

PNM 2014-2033 Integrated Resource Plan

NOVEMBER 15, 2013



Talk to us.



NOVEMBER 15, 2013

AGENDA

NOVEMBER 15TH

Today's agenda

- Welcome, Introductions, Safety and Ground Rules
- Old business
 - Describe the integration of the demand projections and the energy efficiency projections that have been presented at previous meetings
 - Fuel price discussion
 - Water intensity graph
 - Wind price sensitivity analysis
 - Work plan and schedule
- New business
 - Transmission presentation
- Wrap Up

SAFETY AND LOGISTICS

- Fire escape routes via stairways at east and west ends of hallway; please let us know if you require special handicap egress or special assistance
- We must obey any fire or emergency alarm; even drills/test alarms
- Restrooms – Women's room at west end; Men's room at east end
- Must sign in and sign out with security desk each time you enter the building
- Recycling – please help our efforts by dropping plastic or aluminum containers in the designated recycle bins

MEETING GROUND RULES

- Questions and comments are welcome; please be mindful of our time constraints
- Comments should be respectful of all participants
- Use name tents to indicate you have a comment or question
- Reminder: today's presentation is not PNM's plan or a financial forecast, it is an illustration of the IRP modeling process

DISCLOSURE REGARDING FORWARD LOOKING STATEMENTS

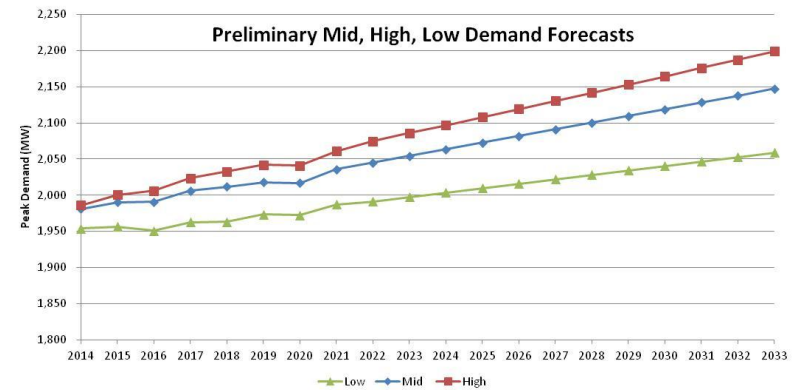
The information provided in this presentation contains scenario planning assumptions to assist in the Integrated Resource Plan public process and should not be considered statements of the company's actual plans. Any assumptions and projections contained in the presentation are subject to a variety of risks, uncertainties and other factors, most of which are beyond the company's control, and many of which could have a significant impact on the company's ultimate conclusions and plans. For further discussion of these and other important factors, please refer to reports filed with the Securities and Exchange Commission. The reports are available online at www.pnmresources.com.

The information in this presentation is based on the best available information at the time of preparation. The company undertakes no obligation to update any forward-looking statement or statements to reflect events or circumstances that occur after the date on which such statement is made or to reflect the occurrence of unanticipated events, except to the extent the events or circumstances constitute material changes in the Integrated Resource Plan that are required to be reported to the New Mexico Public Regulation Commission (NMPRC) pursuant to Rule 17.7.4 New Mexico Administrative Code (NMAC).

FOLLOW-UP

NET SYSTEM PEAK DEMAND

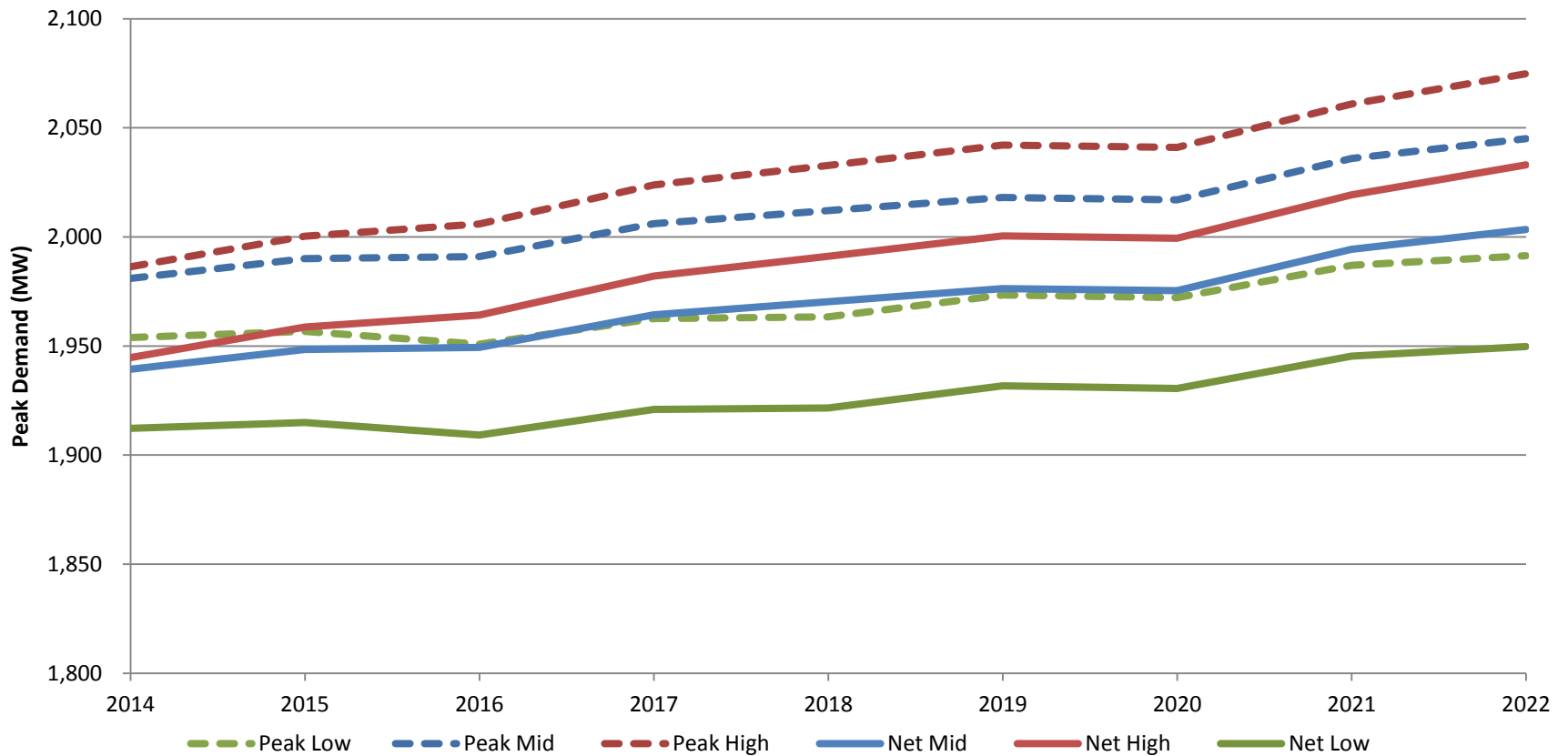
- Demands presented on September 20th correspond to “Forecasted System Peak Demand” line on L&R Table
- Net system peak demand is the result after subtracting incremental energy efficiency and distributed generation
- EE assumption is Plan approved last week + file new plan next year
- High and low bands are so-far only variations in economic forecast assumptions
- Will build a higher high and lower low band based on technology scenarios



PUBLIC SERVICE COMPANY OF NEW MEXICO										
Load and Resource Projections for Summer Peak - 2014 IRP PA Process										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
(1) Current Forecasted System Peak Demands	2,000	2,022	2,042	2,054	2,082	2,096	2,108	2,116	2,138	
(2) Forecasted Incremental Customer Sited PV	(8)	(17)	(18)	(19)	(21)	(22)	(23)	(23)	(23)	
(3) Forecasted Incremental Energy Efficiency	(172)	(241)	(281)	(344)	(510)	(631)	(668)	(770)	(880)	
(4) Net System Peak Demand (MW)	1,982	1,984	1,999	1,991	2,006	2,012	2,018	2,017	2,096	
(5) Four Corners	200	200	200	200	200	200	200	200	200	
(6) San Juan	783	783	783	783	783	783	783	783	783	
(7) Total Coal Resources (MW)	983	983	983	983	983	983	983	983	983	
(8) Palo Verde	258	258	258	258	258	258	258	258	258	
(9) Total Nuclear Resources (MW)	258	258	258	258	258	258	258	258	258	
(10) Inverness	154	154	154	154	154	154	154	154	154	
(11) Altam	230	230	230	230	230	230	230	230	230	
(12) Luna	185	185	185	185	185	185	185	185	185	
(13) Lorchburg	80	80	80	80	80	80	80	80	80	
(14) Valencia Purchase	155	155	155	155	155	155	155	155	155	
(15) Delta-Peterson	132	138	138	138	138	138	138	138	138	
(16) San Juan - Windfall			492	492	492	492	492	492	492	
(16) Total Natural Gas Resources (MMW)	936	942	942	982	982	982	982	982	982	
(17) Total Demand Response Programs (MW, net of losses)	48	50	52	52	54	54	54	54	54	
(18) New Wind Energy Center (Purchase)	10	10	10	10	10	10	10	10	10	
(19) Utility Scale Solar PV (22 MW in 2011 + 20 MW in 2013)	13	25	24	24	24	24	24	24	24	
(20) Utility Scale Prosperity Battery Demo (net of losses)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
(21) PNM Sky Wheel - 1.5 MW Solar	1	1	1	1	1	1	1	1	1	
(22) 2013 Renewable Plan Resource - 10 MW Geothermal	6	6	6	6	6	6	6	6	6	
(23) 2014 Renewable Plan Resource - 102 MW Wind (PENDING)	5	5	5	5	5	5	5	5	5	
(24) 2014 Renewable Plan Resource - 23 MW Solar PV (PENDING)	18	18	18	18	18	18	18	18	18	
(25) Total Renewable Resources (MW)	23	41	60	62	64	64	64	64	64	
(26) Total System Resources (MW)	2,299	2,284	2,309	2,349	2,351	2,351	2,351	2,351	2,351	
(28) Reserve Margin (MW)	277	304	320	358	345	339	333	334	334	
(29) Reserve Margin (%)	14.0%	15.3%	16.2%	18.0%	17.2%	16.9%	16.6%	16.5%	16.5%	

FOLLOW-UP

NET SYSTEM PEAK DEMAND – PRELIMINARY MID, HIGH, LOW FORECASTS



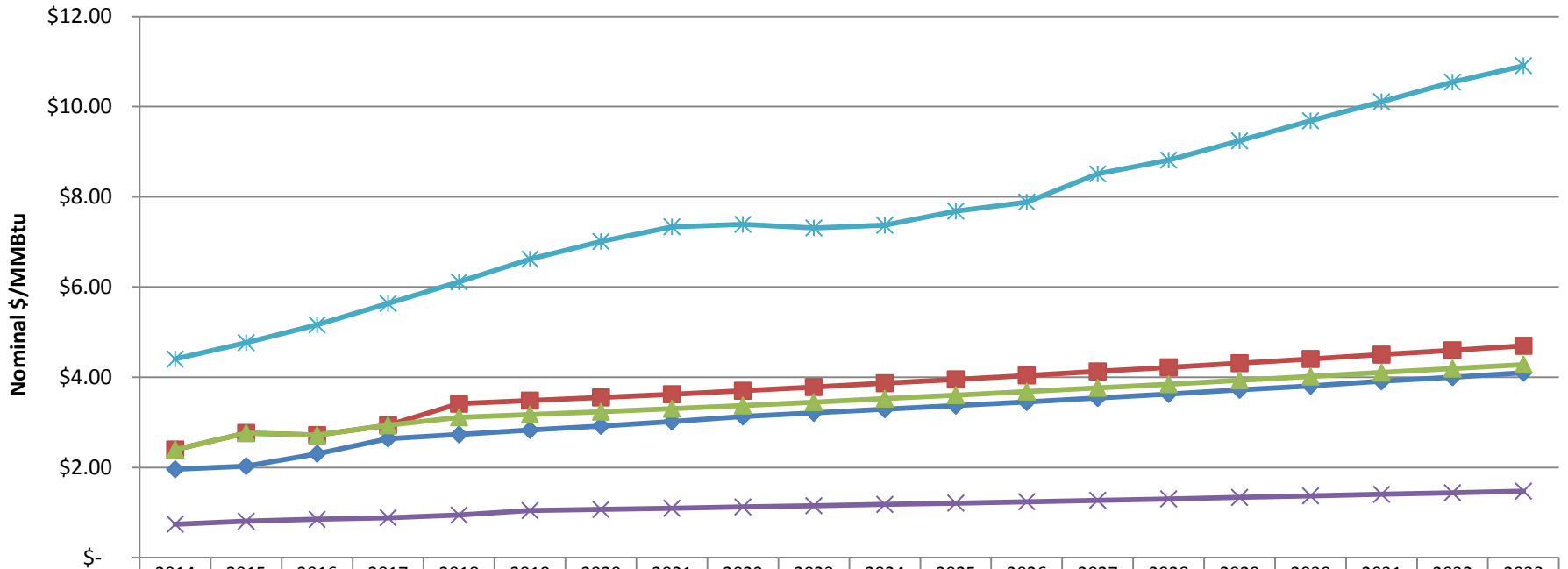
FOLLOW-UP

FUEL PRICES

- Using prices developed by PACE for natural gas, electricity and carbon dioxide emissions
- SJGS coal price is a projection from PNM's Fuel's Group, shows a higher cost for the two unit operation
- FC coal price is the projection provided to PNM by APS/Four Corners
- Palo Verde nuclear fuel price is the projection provided by APS/Palo Verde

FOLLOW-UP

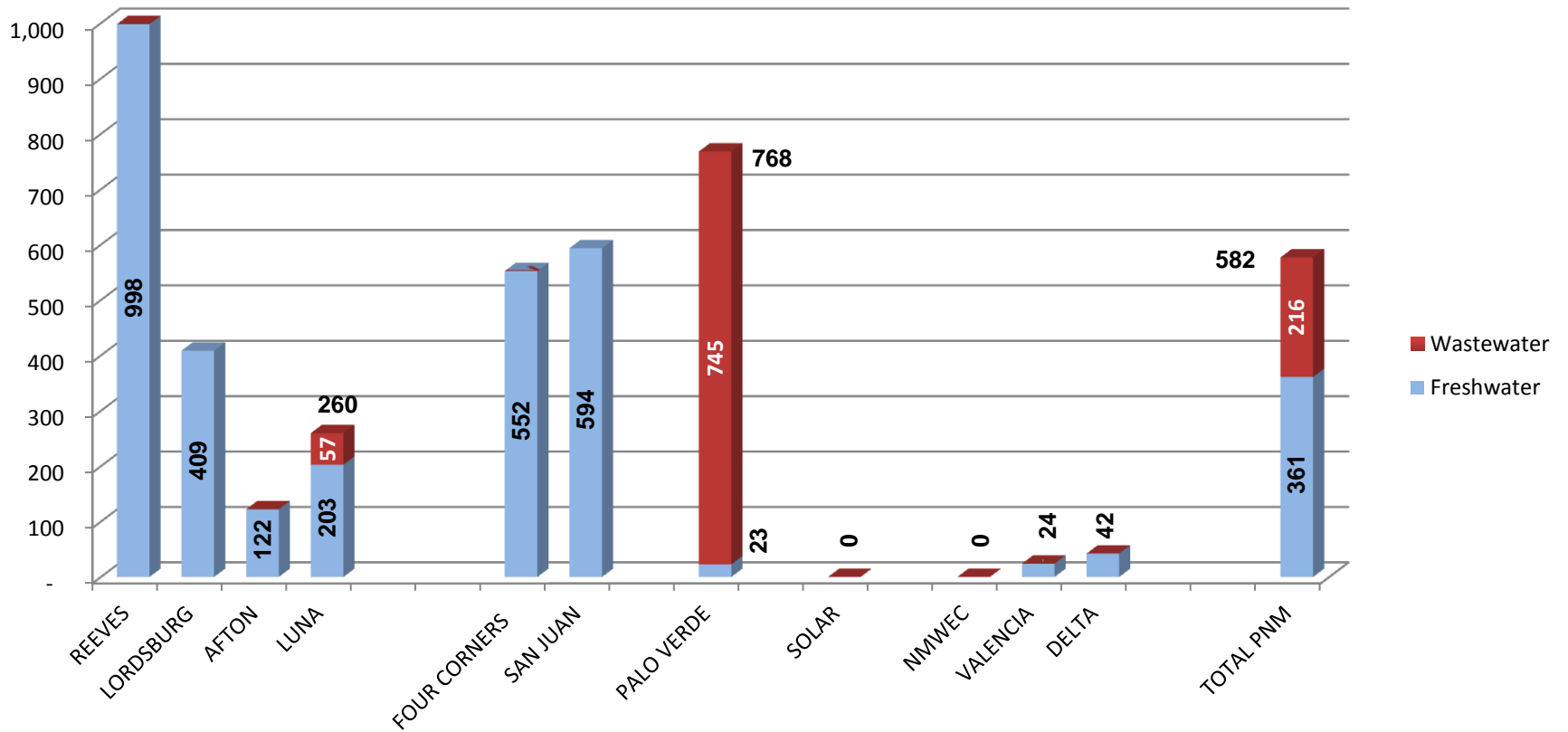
FUEL PRICES



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
FC Coal	\$1.96	\$2.03	\$2.31	\$2.64	\$2.73	\$2.83	\$2.92	\$3.02	\$3.13	\$3.21	\$3.29	\$3.37	\$3.45	\$3.54	\$3.63	\$3.72	\$3.81	\$3.91	\$4.00	\$4.10
SJ Coal 2-unit	\$2.40	\$2.76	\$2.72	\$2.93	\$3.41	\$3.48	\$3.55	\$3.62	\$3.70	\$3.78	\$3.87	\$3.95	\$4.04	\$4.13	\$4.22	\$4.31	\$4.41	\$4.50	\$4.60	\$4.70
SJ Coal 4-unit	\$2.40	\$2.76	\$2.72	\$2.93	\$3.11	\$3.17	\$3.24	\$3.30	\$3.37	\$3.45	\$3.53	\$3.60	\$3.68	\$3.76	\$3.85	\$3.93	\$4.02	\$4.10	\$4.19	\$4.28
PV Uranium	\$0.74	\$0.81	\$0.85	\$0.89	\$0.95	\$1.04	\$1.07	\$1.10	\$1.12	\$1.15	\$1.18	\$1.21	\$1.24	\$1.27	\$1.30	\$1.34	\$1.37	\$1.40	\$1.44	\$1.48
Pace Ref Gas	\$4.40	\$4.77	\$5.16	\$5.63	\$6.11	\$6.62	\$7.01	\$7.33	\$7.39	\$7.31	\$7.37	\$7.68	\$7.88	\$8.51	\$8.81	\$9.24	\$9.68	\$10.11	\$10.54	\$10.91

FOLLOW-UP

WATER USE INTENSITY FOR EXISTING RATE-BASED GENERATION (2011-2012 AVG GAL/MWH)



Prosperity Energy Storage

Evelin Wheeler

PNM Executive Director Generation
Development

FOLLOW-UP

PNM PROSPERITY ENERGY STORAGE PROJECT

- Solar energy and battery storage pilot project was launched Sept. 21, 2011
- Partners included PNM, U.S. DOE, Sandia Laboratories, University of NM, Northern NM College and Ecoult/East Penn Manufacturing
- Project Facts:
 - Solar capacity 500 kW; storage capacity 250 kW per hour delivery up to 1 MWh total; site approx. 4.9 acres
- Funding of project costs:
 - PNM = \$7.1 million
 - Dept of Energy = \$2.3 million
 - Total = \$9.3 million
- www.pnm.com/solarstorage

Wind Energy Sensitivity Analysis

Shane Gutierrez

PNM Planning Engineer

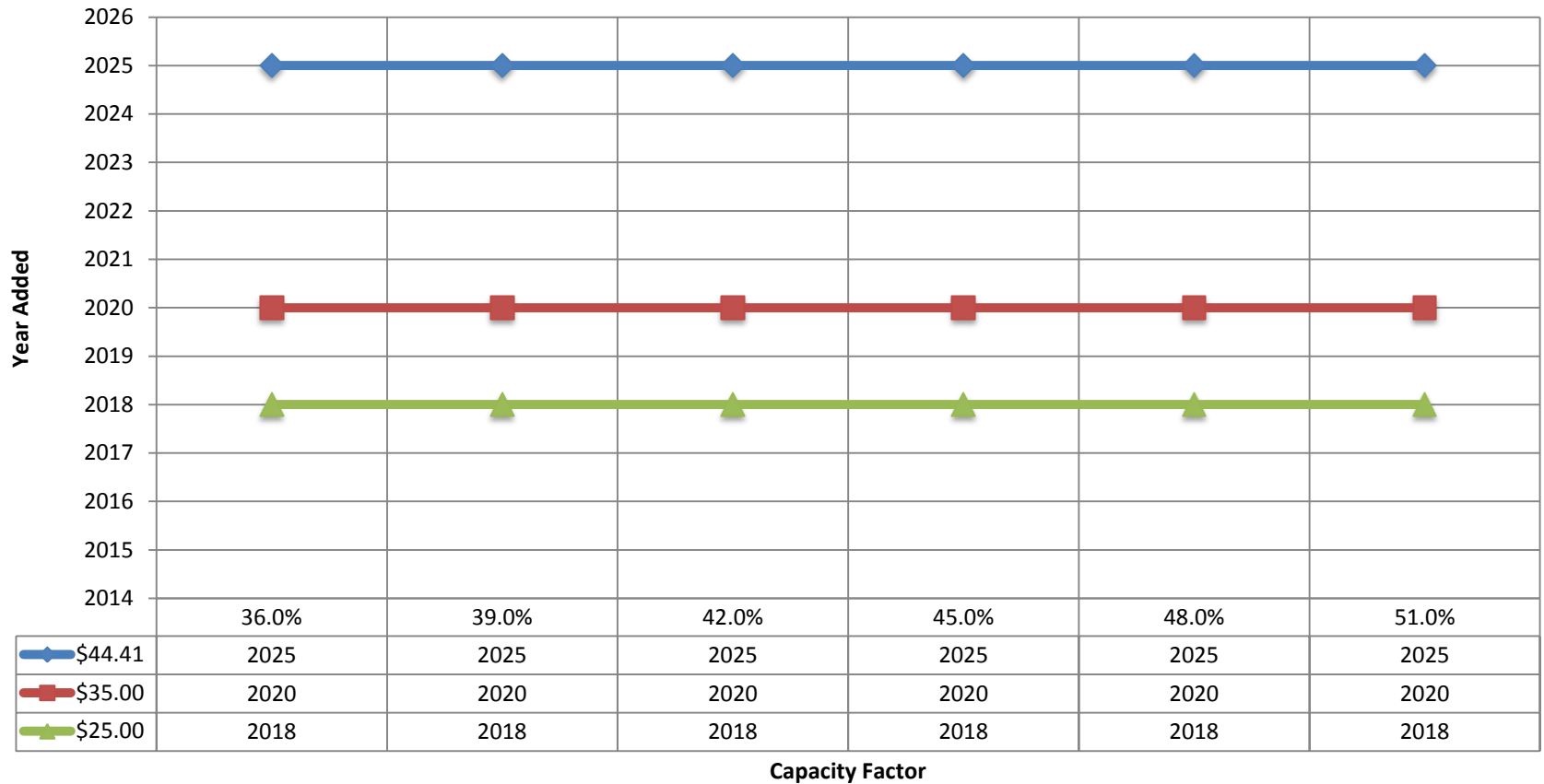
FOLLOW-UP

WIND SENSITIVITY ANALYSIS – OVERVIEW AND ASSUMPTIONS

- Objective of the analysis was to determine the drivers for incorporating wind into PNM's portfolio
- Evaluated wind resource selection using Strategist®
- Focused on three variables in sensitivity analysis
 - Capacity Factor
 - Size
 - Price
- Adjusted each variable within a range of values
- Evaluated all sensitivities on the RSIP+PV3 scenario
- IRP Wind resource base assumptions:
 - 100 MW, 38% capacity factor, \$53.68/MWh LCOE (\$44.41 Energy +\$9.27 Wheeling)

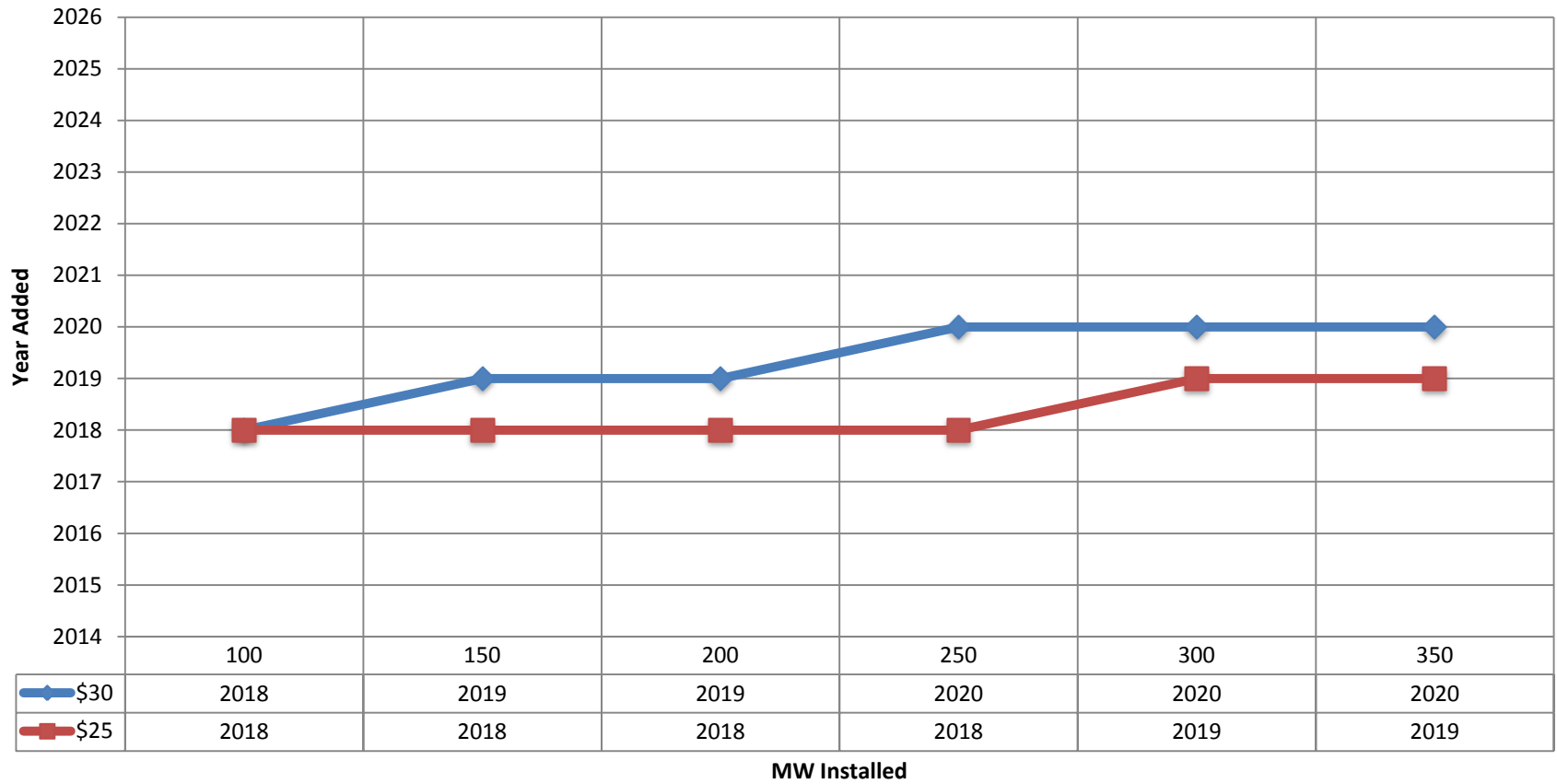
FOLLOW-UP

WIND SENSITIVITY ANALYSIS – WIND SELECTION VS. CAPACITY FACTOR



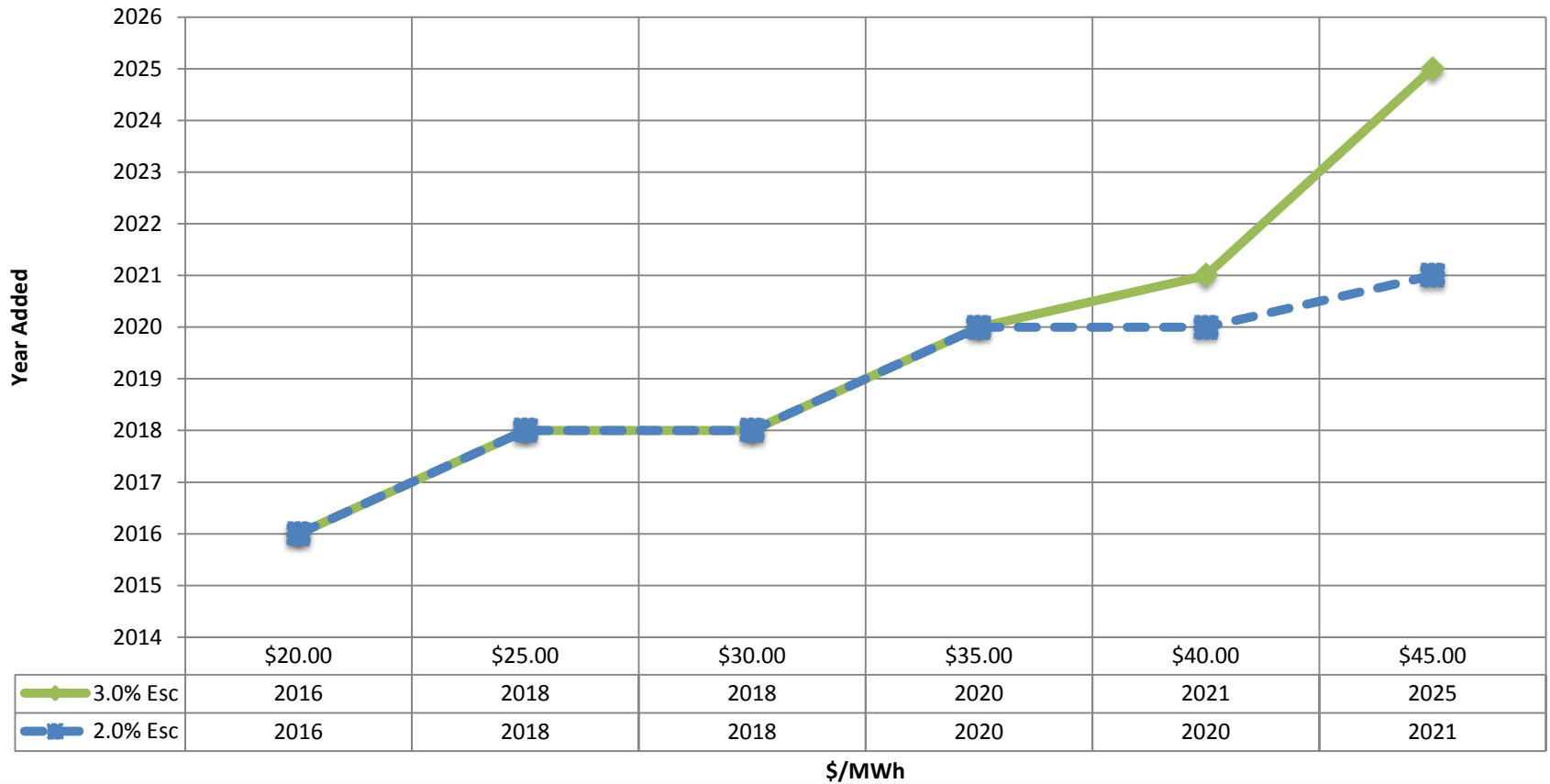
FOLLOW-UP

WIND SENSITIVITY ANALYSIS – WIND SELECTION VS. SIZE



FOLLOW-UP

WIND SENSITIVITY ANALYSIS – WIND SELECTION VS. STARTING PRICE



FOLLOW-UP

WIND SENSITIVITY ANALYSIS - CONCLUSIONS

- Wind price is biggest driver of how early wind is selected in the PNM portfolio
- Capacity factor alone does not have impact on when wind is selected
- Larger wind farm sizes (>100 MW) are selected slightly later in the portfolio than smaller wind facilities
- For all sensitivities, wind did not replace or defer any resources prior to 2020
- IRP Portfolio
 - If price is low enough, wind could be selected prior to 2018, but selection of wind is in addition to SJGS replacement resources
 - PNM did not optimize for load following or reliability concerns in this analysis
 - Future RFP's will be used to determine when to incorporate additional wind facilities into PNM's portfolio

REMAINING ANALYSIS

ANTICIPATED SCHEDULE AND WORK PLAN

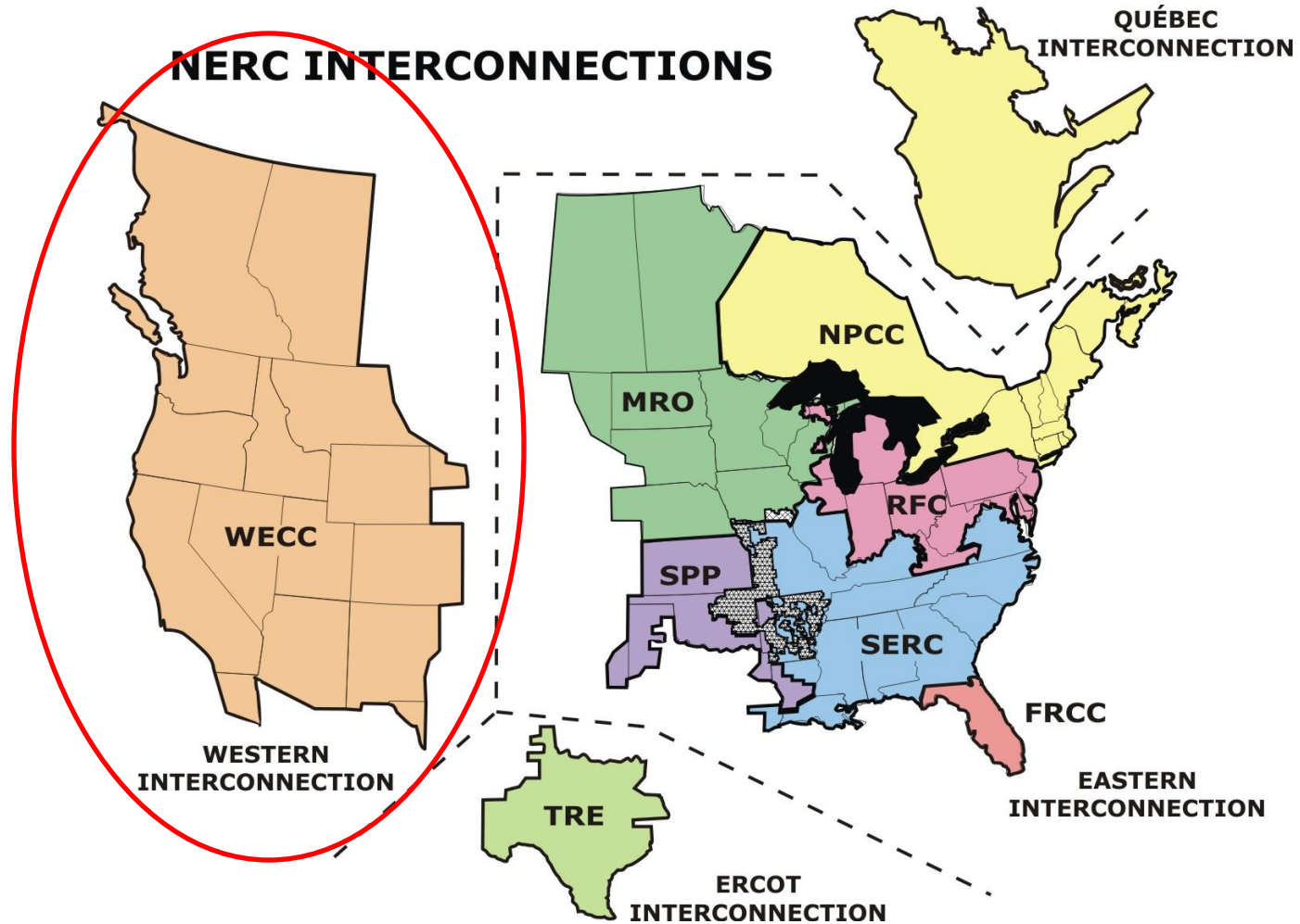
- PNM is finalizing a filing related to SJGS that will occur in December
- Data for that filing overlaps with the IRP
- Will push the data used in the filing out to the IRP group when PNM makes the filing
- Schedule a series of meetings in January to:
 - Discuss data and any remaining data requests
 - Finalize demand scenarios

Transmission System Overview

Tom Duane

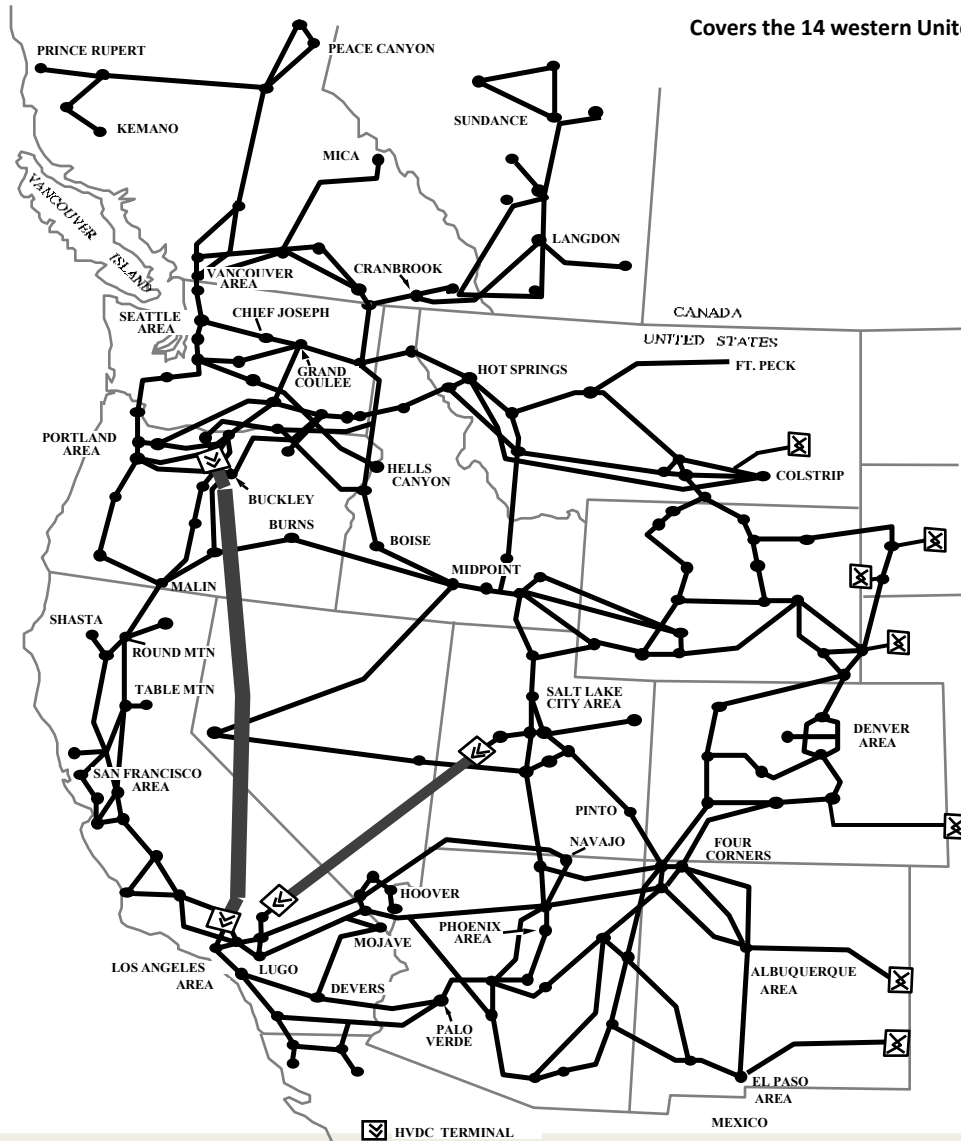
Manager, PNM Transmission Planning

US TRANSMISSION GRIDS



THE WESTERN TRANSMISSION GRID

Covers the 14 western United States and parts of Canada and Mexico

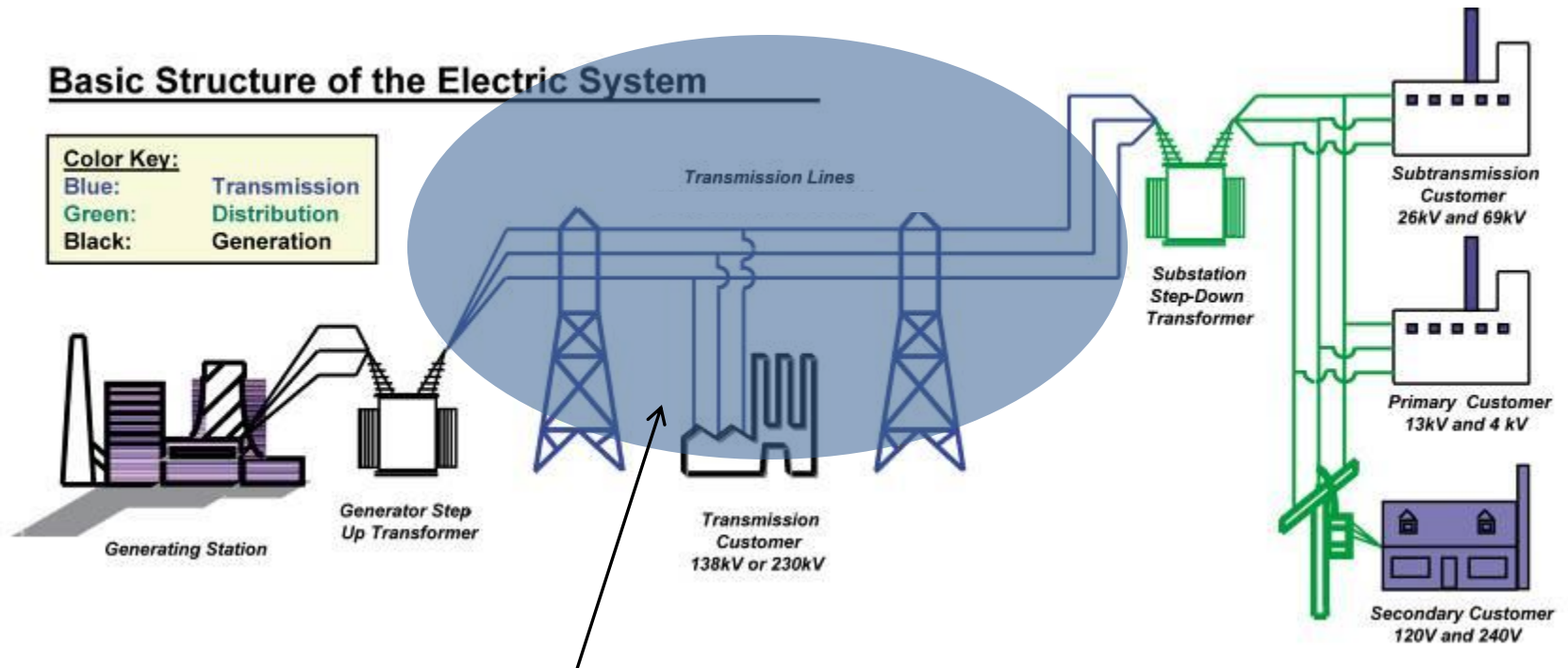


7 HVDC (asynchronous interconnections) between Eastern and Western Grids-1470 MW

2 HVDC interconnections between Eastern grid and ERCOT-820 MW

No interconnections between Western grid and ERCOT

COMPONENTS OF THE GRID



Source: www.nerc.com

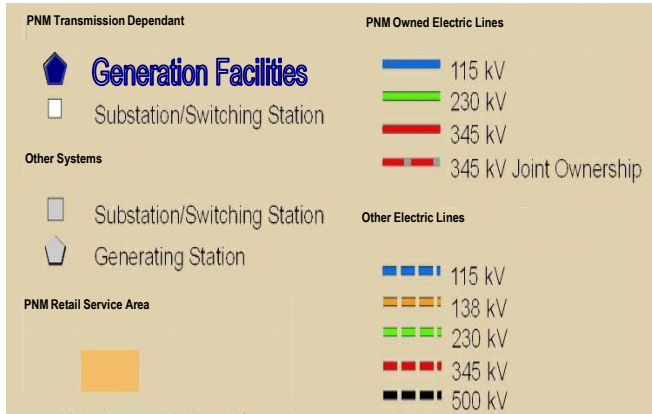
- PNM Transmission Voltage Levels are 115kV, 230kV, 345kV and 500kV

A FEW PNM TRANSMISSION SYSTEM FACTS

- Line mileage (incl. jointly owned lines)
 - 165 miles of 500 kV (Outlet from Palo Verde)
 - 1556 miles of 345 kV
 - 180 miles of 230 kV
 - 1000 miles of 115 kV
- “Backbone” transmission lines (345 kV and 230 kV) are 150 to 200 miles in length.
- Jointly Owned Transmission Projects:
 - Palo Verde Valley Transmission System
 - San Juan – Springerville - Vail Transmission System
 - Southwest New Mexico Transmission System
 - Eddy County HVDC and Eddy– Amrad 345 kV System
- Majority of backbone transmission lines built in late 1960s through the mid-1970s.
- Numerous system improvements made to existing system since that time
- PNM purchases 3rd party transmission to deliver a portion of its generation resources located in southern New Mexico and western Arizona.

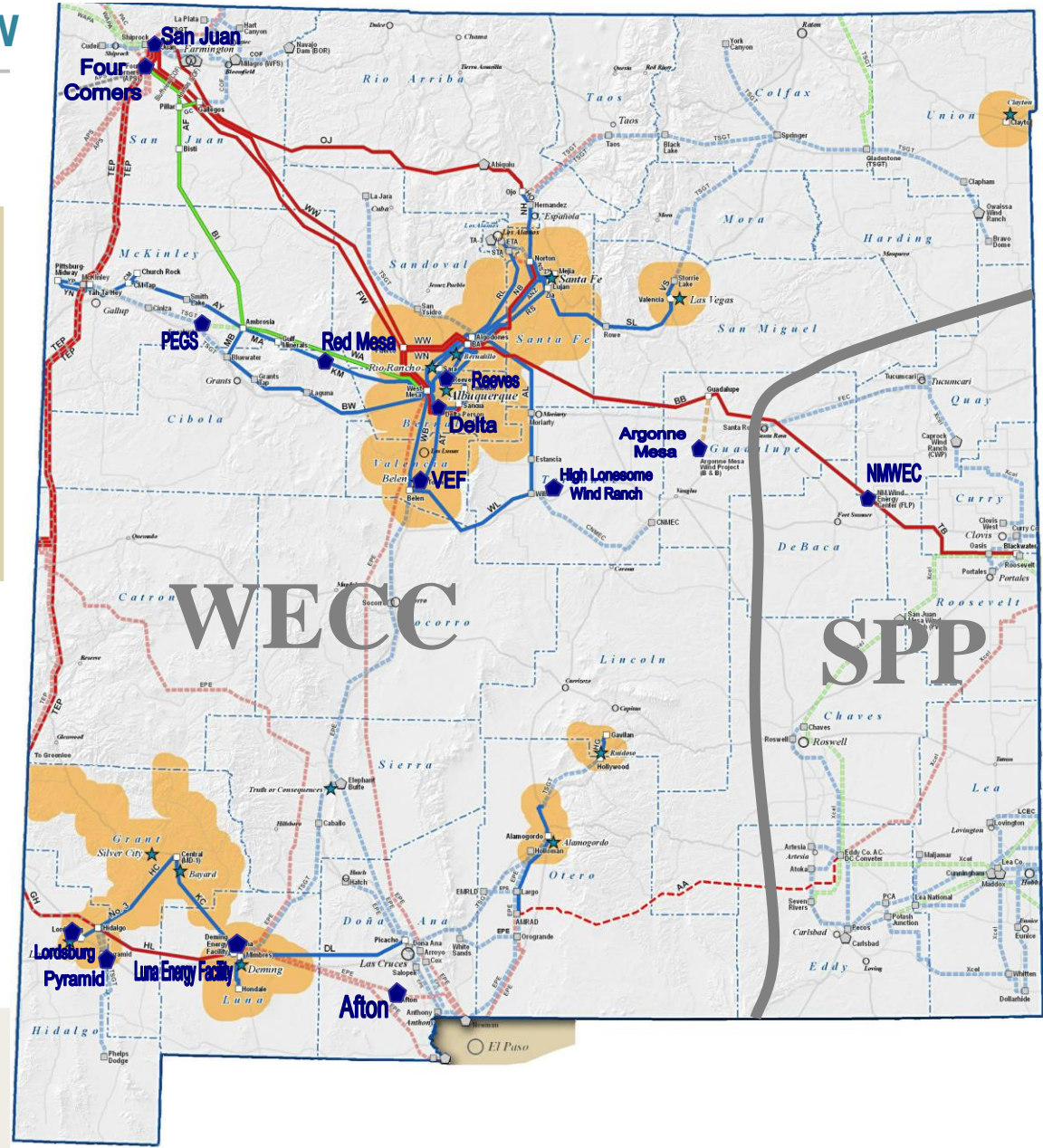
Transmission System Uses

SYSTEM MAP OVERVIEW



Palo Verde
(not shown on map)

- Lines shown in red are the primary backbone transmission lines in NM
- Lower voltage lines provide a portion of the transmission capability to delivery resources and distribute power to outlying smaller load areas distant from Albuquerque and El Paso



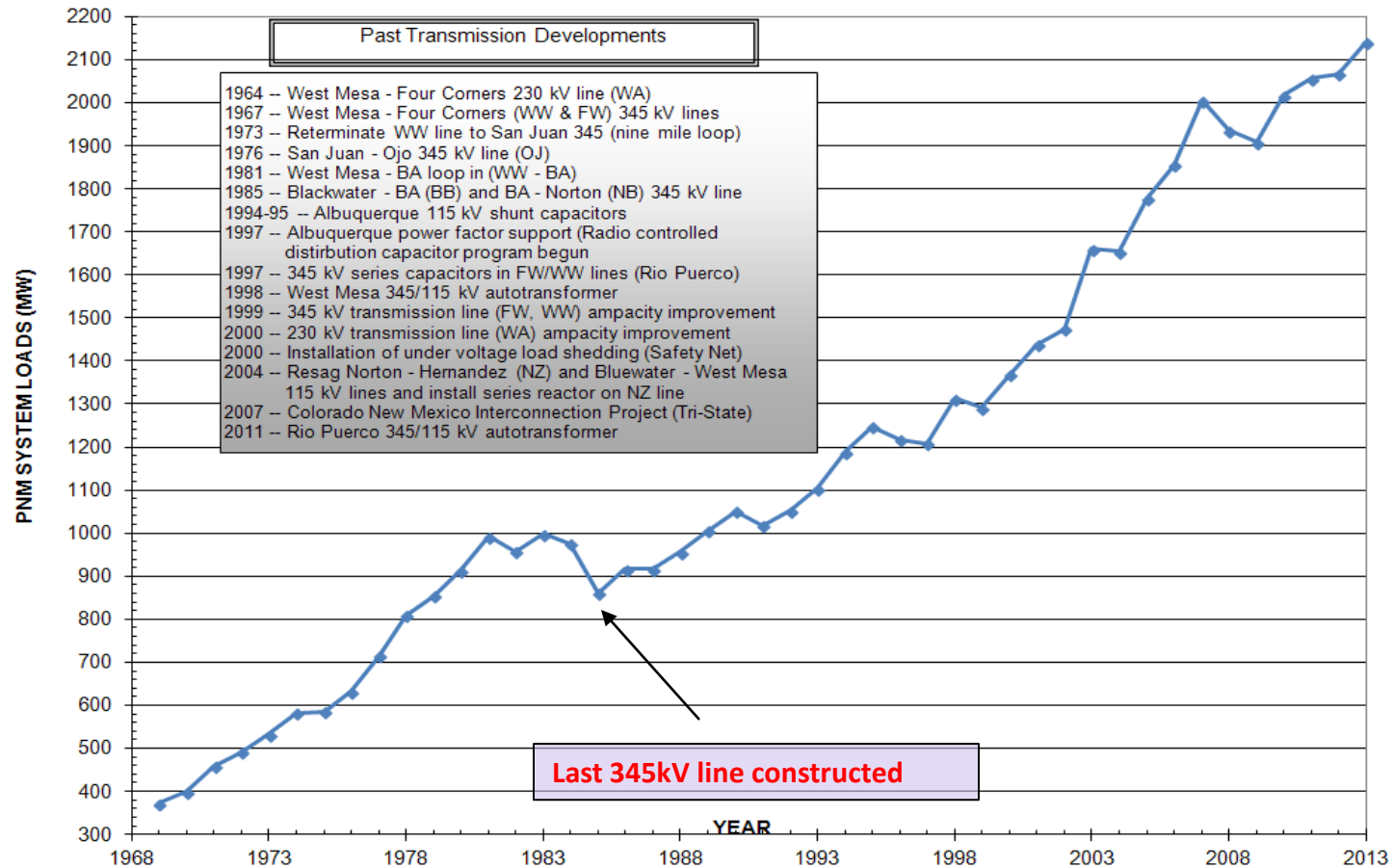
Transmission System Uses

PNM SPECIFICS

- Moves PNM's resources to consumers
- Moves PNM Transmission Customer resources to their delivery points
 - Wholesale services are provided per FERC Open Access Transmission Tariff (OATT)
 - 40% to 45% of system use is by others
 - Network customers include:
 - Tri State, WAPA (for SNL/KAFB), LAC, NTUA, NEC, and PNM-WPM (for PNM retail, City of Gallup, City of Aztec)
 - Point-to-point Customers include:
 - EPE, WAPA, SPS, High Lonesome Mesa, Aragonne Mesa, NextEra-Red Mesa, and PNM-WPM
- PNM plans & constructs its system to meet all customer needs

Transmission System Uses

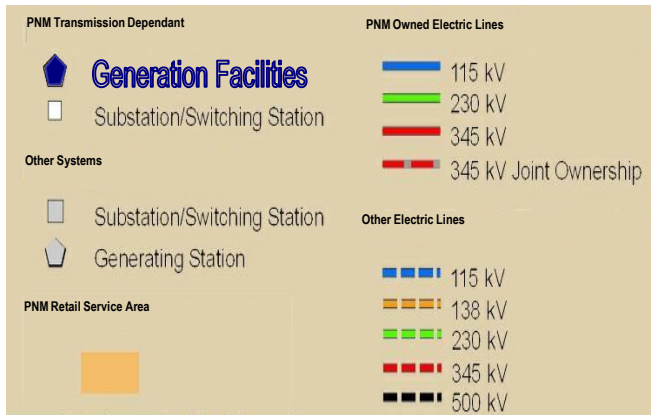
PNM SYSTEM PEAK LOAD



Adjusted for Demand Response 2011-2013

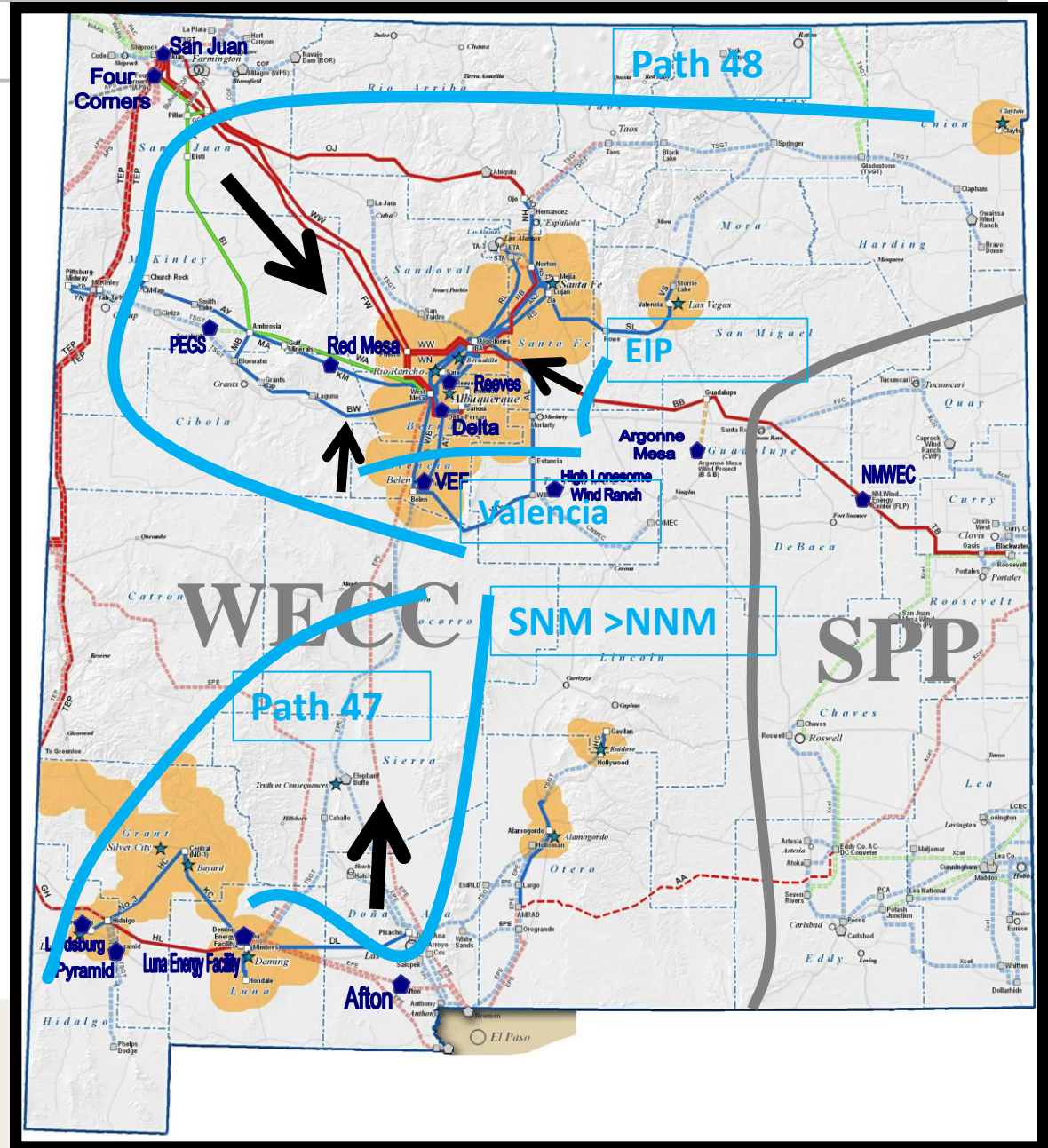
Transmission Limitations

CONSTRAINTS TO GENERATION DELIVERY



Palo Verde (not shown on map)

- Lines shown in red are the primary backbone transmission lines in NM
- Lower voltage lines serve as backup to the backbone lines and to distribute power to outlying smaller load areas distant from Albuquerque and El Paso



Transmission Limitations

CONGESTION

- Albuquerque based generation is required over peak load periods due to transmission constraints.
- Southern NM generation has reduced reliance on imports to southern New Mexico but additional resources have limited ability to be delivered to Northern NM.
- Pending requests exceed the remaining capacity out of Valencia County and Eastern NM.

Transmission Limitations

BARRIERS TO TRANSMISSION CONSTRUCTION

- Very Limited Corridor Options
 - Several years required with uncertain outcomes for Environmental Permitting (e.g. Indian Reservations, National Forests, Wilderness Areas, State and National Parks and Monuments)
 - The not in my backyard ("NIMBY") syndrome is always present
 - Encroachment in metropolitan areas on existing corridors limits the ability to upgrade or expand.
- New construction costs are much higher than embedded
- Regulatory hurdles (City, County, NMPRC, NERC, WECC, FERC, Environmental Compliance, Endangered Species Act, Discharge & Drainage Permits, etc...)

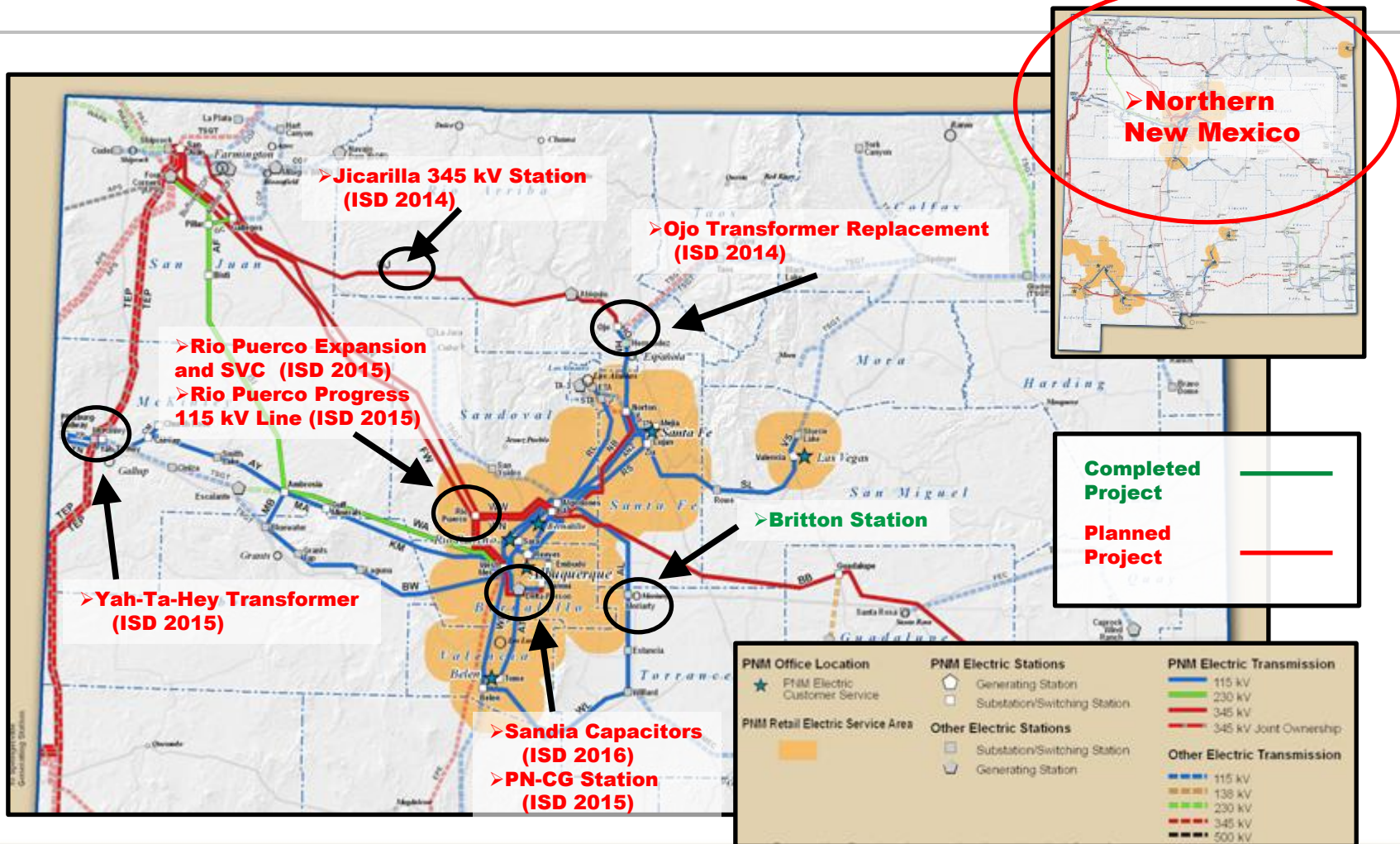
Transmission Planning

DRIVERS FOR TRANSMISSION PROJECTS

- Compliance with NERC/WECC Reliability Standards
 - Must provide uninterrupted service with “system normal” and with any one facility suddenly removed from service.
 - Projects identified through annual adequacy studies.
 - Provide Service to new load locations
 - Interconnection Projects
 - Generation (subject to OATT Interconnection Procedures)
 - Transmission Network Upgrades Identified through OATT defined study processes
 - Wire-to-wire
 - Regional planning requirements of Order 1000 (future)
-
- ✓ “Significant” generation and transmission changes are subject to peer review as defined by WECC reliability study procedures.
 - ✓ Input from stakeholders is required by FERC on development and outcome of PNM transmission expansion plans.

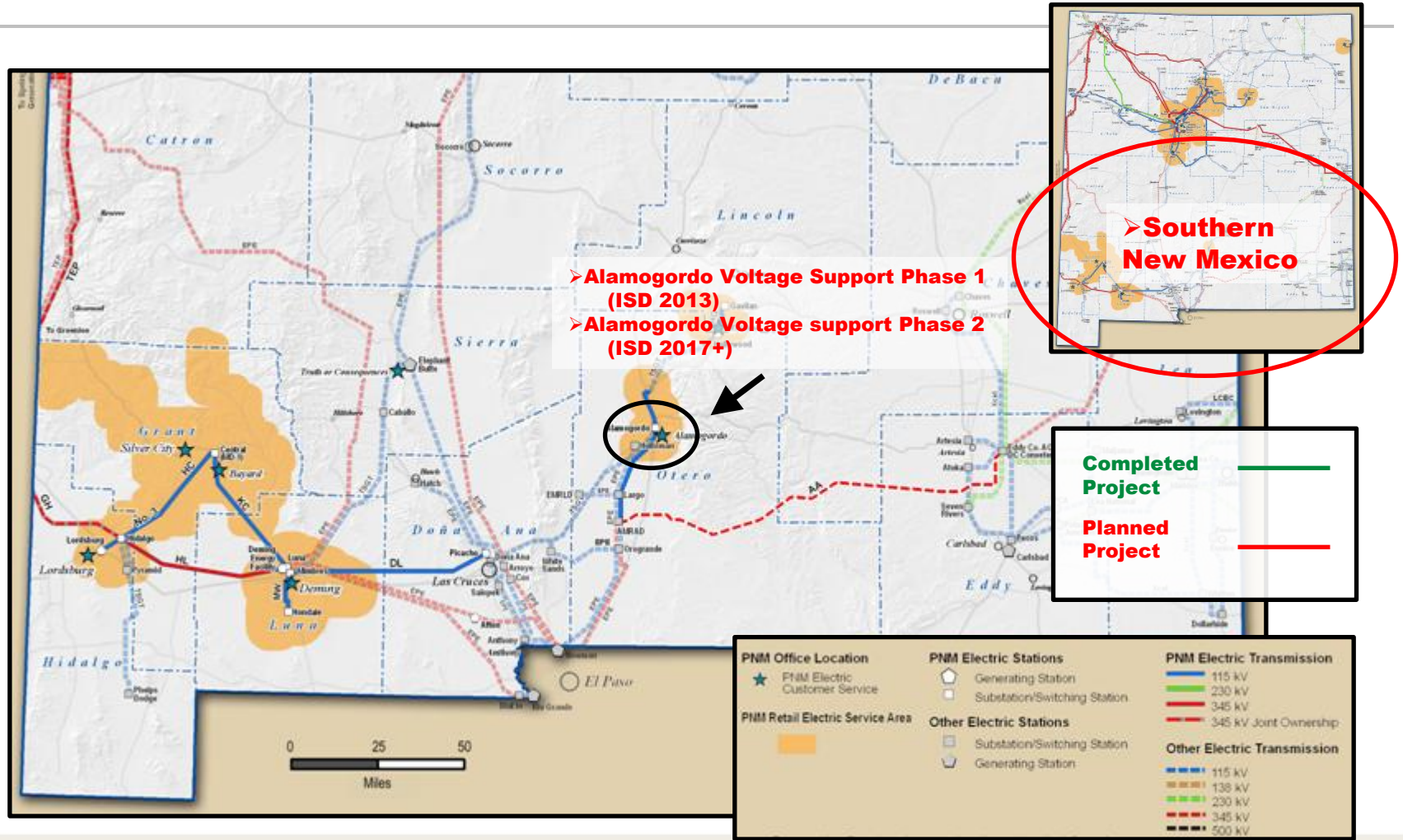
Transmission Planning

PLANNED PROJECTS FOR NORTHERN NEW MEXICO



Transmission Planning

PLANNED PROJECTS FOR SOUTHERN NEW MEXICO











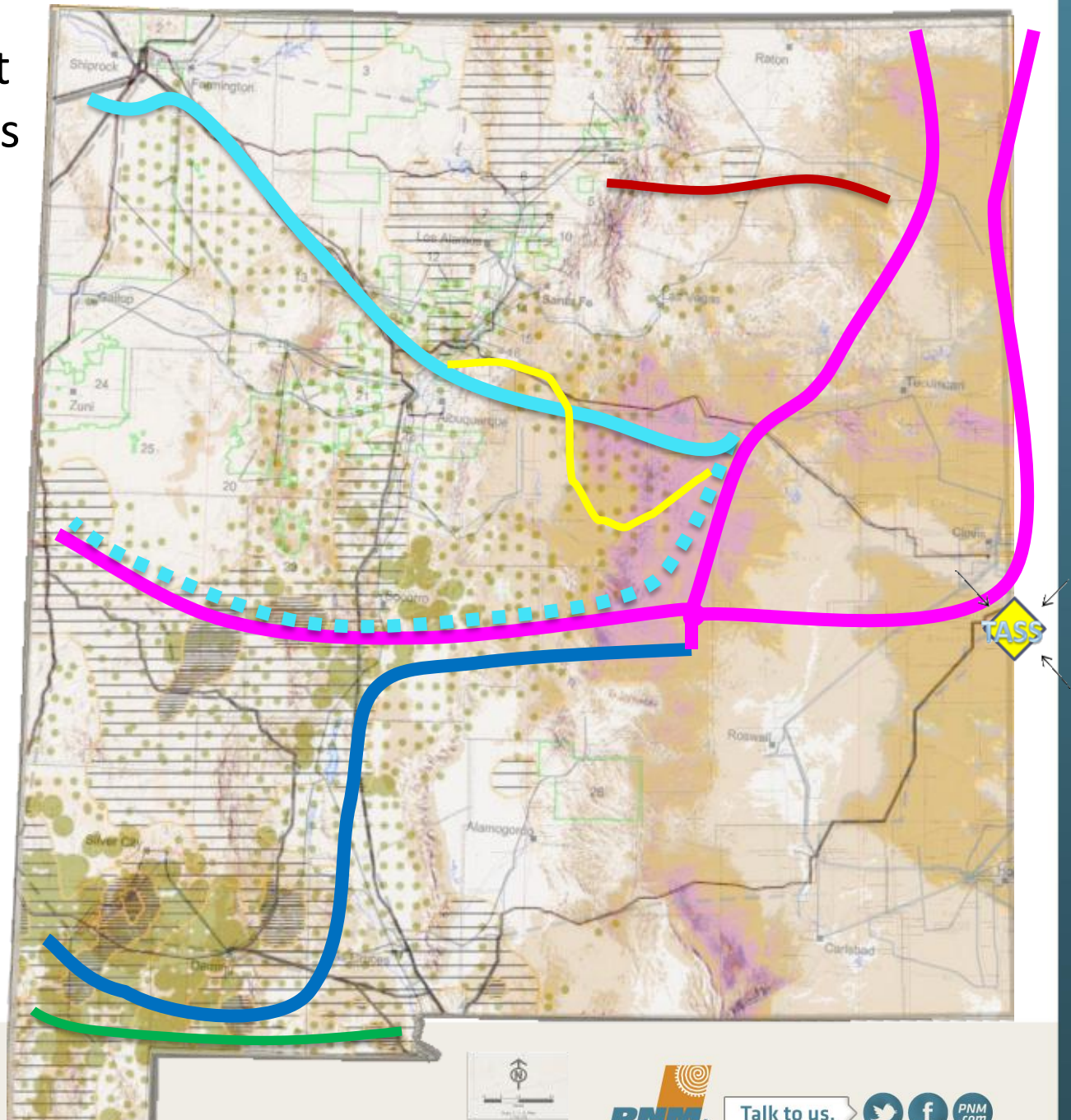
Independent Transmission Projects

ACTIVITIES

- NM's abundant potential for renewable energy development place us at the crossroads of numerous proposals with intended purpose of delivering NM renewable energy to markets.
- Projects in various stages of study or environmental permitting.
- PNM involved with studies to protect interests as an affected transmission owner or to study and process interconnection requests.

Map of Independent Transmission Projects in New Mexico

- HPX 
- SunZia 
- Tres Amigas 
- Lucky Corridor 
- Southline 
- Centennial West 
 Alt
- Western Spirit 



Independent Transmission Projects

RECENT ACTIVITY

High-Plains Express

- MOU Phase II Completed – no Stakeholder activity in 2013.

SunZia

- Final EIS Issued in June 2013
- Record of Decision Expected Later This Year

Tres Amigas

- Working with PNM and SPP on next phase of interconnection studies.

Lucky Corridor

- WECC Project Coordination Review Group

Southline Project

- Completing Phase II of WECC Rating Process

Centennial West Clean Line Project

- Development agreement with Western Area Power Administration
- CAISO interconnection request filing planned for 2014

Western Spirit Clean Line Project

- Acquired from Power Networks
- Stakeholder relationships established with Tribal entities, PNM, and private landowners

WRAP UP DISCUSSION

SUMMARY OF PROGRESS TO DATE

- Tuesday, September 17: Illustrate the process
- Friday, September 20: Discuss assumptions
- Thursday, September 26: Plan next steps
- Friday, October 4: Recap Session in Santa Fe (NMPRC Bldg.)
- Friday, November 15: Follow-up analysis, updates and transmission overview

Discuss proposals/schedule for next meeting

- December 2013: San Juan Generating Station filing w/NMPRC
- January 2014: meet, discuss data in the filing, and finalize demand scenarios

IRP GOALS

BALANCE



MAKE SURE WE HAVE UP TO DATE CONTACT INFORMATION FOR YOU

www.pnm.com/irp for documents

irp@pnm.com for e-mails

Register your email on sign-in sheets for alerts of upcoming meetings and notices that we have posted new information to the website.

Meetings Schedule:

Tuesday, Sept. 17, 2013, 8 a.m.- noon

Friday, Sept. 20, 2013, 8 a.m.- noon

Thursday, Sept. 26, 2013, 8 a.m.- noon

Friday, Oct. 4, 2013, 8 a.m.- noon

Friday, Nov. 15, 2013, 8 a.m.- noon

Thank you

