BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW MEXICO'S APPLICATION FOR APPROVAL OF PURCHASED POWER AGREEMENTS, ENERGY STORAGE AGREEMENTS, AND CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY FOR SYSTEM RESOURCES IN 2026,	)	**Case No. 23-00xxx-UT**
PUBLIC SERVICE COMPANY OF NEW MEXICO,	)	
Applicant.	)	

DIRECT TESTIMONY

OF

NICK WINTERMANTEL

October 25, 2023

NMPRC CASE NO. 23-_____-UT
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NICK WINTERMANTEL

WITNESS FOR
PUBLIC SERVICE COMPANY OF NEW MEXICO

DIRECT TESTIMONY
OF NICK WINTERMANTEL
NMPRC CASE NO. 23-_____-UT

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Nick Wintermantel, and my business address is 3000 Riverchase Galleria Suite 575, Hoover, Alabama, 35224.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.

A. My educational background and relevant employment experience are summarized in PNM Exhibit NW-1 attached to my testimony.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN UTILITY-RELATED PROCEEDINGS?

A. Yes. I presented testimony before the New Mexico Public Regulation Commission ("NMPRC" or "Commission") in PNM's San Juan Replacement Resource Filing in Case No. 19-00195-UT and PNM's Palo Verde Lease Replacement Filing in Case No. 21-00083-UT. I have also testified in Georgia, South Carolina, and North Carolina in utility-related proceedings. These proceedings are reflected in PNM Exhibit NW-1.

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR EXPERTISE PERFORMING RESOURCE ADEQUACY AND PLANNING STUDIES.

A. Since being employed by Astrapé in 2009, I have managed resource adequacy studies across the industry including target reserve margin studies; Effective Load Carrying Capability ("ELCC") studies of wind, solar, storage, and demand response resources; resource selection decisions; and ancillary service studies for integrating renewables. I performed these studies using Astrapé's proprietary Strategic Energy Risk Valuation Model ("SERVM") used by utilities and system operators across the U.S. and internationally. Prior to working at Astrapé I worked in various resource planning functions with the Southern Company, which included work for its operating companies as well as Southern Power.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. My testimony discusses PNM's resource adequacy assessment for 2026 and I present the 2026 loss of load expectation ("LOLE") for specific portfolios provided by PNM as part of the Request for Proposal ("RFP") to ensure that resource adequacy metrics are met.

Q. PROVIDE A BRIEF OVERVIEW OF WHAT YOUR TESTIMONY CONCLUDES.

A. My testimony concludes the new resource portfolio brought forward by PNM resolves the resource adequacy need in 2026 and provides a reliable system as measured by LOLE.

II. SYSTEM RESOURCE ADEQUACY MODELING

Q. PLEASE DESCRIBE GENERALLY YOUR ROLE IN THE PNM INTEGRATED RESOURCE PLANNING (IRP) AND RFP PROCESS AND HOW THE SERVM MODEL WAS UTILIZED.

A. My team was responsible for the resource adequacy analysis conducted in the 2026 RFP and the ongoing 2023 IRP, which was performed using the SERVM model. PNM also used SERVM in the 2020 IRP, the San Juan Replacement RFP, and the Palo Verde Lease replacement RFP. The same resource adequacy framework used for those proceedings was used for this 2026 RFP. For the ongoing 2023 IRP, my team calculated marginal ELCCs[1] for new solar, wind, and storage projects which were implemented in the Encompass modeling as described by Mr. Phillips for the 2026 RFP. My team assessed the LOLE for 2026 to ensure portfolios developed by PNM met reliability requirements. This was accomplished by taking the resources from PNM's EnCompass modeling, reflecting the selected resources, and

[1] *See PNM 2023-2042 IRP for IRP ELCC Modeling: AEG EE Bundles, PNM EE Program & Highlights, Astrape ELCC Study Results, Review of Summer 2022 and Market Assistance included in Resource Adequacy Modeling*, Steering Session at 44-63 (Jan. 17, 2023), https://www.pnmforwardtogether.com/assets/ uploads/2023.01.09-Slides-IRP-PAG-Steering-10-EE-AEG-Astrape-Summer-22.pdf.

including them in SERVM's resource adequacy framework, and assessing the 2026 LOLE.

Q. PLEASE DEFINE LOLE AND THE LOLE STANDARD USED BY PNM.

A. LOLE is a widely accepted metric for determining resource adequacy for electric systems to represent the expected number of days in a year that load will not be met given a specified resource portfolio. The metric selected by PNM in previous IRPs has been 0.2 days per year. In other words, PNM plans to build enough capacity that it would only experience firm load shed events due to capacity shortages two days every 10 years. This standard is less stringent than the 0.1 LOLE standard used by many utilities and Independent System Operators ("ISOs")/Regional Transmission Operators ("RTOs"), which is referred to as the one-day-in-10-year standard. As discussed by PNM Witness Nicholas L. Phillips, PNM is moving toward achieving a one-day-in-10-year standard (i.e., a 0.1 LOLE or 0.1 days per year). As a result, PNM proposed two portfolios for my team to evaluate; one that targets a 0.2 LOLE and one with slightly more capacity to target a 0.1 LOLE.

III. RELIABILITY OF 2026 RESOURCES

Q. MOVING TO THE 2026 RFP RESOURCES, PLEASE DESCRIBE THE 2026 PORTFOLIO RESOURCES YOUR TEAM MODELED IN SERVM.

A. As Witness Phillips discusses, PNM selected the following portfolios to fill the resource adequacy requirement in 2026:

Portfolio 1: Targets 0.2 LOLE
- 100 MW of standalone battery (four-hour)
- 50 MW of standalone battery (four-hour)
- Hybrid resource with 100-MW battery (four-hour) /100 MW of solar

Portfolio 2: Targets 0.1 LOLE
- 100 MW of standalone battery (four-hour)
- 50 MW of standalone battery (four-hour)
- Hybrid resource with 100-MW battery (four-hour) /100 MW of solar
- 60 MW of standalone battery (four-hour)

Q. WHAT WAS YOUR ROLE IN ASSESSING THE 2026 RESOURCE PORTFOLIOS?

A. Similar to the 2023 Palo Verde Replacement RFP, my team evaluated the reliability of the portfolios to ensure the resource adequacy standard was met in 2026.

Q. FROM AN EXTERNAL MARKET PERSPECTIVE, WHAT WAS ASSUMED IN THE RELIABILITY ANALYSIS?

A. Commensurate with previous RFP analysis, the 2026 RFP portfolios were modeled with a 200-300 MW import constraint in all hours in which hourly load was greater than or equal to 85% of the annual gross peak load. In addition, the 2026 RFP portfolios were modeled with a 100–150 MW import constraint during hours 16-18 from June through August when hourly load was greater than or equal to 85% of the annual gross peak load. Lastly a 50-MW import constraint was applied during hours 19-22 from June through August when the hourly load was greater

than or equal to 80%[2] of the annual gross peak load. By modeling imports in this way, the model applies constraints on peak days when PNM and its neighbors would expect to experience high loads. The following table summarizes the import constraint.

Table 1. Import Constraint Summary

Hourly Import Constraints

	June-August	All Other Months
Hours 1-15 and 22-24*	200-300 MW	200-300 MW
Hours 16-18*	100-150 MW	200-300 MW
Hours 19-22**	50 MW	200-300 MW

*applies only when load is greater than or equal to 85% of annual gross load peak
**applies only when load is greater than or equal to 80% of annual gross load peak

On days with lower loads, no import constraint is applied. Instead, imports are limited based on the modeled neighbor balancing area's supply and demand balance as captured in the simulations and the respective transmission path ratings between PNM and each neighboring entity. These are the same assumptions used in the 2023 Palo Verde Replacement RFP analysis.

Q. YOU STATED THE SERVM MODEL HAS BEEN USED IN PREVIOUS PROCEEDINGS INCLUDING THE CURRENT 2023 IRP. CAN YOU

[2] In SERVM, the percentage of annual peak load is provided for each constrained period modeled. In order to ensure the constraint was applied on peak load days, the percentage of annual peak load had to be decreased from 85% to 80% for hours 19-22 because these hours have a gross load much less than peak daily load.

DESCRIBE MODELING CHANGES FROM THE PREVIOUS IRP AND PALO VERDE REPLACEMENT PROCEEDINGS?

A. General updates were made to inputs including PNM recent resource portfolio updates, load forecast updates, and adding additional weather years which are added as we move forward in time. We also updated the neighboring loads and resource projections to reflect the Southwest Resource Adequacy Study performed by E3 which provides a more accurate picture of those regions in the modeling.

Q. PLEASE PROVIDE THE RELIABILITY RESULTS FOR THE 2026 RFP PORTFOLIOS.

A. PNM's Portfolio 1 yielded a 0.195 LOLE and Portfolio 2 yielded a 0.113 LOLE. As expected, Portfolio 1 met the 0.2 LOLE target and Portfolio 2 essentially brought the PNM system close to the 0.1 LOLE target. Due to resource sizing issues, it is not expected that any specific portfolio will perfectly achieve a desired 0.2 or 0.1 LOLE metric.

IV. CONCLUSIONS

Q. PLEASE SUMMARIZE THE CONCLUSIONS AND RECOMMENDATIONS IN YOUR TESTIMONY.

A. I conclude that the preferred portfolios which target a 0.2 and a 0.1 LOLE submitted by PNM reasonably meet those desired targets. As PNM continues its path towards

decarbonization, resource adequacy should be a priority and as discussed by PNM Witness Phillips, PNM should shift towards a 0.1 LOLE standard.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

GCG#531682

Résumé of Nick Wintermantel

PNM Exhibit NW-1

Is contained in the following 4pages.

Nick Wintermantel | Principal, Astrapé Consulting, LLC

3000 Riverchase Galleria Suite 575
Hoover, AL 35224
(205) 988-4404
nwintermantel@Astrapé.com

Mr. Wintermantel has over 20 years of experience in utility planning and electric market modeling, Areas of utility planning experience includes utility integrated resource planning (IRP) for vertically-integrated utilities, market price forecasting, resource adequacy modeling, RFP evaluations, environmental compliance analysis, asset management, financial risk analysis, and contract structuring. Mr. Wintermantel also has expertise in production cost simulations and evaluation methodologies used for IRPs and reliability planning. As a consultant with Astrapé Consulting, Mr. Wintermantel has managed reliability and planning studies for large power systems across the U.S. and internationally. Prior to joining Astrapé Consulting, Mr. Wintermantel was employed by the Southern Company where he served in various resource planning, asset management, and generation development roles.

Experience

Principal Consultant at Astrapé Consulting (2009 – Present)

Managed detailed system resource adequacy studies for large scale utilities
Managed ancillary service and renewable integration studies
Managed capacity value studies
Managed resource selection studies
Performed financial and risk analysis for utilities, developers, and manufacturers
Demand side resource evaluation
Storage evaluation
Served on IE Teams to evaluate assumptions, models, and methodologies for competitive procurement solicitations
Project Management on large scale consulting engagements
Production cost model development
Model quality assurance
Sales and customer service

Sr. Engineer for Southern Company Services (2007-2009)

Integrated Resource Planning and environmental compliance
Developed future retail projects for operating companies while at the Southern Company
Asset management for Southern Company Services

Sr. Engineer for Southern Power Company (Subsidiary of Southern Company) (2003-2007)

Structured wholesale power contracts for Combined Cycle, Coal, Simple Cycle, and IGCC Projects
Model development to forecast market prices across the eastern interconnect
Evaluate financials of new generation projects
Bid development for Resource Solicitations

Cooperative Student Engineer for Southern Nuclear (2000-2003)

Probabilistic risk assessment of the Southern Company Nuclear Fleet

Industry Specialization

Resource Adequacy Planning	Resource Planning	Integrated Resource Planning
Competitive Procurement	Asset Evaluation	Financial Analysis
Environmental Compliance Analysis	Generation Development	Capacity Value Analysis
Renewable Integration	Ancillary Service Studies	

Education

MBA, University of Alabama at Birmingham – Summa Cum Laude
B.S. Degree Mechanical Engineering - University of Alabama - Summa Cum Laude

Relevant Experience

Resource Adequacy Planning and Production Cost Modeling

Tennessee Valley Authority: Performed Various Reliability Planning Studies including Optimal Reserve Margin Analysis, Capacity Benefit Margin Analysis, and Demand Side Resource Evaluations using the Strategic Energy and Risk Valuation Model (SERVM) which is Astrapé Consulting's proprietary reliability planning software. Recommended a new planning target reserve margin for the TVA system and assisted in structuring new demand side option programs in 2010. Performed Production Cost and Resource Adequacy Studies in 2009, 2011, 2013, 2015 and 2017. Performed renewable integration and ancillary service work from 2015-2017.

Southern Company Services: Assisted in resource adequacy and capacity value studies as well as model development from 2009 – 2018.

Louisville Gas & Electric and Kentucky Utilities: Performed reliability studies including reserve margin analysis for its Integrated Resource Planning process.

Duke Energy: Performed resource adequacy studies for Duke Energy Carolinas, LLC and Duke Energy Progress, LLC in 2012 and 2016. Performed capacity value and ancillary service studies in 2018. Performed ELCC analysis in 2022, and Resource Adequacy and ELCC Analysis in 2023.

California Energy Systems for the 21st Century Project: Performed 2016 Flexibility Metrics and Standards Project. Developed new flexibility metrics such as EUE_{flex} and $LOLE_{flex}$ which represent LOLE occurring due to system flexibility constraints and not capacity constraints.

Terna: Performed Resource Adequacy Study used to set demand curves in Italian Capacity Market Design.

Pacific Gas and Electric (PG&E): Performed flexibility requirement and ancillary service study from 2015–2017. Performed CES Study for Renewable Integration and Flexibility from 2015 – 2016.

PNM (Public Service Company of New Mexico): Managed resource adequacy studies and renewable integration studies and ancillary service studies from 2013 – 2023. Performed resource selection studies in 2017 and 2018. Additional IRP work from 2020 – 2023.

GASOC: Managed resource adequacy studies from 2015 – 2018.

MISO: Managed resource adequacy study in 2015 and performed ongoing seasonal resource adequacy

analysis in 2020 and 2021. Provided ongoing support in regard to accreditation and LOLE studies in 2022 and 2023.

SPP: Managed resource adequacy study in 2017. Ongoing planned maintenance Study in 2020-2021.

SPP: Managed resource adequacy study in 2017. Ongoing planned maintenance Study in 2020-2021.

Santee Cooper: Managed resource adequacy, ELCC, and solar integration studies in 2022-2023.

Dominion Energy South Carolina: Managed resource adequacy and ELCC studies in 2022-2023.

NWPP: Managed resource adequacy study for the northwest power pool in 2022.

Malaysia (TNB, Sabah, Sarawak)): Performed and managed resource adequacy studies from 2015-2018 for three different Malaysian entities.

ERCOT: Performed economic optimal reserve margin studies in cooperation with the Brattle Group in 2014 and 2018. The report examined total system costs, generator energy margins, reliability metrics, and economics under various market structures (energy only vs. capacity markets). Completed a Reserve Margin Study requested by the PUCT, examining an array of physical reliability metrics in 2014 (See Publications: Expected Unserved Energy and Reserve Margin Implications of Various Reliability Standards). Probabilistic Risk Assessment for the North American Electric Reliability Corporation (NERC) in 2014, 2016, and 2018.

FERC: Performed economics of resource adequacy work in 2012-2013 in cooperation with the Brattle Group. Work included analyzing resource adequacy from regulated utility and structured market perspective.

EPRI: Performed research projects studying reliability impact and flexibility requirements needed with increased penetration of intermittent resources in 2013. Created Risk-Based Planning system reliability metrics framework in 2014 that is still in use today.

Independent Evaluator Work for RFPs: Served on independent evaluator teams for capacity RFPs in Georgia, Arizona, Oregon, and Colorado (2010-2023).

Evergy: Managed resource adequacy study in 2022.

Ameren: Managed resource adequacy, ELCC, and flexibility analysis for ongoing planning and IRP support (2019-2023).

Expert Witness Testimony

Dominion Energy South Carolina (2023): Testified on behalf of Dominion Energy South Carolina (2023) in South Carolina in regard to a resource adequacy and ELCC Study. DOCKET NO.2023-9-E.

New Mexico Public Regulation Commission (2021): Testified on behalf of Public Service Company of New Mexico in regard to the evaluation and recommendation of new generation resources. Case No. 21-00083-UT.

Public Service Commission of South Carolina (2021): Testified on behalf of Duke Energy in regard to the

Resource Adequacy Study and Storage ELCC conducted by Astrapé Consulting. DOCKET NO.2019-224-E, NO.2019-225-E.

New Mexico Public Regulation Commission (2019 and 2020): Testified on behalf of Public Service Company of New Mexico in regard to the evaluation and recommendation of replacement resources for San Juan Generation Station Units 1 and 4. Case No 19-00195-UT.

Public Service Commission of South Carolina (2019): Testified on behalf of Duke Energy in regard to the Solar Integration Study Astrapé Consulting conducted for the Companies' Avoided Cost Filing. Docket No. 2019-185-E. Docket No. 2019-186-E.

North Carolina Public Service Commission (2019): Testified on behalf of Duke Energy in regard to the Solar Integration Study Astrapé Consulting conducted for the Companies' Avoided Cost Filing. Docket No. E-100, Sub 175.

Georgia Public Service Commission (2014): Testified on behalf of the Commission Staff as an Independent Evaluator for the Advanced Solar Initiative RFP. Docket 38877.

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PUBLIC SERVICE COMPANY OF NEW MEXICO,	)	
Applicant	)	

SELF AFFIRMATION

NICK WINTERMANTEL, Principal, Astrape Consulting, upon being duly sworn according to law, under oath, deposes and states: I have read the foregoing **Direct Testimony of Nick Wintermantel** and it is true and accurate based on my own personal knowledge and belief.

Dated this 25th day of October, 2023.

/s/ Nick Wintermantel
NICK WINTERMANTEL