



# **WestConnect**

# **2021 Annual Interregional Information**

Annual Interregional Coordination Meeting  
March 30, 2021

# Topics

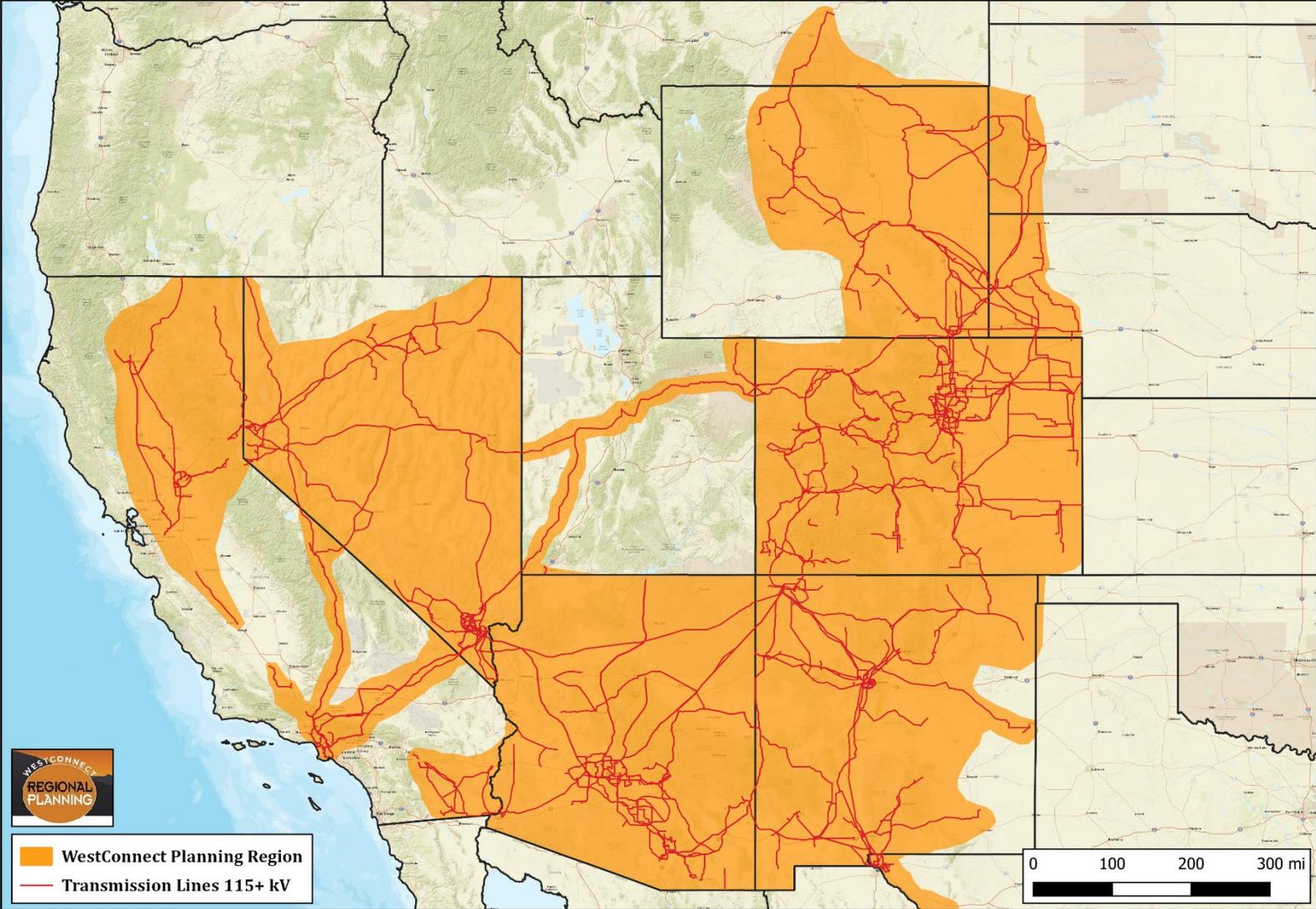
- WestConnect Regional Planning Overview
- 2020-2021 Regional Planning Cycle Update
  - WestConnect Regional Needs Assessment
  - 2021 Planning Activities
- Interregional Transmission Projects
- Upcoming Meetings



# WestConnect Regional Planning Overview

Heidi Pacini, WestConnect Project Manager

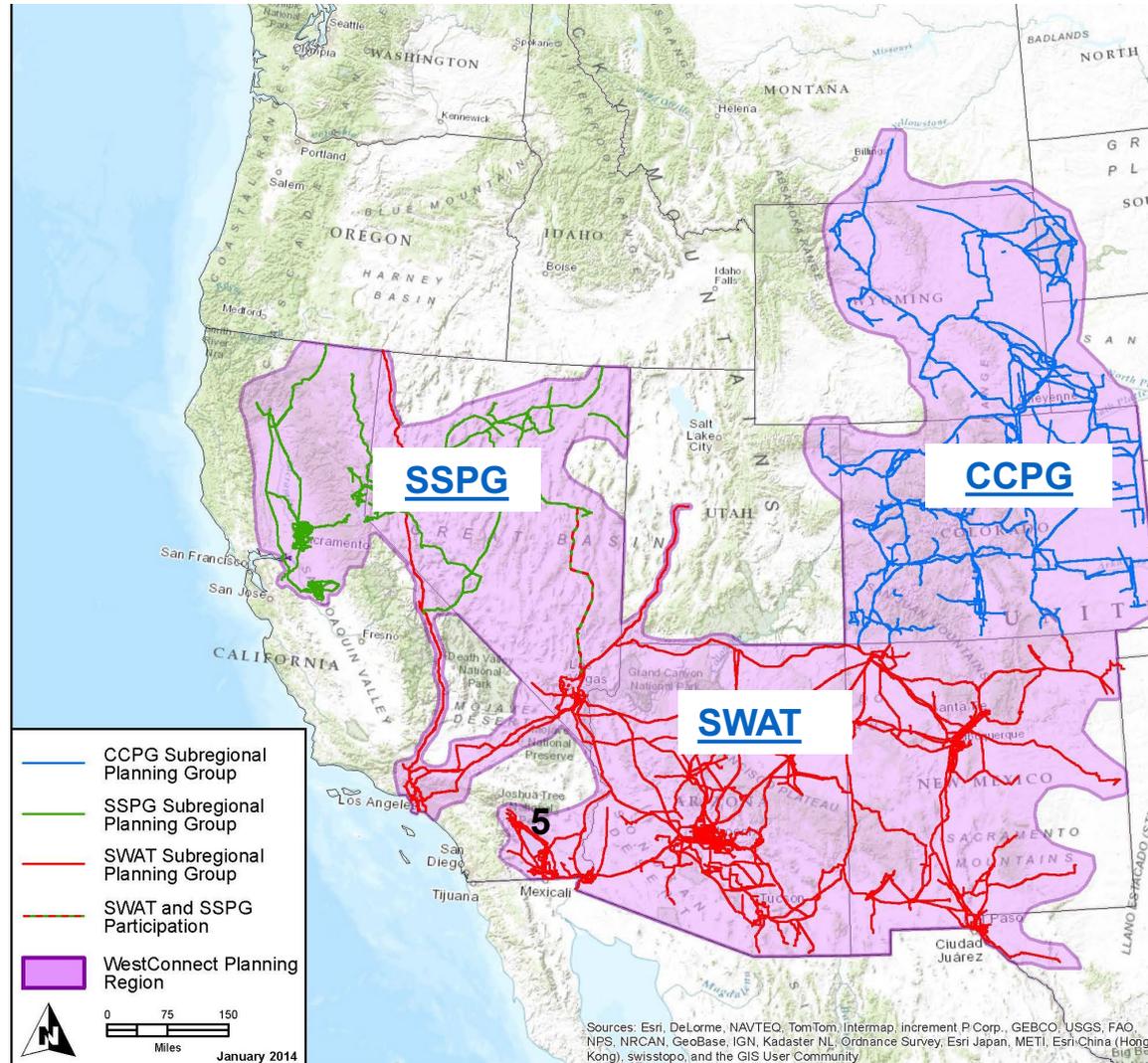
# WestConnect Planning Region



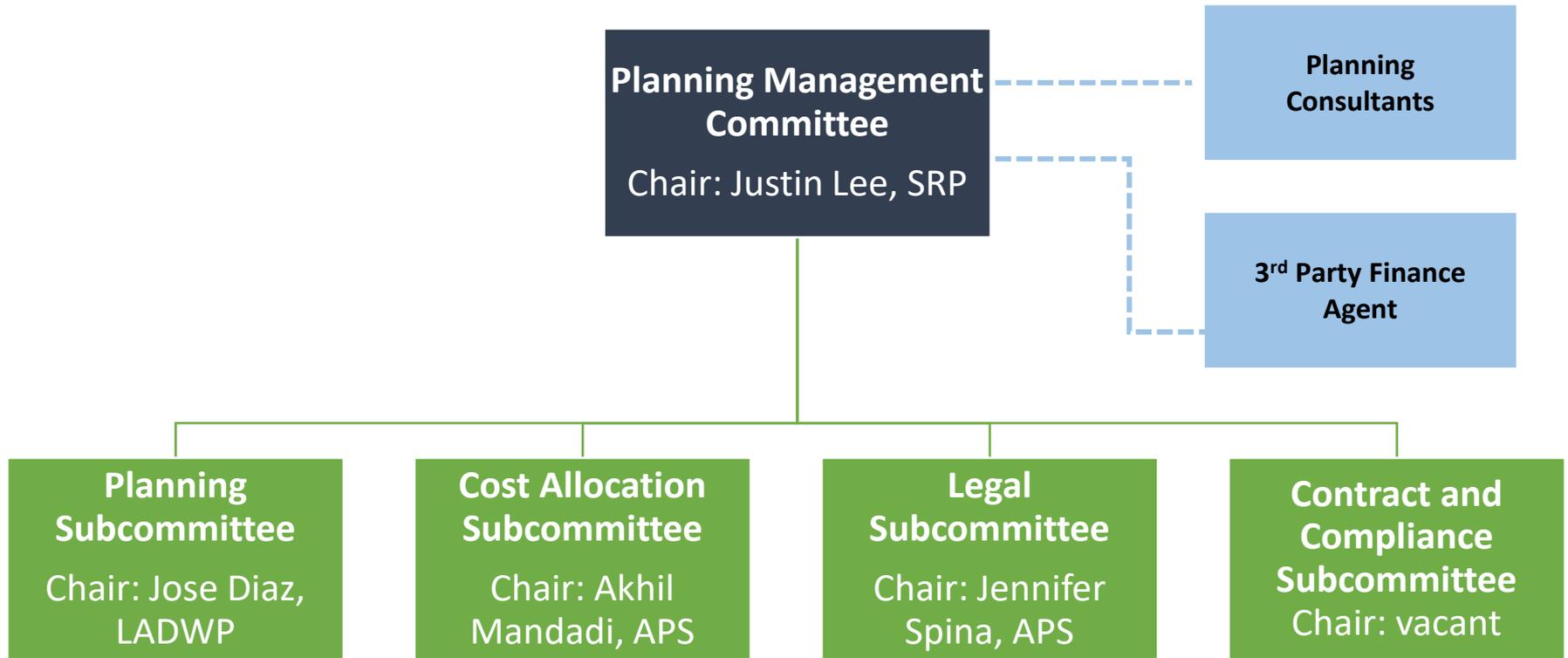
WestConnect



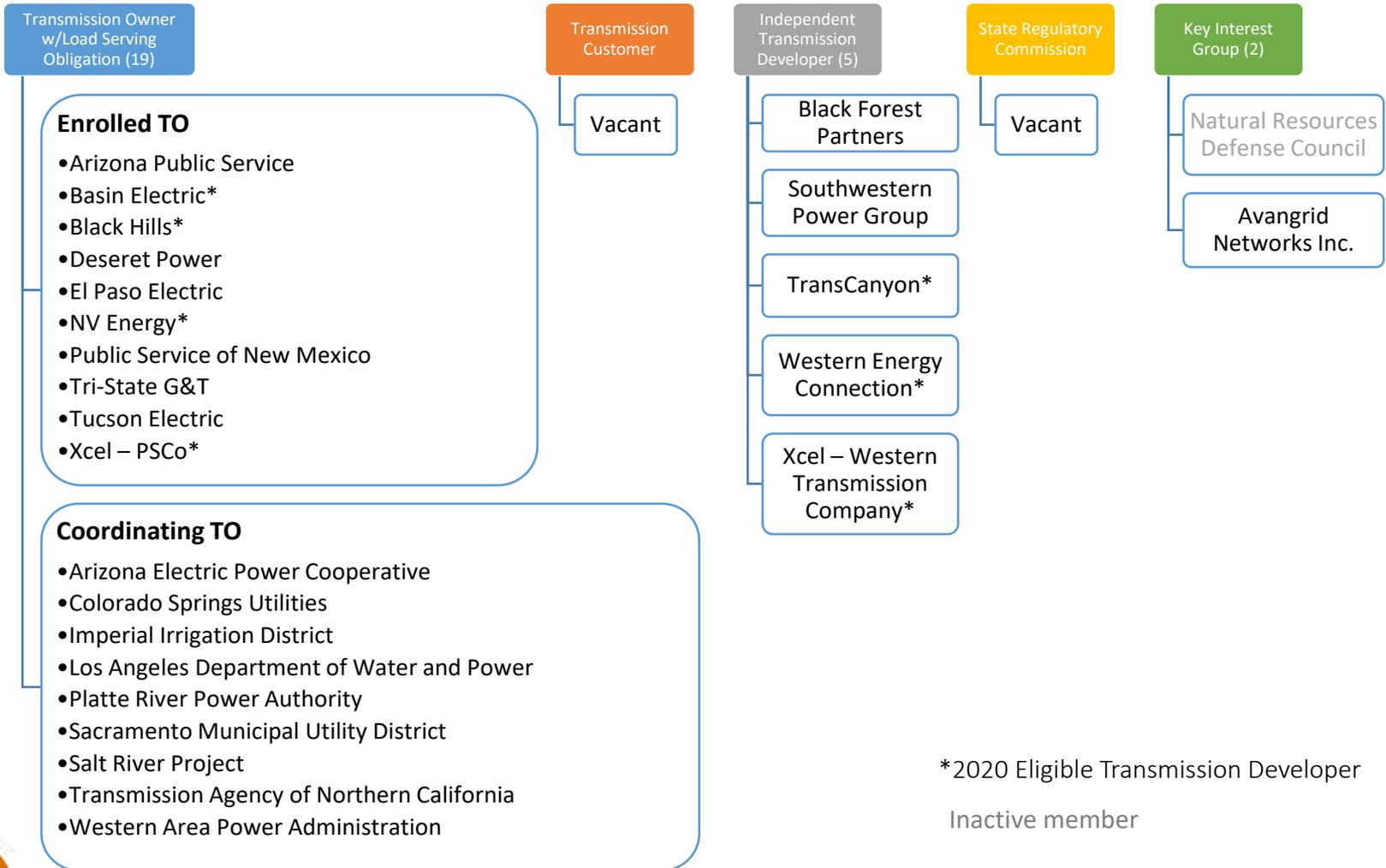
# Subregional Planning Groups



# PMC Organization



# PMC Membership as of 1/1/2021



\*2020 Eligible Transmission Developer  
Inactive member

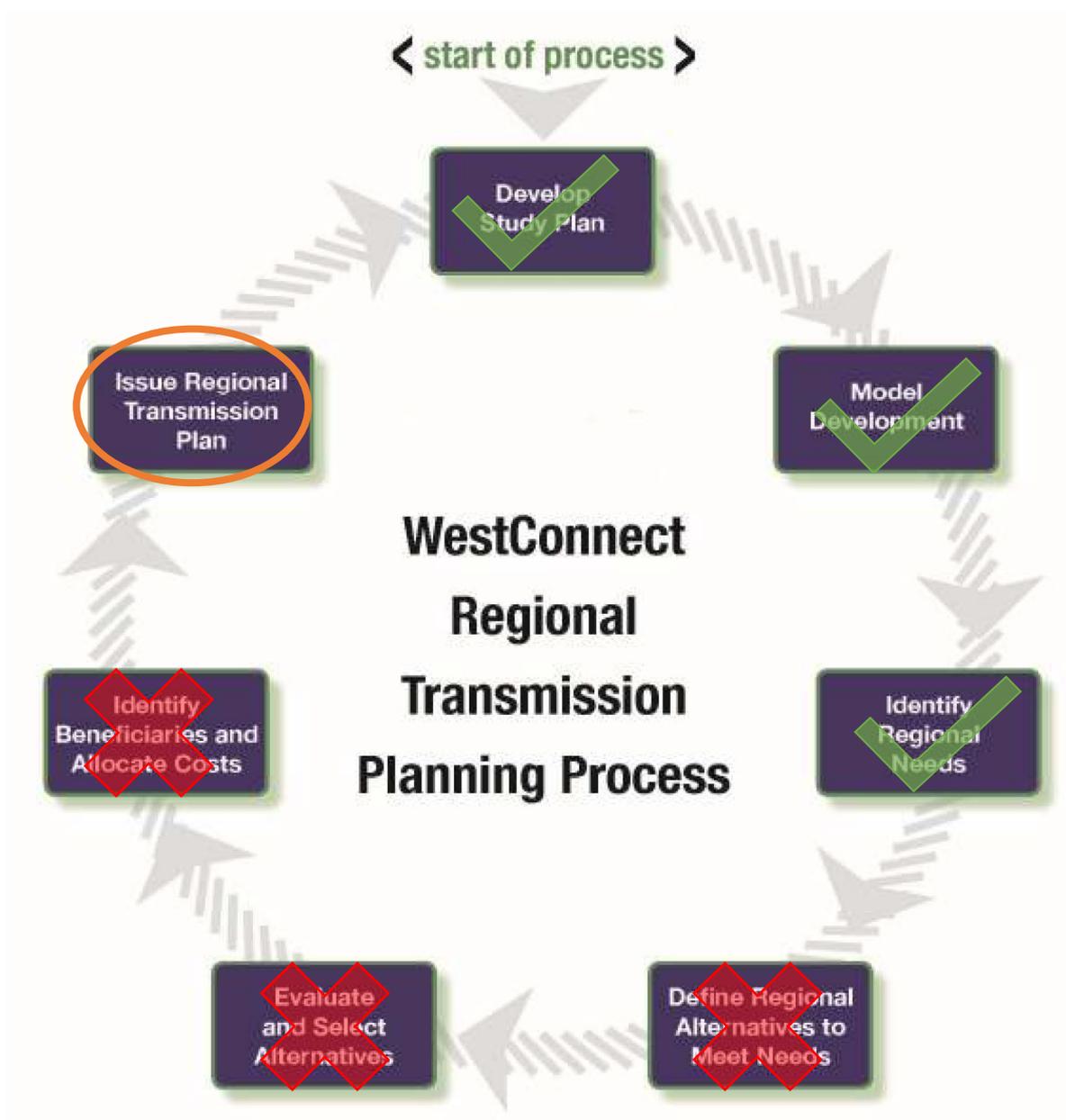
# PMC Activities

- Monthly meetings held via WebEx, at least through June 2021
- Meetings are posted to the [WestConnect Calendar](#)
- Manages the Regional Transmission Planning Process
- Currently monitoring the Planning Subcommittee's work on the 2020-21 scenario studies



# 2020-21 Regional Planning Cycle Update

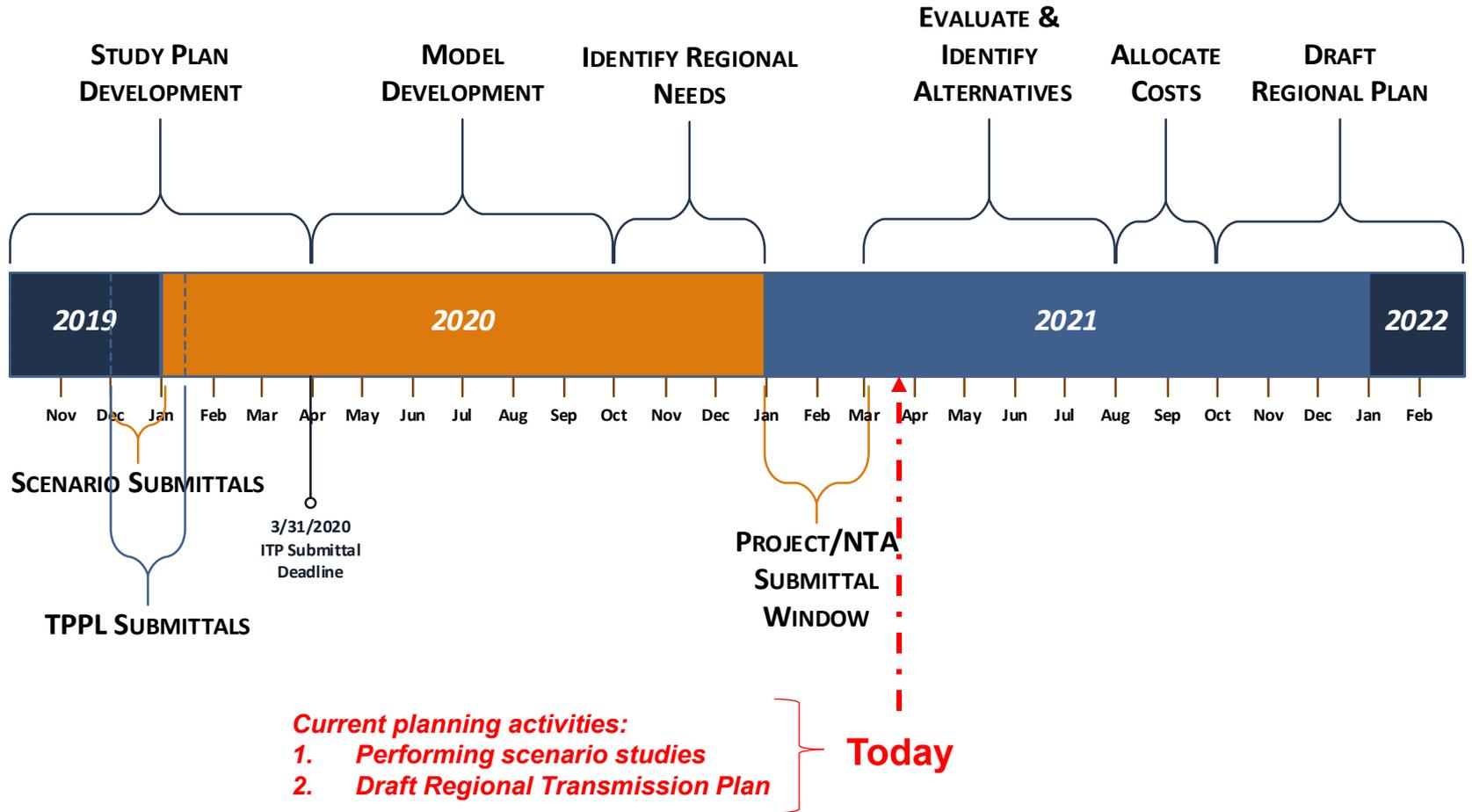
Ben Brownlee, WestConnect Planning Consultant,  
Energy Strategies



# Key Planning Tasks are Complete

- [2020-21 Study Plan](#)
  - Identifies reliability and economic Base Cases (which inform the Regional Assessment), the Base Transmission Plan, and the scope of the Regional Assessments
  - Includes two information-only scenario studies: Committed uses economic assessment and New Mexico export stress reliability assessment
- 2030 Regional Reliability and Economic Base Cases are complete
  - [Model Development Report is publicly posted](#)
- 2021-21 Regional Needs Assessment is complete
  - ***No regional transmission needs were identified in the 2020-21 Regional Planning Cycle***
  - Reliability analyses: Neither the Heavy Summer or Light Spring assessments identified regionally significant reliability issues that were between two or more WestConnect members or impacted two or more WestConnect members
  - Economic analysis: There was no regionally significant congestion identified in the base case, and thus, there were no identified regional economic needs
  - Public Policy analysis: no identified public policy needs, based on two findings:
    - No regional reliability or economic needs, so none driven by enacted public policy requirements.
    - Stakeholders did not suggest or recommend the identification of a regional public policy-driven transmission need based on the enacted public policies driving local transmission needs and the associated list of local public policy-driven transmission projects.
  - [Regional Needs Assessment Report is publicly posted](#)
- Scenario studies are underway

# 2020-21 Process Timeline



# Models Approved for Regional Assessment

WestConnect Base Case Name	Study Type	Case Description
2030 Heavy Summer	Reliability	Summer peak load conditions during 1500 to 1700 MDT, with typical flows throughout the Western Interconnection.
2030 Light Spring	Reliability	Light load conditions during 1000 to 1400 MDT in spring months of March, April, and May with solar and wind serving a significant but realistic portion of the Western Interconnection total load. Case includes renewable resource <i>capacity</i> consistent with any applicable and enacted public policy requirements.
2030 Base Case	Economic	Business-as-usual, expected-future case with median load and hydro conditions and representation of resources consistent with enacted public policies.

- Models encompass the local TO planned load and resources, as well as the WestConnect 2020-21 Base Transmission Plan presented during the WestConnect stakeholder meeting on [November 19, 2020](#)
- Full model details are available in the [Model Development Report](#)

# Regional Reliability Assessment

- Assessment for regional needs was based on reliability standards adopted by the North American Electric Reliability Corporation (NERC) [TPL-001-4 Table 1](#) (P0 and P1) and [TPL-001-WECC-CRT-3.2](#) (Transmission System Planning Performance WECC Regional Criterion)
- Steady state contingency analysis:
  - Limited to N-1 contingencies for elements 230-kV and above, generator step-up transformers for generation with at least 200 MW capacity, and member-requested N-2 contingencies.
  - All bulk electric system (BES) branches and buses – i.e., elements above 90-kV – in WECC were monitored
- Transient stability analysis:
  - Limited to contingencies that could have a regional impact: 10 major contingencies across system

**Results are available in Appendix B of the [2020-21 Regional Transmission Needs Assessment Report](#)**

# Steady State Contingency Analysis

- Issues under no disturbance (N-0): None
- Issues under disturbance:
  - 2030 Light Spring Base Case PF: No Issues
  - 2030 Heavy Summer Base Case PF: Report references the slides of the [PMC meeting on December 16, 2020](#)
- **No Multi-Owner Issues**

*Technical Reference: 201201\_WC\_2030HS+LSP\_BasePFs\_D7\_Associated\_Materials.xlsm  
in 201201\_WC\_2030HS+LSP\_Final\_Base\_PF\_Cases.zip (<https://wcenergygroup1.egnyte.com/>)*

# Transient Stability Analysis – Disturbances

1. 1 PV gen terminal fault: Tripping 1 Palo Verde (PV) generator and its generator step-up (GSU) transformer with 3-phase fault on the Palo Verde generator terminal bus
2. Com-DP: Tripping Daniel Park-Comanche 345kv Lines 1 & 2 with fault at the Comanche 345kV bus
3. MS-Wind: Fault on Missile Site 345kV Bus, loss of Missile Site – Daniels Park 345kV Lines, and loss of Limon Wind Generation
4. LRS-Fault: Fault on Laramie River 345kV Bus, loss of Laramie River – Ault 345kV Line, & loss of Laramie River #3 Generation
5. JOJOBA-KYRENE: Loss of Jojoba – Kyrene 500kV Line #1 due to 3-phase fault on the end with the most severe fault
6. PALOVRDE-RUDD: Loss of Palo Verde – Rudd 500kV Line #1 due to 3-phase fault on the end with the most severe fault
7. PALOVRDE-WESTWING: Loss of Palo Verde – West Wing 500kV Line #1 due to 3-phase fault on the end with the most severe fault
8. CaptJack-Olinda: Loss of Captain Jack – Olinda 500kV Line #1 due to 3-phase fault on the end with the most severe fault
9. Olinda-Tracy: Loss of Olinda – Tracy 500kV Line #1 due to 3-phase fault on the end with the most severe fault
10. McCullough-Victorville: Loss of McCullough – Victorville 500kV Line #1 due to 3-phase fault on the end with the most severe fault

# Transient Stability Analysis – Summary

Disturbance			HS Summary				LSP Summary			
Area Name	Owner Name	Name	Violations	Tripped Load (Unrestored)	Tripped Gen	Islanded Load	Violations	Tripped Load (Unrestored)	Tripped Gen	Islanded Load
WestConnect	WestConnect	Base	0	0	0	0	0	0	0	0
ARIZONA	APS, City of LA, EPE, IID, PNM, SRP, SCE, SCPA	1PV	0	0	0	0	0	0	406	0
PSCOLORADO	Xcel/PSCO	DP-Com	0	160	0	0	0	54	0	0
PSCOLORADO	Xcel/PSCO	MS-Wind	0	132	126	0	0	52	222	0
WAPA R.M.	BEPC, TSGT	LRS-Fault	0	20	0	0	0	7	96	0
SRP	Salt River Project	JOJOBA-KYRENE	0	1010	0	0	0	195	310	0
SRP	Salt River Project	PALOVRDE-RUDD	0	2368	0	0	0	466	324	0
APS, SRP	Salt River Project	PALOVRDE-WESTWING	0	2478	0	0	0	466	324	0
NORTHWEST, PG AND E	Bonneville Power Admin, California-Oregon Trans. Project, Pacific Gas and Electric, WAPA - SNR	CaptJack-Olinda	0	553	0	0	0	45	160	0
PG AND E	California-Oregon Trans. Project, Pacific Gas and Electric, WAPA - SNR	Olinda-Tracy	0	21	0	0	0	2	160	0
LADWP	City of Los Angeles	McCullough-Victorville	0	0	0	0	0	0	0	0

**No Violations, & the unrestored load & tripped gen reported by the simulations is acceptable per TPL standards (see Table 1 in [TPL-001-4](#))**

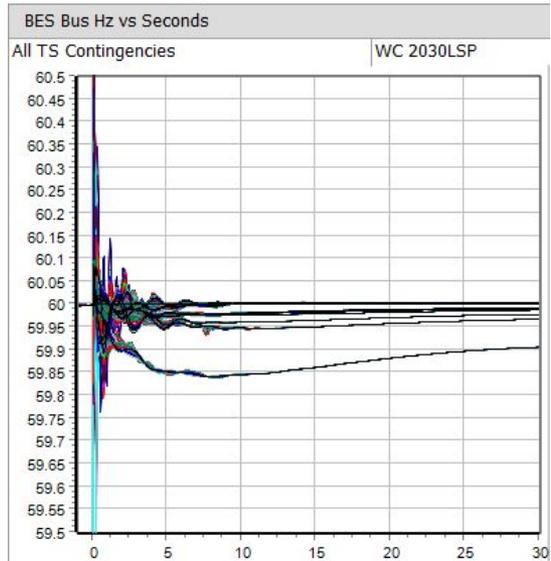
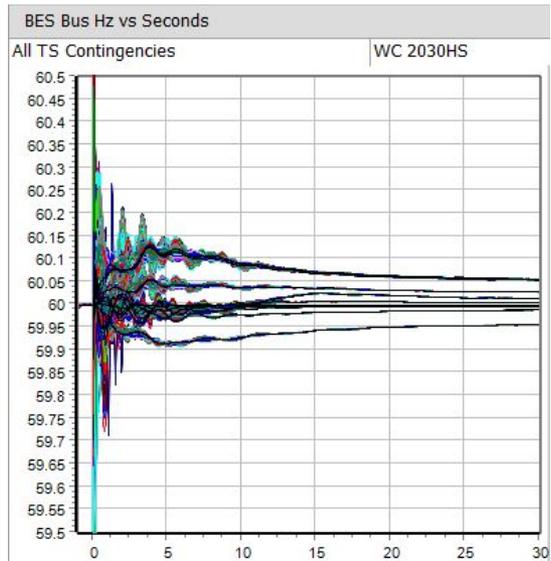
- Note “c.” in [TPL-001-4](#): Simulate the removal of all elements that Protection Systems and other controls are expected to automatically disconnect for each event.
- Note “b.” in [TPL-001-4](#): Consequential Load Loss as well as generation loss is acceptable as a consequence of any event excluding P0.

Technical Reference: 201201\_WC\_2030HS+LSP\_BasePFs\_D7\_Associated\_Materials.xlsm  
in 201201\_WC\_2030HS+LSP\_Final\_Base\_PF\_Cases.zip (<https://wcenergygroup1.egnyte.com/>)

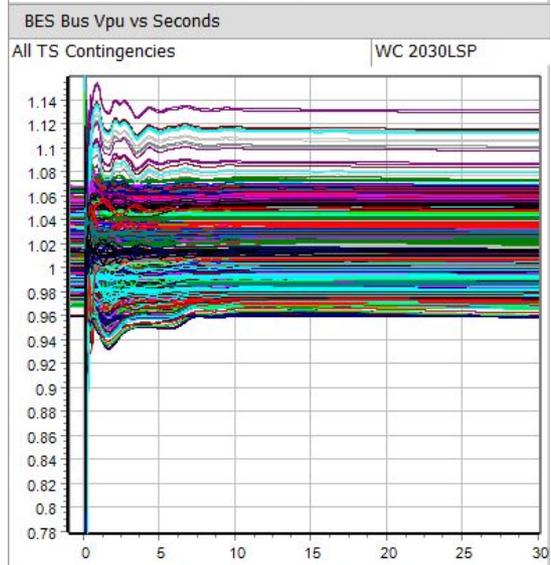
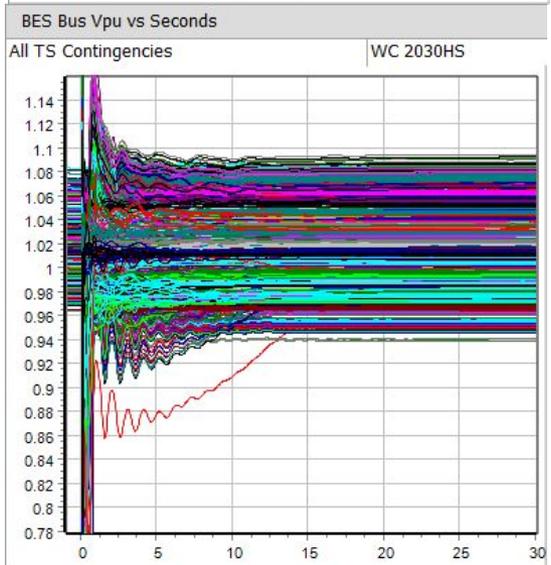
# Transient Stability Analysis – Voltage and Frequency Recovery of All Disturbances

## Heavy Summer

## Light Spring



BES Bus  
Freq  
(Hz)



BES Bus  
Voltage  
(per unit)

Technical Reference: 201201\_WC\_2030HS+LSP\_BasePFs\_D7\_Associated\_Materials.xlsm  
in 201201\_WC\_2030HS+LSP\_Final\_Base\_PF\_Cases.zip (<https://wcenergygroup1.egnyte.com/>)

# Regional Economic Assessment

- Objective was to arrive at a set of congested elements that warranted testing for the economic potential for a regional project solution, recognizing that the presence of congestion does not always equate to a regional need for congestion relief at a particular location
- The congestion analysis was limited to:
  - Transmission elements (or paths/interfaces) between multiple WestConnect member TOs;
  - Transmission elements (or paths/interfaces) owned by multiple WestConnect member TOs; and
  - Congestion occurring within the footprints of multiple TOs that has potential to be addressed by a regional transmission project or non-transmission alternative.
- Congestion within a single TO's footprint (and not reasonably related or tied to other TO footprints) is out of scope of the regional planning effort and is alternatively subject to Order 890 economic planning requirements
- The assessment included a sensitivity analysis to better understand whether regional transmission congestion may be impacted by adjusting certain input assumptions subject to significant uncertainty. Four sensitivities of interest were selected: High Load, Low Hydro, High Gas Price, and System-Wide Carbon Emission Cost.

**Results are available in Appendix C of the [2020-21 Regional Transmission Needs Assessment Report](#).**

**WestConnect**

# Economic Sensitivity Study Case Assumptions

- 1. 2030 High Load Sensitivity Case:** The hourly load shapes of the Balancing Authority Areas (BAAs) within WestConnect were scaled up so their annual peak and energy was beyond their values in the 2030 Base Case. The WestConnect BAAs total coincident annual peak load and load energy in this case ended up being higher than the 2030 Base Case by 8,644 MW (14%) and 45,591 GWh (15%), respectively.
- 2. 2030 Low Hydro Sensitivity Case:** The hydro modeling was replaced with WECC's 2001-based hydro modeling developed by WECC in conjunction with their 2024 Common Case PCM dataset. The system-wide hydro generation of this case ended up being lower than in the 2030 Base Case by 40,249 GWh (17%).
- 3. 2030 High Gas Price Sensitivity Case:** All the natural gas prices were increased to 140% of their value in the 2030 Base Case.
- 4. 2030 System-Wide Carbon Emission Cost Sensitivity Case:** Applied CO2 emission charges to all generators in WECC.

# Final Draft Base PCM & Sensitivity PCM Annual Congestion Results *Seams Results Only*

Element Information		Congestion Hours (% Hrs) / Cost (\$)					Regional Need	Determination
		[& Penalty Cost Component of Congestion Cost (if any)]						
Owner/ Operator(s)	Branch/Path Name	Base Case	Sensitivity Cases (Results filtered to only show changes to the congestion in the Base Case)					
		2030 Base Case	High Gas Price Sensitivity	High Load Sensitivity	Low Hydro Sensitivity	System-wide Carbon Emission Cost Sensitivity		
Imperial Irrigation District Southern California Edison	P42 IID-SCE Interface	281 (3%) / 7,264K	268 (3%) / 7,197K	102 (1%) / 1,373K	341 (4%) / 9,033K	265 (3%) / 6,155K	N/A	Single system issue on border of region
Southern California Edison City of Los Angeles	P61 Lugo-Victorville 500 kV Line Interface	176 (2%) / 2,960K	133 (2%) / 1,985K	226 (3%) / 5,846K	137 (2%) / 2,617K	205 (2%) / 5,353K	N/A	Single system issue on border of region
Intermountain Power Agency PacifiCorp - East	INTERMT-MONA 345kV Line Ckt 1&2 (26043_65995_1&2 )	459 (5%) / 2,262K	498 (6%) / 2,525K	573 (7%) / 3,470K	411 (5%) / 2,482K	920 (11%) / 8,919K	N/A	Single system issue on border of region
Bonneville Power Admin PacifiCorp - West TANC	P66 COI Interface	123 (1%) / 1,644K	112 (1%) / 1,974K	86 (0.98%) / 1,215K	9 (0.10%) / 647K	16 (0.18%) / 174K	N/A	Single system issue on border of region
Intermountain Power Agency PacifiCorp - East	P28 Intermountain-Mona 345 kV Interface	2 (0.02%) / 5K			1 (0.01%) / 0.64K	2 (0.02%) / 11K	N/A	Single system issue on border of region
City of Los Angeles Southern California Edison	P41 Sylmar to SCE Interface	1 (0.01%) / 4K	1 (0.01%) / 0.86K	36 (0.41%) / 182K			N/A	Single system issue on border of region
Pacific Gas and Electric California-Oregon Trans. Project	P15 Midway-LosBanos Interface	1 (0.01%) / 2K		10 (0.11%) / 129K	1 (0.01%) / 0.67K	6 (0.07%) / 13K	N/A	Single system issue on border of region

Full congestion results were presented in the [PMC meeting on December 16, 2020](#)

Technical Reference: [\\_02\\_Summary Branch & Path Congestion\\_201201\\_WC\\_2030\\_Final\\_Base\\_PCM\\_and\\_SensitivityPCMs.xlsm](#) in [201201\\_WC\\_2030\\_Final\\_Base\\_PCM\\_and\\_SensitivityPCMs\\_Results-SelectReviewTools.zip](#) (<https://wcenergygroup1.egnyte.com/>)



# Public Policy Assessment

- WestConnect begins evaluation by identifying a list of enacted public policies that impact local TOs (see study plan)
- Enacted public policies were incorporated into the base models through the roll-up of local TO plans and their associated load, resource, and transmission assumptions.
- Regional public policy needs can be identified one of two ways:
  - New regional economic or reliability needs driven by enacted Public Policy Requirements; or
  - Stakeholder review of local TO Public Policy Requirements-driven transmission projects and associated suggestions as to whether one or more TO projects may constitute a public policy-driven regional transmission need.
- No regional public policy needs were identified in the 2020-21 planning cycle:
  - ***No regional reliability or economic needs, so none driven by enacted public policy requirements.***
  - ***Stakeholders did not suggest or recommend the identification of regional public policy-driven transmission needs during the comment period between November 19 and December 3, 2020.***
    - *The stakeholder meeting on [November 19, 2020](#) kicked off a stakeholder comment period in which stakeholders were asked to suggest potential regional public policy-driven transmission need based on the enacted public policies driving local transmission needs and the associated list of local public policy-driven transmission projects.*

# 2020-21 Scenario Studies

- In addition to the regional needs assessment, WestConnect also conducts information-only scenario studies that look at alternate but plausible futures.
- Scenarios represent futures with resource, load, and public policy assumptions that are different in one or more ways than what is assumed in the Base Cases.

## Committed Uses Scenario Study

**Purpose:** Improve PCM results.

**Assumptions:** WestConnect Members will work to explicitly model existing contracts – based on OASIS and member-submitted data – for both generator off-take and transmission uses to determine impacts on WestConnect economic study findings. May involve removal or adjustment of certain wheeling charge assumptions. Only firm long-term (month or longer) commitments that are under contracts should be included, such that any requests under study or received (and not currently under contract) would be excluded.

## New Mexico Export Stress Study

**Purpose:** Evaluate the reliability of the WestConnect regional system when power flows east-to-west from New Mexico

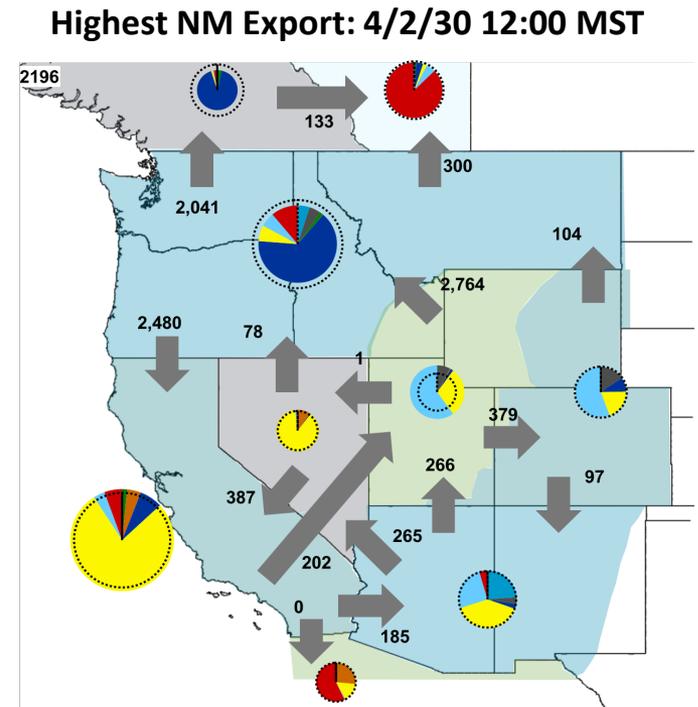
**Assumptions:** Simulation results from the WestConnect 2030 Base Case PCM with New Mexico exports high levels of east-to-west flow across WestConnect will be exported into a reliability model for evaluation.

# Committed Uses (CU) Scenario Study Status Update

- Scope Development References:
  - [High-level Scope in Section 8.2 of 2020-21 Study Plan](#), 3/18/20
  - [Committed Uses PCM White Paper](#), 11/23/2020
  - [Summary of Approach discussed in PS December 2020 meeting](#), 12/14-15/2020
- Draft 1 Committed Uses results and next steps were discussed on [March 17, 2020](#)
- Comments on Draft 1 Committed Uses cases and results were due Friday, March 26, 2021
- Draft 2 models are currently being compiled

# New Mexico Export Stress Study Status Update

- The Planning Subcommittee selected Hour 12 on April 2, 2030 from the Final 2030 Base PCM during its [December 14-15, 2020 meeting](#)
- Draft 1 NM Export Stress PF results were discussed on [February 17, 2020](#)
- Draft 2 results and next steps were discussed on [March 17, 2020](#)
- Draft 3 models and review are underway



# Next Steps for Planning Process

1. Finalize scenario studies
2. Complete Scenario Assessment
  - WestConnect Leadership will be evaluating whether to produce a stand-alone Scenario Assessment Report or just include it in the Regional Transmission Plan report
3. Compile 2020-21 Regional Transmission Plan report

# Interregional Coordination Opportunities

1. WestConnect monitored the development of the WECC 2030 Anchor Data Set (ADS), and pulled several underlying assumptions into its 2030 models:
  - Resource portfolio and load forecast outside of WestConnect
  - Fuel price forecasts and emission rate assumptions, including new coal prices accepted by the WECC PCDS during their [meeting on April 14, 2020](#)
  - Thermal generation modeling assumptions were taken from the [WECC Intertek report dated May 12, 2020](#): Cost per start (warm, median), ramping limits, minimum up and down times, variable operations and maintenance (VOM) cost
2. Coordinated Valley Electric Association (VEA) and San Diego Gas & Electric (SDG&E) solar resource assumptions with the California ISO and SDG&E
3. Boardman to Hemingway 500-kV Line (B2H) (a.k.a. Longhorn to Hemingway) was added for consistency with WECC and NorthernGrid transmission assumptions.

# 2020 ITP Submittals

Project Name	Company	Project Submitted To	Submitted in 2018? Lead Planning Region	Seeking Cost Allocation from WestConnect
<a href="#"><u>Cross-Tie Project</u></a>	TransCanyon, LLC	WestConnect CAISO NTTG & NorthernGrid (NG)	Yes WestConnect	Yes
<a href="#"><u>Northwest Tie Upgrade</u></a>	GridLiance West	WestConnect CAISO	No WestConnect	Yes
<a href="#"><u>SWIP North</u></a>	Western Energy Connection, LLC	WestConnect CAISO NTTG (transferred to NG)	Yes NorthernGrid	Yes
<a href="#"><u>TransWest Express – Multiple configurations</u></a>	TransWest Express, LLC	CAISO NTTG (transferred to NG)	In-part CAISO	No

- *Since WestConnect did not identify any regional transmission needs this planning cycle, WestConnect will not be evaluating any of the ITPs submitted this cycle.*

## Next Meetings

- **April 2021 Meetings:** *all meetings are scheduled as webinars*
  - **PS meeting:** Tuesday, April 20<sup>th</sup>, 9:00 a.m. - 11:00 a.m. MDT
  - **PMC meeting:** Wednesday, April 21<sup>st</sup>, 9:00 a.m. - 12:00 p.m. MDT
- All 2021 meetings are posted to the WestConnect calendar
- All meetings through June 2021 will be held via WebEx

# ADJOURNMENT

Presenter Contact Information:

Heidi Pacini, [heidi@pacenergies.com](mailto:heidi@pacenergies.com)

Jose Diaz, [jose.diaz@ladwp.com](mailto:jose.diaz@ladwp.com)

Ben Brownlee, [bbrownlee@energystrat.com](mailto:bbrownlee@energystrat.com)

Justin Lee, [Justin.Lee@srpnet.com](mailto:Justin.Lee@srpnet.com)