

Overview of PNM WMEG Study Results

WEIM Regional Issue Forum

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PNM SPECIFIC REMARKS

- PNM views the results as a comparison tool rather than an estimator of benefit quantity
- Other studies have not considered the wide-variety of potential footprints and their effect on benefits
- PNM participated in an additional sensitivity run that modeled PNM and EPE in a separate market than APS, SRP, and TEP
- Additional analysis is needed to examine impacts from potential transmission “carve-outs” and pseudo-tied generation in the PNM BA



WMEG Cost Benefit Study (CBS)

- + The CBS was designed to provide WMEG members with credible information on the benefit of joining either Markets+ or EDAM
- + The Study:
 - **Simulates scenarios** with different potential **footprints** (of entities that could join each market) and different **features** of the currently proposed market designs
 - **Uses a detailed hourly PLEXOS production cost model of the WECC** that represents **both a day ahead (DA) stage** of unit commitment and transactions and **real-time (RT) operational stage**
 - **Reports the impact** to costs and revenues **for each WMEG member** in each market scenario
 - **For 2026:** compares DA Market options (Markets+ and EDAM) & footprints versus a Business as Usual (BAU) case that has only bilateral DA trading plus RT market transactions within the current EIM/EIS footprints
 - **For 2030 and 2035:** compares the impact of increasingly integrated market design options
 - **Utilizes confidential data from each WMEG member** to represent their systems in more rigorous detail than can be achieved with only public datasets



CBS Study Focus: Variable Production Cost and Market Price Impact

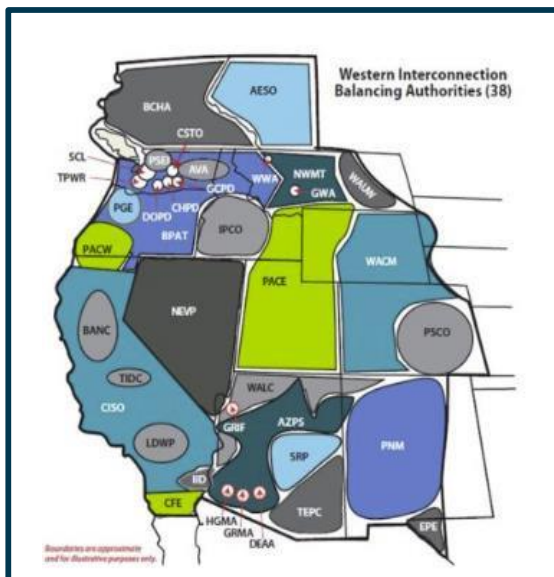
- + **The Study's scope focuses on variable production costs and energy market prices**
 - Variable costs savings are one category among a range of potential benefits of regional markets often discussed, and they are one among many to consider when deciding whether to join either market
- + **The Study scope did not include calculating potential capacity savings due to**
 - (1) peak load & resource diversity
 - (2) investment savings from either market enabling resource procurement over a wider geography, or
 - (3) coordinated regional transmission planning or investment
- + **Other market studies have shown those other benefit categories can create 2-10x the impact of production cost savings alone**
 - e.g., State-Led Study, CAISO SB 350 Study, MISO Value Proposition



Market Footprints Considered in Core CBS Analysis

+ The Core CBS Study simulates 4 cases for 2026 to compare different DA market footprints

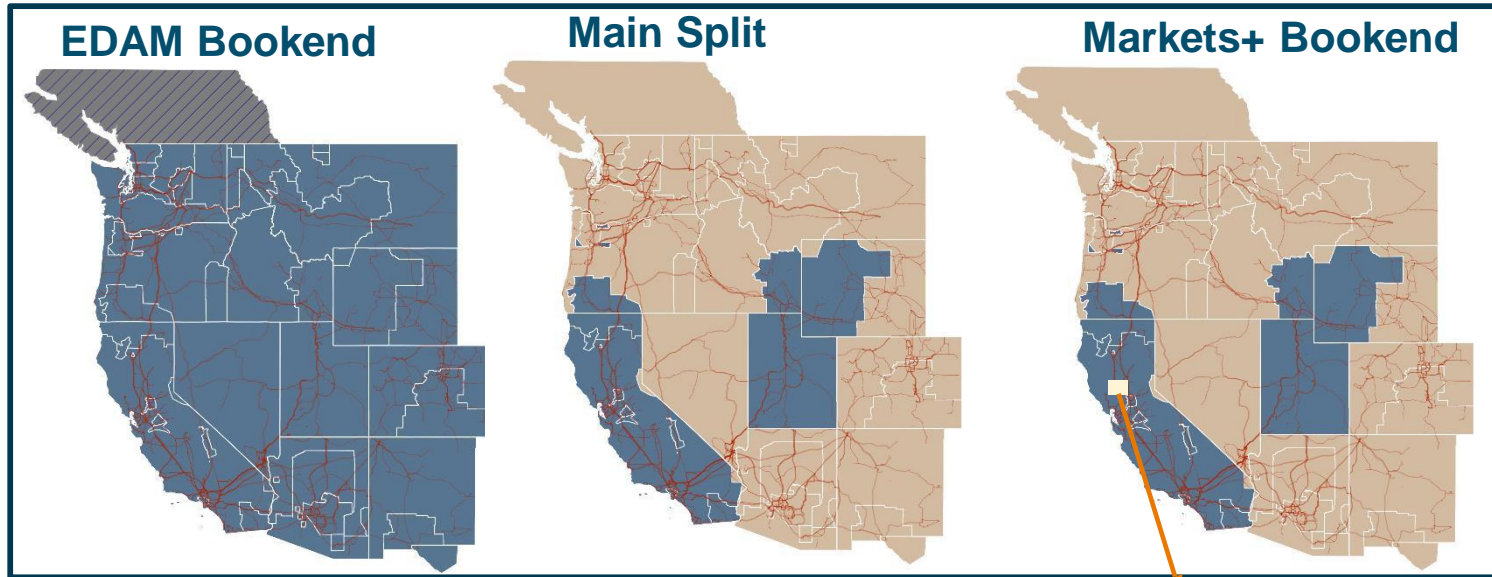
2026 BAU Case



The **BAU Case** models DA bilateral trading with transmission wheeling charges & transactional friction on trades crossing BAA boundaries

In the real-time (RT) stage, the BAU case represents wheeling & friction-free trading within the existing EIM and EIS footprints

2026 Market Cases



The **EDAM Bookend** models a single DA and RT market that covers the entire WECC excluding Alberta and BC

Trades inside the Market reflect the currently proposed EDAM design, and are simulated with no wheeling costs or friction

The **Main Split** Case models two separate DA and RT footprints:

EDAM: PacifiCorp, CAISO, LADWP, BANC, LADWP, TIDC, and IID

Markets+: The rest of the US WECC & BC; simulated based on the current M+ design

The **Markets+ Bookend** models two separate DA & RT footprints similar to the Main Split, except that the **WAPA SNR sub-BA is moved to M+**

Within each Market (M+ and EDAM) transactions do not face wheeling or friction but these charges are applied to trades on the seams between markets

Map Legend

- EDAM
- Markets+ (M+)

Credit: Greg MacDonald, PSE

*Note: A subset of members opted for modeling extra market cases of additional footprints



Results Summary: PNM-Specific Cost Impact

- + The table below compares PNM’s change in net variable cost in the EDAM Bookend & Main Split Case versus the BAU case (which has no day ahead market, but PNM remains in EIM)
- + The EDAM Bookend scenario (with PNM in EDAM) and the Main Split scenario (with PNM in Markets+, along with the rest of the Northwest and Southwest) shows an increase vs. BAU in PNM’s “Net Cost”
 - “Net Cost” tracks the variable cost of generation (fuel and VOM) on PNM units, plus the cost of energy purchases or revenues from sales, and also includes wheeling revenue and congestion revenue
 - The major driver of the higher net cost for PNM was a reduction in Wheeling revenue (which had been \$63M in the BAU) case; this BAU wheeling revenue, however, is driven by a significant amount exports from the PNM BAA that are wind and other resources contracted for export to external entities under long-term contracts; even though DA markets don’t charge marginal costs on exports, the transmission contracts to wheel these resources to other areas may stay in place if PNM joins a market (to provide more certainty to offtakers)

+ **If wheeling revenue is ignored in these results (assumed to be unchanged between cases), then PNM would show savings in either market**

- \$6.1 million savings in the EDAM bookend case
- \$5.1 million savings in Markets + in the Main Split Case
- These results are very similar and indicate that day ahead markets could have modest positive variable cost savings for PNM

Cost/Benefit (\$ millions)	Case		
	BAU (2026)	EDAM Bookend (2026)	Main Split (2026)
Load Cost	184.1	218.2	223.8
Generation Cost	71.2	62.9	63.1
Reserve Cost	0.0	0.0	0.0
Generation Revenue	-203.3	-237.1	-241.6
Reserve Revenue	0.0	0.0	0.0
Wheeling Revenue	-63.3	-1.1	-7.0
Congestion Revenue	-4.1	-2.1	-2.4
GhG Revenue	0.0	-0.2	0.0
Net Cost	-15.4	40.7	35.8
vs. BAU		56.1	51.2
Net Cost excluding Wheeling	47.9	41.8	42.8
vs. BAU		-6.1	-5.1



Results Summary: PNM-Specific Dispatch Impact

+ The table below compares PNM’s change in Annual Energy Dispatch (in MWh) in the EDAM Bookend & Main Split Case versus the BAU case

- In all cases, Solar and Wind generation makes up the largest portion of PNM’s generation in 2026, followed by Nuclear generation and a smaller amount of gas and coal generation
- The market cases both show a modest reduction (~10%) in the amount of solar curtailment that PNM experiences vs. the BAU
- PNM is a strong net exporter in all scenarios, though does make market purchases from other areas in certain hours; the market cases shift PNM to purchase slightly more in certain hours and sell slightly less, likely because PNM is able to keep slightly less thermal generation online in the market cases
- The model did not impose restrictive limits on the minimum gas dispatch by PNM in particular hours for local generation needs

+ In the EDAM Bookend (with PNM in EDAM) and Main Split (PNM in Markets+) Scenarios, PNM shows a moderate reduction in gas generation

- the change likely replaced by a small increase in market purchases

Annual Summary (MWh)	Case		
	BAU (2026)	EDAM Bookend (2026)	Main Split (2026)
Nuclear	2,339,686	2,339,686	2,339,686
Other	107,104	107,072	107,984
Coal	756,054	782,171	781,822
Hydro	32,189	32,189	32,189
Gas	875,373	501,260	504,997
Customer Solar	689,901	689,901	689,901
Solar	4,861,276	4,870,882	4,901,730
Wind	3,008,403	3,008,403	3,008,403
Battery Storage	1,246,525	1,251,604	1,235,396
Pumped Hydro	0	0	0
Purchases	802,927	994,099	992,727
Sales	2,982,977	2,834,214	2,870,746
Curtailment	169,503	159,897	129,050
Native Load	10,327,498	10,327,498	10,327,498
Load	11,736,463	11,743,054	11,724,089
Net sales	2,180,050	1,840,115	1,878,020

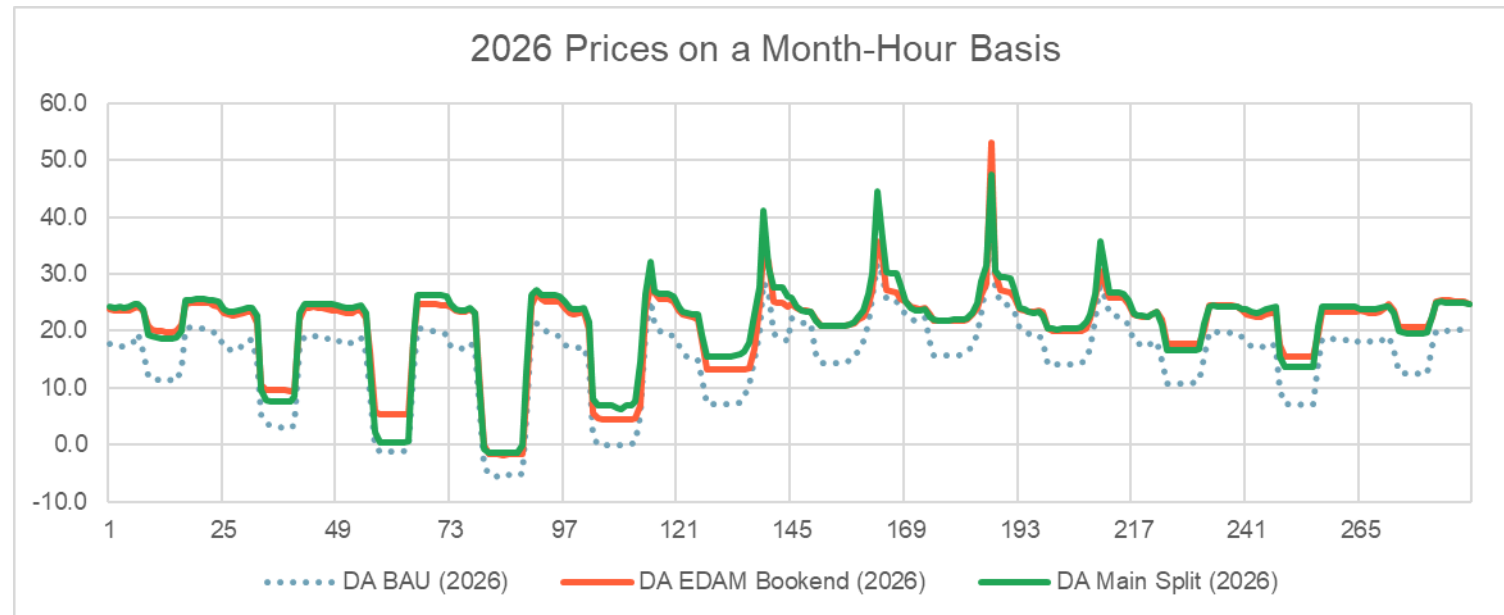


Results Summary: PNM-zonal Prices

- + The figure below compares PNM's change in Month-hour average market prices in the EDAM Bookend & Main Split Case versus the BAU case (each section between gridlines represents 24 hours of a day within each month)
 - The EDAM and Main Split Scenarios show an increase in prices during hours when PNM has heavy renewable generation output, which would imply that PNM would receive higher market revenue from sales of those resources than in the BAU case
 - It is possible that BAU case prices for PNM are lower than would be expected actual operations due to the model not scheduling resources contracted to external for immediate export (which might reduce their impact on local prices)

- + **Price impacts between the EDAM and Main Split Cases are similar for PNM**

- Peak hour prices are slightly higher in June & July for PNM in Main Split likely due to the inclusion of fast start pricing for Markets+
- August peak hour prices are higher in the EDAM bookend case likely due to overall demand for power across the broader EDAM bookend footprint (which includes California)





Key Takeaways: PNM-Specific Results

- + Overall, PNM-specific results show that EDAM or the Markets+ market would have modest positive benefits in energy cost savings for PNM provided that PNM's current transmission contracts for wheeling renewable generation to 3rd parties outside of the PNM BAA stay in place after PNM joins a market (ie no reduction in wheeling revenue)
 - This is a plausible assumption in that 3rd parties contract for the generation under long-term contracts and likely will seek a higher degree of certainty on deliverability, non-curtailment, and would like to avoid congestion-driven basis spreads in the value of the energy output
- + The results for both markets are relatively similar for PNM and modestly positive
 - Both markets result in slightly less gas dispatch for PNM, less curtailment, and slightly more imports, as well as higher market prices for the PNM zone
 - Results are dependent on the footprint of the market (i.e., which other entities choose to participate): If PNM were surrounded by zones participating in a different market, and PNM did not have a contiguous transmission path to reach the bulk of other zones in its own market, then transmission could potentially diminish opportunities created by a market or create risks to obtaining energy from the market
- + These results show only the variable energy cost impacts to PNM, which are one part of an overall picture of potential benefits
 - Additional categories of benefits were outside of the scope of the WMEG study but other studies have indicated that non-energy related benefits (such as capacity for resource adequacy, and coordinated transmission planning) often provide a greater magnitude of long-term savings than energy benefits

ADDITIONAL PNM SENSITIVITY

- In this sensitivity, PNM and EPE were modeled in EDAM, while APS, SRP, and TEP were modeled in Markets+
- Results show much higher net cost, mostly due to a loss of generation revenue
- Further analysis needed to determine effects of “carved-out” transmission and large amount of pseudo-tied generation

Cost/Benefit (\$ millions)	Case		
	BAU (2026)	Main Split (2026)	Main Split APP6 (2026)
Load Cost	184.1	223.8	96.7
Generation Cost	71.2	63.1	65.7
Reserve Cost	0.0	0.0	0.0
Generation Revenue	-203.3	-241.6	-67.1
Reserve Revenue	0.0	0.0	0.0
Wheeling Revenue	-63.3	-7.0	-5.6
Congestion Revenue	-4.1	-2.4	-23.9
GhG Revenue	0.0	0.0	-0.7
Net Cost	-15.4	35.8	65.0
	52.0	45.3	95.3
	-19.5	33.4	40.3
	32.5	78.6	135.6