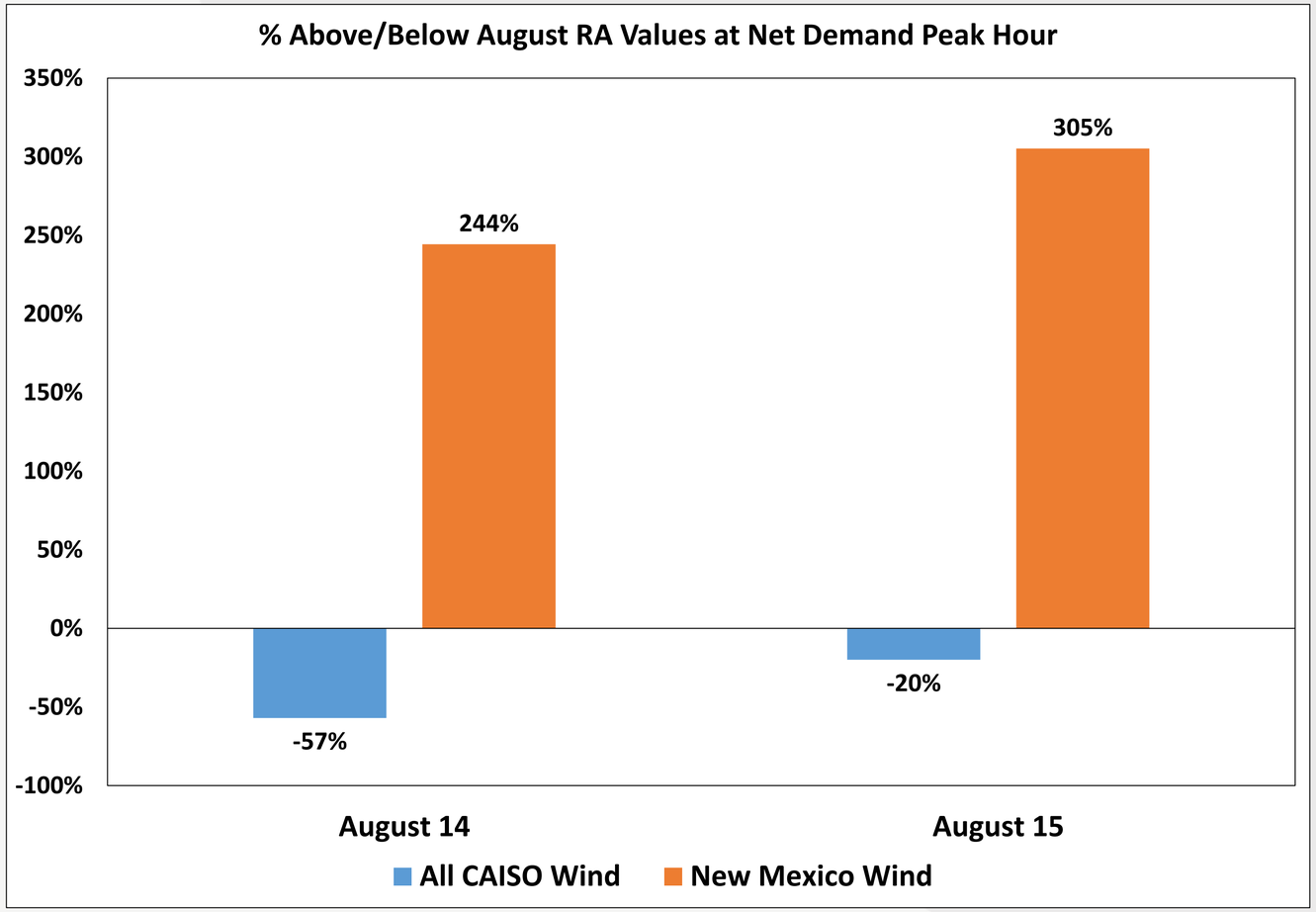
Source: Pattern Energy operational wind data from Pattern-owned wind farms. New Mexico data from Curry County, NM. CA-NorCal data from Shasta County, CA, and CA-Imperial data from Imperial County, CA.

August 2020 Wind Output (2 of 2)

Final Root Cause Analysis of Mid-August 2020 Extreme Heat Wave, January 13, 2021, pp. 49-50:

"The total wind fleet within the CAISO collectively bid into the day-ahead market about 230 MW (20%) less than the RA obligation at the net peak demand on August 14 but 120 MW (10%) more on August 15. In contrast, actual energy production during the net demand peak was 640 MW (57%) less and 230 MW (20%) less [than the RA obligation] on August 14 and 15, respectively."

NM Wind produced 244% and 305% above August RA value during net demand peak hour on August 14 and 15, respectively, compared to total CAISO wind fleet at -57% and -20%.



Source: NM Wind data from Pattern operational wind sites in Curry County, NM. Graph shows % above August RA value based on energy dynamically scheduled to CAISO Scheduling Point at net demand peak hour August 14 and 15.

Key SunZia Takeaways

- Permits are in hand and being amended for final route modifications
- Federal ROW is signed, State ROW is in-process, Private ROW is 98% done
- Engineering for HVDC Converter Stations is underway by Hitachi-ABB with procurement starting in late 2021. This is the long-lead item.
- Anchor tenant Pattern Energy is marketing SunZia Wind energy, based on success of Western Spirit project
- After 15 years of development and $150 million, we have line-of-sight to Line 1 construction start by end-2022, operational in 2025

Out-of-State Development Challenges

- Long-term, capital-intensive development period
- Need for sufficient commercial interest prior to construction start
- Lack of inclusion in CAISO Transmission Planning Process (TPP) base portfolios
- Need for sufficient import capability and deliverability at CAISO interties, known in advance
- Resource Adequacy (RA) counting rules need to recognize increased RA value of out-of-state wind resource

Starwood Energy
Ali Amirali

California Energy Commission

July 21, 2021

Introduction of Ten West Link / DCRT

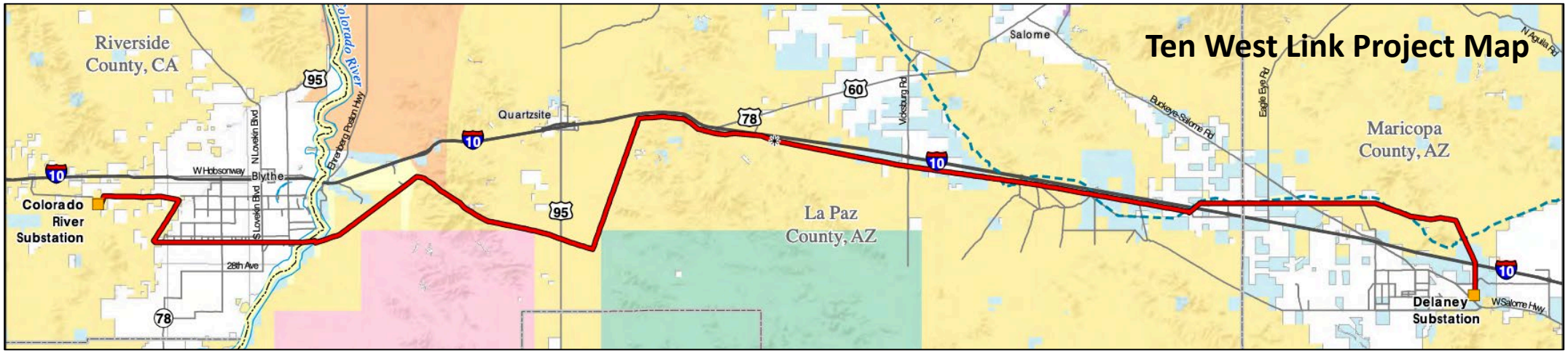
Ten West Link Project

- 500 kV transmission line from Delaney Substation (west of Phoenix) to Colorado River Substation in Riverside County, CA.
- Strong project economic Benefit/Cost based on identified need. Will also enhance grid flexibility and robustness, and renewable development and integration.
- Advanced state of development after extensive 3+ year BLM/CPUC environmental review. Construction pending CPCN.
- Agencies involved in the permitting process include:
  - Bureau of Land Management (BLM)
  - California Public Utilities Commission (CPUC), and
  - Arizona Corporation Commission (ACC)

Project Sponsor: DCR Transmission, LLC (DCRT)

- Selected by CAISO in 2015 following an extensive competitive solicitation process to develop Ten West Link.
- Starwood Energy specializes in energy infrastructure investments, with a focus on power generation, transmission, storage, CCUS, RNG and related projects. Significant development, construction, financing and operations expertise.

Ten West Link Will Expand Access to New Renewable Resources in California While Minimizing Resource Impacts



- 500 kV line, ***125 miles in length***
- Interconnects SCE and APS 500 kV substations
- ***Parallels existing infrastructure***, including 60+ miles of existing SCE 500 kV DPV line
- *Creates critical transmission infrastructure though region with highly desirable solar resource*
- ***Significant renewables interconnection*** interest; especially solar + storage project
- ***Extensive consultation*** in BLM/CPUC NEPA/CEQA process. ***Broad stakeholder support*** including local communities, CRIT, and NRDC.
- Wide ***variety of route alternatives considered*** balancing impacts, including no-wires alternative.
- Route selected ***reduces visual, biological and cultural impacts*** … KofA Refuge + Mule Mountains
- Structure placement/types generally ***matched to existing infrastructure***, reducing visual impacts

Project Benefits

- Ten West Link offers a wide array of economic, reliability, operational flexibility, and public policy related benefits to Arizona and California. These benefits include:
  - Providing a second parallel line to the existing DPV line
    - ❖ Enhance reliability of California's and Arizona's interconnected transmission network Increases the transfer capability between critical transmission hubs in Central Arizona and Southern California
    - ❖ Reduce transmission system losses
    - ❖ Enhance the efficiency and operational flexibility of the bulk transmission network
  - Allowing for a cost-effective transfer of energy in the Southwestern United States, expanding regional access to low-cost and diverse renewable resources
  - Facilitating the interconnection of and energy delivery from new renewable energy resources
    - ❖ 3,200 MW of Solar plus storage project already executed an LGIA
    - ❖ 500 MW of solar plus storage project negotiating LGIA
    - ❖ Approximately 9,000 MW of new renewable generation proposing to use the transmission line
  - Reducing transmission system congestion and enhancing the economic supply of electric power to Arizona
  - Increasing competition at the Palo Verde trading hub
  - Enhancing participation in EIM and EDAM

Project Status

- Received Certificate of Environmental Compatibility (CEC) from ACC in March 2020
  - Filed the application with ACC in October 2019
  - Line Siting Committee recommended approving the project on February 7, 2020
  - ACC unanimously approved granting CEC on March 25, 2020
- Record of Decision (ROD) received from BLM November 2019
  - National Environmental Policy Act (NEPA) process started in October 2015
  - Draft Environmental Impact Statement (EIS) issued August 30, 2018 and Final EIS issued September 13, 2019
  - ROD received November 22, 2019 and Right-of-Way Grant received August 4, 2020
- Certificate of Public Convenience and Necessity (CPCN) process underway at CPUC
  - CPCN application filed October 2016
  - Testimonies filed December 2019, Reply Testimonies filed in March 2020, and Briefing process completed March 2021
  - Waiting for Proposed Decision
- Finalizing leasing of land by means of ROW Agreement with Arizona State Lands Department
- Working with private land owners along the Project route
- Engineering, Procurement, and Construction company on board
- 90% engineering completed, structure testing completed, and vendors on board
- Construction to begin following the receipt of CPCN

Southline Transmission Project
Doug Patterson

Joint Agency Workshop on Next Steps to Plan for Senate Bill 100 Resource Build: Transmission Panel

Doug Patterson

July 22, 2021

Overview

SOUTHLINE TRANSMISSION PROJECT

Fully Permitted Path Connecting NM & AZ For Up to 1,000 MW
Phased Construction Starting 2021

Two segments, approximately 370 miles

- New Build — 345kV double-circuit Afton-Apache, 259 miles
- Upgrade — 230kV double-circuit Apache-Saguaro/Tortolita, 121 miles

TEP Acquiring Vail-Tortolita Segment

Construction Starting 2021

Regional Planning
- WestConnect (2009)
- WECC Path Rating

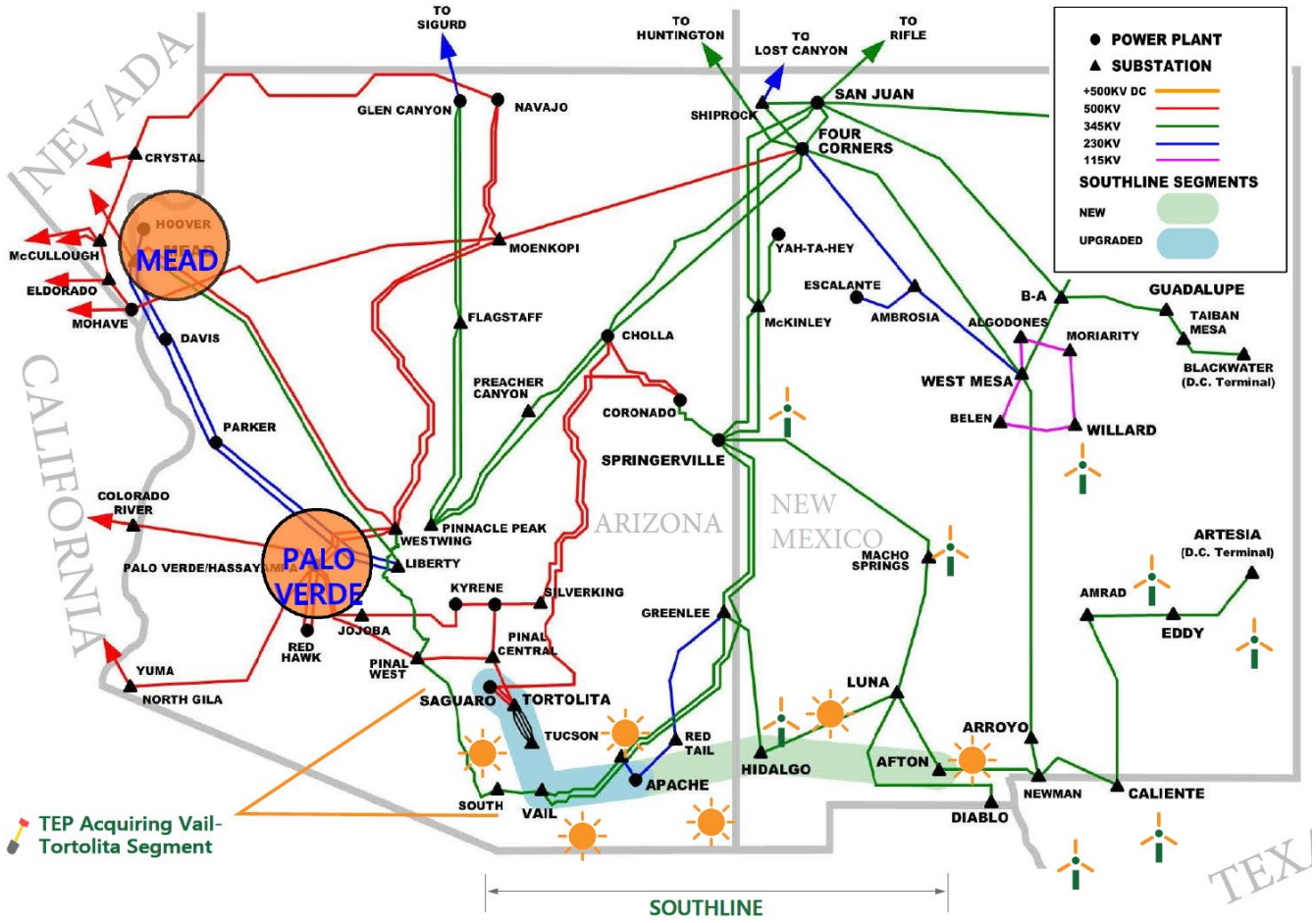
Permitting
- Pre-NEPA (2009-2011)
- DEIS (2014) FEIS (2015)
- Federal ROD's (2016)
- ACC CEC (2017), NMPRC (2017)
- ACC CEC Modification (2021)

Commercial
- FERC PDO (2015)
- Initiated Open Solicitation (2016)
- Vail – Tortolita Acquisition (2021)

Address multiple needs
- Improve Reliability
- Relieve Congestion
- Support Growth
- Facilitate Access to Renewable Resources

Minimize Environmental Impacts:
- Upgrade existing lines
- Follow existing corridors
- More that 85% of Agency Preferred Route parallels or upgrades existing corridors

Regional System and Resources



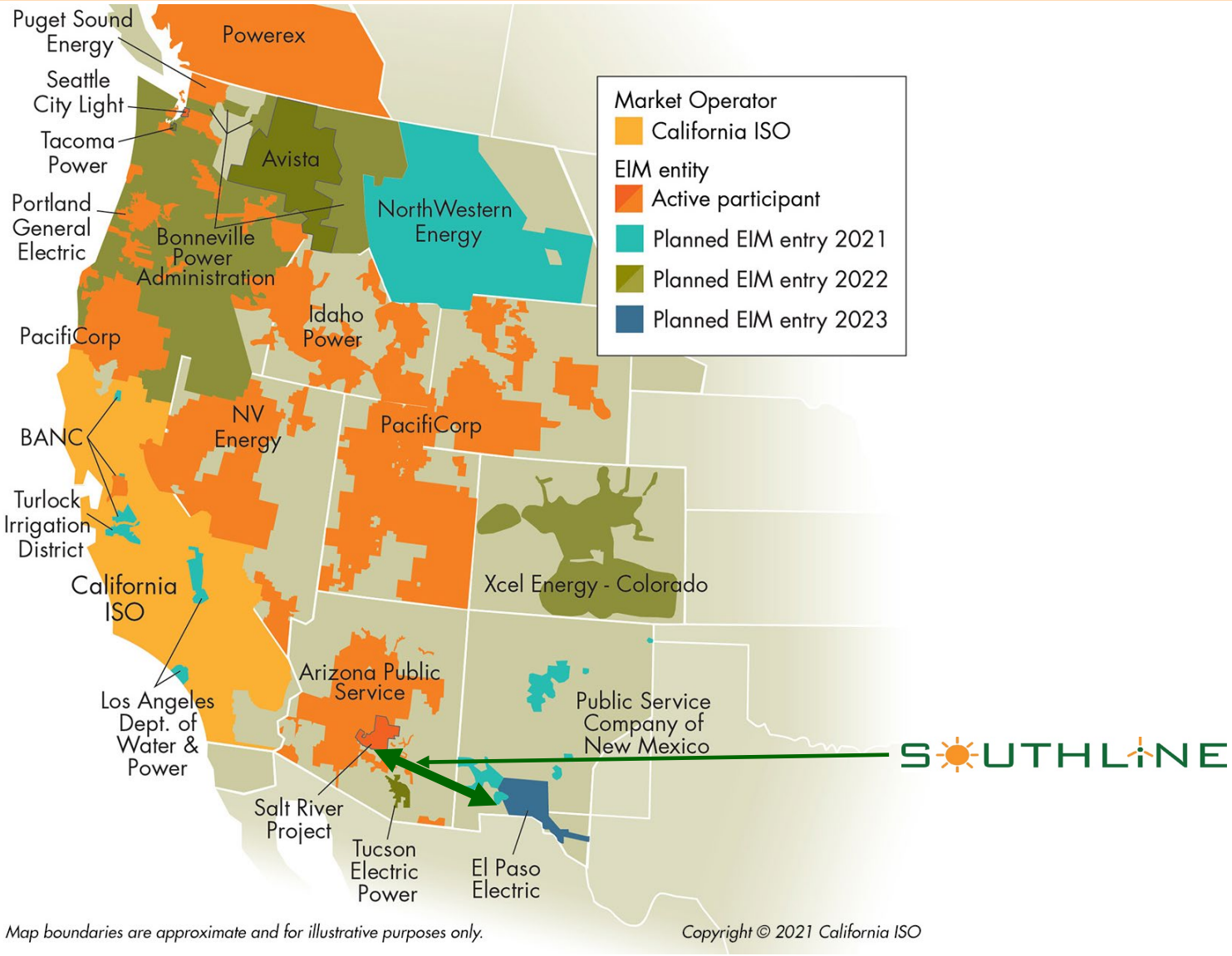
- Creates path to market for transmission-constrained renewable energy resources
- Bridges large gap between systems in southern New Mexico and southern Arizona
- Provides local economic development
- Follows I-10 corridor to create complementary EV and communications opportunities
- Careful routing minimizes impact, and conserves resources

Phased capacity of 600MW to 1,000MW

Utility Partners: Tucson Electric Power and Western Area Power Administration

EIM

SOUTHLINE TRANSMISSION PROJECT

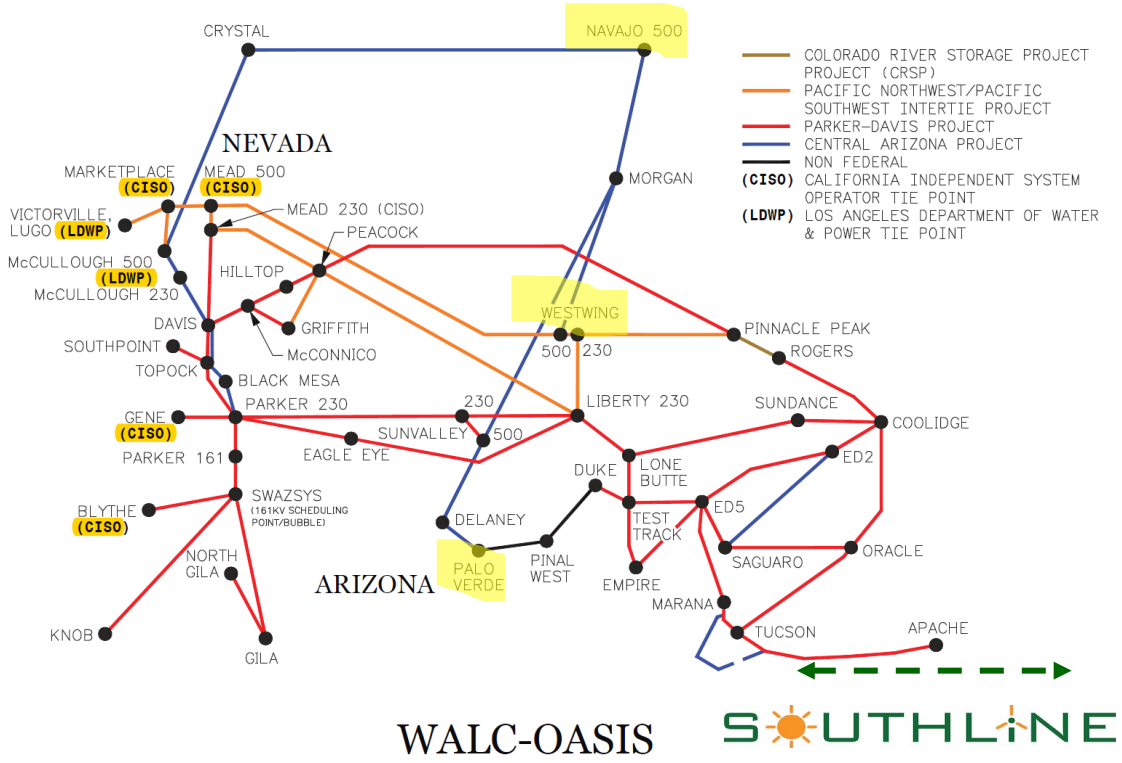


Southline Could Enhance EIM Benefits

Interfaces & Upgrade Example

SOUTHLINE TRANSMISSION PROJECT

WAPA DSW System with CA interfaces



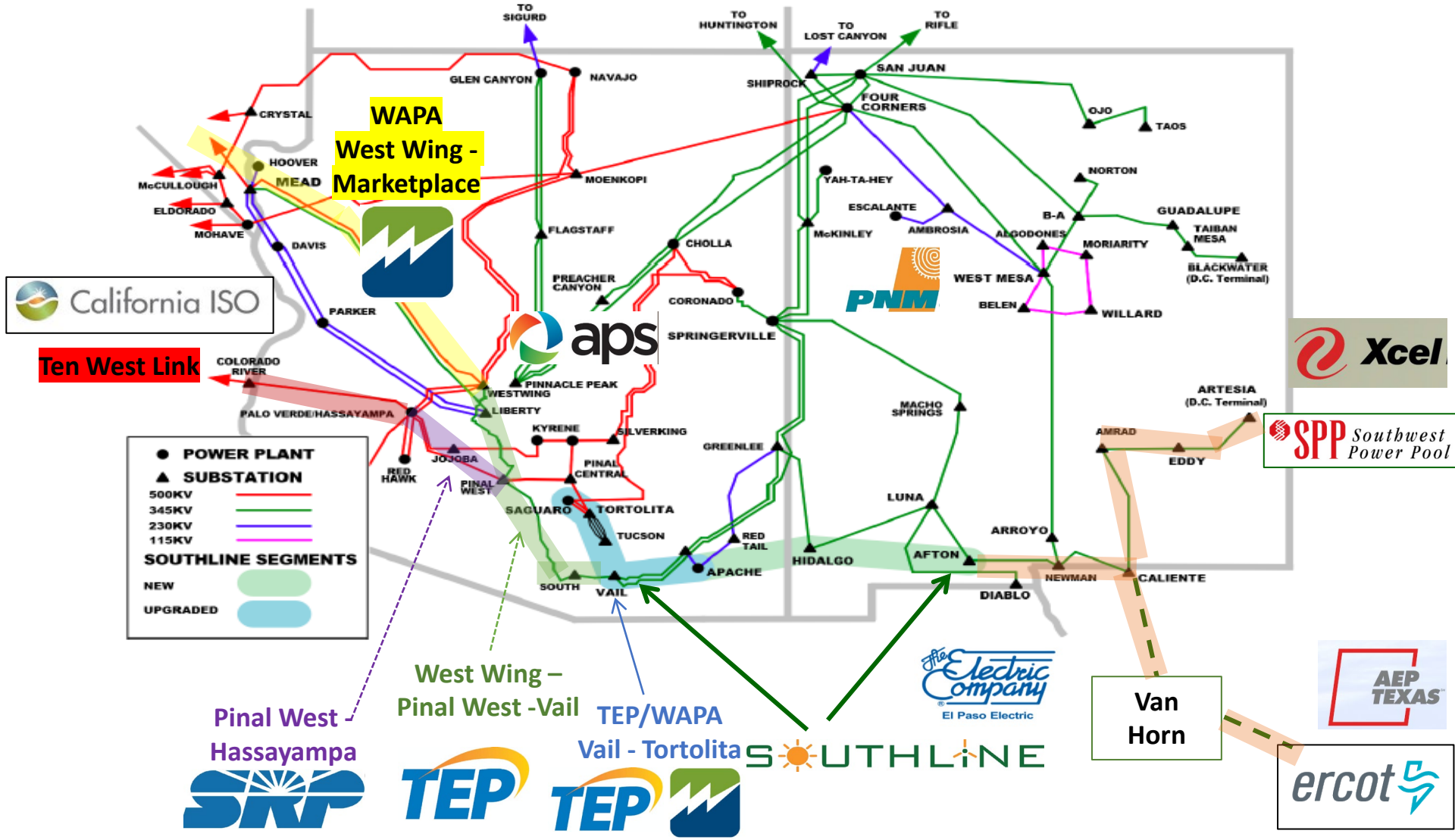
Example of upgraded and old WAPA lines

New line = 8X capacity in same ROW

Additional Similar Upgrade Opportunities Exist

Permitted Lines & Existing Corridors

SOUTHLINE TRANSMISSION PROJECT



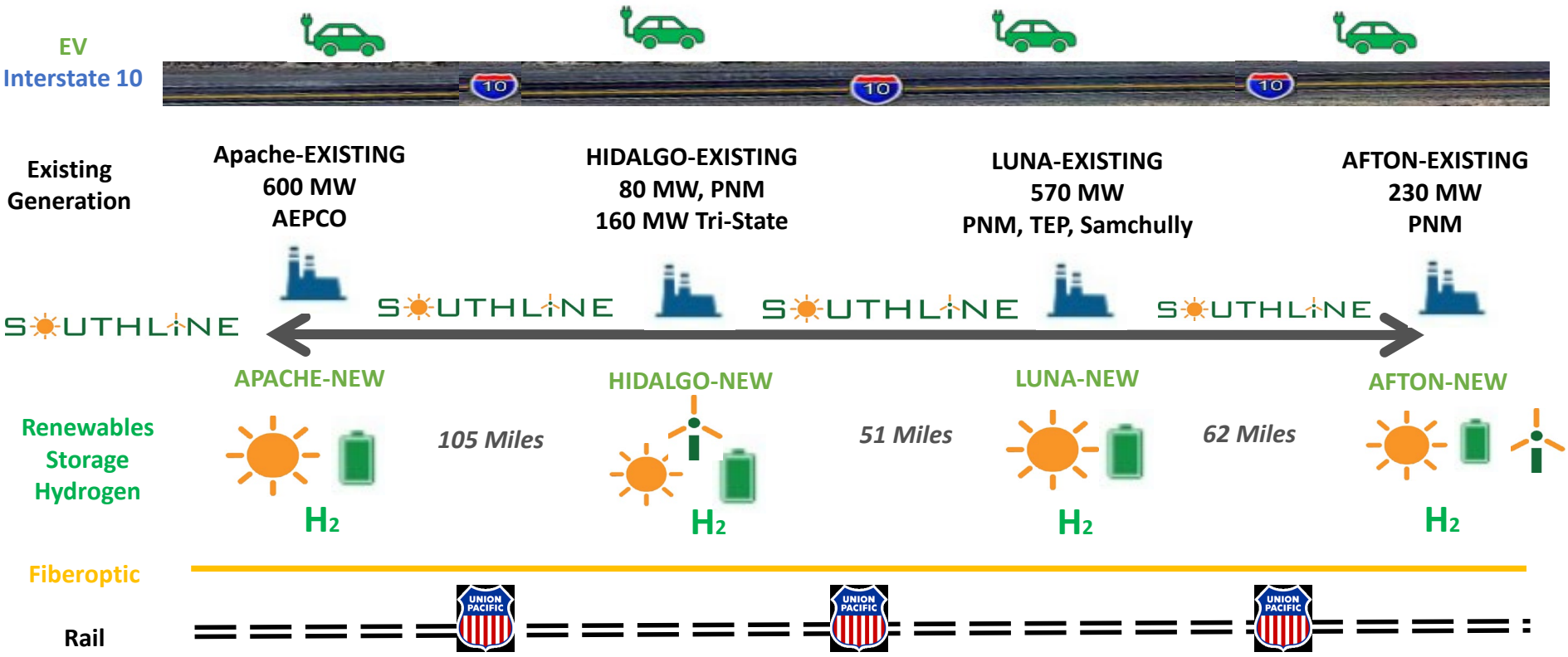
Source: SWAT, Southline

Leverage Permitted Projects & Existing Corridors for Policy Objectives

Corridor Opportunities

SOUTHLINE TRANSMISSION PROJECT

- Southline connects to or is adjacent to over 1,600MW of existing thermal generation
- Opportunity to add solar, battery storage, offer firm renewable wind + solar + bess combination
- Potential to convert existing units to Hydrogen
- Interstate 10 an EV opportunity
- Parallels Major Rail Corridor and Fiber Optic Corridor



Shared Energy, Transportation and Communications Corridors Provide Long Term Synergies

Thoughts on Next Steps

SOUTHLINE TRANSMISSION PROJECT

Expansion Tx Ranking

1) Optimize Existing ATC with Neighbors
   - Contract modifications
   - Network Service, Conditional Firm

2) Leveraging Existing System
   - Low Impact (eg Station Improvements)
   - Grid Enhancing Technologies
   - Storage (Network? Hubs? PVH, Mead, etc)
   - Re-Conductor (new materials?)
   - Re-build in existing corridor

3) New Transmission
   - Parallel & Connect With Existing System
   - New Corridor for New Transmission

Consider an Implementation Iteration to Prioritize
   - Analysis of #1 & 2 and fully permitted #3
   - Back these "Most Buildable" resources out and re-run models on remaining need.

Additional Considerations

4) Operating Benefits
   - New / Increased BAA ties
   - Resource/Load Diversity

5) EIM

6) Federal Nexus / Partnership
   - WAPA, BPA, BOR etc

7) Corridors
   - Energy
     - Transmission
     - Thermal Generation
     - Natural Gas
   - Transportation
     - Interstate Highway
     - Rail
   - Communication

Most Effective Way to meet SB100 and to Build Back Better is to Leverage Existing System and Participants

Contact

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Black Forest Partners, L.P.
Tiburon, CA
415-944-0656
doug@blackforestpartners.com

www.southlinetransmissionproject.com

Lucky Corridor Transmission Project
Sean Black

Presentation to the California Energy Commission

Lucky Corridor Project Portfolio in New Mexico

July 22, 2021

Lucky Corridor Transmission Project Portfolio

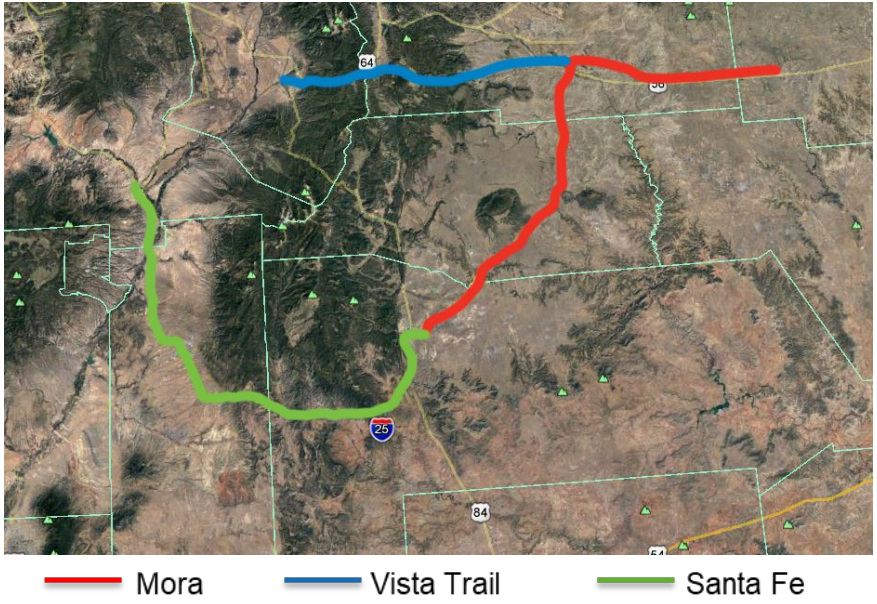
Empowering New Mexico's Renewable Energy Future

Northeast New Mexico has some of the best wind and solar resources in the country. However, transmission infrastructure is needed to deliver these clean resources.

The portfolio will:

- Stimulate the New Mexico economy with access to low cost, renewable energy
- Help New Mexico meet new emission reduction targets, and build a clean, 21st century economy
- These projects will provide reliability benefits and increase access to renewable energy for consumers

Ameren Transmission acquired Lucky Corridor LLC in August 2020 to actively develop the portfolio of transmission projects in Northern New Mexico



Ameren Transmission

Ameren business focused on transmission development, construction and operation

Operating subsidiary of Ameren Corporation (AEE); a Fortune 500 Electric Utility that owns and operates over 8,000 circuit miles of NERC jurisdictional electric transmission and over 10,700 MW of electric generation

Over 100 years planning, constructing, operating and maintaining FERC/NERC jurisdictional transmission assets

Over 375 FTEs focused on transmission engineering, construction, project management, operations and maintenance

$3.6 billion* in FERC-Regulated transmission rate base at the end of 2020

Executing **$3.7 billion** of transmission projects over the next five years (2021 – 2025)

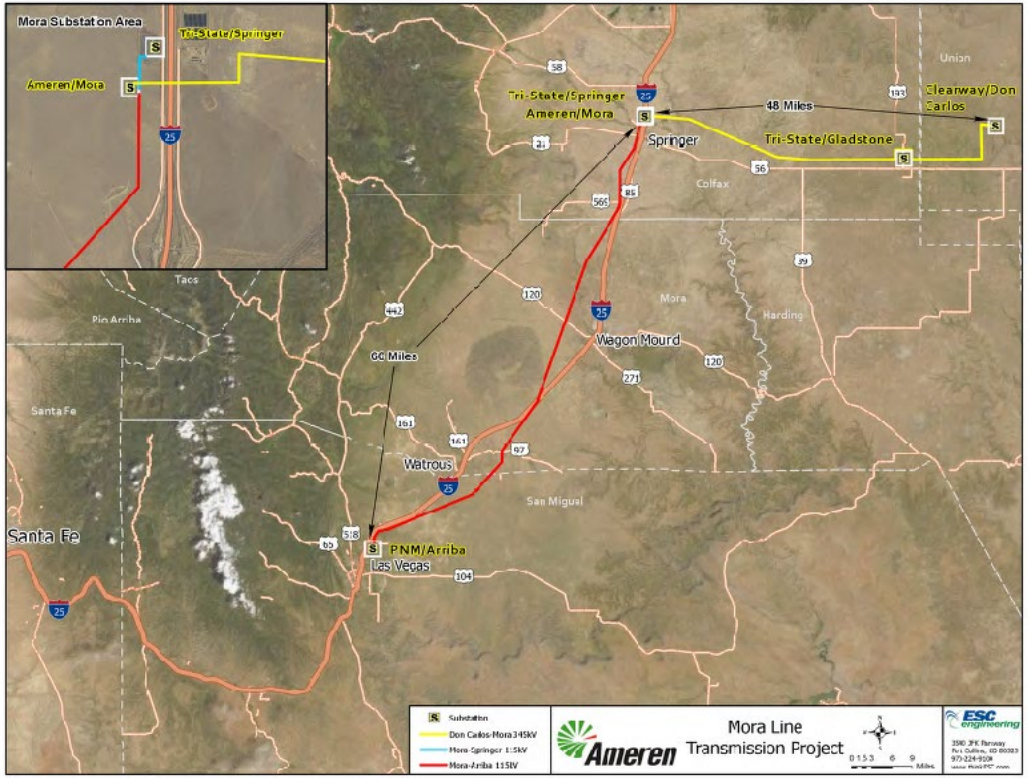
Construction of a lattice tower structure crossing the Illinois River; part of the Illinois Rivers Transmission Project

*Excludes transmission investment in Missouri which is vertically integrated

Mora Transmission Project

Project Overview

- 114-mile 345 kV/115 kV Transmission Project that interconnects the 180 MW Don Carlos Wind Farm Collector Station in Union County, NM to the Springer Substation located in Springer, NM (owned by Tri-State) and, finally the Arriba Substation located north of Las Vegas, NM (owned by PNM)
  - Don Carlos – Mora Segment: 48-mile, 345 kV line (yellow line)
  - Mora 345 kV/115 kV Substation
  - Mora – Arriba Segment: 66-mile, 115 kV line (red line)
- Anchor Tenant Agreement for 180 MW with Don Carlos (acquired by Clearway Energy)
- Negotiated Transmission Construction Interconnection Agreements with:
  - Public Service of New Mexico for interconnection at the Arriba substation
  - Tri-State Electric Cooperative for interconnection at the Springer substation
- Working on the OATT and *pro forma* agreements; anticipate FERC filing before end 3rd quarter 2021
- Site Acquisition - Over 760 acres of easements acquired; 95% site control of Don Carlos – Mora line segment
- Environmental Status - Completed archeological, cultural and biological pedestrian studies, supervised by State Land Office
- Targeting construction (NTP) on or before the 3rd quarter of 2022



Vista Trail Transmission Project (formerly Lucky Corridor)

345 kV transmission project to transfer renewable energy towards Four Corners

- The 65-mile, greenfield segment will interconnect the Mora substation to the Taos substation (owned and operated by Tri-State Generation and Transmission Association, Inc.)
- Subject to interconnection requests, the project will deliver up to 1,500 MW to the Public Service Company of New Mexico's Ojo substation;
  - FERC negotiated rate authority has already been approved to offer 850 MW of capacity;
- Joint routing/development study with key stakeholders in progress;
- Public stakeholder meetings planned in the fall of 2021;
- Plan to file amended SF-299 application to the National Forest Service by end of 2021;
- Targeting commercial operation in 2025.

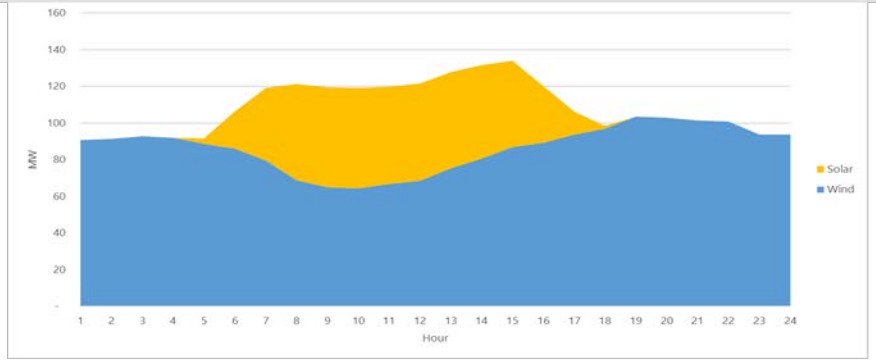
Renewable Development in New Mexico

Union County, New Mexico has outstanding wind and solar resources

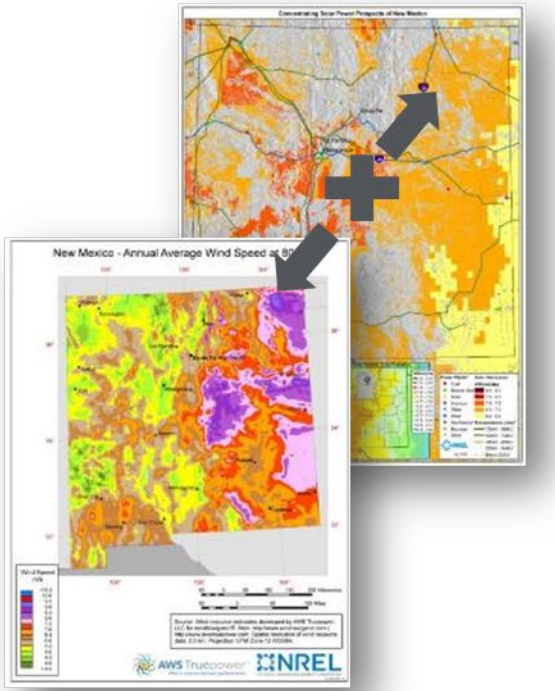
Renewable Development in New Mexico

- Lucky's anchor tenant (Clearway Energy Group) has a recognized presence in delivering renewable energy to California, as well as a long history of working in New Mexico
- Complimentary wind and solar resources provide reliably shaped renewable energy
- The combination of robust scalable wind and solar facility resources and strong transmission and generation developers creates a unique opportunity to serve CAISO load

Avg Daily Generation from Meteorological towers in Union County



Wind & Solar Resources in New Mexico




Ameren
TRANSMISSION

GridLiance West
Michael Landgraf

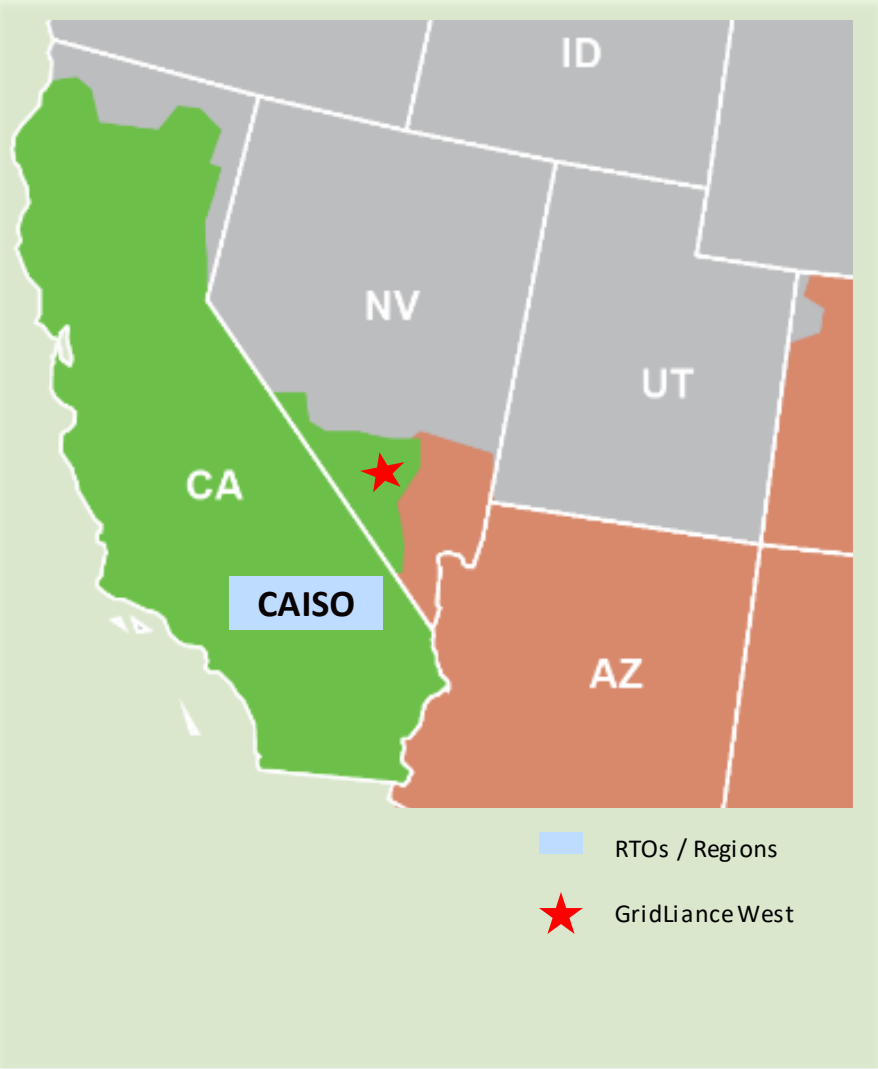
GRIDLIANCE

Potential Transmission to Support SB 100

July 22, 2021

GridLiance West Overview

Providing access to renewables in southwest Nevada to support California's clean energy goals

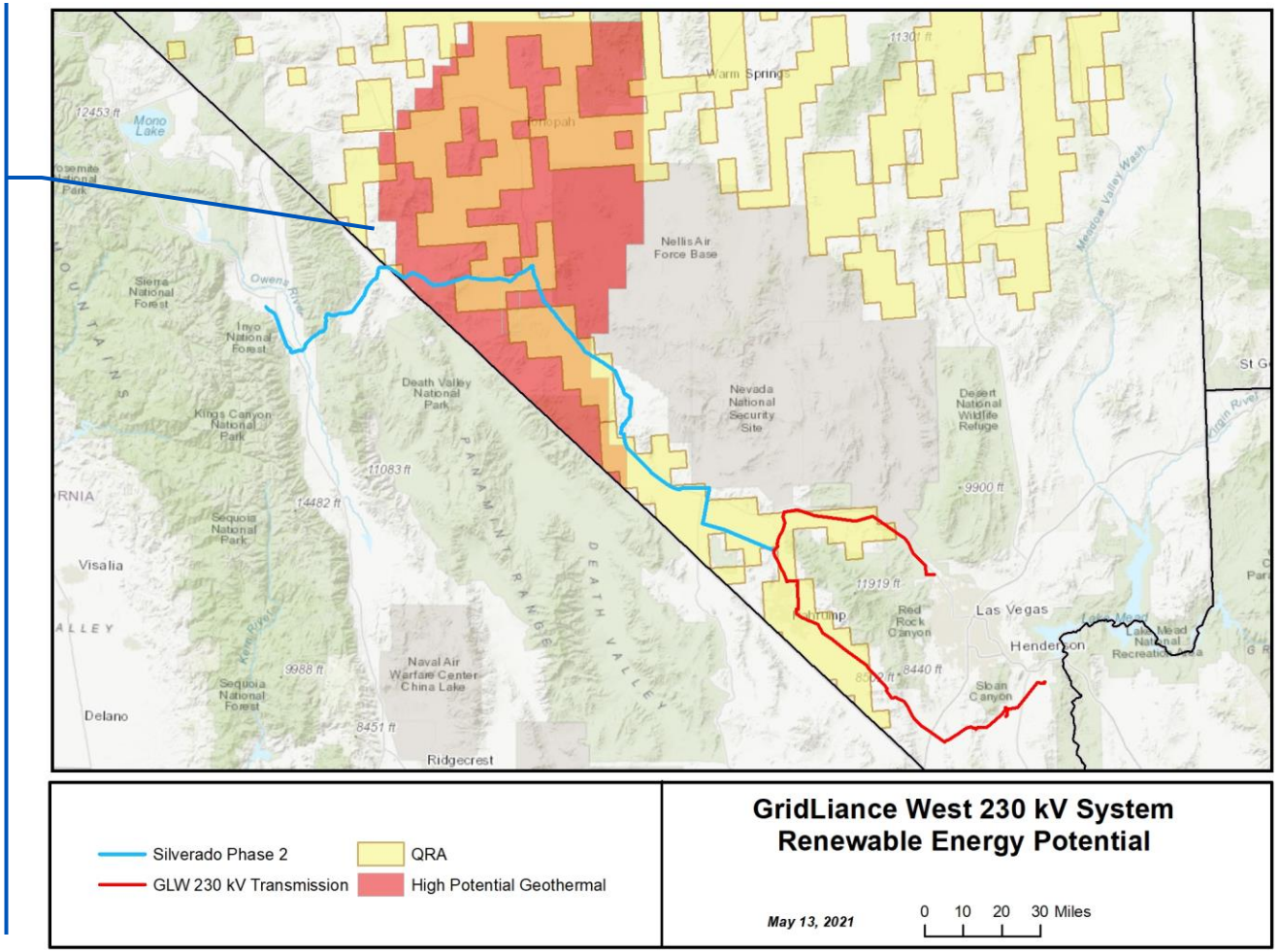


- 167 miles of 230 kV transmission network in Southwest Nevada
- Integrated into the CAISO; the only out-of-state transmission system in the CAISO and interconnecting renewables
- Located outside of high wildfire risk areas in the region
- >6 GW of renewables in the CAISO queue, including >400 MW geothermal which can provide firm clean capacity to serve CA and support reliability

GridLiance West Supporting SB100

Upgrades to GridLiance West system can enable >6 GW of renewables in support of SB100

GridLiance West can enable development of untapped diverse renewable resources, with up to 40 GW renewable potential. CPUC has sited solar, storage, wind, and geothermal resources in Southern Nevada, and expanding GLW system to tap into these resources is a least-regrets approach to help meet CA's mid-term reliability needs and support SB 100.



Session 1 Public Comment

Rules
- 3 minutes per person
- 1 person per organization

Zoom
- Click "raise hand"

Telephone
- Press *9 to raise hand
- Press *6 to (un)mute

When called upon
- Unmute, spell name, state affiliation, if any

Written Comments:
- Due: 8/11/2021 by 5:00 p.m.
- Docket: 21-SIT-01
- Submit at: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=21-SIT-01

3-MINUTE TIMER

Session 2 Begins at 1:30 p.m.

- **Stakeholder and Balancing Authorities Discussion of Transmission Issues**
- https://energy.zoom.us/j/92673190192?pwd=V3BWeXE1alRtdDJTUWV1UENXTTRQQT09
- ID: 926 7319 0192
- Password: 780069

Written Comments:

- Due: 8/11/2021 by 5:00 p.m.
- Docket: 21-SIT-01
- Submit at: **https://efiling.energy.ca.gov/EComment/Ecomment.aspx?docketnumber=21-SIT-01**

Joint Agency Workshop: Next Steps to Plan for Senate Bill 100 Resource Build - Transmission

Session 2

July 22, 2021

Additional Planning and Financing for Transmission

- Integrating Land-Use and Environmental Impacts into Energy Planning
  - ✓ **Erica Brand**, The Nature Conservancy
- Backbone Transmission for Central Coast Offshore Wind
  - ✓ **V. John White and Jim Caldwell**, Center for Energy Efficiency & Renewable Technologies
- Transmission Infrastructure Program - Project Financing and Development Assistance
  - ✓ **Tracey LeBeau**, Western Area Power Administration
  - ✓ **Jennifer Rodgers**, Western Area Power Administration

POU/ Balancing Authority Discussion of Transmission Issues

- Los Angeles Department of Water and Power
  - ✓ Simon Zewdu
  - ✓ Jason Rondou
- Imperial Irrigation District
  - ✓ Enrique Martinez
-
  - ✓

Public Comment Instructions

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3-MINUTE TIMER

Agency Leadership Remarks

- **Karen Douglas**, CEC Commissioner
- **Siva Gunda,** CEC Commissioner
- **Marybel Batjer**, CPUC President
- **Cliff Rechtshaffen,** CPUC Commissioner
- **Darcie Houck,** CPUC Commissioner
- **Elliot Mainzer**, President and CEO, CAISO
- **Neil Millar,** Vice President, Transmission Planning & Infrastructure Development, CAISO

The Nature Conservancy
Erica Brand

SB100 Transmission Workshop

Presentation by The Nature Conservancy

Integrating land-use and environmental impacts into energy planning

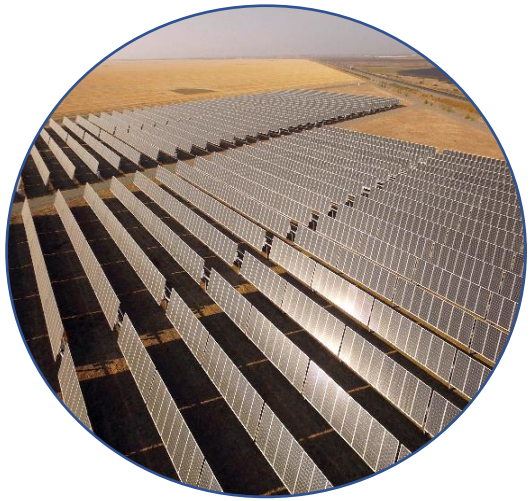
July 22, 2021

Erica Brand
California Energy Strategy Director
ebrand@tnc.org

Decarbonizing California through clean power and electrification will require significant land area for new electricity infrastructure

Integrating environmental and land use data *as a first step in* long term energy models yields multiple benefits

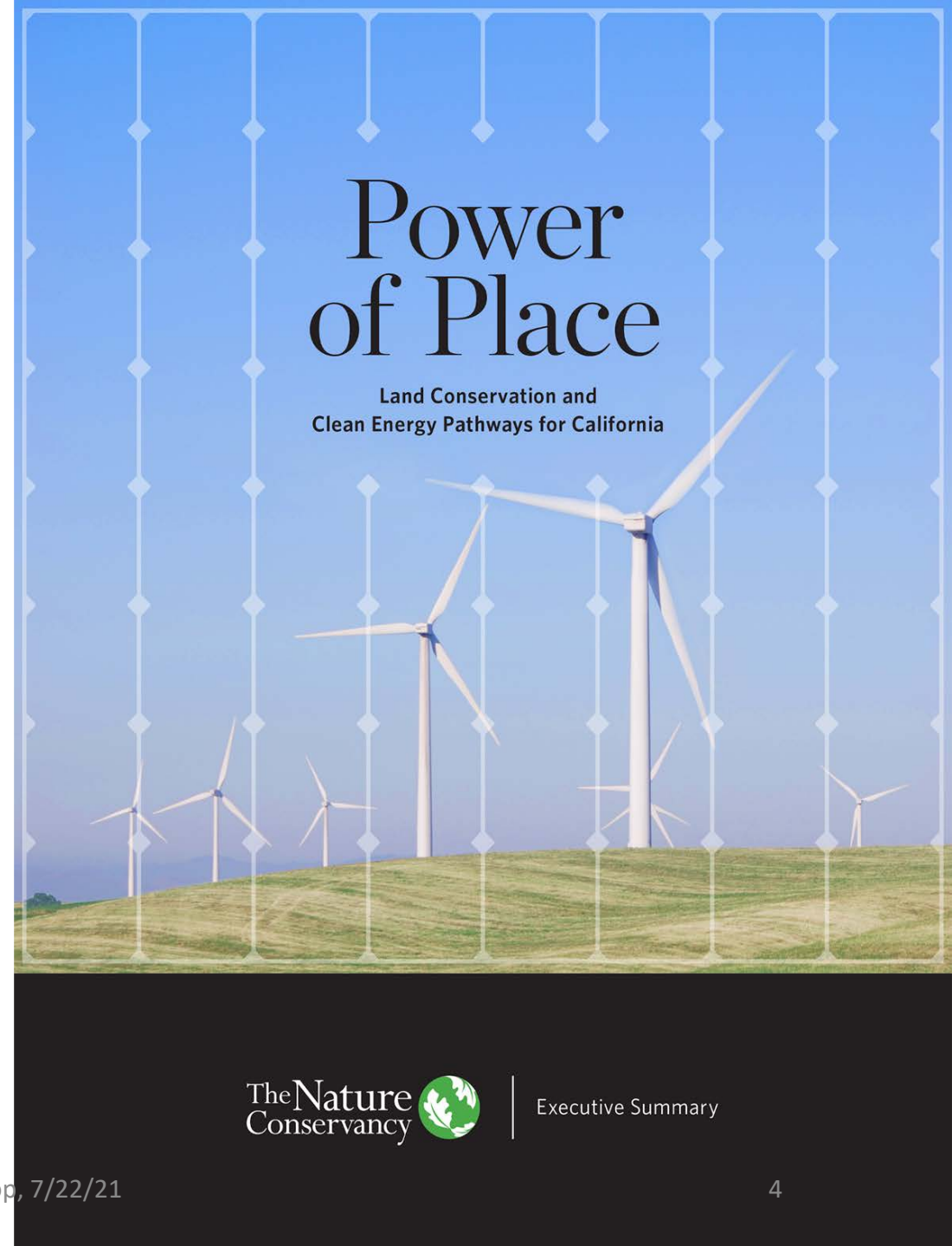
GEOSPATIAL ENVIRONMENTAL AND LAND USE DATA



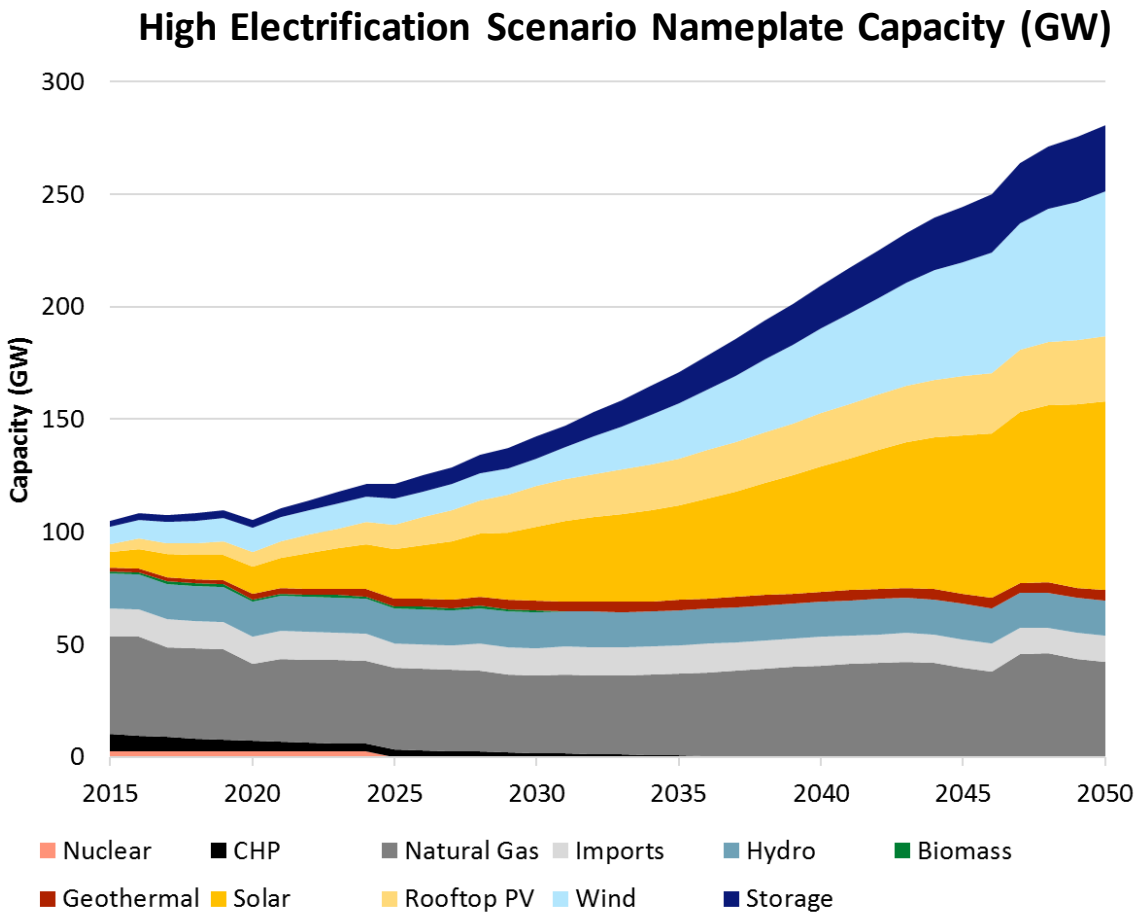
ENERGY RESOURCE PORTFOLIOS

Development opportunity areas and constraint areas become visible much earlier in resource and transmission planning, improving projections and the policy decisions that flow from them.

- Modeling partners: Energy and Environmental Economics (E3) & Montara Mountain Energy
- To help California implement its climate commitments, including SB100, our research team developed detailed technology, infrastructure, and land use pathways
- 61 scenarios. Two models: RESOLVE and ORB
- The findings highlight the significant scale of infrastructure that may be required to power the electric sector with renewable resources and electrify transportation and buildings
  - solar, wind, geothermal, transmission
- Released in 2019



Statewide Modeling of California Goals

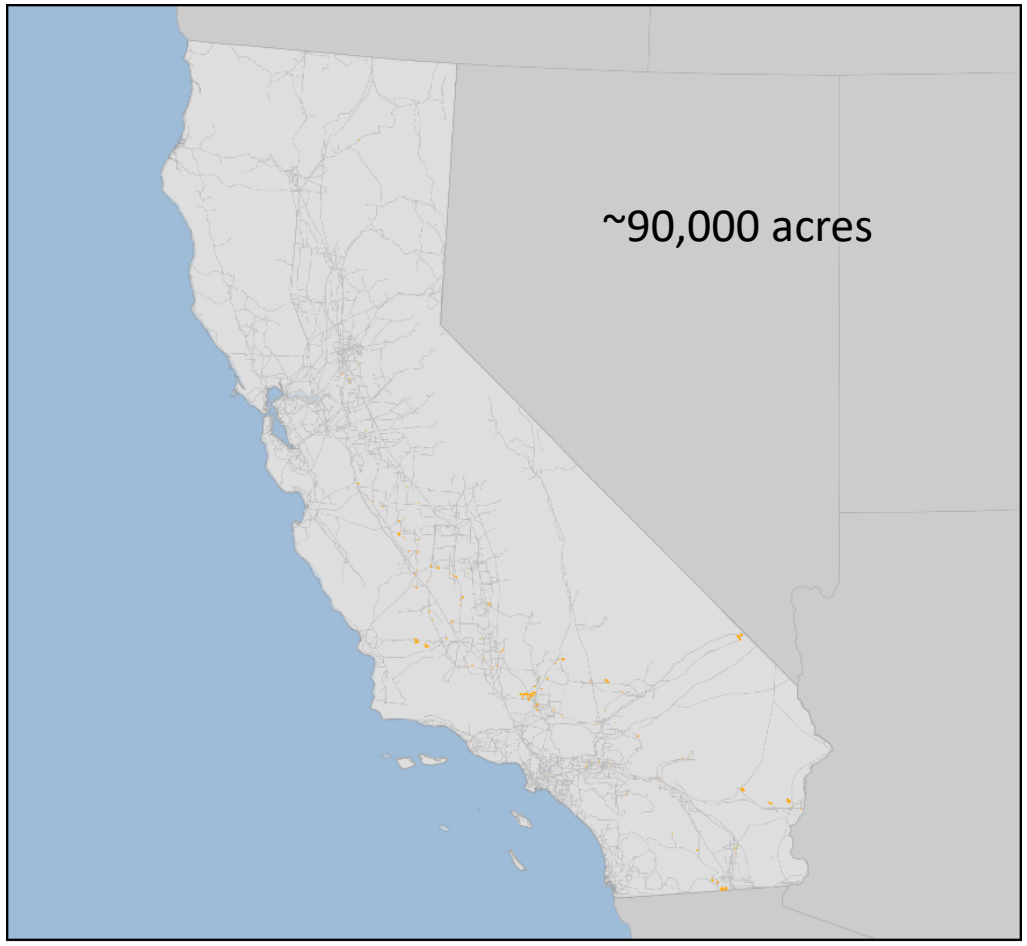


- The Power of Place California study builds upon the California Energy Commission EPIC project "Deep Decarbonization in a High Renewables Future", which considered multiple scenarios for achieving statewide emissions targets
- All scenarios incorporated high levels of vehicle and building electrification
- All scenarios met SB 100 targets of 100% of retail electricity sales with zero-carbon resources and 80 percent reduction in GHGs by 2050

Power of Place California: Approach to Planned Bulk Transmission Across the West

The most cost-effective and least-conservation-impact scenario required a regional approach

The results indicate that the land required for electricity infrastructure across the range of scenarios would double the recent historical rate of urbanization in California



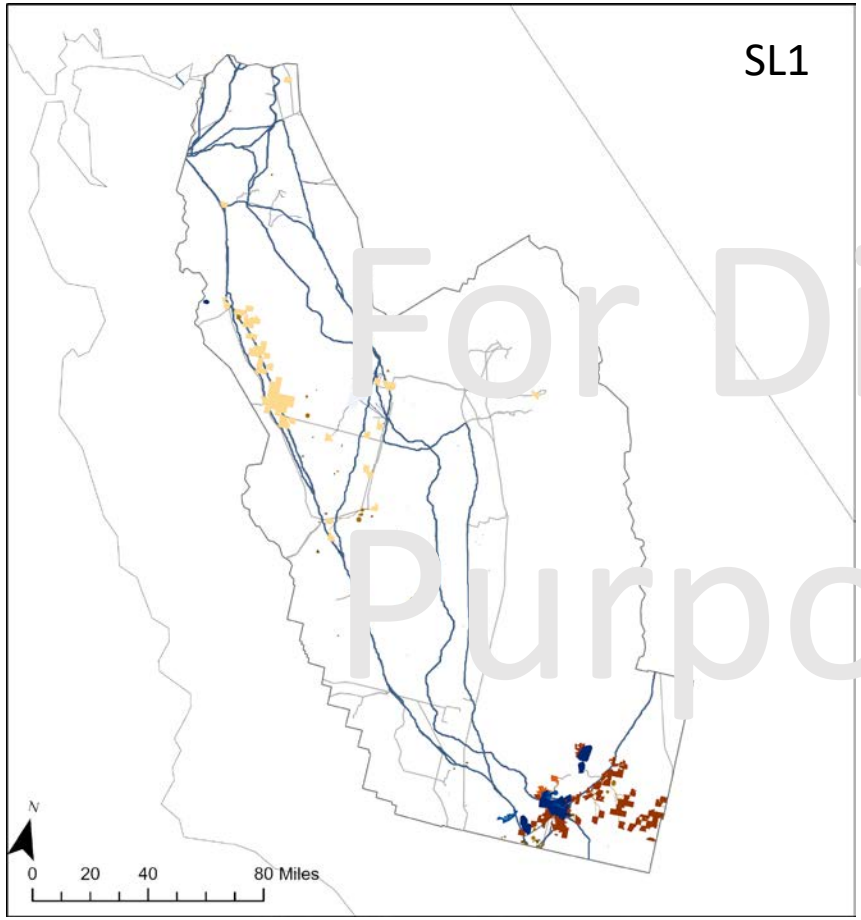
Key Takeaways

- Investing in the transmission grid (upgrades + new lines) will play a key role in decarbonizing the electricity system and achieving SB100 goals.
- Gen-tie and bulk transmission land requirements are a small fraction of the total land area required (< 5%); however, transmission projects are known to have disproportionate siting impacts due to landscape fragmentation and have long lead times for permitting and construction.
- The technology mix, spatial build-out, and system costs are sensitive to land protections and availability of out-of-state renewable resources.
- Our research suggests that failure to consider land availability in energy and transmission planning could increase uncertainties, environmental impacts, and risks in meeting climate targets.

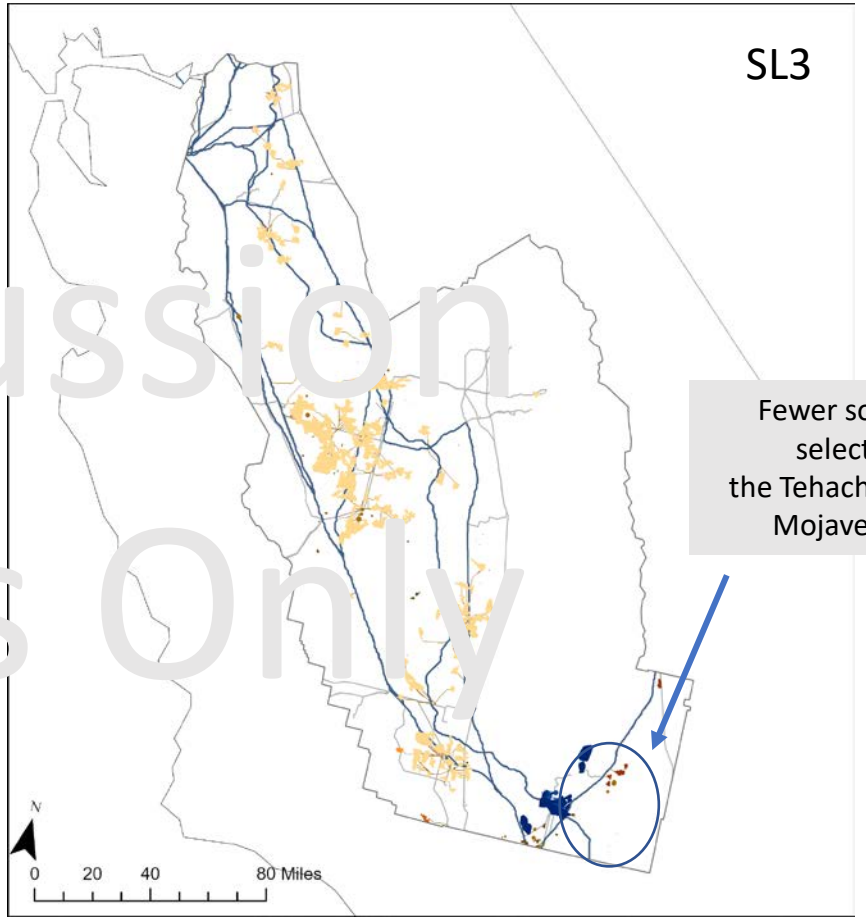

Preview of
2050
net-zero
scenarios

- Modeling Partners: Evolved Energy Research & Montara Mountain Energy
- Explores land use requirements associated with economy-wide net zero targets across the eleven Western States
- Transmission-related research will include planned transmission lines, interzonal transmission (upgrades + new), and spur lines for generation
- Anticipated in late 2021

A preview of the San Joaquin Valley in a High-Electrification Scenario



Unpublished and preliminary results – do not circulate



Fewer solar sites selected in the Tehachapi / West Mojave region

Selected sites wind (CF)
- 0.31 - 0.34
- 0.34 - 0.38
- 0.38 - 0.42
- 0.42 - 0.46
- 0.46 - 0.51

Selected sites solar (CF)
- 0.16 - 0.25
- 0.25- 0.29
- 0.29 - 0.30
- 0.30 - 0.31
- 0.31 - 0.32

- Existing_electric_transmission
- Planned electric transmission
- Interzonal transmission (upgrade and new)
- Spur lines wind
- Spur lines solar

With the appropriate planning approaches, California can scale up the clean energy infrastructure (generation + transmission) needed to decarbonize while limiting impacts to natural and agricultural lands across the west



Thank you

For more information on Power of Place California, please visit:
https://www.scienceforconservation.org/products/power-of-place
Journal Article: https://iopscience.iop.org/article/10.1088/1748-9326/ab87d1

Center for Energy Efficiency & Renewable Technologies
John White and Jim Caldwell

Backbone Transmission for Central Coast Offshore Wind

July 22, 2021

CEC Inter-Agency SB 100 Workshop on Transmission

V. John White
Jim Caldwell
Center for Energy Efficiency and Renewable Technologies

Offshore Wind Push Gains Momentum in California

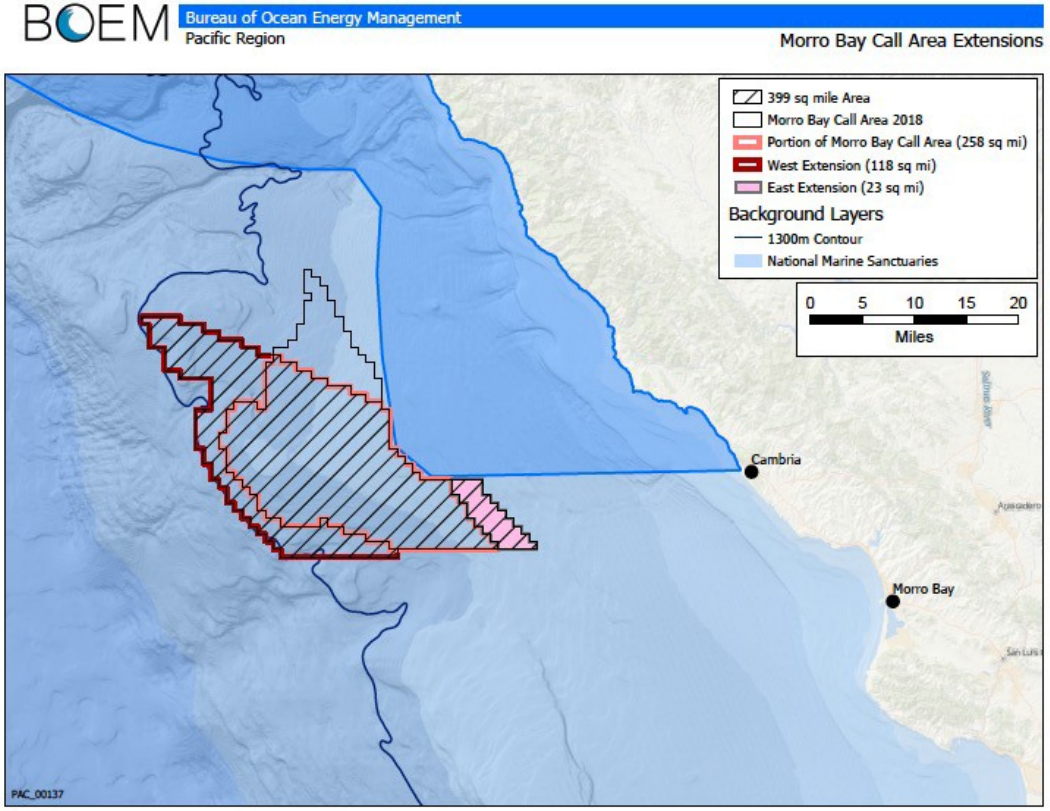
Lawmakers clear a proposal intended to jumpstart floating wind farms off the coast, saying the technology could prop the state's buckling power grid and create more than 10,000 new jobs.

Biden Administration Announces Offshore Wind Lease Sales

1. Announced upcoming lease area for up to 3 GW of Floating Offshore Wind Energy Northwest of Morro Bay, CA

2. Ongoing decommissioning of the Diablo Canyon Power Plant, projected for 2025

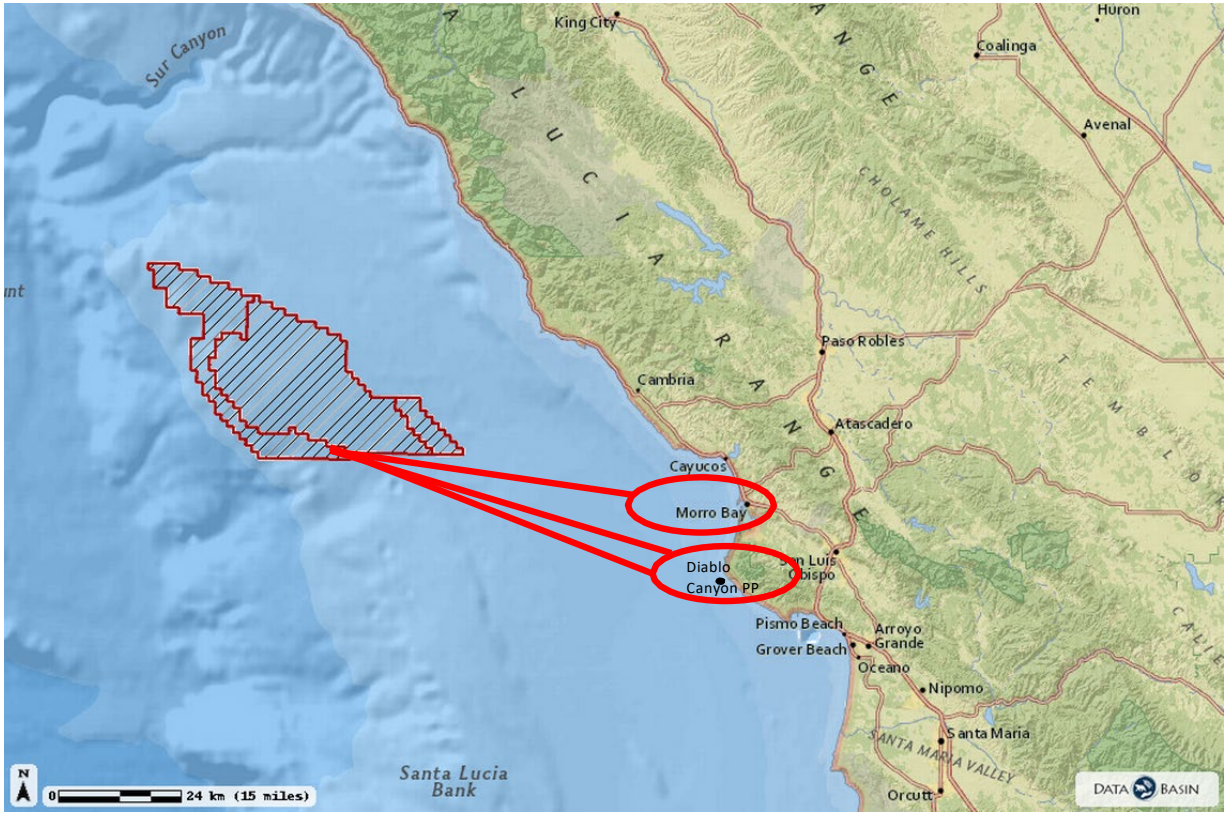
3. Large existing interest in repurposing existing assets, revitalizing area and ensuring economic growth in the Central Coast



Tehachapi Wind Resource Area

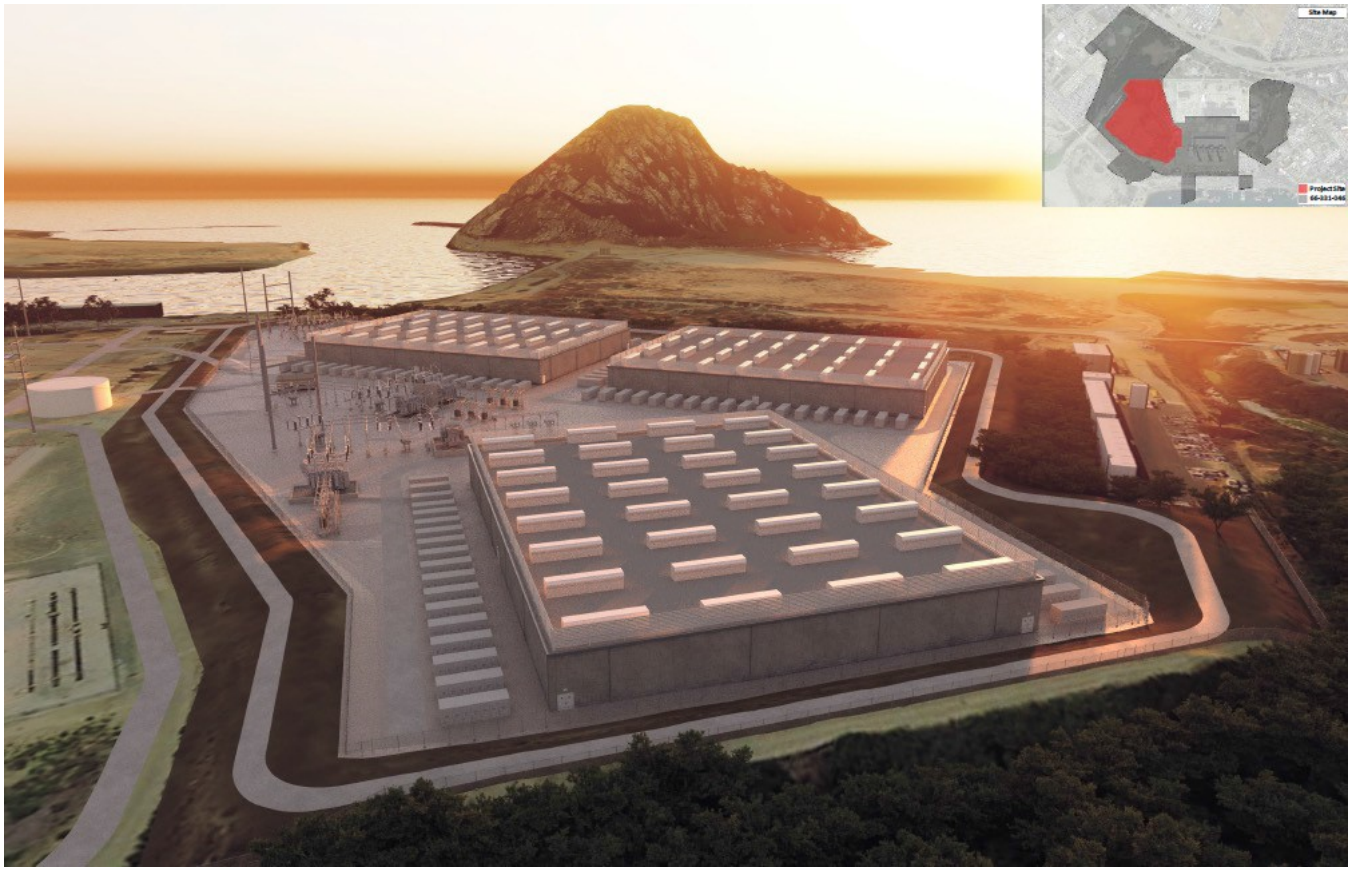
- In the early 2000's, as California began to implement the RPS, there was recognition that the Tehachapi Wind Resource Area held special promise for large-scale, cost-effective wind projects.
- But there was a lack of transmission access to the Southern California Edison system; and building transmission for Tehachapi would be a "generator interconnection" instead of a "network upgrade," which meant the cost of the new transmission line would be borne by the generators, and that no transmission would be built unless there were power purchase agreements in place.
- CPUC Commissioner Dian Grueneich convened the Tehachapi Collaborative Study Group, which included CAISO, utilities, wind developers and environmental groups, and was facilitated by CEERT Board Members Dave Olsen and Rich Ferguson.
- A new idea emerged, called a "renewable trunkline"; the line would be built by Southern California Edison in order to comply with state policy, i.e., the RPS; generators would pay back SCE and its customers as they used the line to send wind power to the SCE grid.
- This innovation in transmission planning was the first of its kind and enabled the transmission line to be built before power purchase agreements were signed. It was approved by FERC, and paved the way for billions in new investment and delivery of high-quality wind power to the California gird.
- CEERT believes the same principles can apply to building a backbone transmission line to connect Central Coast offshore wind resource to the California grid at the Diablo Canyon and Morro Bay power plant sites.

Interconnect possibilities – existing basic options



- The interconnect discussions for the Central Coast offshore wind area have been concentrated on:
  - Morro Bay, existing transmission for the old 650 MW power plant
  - Diablo Canyon, using existing transmission of DCPP 2 GW
- An emerging approach is that each project could connect directly to each Point of Interconnection and incorporate an export cable in each project's economics

Morro Bay Storage



- Vistra Energy Morro Bay Energy Storage project
- 600 MW Lithium-Ion Batteries
- Construction start 2022
- COD: 2024
- Timed for when the 1st unit of Diablo goes offline

The possibility of developing a synergetic Offshore Wind Transmission project to the Morro Bay Wind Resource Area

Concept:

- **3 GW HV line from Offshore Wind Areas to:**
  - Diablo Canyon Point of Interconnection
  - Possibly also Morro Bay, where there would be storage capabilities adding ability for better grid management
- **Wind projects connect offshore to HV line**

Near Term Launch of Offshore Wind

Rationale:

- Given that Morro Bay will already be building an energy storage facility and that it will have interconnection limitations, Diablo Canyon becomes the main natural choice for the region, given its existing high interconnection capacity (approx. 2 GW)
- The Diablo Canyon Economic proposition is a much more salient issue at this point and the repurposing topic attracts many allies and could open up multiple avenues of funding
- Building a single HV transmission line to connect the different leases can bring large economic savings, reduce dramatically the risk for the projects and improve their ultimate Power Purchase Agreement price
- It could also accelerate development by integrating the line within transmission plans and remove barriers for developers to concentrate on the wind projects themselves
- It is also compatible with other needed transmission expansions, to enable solar plus storage projects in the Central Valley, and increase North South transfer capacity

The opportunity

1. Develop the Central Coast Offshore Wind Hub in the most efficient and fast track way possible, saving time and money for California ratepayers
2. Encourage the focused development of an offshore transmission project to the Central Coast offshore wind lease area which could accelerate the launch of offshore wind projects and largely de-risk development of the wind leases.
3. California should explore alternative financing mechanisms for planned offshore transmission and allocation of costs between customers and generators, including the possibility of a public- private partnership with infrastructure investors, public ownership or jointly with utilities
4. Reutilize infrastructure @ Diablo Canyon, possibly for additional proposals for repurposing solutions and driving economic development quickly, post decommissioning: Time is running out for repurposing opportunities to be proposed, funded and captured
5. The Humboldt Offshore Wind Area is also constrained by the lack of transmission, and planning to meet the transmission needs of this region should be included in the public agencies' planning process

California's energy agencies should explore opportunities for a Public-Private solution, allowing the state to fund transmission expenses before costs reach ratepayers.

- The FERC-regulated Transmission Access Charge (TAC) grants a generous Rate of Return to the utility.
  - Results in an interest rate of ~18% to finance those investments (after taxes).
  - Tax-free, State-backed revenue bonds could yield an interest rate of ~5%.
- This is similar to a consumer refinancing credit card debt through a home equity loan to lower monthly payments.
- A private/public partnership between experienced private infrastructure developers, the State of California, CAISO, investors, and public owned utilities could be the model for an innovative, cost-effective, and timely approach to laying the foundation for the launch of California offshore wind industry.

Western Area Power Administration
Tracey LeBeau and Jennifer Rodgers

Investing in the Stronger Grid of the Future

Transmission Infrastructure Program

Overview for Joint Agency Workshop for California SB 100

July 2021

Western Area Power Administration

$3.25 Billion Loan Authority

The Transmission Infrastructure Program (TIP) manages WAPA's $3.25 Billion revolving loan program. A unique federal financing program, TIP has as its core a congressional mandate to support the development of projects that facilitate and optimize the delivery of reliable, affordable power generated by clean energy resources.

Program Goals

- Attract substantial private and other co-investment in transmission infrastructure and related projects
- Provide private developers with siting, permitting and development assistance to reduce project and schedule risks
- Contribute to lowering the cost of capital, making projects more competitive and beneficial to rate payers
- Assisting to help de-risk project finance during pre-construction and construction

Portfolio Management Fundamentals

- Diverse portfolio structured by loan & project types & in various markets
- Integrated approach to risk management, including loan portfolio controls linked to audit and oversight requirements and industry standards for underwriting
- Continuous improvement approach for rebalancing risks, engaging range of stakeholders, and tailoring approach for market relevance

Program Assistance Available

Financing

Eligible construction-ready projects may apply to TIP to borrow capital to construct new or upgrade existing grid infrastructure

Project Development

Prior to a loan application, eligible projects can request technical assistance on typical development activities. Applicants provide advance funding to cover costs.

Statutory TIP Eligibility Criteria

- Transmission or related infrastructure (e.g., commercially deployed utility scale storage)
- Has one terminus within WAPA's 15-state service territory
- Facilitates the delivery of renewables
- Demonstrates reasonable expectation of repayment
- Will not adversely impact transmission system reliability or operations
- Is found to be in the public interest

Benefits to Infrastructure Investor Developers

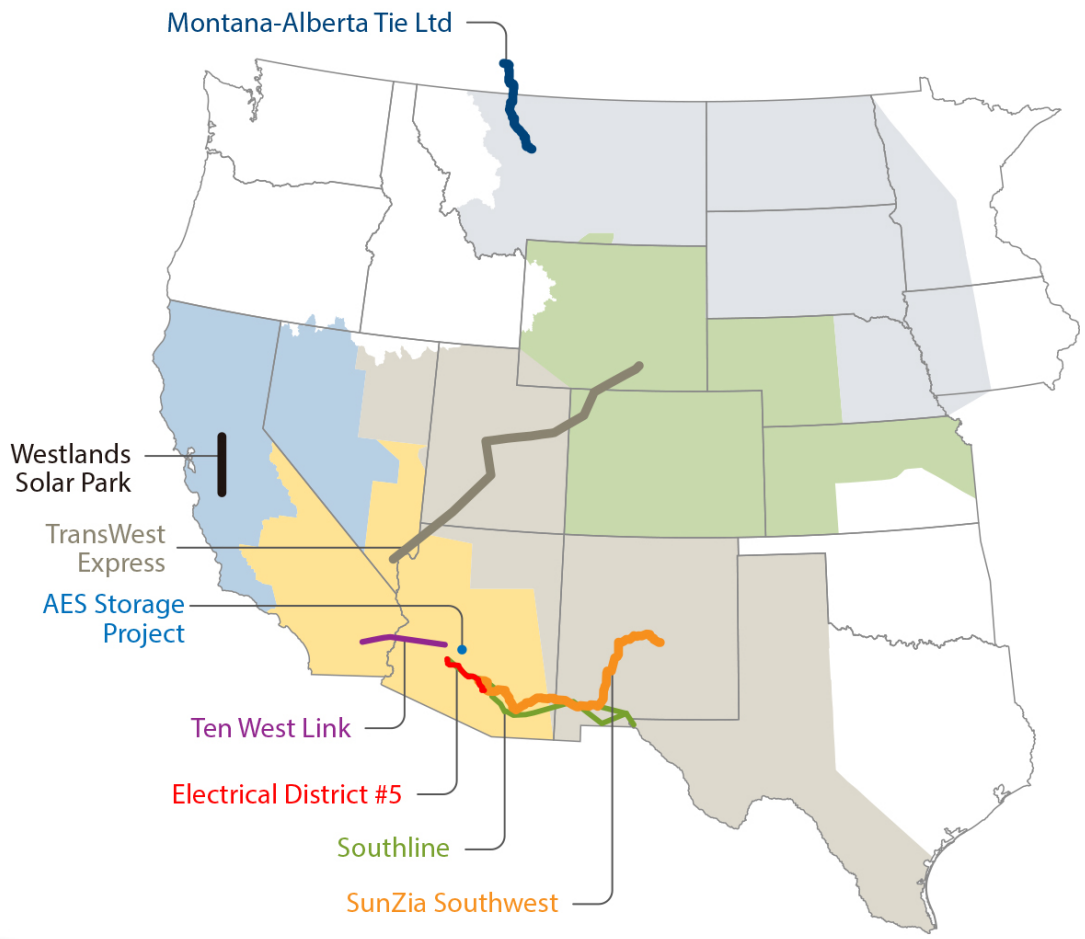
- WAPA can assist with navigating complex world of NEPA and other siting, permitting requirements, often acting as lead or cooperating agency
- WAPA is a valued partner by offering knowledgeable financial and utility sector risk mitigation during development and construction
- Developers leverage WAPA's project development knowledge, e.g., engineering and path rating work, interconnection expertise, financial and risk analysis specific to infrastructure, stakeholder engagement and navigating commercial market challenges
- Cost and timing of debt, targeted during construction, addresses a market challenge

Types of Financing

Pre-Construction	• Not to exceed 1 year • Requires applicant to arrange for take out, long-term asset financing
Construction Only	• Formal program preferred • Requires applicant to arrange for take out, long-term asset financing • Typically, 2-4 years
Term	• Typically, not to exceed 10 years, but can coincide with length of off-take contract(s) • Requires applicant to arrange for take out, long-term asset financing

Representative TIP Projects

Operational, Repaid or Advance Funded Development Assistance



Financed

Electrical District 5 – Palo Verde Hub: $91M loan, In service January 2015; Loan in Repayment. 110-mile transmission line in solar rich Arizona serves customers in Arizona, S. California and Nevada

Montana Alberta Tie: $161M loan, In service 2013; construction loan fully repaid. 214-mile, 230-kV transmission line to deliver wind energy to interconnected markets.

TransWest Express: $25M loan, Under development; development loan repaid April 2019. (See Project Description Below)

Development/Pre-Financing

AES Storage Project: Proposed utility-scale 100MW battery energy storage project in Maricopa county Arizona.

Ten West: CAISO Project - 110 mi 500kV single circuit line from Delaney Substation (AZ) to Colorado River Substation (CA) and associated facilities.

TransWest: Proposed 725 mi 500kV HVDC transmission line from Wyoming to Nevada. 3000MW capacity. Phase I: 1500MW; Phase II 1500MW.

Southline: Proposed 360 mi 345kV and 230kV; upgrade of a double circuit AC line (Western's Parker Davis line) + new build AC line and associated facilities. Bi-directional flow planned.

SunZia: Federally permitted 515 mi 500kV AC transmission project; bidirectional.

Westlands: Proposed 154 mi 230kV transmission line from 3,000 MW solar park to Tracy Substation and associated facilities.

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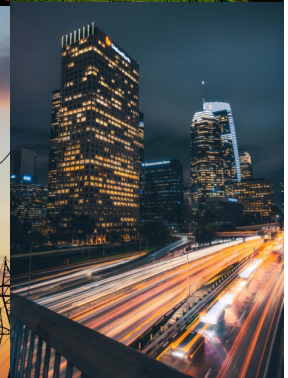
Los Angeles Department of Water and Power
Simon Zewdu



LA100

The Los Angeles 100% Renewable Energy Study

LA City Council motions directed LADWP to evaluate:

- What are the **pathways and costs to achieve a 100% renewable electricity supply** while electrifying key end uses and maintaining the current high degree of reliability?
- What are the potential benefits to **the environment** and **health**?
- How might **local jobs** and the **economy** change?
- How can communities shape these changes to prioritize **environmental justice?**

Scenarios Based on Advisory Group Priorities

Each Scenario Evaluated Under Different Customer Demand Projections (different levels of energy efficiency, electrification, and demand response)

- Moderate
- High
- Stress

SB100

Evaluated under Moderate, High, and Stress Load Electrification

- 100% clean energy by **2045**
- Only scenario with a target based on retail sales, not generation
- Only scenario that allows up to 10% of the target to be natural gas offset by renewable electricity credits
- Allows existing nuclear and upgrades to transmission

Early & No Biofuels

Evaluated under Moderate and High Load Electrification

- 100% clean energy by **2035**, 10 years sooner than other scenarios
- No natural gas generation or biofuels
- Allows existing nuclear and upgrades to transmission

Limited New Transmission

Evaluated under Moderate and High Load Electrification

- 100% clean energy by **2045**
- Only scenario that does not allow upgrades to transmission beyond currently planned projects
- No natural gas or nuclear generation

Transmission Focus

Evaluated under Moderate and High Load Electrification

- 100% clean energy by **2045**
- Only scenario that builds new transmission corridors
- No natural gas or nuclear generation

LA100 Study

The 100 Percent Renewable Energy Study was completed and final report was released on March 24, 2021.

- 100% renewable energy is achievable through multiple pathways
- We can achieve 100% by 2035
- Rate impacts will approximately track inflation if we see building and transportation electrification
- Significant investment (approx. $50-80B) and job creation
- There will be significant growth in customer-facing programs like rooftop solar, storage, demand response and electric vehicles

Across All LA100 Scenarios

Electrification
Efficiency
Flexible Load

Customer
Rooftop Solar

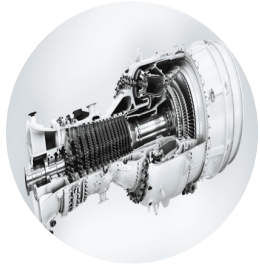
Renewable
Energy

Solar: + >5,700 MW
Wind: + >4,300 MW

Storage

+ >2,600 MW

Transmission,
Distribution



Renewably Fueled
Dispatchable
Turbines

+>2,600 MW
(in basin)

Much More

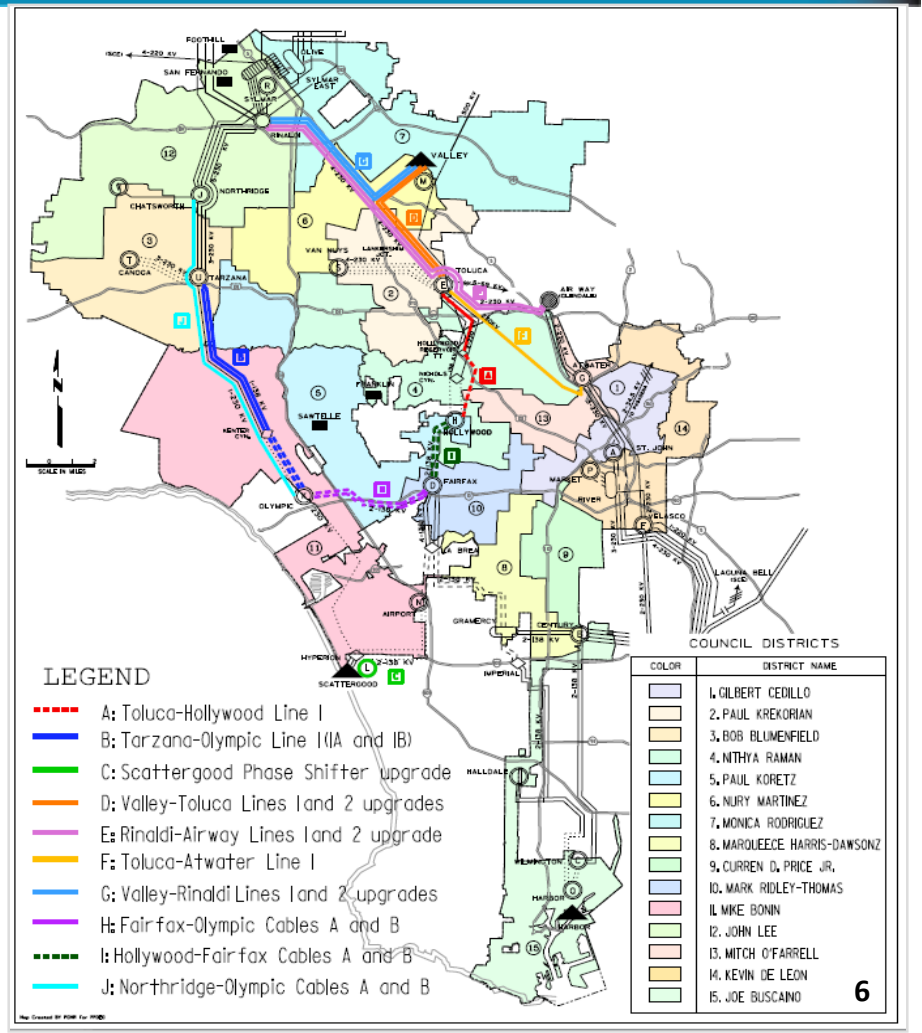
Natural gas → Biofuel/ hydrogen	
Today: Daily	**Future:** Infrequently

LA100 Transmission Needs

- LADWP Transmission studies have identified deficiencies in local transmission capacities
- Additional transmission capacities are needed to support LA100
- **The planning, design, and the timely delivery of such transmission capacities are critical**

Accelerate Local Transmission Projects

- 10 Transmission Projects over 10 years to bring renewable power where its needed within the City
- **Flexible generation capacity in-basin needed to complete transmission projects in time for 2035**



LA100 Transmission Challenges

- Unprecedented number of transmission projects are needed
- How are we going to build those projects?
- Would existing State practices and policies help?

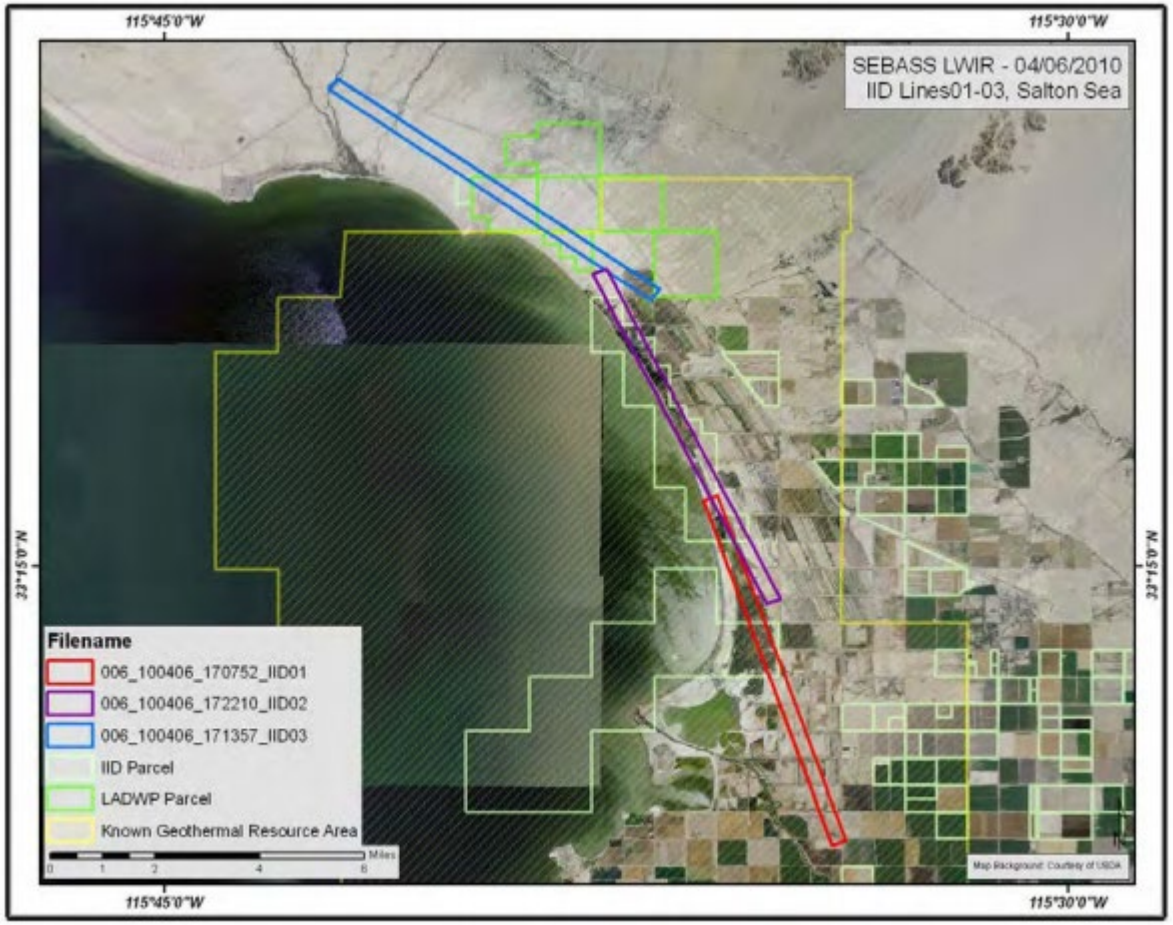
Items for Consideration

- Have targets for transmission development consistent with RPS/Decarbonization goals
- Provide relief in transmission permitting and siting
- Expedite transmission projects in California
- Collaboration – Conduct regularly joint studies among electric utilities and balancing authorities in California to achieve RPS goal of 100% in a manner that ensures system reliability
- Investigate Major Transmission Corridors that maximize energy transfer in and out of California and potential upgrade

Questions?

Imperial Irrigation District
Enrique Martinez

Geothermal Region



IID
A century of service.

Recent Events

- CTR – GM partnership
  - *Multi-million dollar partnership related to lithium mining*
  - *Waiting on details to emerge*

- CPUC Renewable Resource Order
  - *LSE to procure 1000MW of Geothermal*
  - *Required by 2025*

IID Geothermal Interconnections

- Over 600MW currently interconnected
- Multiple interconnection requests
  - *550MW of geothermal in queue*
  - *15MW of new geothermal waiting for COD*
  - *Regional interest from mineral resource miners*
- Geothermal exploration driven by both energy and mineral extraction

Requirements for Geothermal Expansion

- IID
  - New Transmission
    - *~75 miles from geothermal region to Path 42*
    - *Functional requirements scale with amount of geothermal influx*
    - *Likely to come as Network Upgrades from Interconnection Projects*
  - Upgrading existing transmission
    - *Limiting RAS penetration*
    - *Bottleneck elimination/underlying 92kV system*
    - *Upgrade existing infrastructure*
- CAISO
  - MIC into CAISO
    - *ATC on CAISO tie lines*
    - *CAISO-end upgrades*

California Municipal Utilities Association
Tony Braun

POU Collaborative Transmission Planning – Building on Past Success

Joint Agency Workshop,

July 22, 2021

BB SW | Braun Blaising Smith Wynne

Look Back at Regional Transmission Planning and Possible Lessons Learned

- POUs Have a Strong History of Regional Transmission Development
- A Look at How and Why Major Projects Were Built
- Do Any Lessons Carry over to Today?

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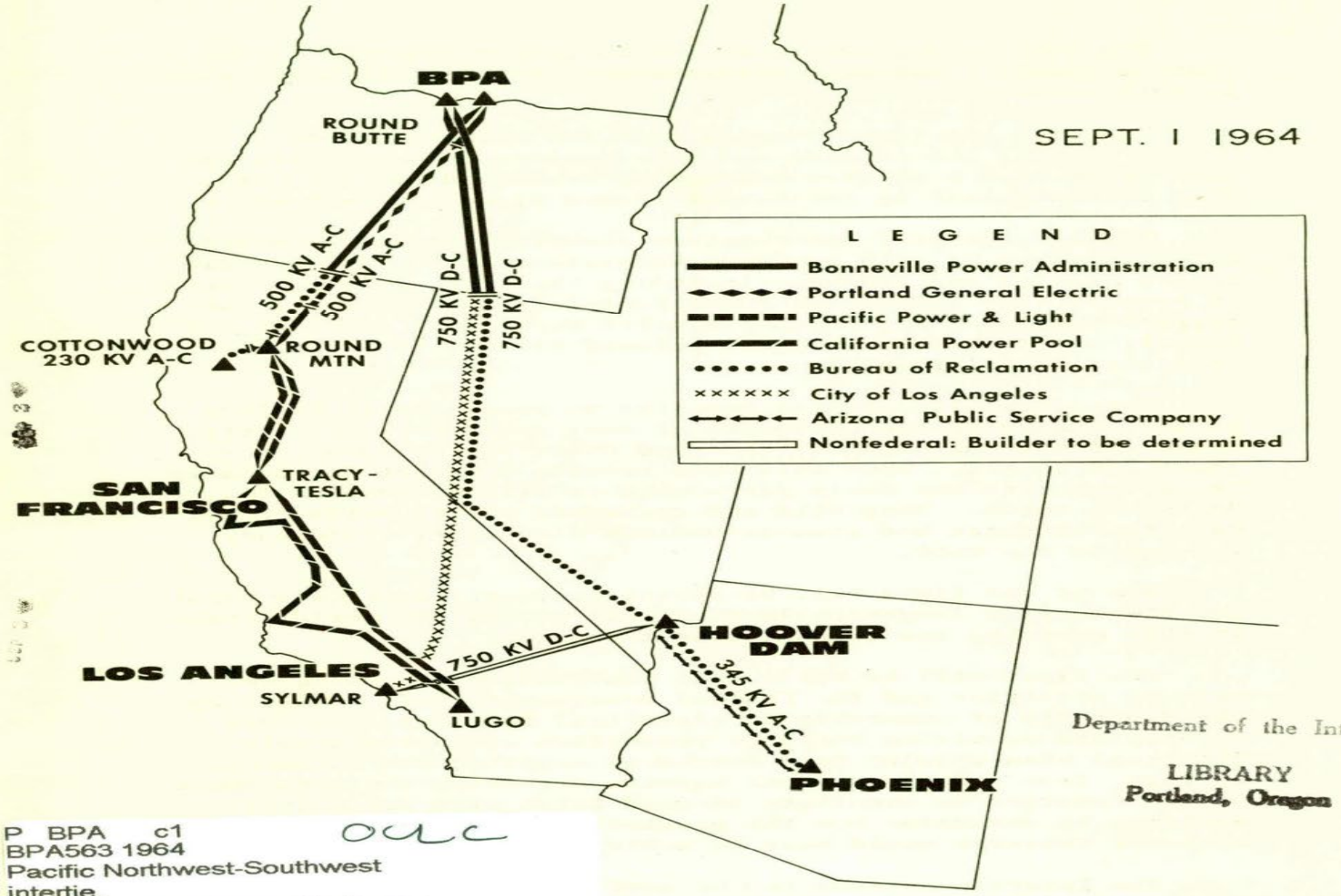
PACIFIC NORTHWEST - SOUTHWEST INTERTIE



Legend shows who will build power lines. Intertie would permit exchanges of power, open markets for NW seasonal surpluses, do much to keep NW power rates low. Total cost $700 million. Total benefits $2.6 billion.


Captain Jack
BA tie to BPA
PacifiCorp-West
BPA
USBR
(1220 MW)
Trinity PUD
Shasta Lake
Round Mountain
Redding
Electric Utility
(183 MW Gen)
Olinda
Cottonwood
Balancing Authority
of Northern California
Peak Loads
SMUD 3299 MW
MID 696 MW
Roseville 357 MW
WAPA 332 MW
Redding 253 MW
Shasta 35 MW
Trinity 24 MW
BANC Peak 4906 MW
BANC Generation 5196 MW
Sutter to SMUD
(258 MW)
NV Energy
Folsom
(200 MW)
Roseville Electric
(210 MW Gen)
UARP
(688 MW)
Lake
Nimbus
SMUD
Rancho Seco
CPP (500 MW)
New Melones
to BANC (380 MW)
Tracy
LLNL
Modesto Irrigation
District (471 MW Gen)
BA tie to TID
TID BA
500 kV Lines
230 kV Lines
500 kV Substation
230 kV Substation
115 kV Substation
BA Interties
BA Intertie to CAISO
Generation
Pseudo Tie

Major Regional Facilities in Which POUs Led or Jointly Developed

- COI/PACI, including COTP
- PDCI
- Mead Phoenix
- Mead Adelanto
- Southern Transmission System

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Existing Major Facilities Were Built Through Voluntary Regional Collaboration

- Accessing Sources of Economic Power/Seasonable Exchange/Sales
- Delivery of Long-Term Cost-Effective Power Sources
- Projects were the Product of Voluntary Collaboration and Mutual Agreement
- Key Question: How Can You Revive any Element of the Collaborative Dynamics?

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What Has Changed?

- Shifting Roles and Responsibilities
- Shift Toward Policy Driven Transmission Upgrades Replacing Historical Drivers
- Voluntary Collaboration Replaced with Regulatory Compliance

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What Remains Common?

- The Federal Government is a Major Transmission Owner/Operator/Facilitator
- Public Power Continues to Play Key Role
- Jointly Held Lines Still Work Today in Different Operational Paradigms
- The Reasons for Building Lines Remain Similar
  - Support Grid Reliability
  - Achieve Cost Savings and Efficiencies
  - Reach Desired Power Sources

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Possible Suggestions

- Create Bridges between Portfolio Planning to See if Collaboration is Possible
- Use this Process to Take a Serious Look at Highest Transmission Needs
- POU BAA Process Suggestions in Written Comments
  - Augment Workshops with Technical Teams
  - Focus on Reliability Assessment and Transmission Needs

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Session 2 Public Comment

Rules
- 3 minutes per person
- 1 person per organization

Zoom
- Click "raise hand"

Telephone
- Press *9 to raise hand
- Press *6 to (un)mute

When called upon
- Unmute, spell name, state affiliation, if any

Written Comments:
- Due: 8/11/2021 by 5:00 p.m.
- Docket: 21-SIT-01
- Submit at: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=21-SIT-01

3-MINUTE TIMER

Thank You!