BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW MEXICO'S ABANDONMENT OF SAN JUAN GENERATING STATION UNITS 1 AND 4	)	**Case No. 19-00018-UT**
IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW MEXICO'S CONSOLIDATED APPLICATION FOR APPROVALS FOR THE ABANDONMENT, FINANCING, AND RESOURCE REPLACEMENT FOR SAN JUAN GENERATING STATION PURSUANT TO THE ENERGY TRANSITION ACT	)	**Case No. 19-00195-UT**

PUBLIC SERVICE COMPANY OF NEW MEXICO'S
LIST OF ERRATA TO THE JULY 1, 2019 PREFILED DIRECT TESTIMONY

Public Service Company of New Mexico ("PNM") hereby files its list of errata to the July 1, 2019 prefiled Direct Testimony. A list of errata for PNM Witnesses Ronald N. Darnell, Thomas G. Fallgren, Roger W. Nagel. Nicholas Phillips, Nick Wintermantel, Henry E. Monroy, and Michael J. Settlage and the corresponding corrected pages with marked changes to the prefiled direct testimony or exhibits are attached.

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Ronald N. Darnell

DIRECT TESTIMONY AND EXHIBITS OF RON DARNELL		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 4 Ln. 4	Insert "2-MW of" between "by and "natural".
Testimony	Pg. 4 Ln. 5	Insert "combined with a 130 MW solar battery hybrid project" between "resources" and "located".
Testimony	Pg.11, PNM Table RND -1	Various numbers in table were updated as a result of the corrections and changes to modeling and cost information.

Q. CAN YOU DESCRIBE THE THREE OTHER RESOURCE REPLACEMENT SCENARIOS THAT PNM IS PRESENTING IN TODAY'S FILING?

A. Yes. Under Scenario 2, the San Juan coal plant would be replaced by 2-MW of natural gas-fired resources combined with a 130 MW solar battery hybrid project, located in San Juan County. This scenario would offer the most localized benefits to San Juan County of any scenario.

Under Scenario 3, the San Juan coal plant would be replaced by renewables and battery storage distributed throughout the state, with no new natural gas generation.

Under Scenario 4, San Juan coal plant would be replaced entirely by renewable energy resources. There would be no new natural gas generation or battery storage under this scenario.

PNM Witness Thomas Fallgren provides detailed information about each of these scenarios.

Q. WHAT IS THE COMPANY'S ASSESSMENT OF THESE THREE SCENARIOS?

A. We believe that Scenario 2 represents the best situation for San Juan County in terms of mitigating community impacts, as it will keep more jobs and taxes in San

PNM Table RND-1 – Scenario Comparison

Resource Portfolio	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Carbon Reduction (from 2005 levels)[3]	62%	60%~~59%~~	65%	67%
Loss of Load Expectation in 2023 (events per year)[4]	0.17~~0.19~~	0.13~~0.21~~	0.39~~0.36~~	5.70~~5.63~~
20-year Net Present Value (in millions)[5]	$4,673~~$4.678~~	$4,717~~$4.732~~	$4,837~~$4.834~~	$5,454~~$5.452~~
Average Monthly Residential Customer Savings in 2023 (compared to business as usual)[6]	-$6.87~~7.11~~	-$6.55~~6.53~~	-$7.42~~7.57~~	-$0.25~~1.65~~

[3] *See* Direct Testimony of PNM Witness Fallgren, PNM Table TGF-2.

[4] This metric represents the number of loss of load events due to capacity shortages, calculated in events per year. *See* Direct Testimony of PNM Witness Wintermantel at 9, lines 10-17. Based on the size of PNM's system, Astrapé recommended as part of the 2017 IRP that PNM target a 0.2 Loss of Load Expectation ("LOLE") standard (which means two events in ten years) at a minimum, which was included in the 2017 IRP. *Id.* at 12, lines 3-5. The LOLE figures in this table were calculated by Astrapé. They are included in the company's report. *See id.*, PNM Exhibit NW-2, Table 29.

[5] *See* Direct Testimony of PNM Witness Wintermantel, Table NW-7.

[6] Savings "compared to business as usual" means how much an average residential customer would pay if the San Juan coal plant continues to operate, versus the costs associated with the replacement resources under each scenario. The figures in this table are based on an assessment performed by PNM Witness Settlage. *See* Direct Testimony of PNM Witness Settlage, Exhibit MJS-7, pages 1-4 (column labeled "Net Impact"). The average residential customer uses approximately 600 kWh per month. *See* Direct Testimony of PNM Witness Settlage at 26, lines 17-18. Mr. Settlage also estimates the impact of Scenarios 1 through 4 over a variety of usage levels for the Residential and Small Power Classes, which comprise over 90% of all PNM customers. *See id.* at 26, lines 12-18; PNM Exhibit MJS-7.

Thomas G. Fallgren

DIRECT TESTIMONY AND EXHIBITS OF TOM FALLGREN		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 1, Ln. 10	After "These" insert "resources" and delete "resources" after "include".
Testimony	Pg. 11, PNM Table TGF-2	Various numbers in PNM Table TGF-2 were updated to reflect corrected 2023 CO_2 emission reductions by scenario.
Testimony	Pg. 11, Ln. 9	Replace "$7.11" with "$6.87". Reflects updated bill impacts as a result of changes to modeling.
Testimony	Pg. 12, PNM Table TGF-3	Various numbers in this tabled were updated to reflect; (1) the reduced actual estimated Capital Investment for the Pinon Gas Plant which due to an escalation factor that had inadvertently been applied twice to the estimated cost of the seventh unit and the 2% percent cost of the performance bond had been applied to the higher estimated project cost and GRT incorrectly applied which affected the Property Tax estimate.; (2) a reduced estimate for the Zamora Storage EPC contract due to an earlier, higher estimate for the EPC contract which had inadvertently been used in developing the cost estimates.
Testimony	Pg. 19, Ln. 6	After "except" replace "is" with "as".
Testimony	Pg. 24, Ln. 7-10	Insert "two best replacement resource combinations" after "the" and delete "best standalone battery options". Updated to reflect the modeling changes.
Testimony	Pg. 24, Ln. 11	Delete "6" after "NW-"and insert "7". Corrected the reference.
Testimony	Pg. 27, PNM Table TGF-4	Updated table to reflect the change in resources for Scenario 2. Insert "440" and delete "280" before MW; Insert "Solar/Battery Hybrid" and delete "Heavy Frame #1"; delete "Gas" and insert "Solar/Battery"; delete "196" and insert "100" before MW and insert "Solar" after MW; insert "30 MW Battery"; delete "EPC" and insert "PPA/ESA".
Testimony	Pg. 27, Ln. 9	Replace "$54" with "$43".
Testimony	Pg. 33, Ln. 7	Add "received" after "pricing".
Testimony	Pg. 35, Ln. 14	Delete "2018" and insert "2019".
Testimony	Pg. 51, Ln. 10	Delete "the" between "of" and "each".
Testimony	Pg. 56, Ln. 18	Updated Arroyo Storage ESA testimony to reflect GRT of $0.50/kw-mo. Insert "(plus $0.50/kw-mo GRT)" after "kw-mo".
Testimony	Pg. 56, Ln. 23	Deleted typo "and PNM".
Testimony	Pg. 57, Ln. 10	Updated Jicarilla Storage ESA 1 testimony to reflect GRT of $0.69/kw-mo. Insert "(plus $0.69/kw-mo GRT)" after "kw-mo".
Testimony	Pg. 75, PNM Table TGF-7	Various numbers in PNM Table TGF-7 were updated to reflect; (1) the reduced actual estimated Capital Investment for the Pinon Gas Plant which due to an escalation factor that had inadvertently been applied twice to the estimated cost of

DIRECT TESTIMONY AND EXHIBITS OF TOM FALLGREN		
Document	**Page and Line**	**Explanation**
		the seventh unit and the 2% percent cost of the performance bond had been applied to the higher estimated project cost and New Mexico gross receipts taxes ("GRT") incorrectly applied which affected the Property Tax estimate.
Testimony	Pg. 76, Ln. 4 – 5	The total annualized O&M costs for 2022 and 2023 were corrected. Delete "892,500" and replace with "$2,363,604" and delete "905,888" and replace with "$2,399,058". O&M costs for the Pinon Gas Plant in testimony only included variable LTSA costs and did not include annualized O&M costs.
Testimony	Pg. 76, Ln. 11	The ratemaking treatment for the Pinon Gas Plant has been updated. Change "190.9" to "190.3".
Testimony	Pg. 81, PNM Table TGF-8	Various numbers in table were updated to reflect the GRT separately from the Sandia Storage EPC price and also correcting the GRT rate and adjusting the Owner's cost. These updates do not change the Total Project Cost.
Testimony	Pg. 81, Ln. 17	The ratemaking treatment for the Sandia Storage Project has been updated to reflect the correct amount. Change "49.8" to "48.9".
Testimony	Pg. 82, PNM Table TGF-9	Various numbers in table were updated to reflect the GRT separately from the Zamora Storage EPC price and also correcting the GRT rate which reduced the Total Project Cost by approximately $150,000.00.
Testimony	Pg. 83, Ln. 2	The ratemaking treatment for the Zamora Storage Project has been updated to reflect the correct amount. Change "39.0" to "$38.9".
Testimony	Pg. 86, Ln. 6	Insert "the" between offsets" and "need".

DIRECT TESTIMONY
OF THOMAS G. FALLGREN
NMPRC CASE NO. 19-_____-UT

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Thomas G. Fallgren. I am Vice President of Generation for Public Service Company of New Mexico ("PNM"). My business address is Public Service Company of New Mexico, 2401 Aztec Rd, NE, Albuquerque, New Mexico 87107.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I describe and support the optimum mix of resources to replace Units 1 and 4 of the San Juan coal plant. These resources include ~~resources~~ 350 MW of new solar resources, 130 MW of new battery storage and 280 MW of new natural gas resources, collectively referred to as Scenario 1, which meets the objectives of the recently enacted Energy Transition Act. I describe the competitive bid and evaluation process that led to the selection of Scenario 1 and discuss why it is preferable to the other scenarios that PNM analyzed and presents in this case. My testimony provides factual support for approval of the purchase power agreements ("PPAs") and certificates of public convenience and necessity ("CCNs") for the replacement resources in Scenario 1.

I provide factual support for the proposed abandonment of San Juan Units 1 and 4 in June of 2022, as well as support for certain abandonment costs related to plant

PNM Table TGF-2 - Carbon Emission Reductions

	2005	2023	
San Juan Abandonment and Replacement Alternatives	CO_2 (short tons)		CO_2 Percentage Reduction, 2005 to 2023
2005 System-Wide Generation	7,695,240		
2023 San Juan Continues		5,555~~600~~,000	27%
2023 Scenario 1 (Recommended)		2,900,000	62%
2023 Scenario 2 (San Juan Location Preferred)		3,088~~150~~,000	60~~59~~%
2023 Scenario 3 (No Gas)		2,685~~680~~,000	65%
2023 Scenario 4 (All Renewable)		2,535~~530~~,000	67%

Q. WHAT ARE THE COST BENEFITS ASSOCIATED WITH SCENARIO 1?

A. Scenario 1 achieves this significant transition to more sustainable energy while reducing costs to PNM customers. As discussed by PNM Witnesses Phillips, Wintermantel and Dorris, Scenario 1 results in the lowest Net Present Value (NPV) of costs and therefore the best savings for customers. PNM Witness Settlage calculates the bill impacts for residential and small business customers, which indicates a related savings of approximately $6.87 ~~$7.11~~ per month in the first year versus continued operation of San Juan. Actual savings depend on a given customer's energy usage and will vary over time.

Q. PLEASE PROVIDE A SUMMARY OF THE ESTIMATED CAPITAL INVESTMENTS, JOB CREATION AND PROPERTY TAX REVENUES ASSOCIATED WITH SCENARIO 1.

A. Scenario 1 will result in economic development and provide good jobs for the Farmington/San Juan County region and other parts of our state. PNM Table

TGF-3 provides estimates for the large capital investments, significant number of construction jobs, and property taxes generated across New Mexico as a result of Scenario 1.

PNM Table TGF-3 – Economic Benefits of Scenario 1

	Project	Technology	Size (MW)	Capital Investment	Construction Jobs Estimate	Long Term Jobs	2023 Property Taxes 1st full year (thousands)
School District	Pinon Generarating Station	Gas	280 MW	$189.9M~~$192.3M~~	225	5	$1,478 ~~$1,483~~
	New Gas Transmission Line	Gas Trans	NA	$20M	150	0	$160
100 Mile Radius	Arroyo Solar	Solar	300 MW	$360M	500	5	$307
	Arroyo Storage	Battery	40 MW, 4hr				
	Jicarilla Solar	Solar	50	$70M	200	7-10	$150
	Jicarilla Storage	Battery	20 MW, 4hr				
New Mexico	Sandia Energy Storage	Battery	40MW, 2hr	$48.5M~~$50.5M~~	70	3	$509
	Zamora Energy Storage	Battery	30 MW, 2hr	$38.5M~~$40.3M~~			$410 ~~$411~~
	Total			$727.5M ~~$733M~~	1145	20-23	$3,014 ~~$3,020~~
	PNM Current SJGS Property Tax						$3,200

Q. DOES SCENARIO 1 MITIGATE THE ECONOMIC IMPACTS TO THE SAN JUAN COUNTY REGION DUE TO THE PROPOSED RETIREMENT OF THE SAN JUAN COAL PLANT?

A. Yes. Scenario 1 provides for an approximate 50% replacement of the tax base within the Central Consolidated School District and results in ~~over~~ almost $730 million dollars in capital investments and an estimated 1,145 construction jobs across New Mexico in the form of both vendor supplied and utility-owned resources.

dates. Additionally, the same degree of favorable pricing associated with renewable investment tax credits may not have remained available from bidders. These tax credits, which are already declining over time, currently have contributed to PNM's selection of extremely low priced solar PPAs in its recommended Scenario 1. Nor was it necessary to reissue the all source RFP to meet the provisions of the law, except as ~~is~~ covered by the Supplemental RFP.

Q. HOW DID PNM ENCOURAGE THE USE OF WORKERS RESIDING IN NEW MEXICO CONSISTENT WITH SECTION 3(C) OF THE ENERGY TRANSITION ACT?

A. PNM provided a clarifying requirement to bidders during the bid review process to confirm that responsive bid responses should reflect how bidders intended to utilize workers residing in New Mexico. PNM has received commitments from the successful bidders for the resources included in Scenario 1 of their intent to utilize New Mexico workers to the greatest extent reasonably possible. For the PNM-owned resources, PNM will also be using, and requiring its contractors to use, New Mexico workers to the greatest extent possible.

Q. DID PNM CONDUCT ANY STAKEHOLDER ENGAGEMENT MEETINGS IN CONNECTION WITH THE RFP?

A. Yes. PNM held an Energy Storage Public Listening Session for any interested stakeholders. The listening session focused on the current state of energy storage in the industry and gave the public the opportunity to ask related questions. The

Q. HOW DID PNM IDENTIFY AND INCORPORATE ADDITIONAL DIVERSE BATTERY STORAGE PROJECTS INTO SCENARIO 1?

A. PNM selected both ownership types in roughly equivalent amounts. PNM selected 60 MW of vendor-owned PPA battery storage from the original RFP bids, and 70 MW of utility-owned battery storage from the supplemental RFP bids. PNM evaluated all bids from both RFPs at the same time to select the best available options for battery storage. PNM Witness Wintermantel determined that for the ~~five best standalone battery options~~ two best replacement resource combinations there is a maximum NPV difference of $1 ~~2~~ million, without accounting for other values associated with operational control and optimal siting (Reference PNM Table NW-~~7~~6). PNM utilized the Brattle Study to identify additional economic benefits due to utility locational preference for transmission purposes, and the recommendations of PNM Witnesses Kemp and Dorris regarding utility learning opportunities to better inform future deployment of battery storage on PNM's system in the future. PNM therefore selected the Sandia and Zamora battery projects due to the essentially equal economics considered with the locational benefits identified in the Brattle study and based on utility learning providing the best value.

Q. DID PNM CONSIDER THE FACTORS FOR REPLACEMENT PORTFOLIOS UNDER THE ENERGY TRANSITION ACT?

A. Yes. As discussed in Section II above, PNM's evaluation of proposed new resources also incorporated the increased renewable portfolio standard and other requirements under the Energy Transition Act.

PNM Table TGF-4 – Scenario 2- San Juan Location Preference

Name	Resource Type	Nameplate Capacity	Ownership	Location
Pinon Gas	Gas	440~~280~~ MW	EPC	San Juan
Solar/Battery Hybrid ~~Heavy Frame #1~~	Solar/Battery ~~Gas~~	~~196~~ 100 MW Solar 30 MW Battery	PPA/ESA ~~EPC~~	San Juan

Q. WHY ISN'T SCENARIO 2 PNM'S RECOMMENDED REPLACEMENT PORTFOLIO?

A. Limiting replacement resources to only be located in San Juan County results in elimination of other low cost resources. This eliminates the low-cost renewable resource bids of Arroyo Solar and Jicarilla 1 and the related energy storage projects listed in Scenario 1 and also limits resource diversity as discussed earlier in my testimony. This portfolio of resources results in a higher NPV of $43~~54~~ million for Scenario 2.

Q. ARE THERE BENEFITS TO SCENARIO 2?

A. Scenario 2 is the alternative that most mitigates the economic impacts to the Farmington/San Juan regions related to the retirement of the San Juan coal plant. Location of all replacement resources at or near the San Juan site preserves much of the property tax base.

Q. IS PNM'S DECISION TO SEEK ABANDONMENT OF THE SAN JUAN COAL PLANT EFFECTIVE IN JUNE 2022 BASED ON COMPARATIVE ANALYSES?

A. Yes, as discussed by PNM Witness Phillips, PNM's 2017 IRP demonstrated there would be savings, although the degree of benefits required further understanding of available alternative resources. PNM refreshed that evaluation with updated coal pricing received from the San Juan Coal Company in May 2018, and also accounted for changes in federal tax law, natural gas futures forecasts, and updated capital and O&M forecasts for the San Juan coal plant. PNM again analyzed updated coal pricing received in December 2018. PNM Exhibit TGF-5 contains the detailed inputs and their assumptions that were used to model continuation of the plant. As discussed by PNM Witness Phillips, the updated analyses confirmed that PNM's abandonment of the San Juan coal plant in 2022 provides long-term benefits to customers.

Q. YOU MENTION THAT FARMINGTON WISHES TO CONTINUE TO RELY ON THE SAN JUAN COAL PLANT. HAS FARMINGTON REACHED AGREEMENT WITH THE OTHER OWNERS TO ACQUIRE THEIR INTERESTS IN THE SAN JUAN COAL PLANT?

A. No. PNM understands that Farmington is actively seeking other parties to continue plant operations beyond 2022. PNM has been acting in good faith with respect to Farmington's efforts by providing requested information about plant operations, such as capital costs, fixed and variable costs, coal supply and mine

A. Necessary Ongoing Plant Capital Expenses

Q. IS IT NECESSARY FOR PNM AND THE OTHER SAN JUAN OWNERS TO MAKE CAPITAL INVESTMENTS IN THE PLANT EVEN THOUGH PLANS NOW CALL FOR RETIREMENT IN JUNE 2022?

A. Yes. In order to ensure the continued reliable and safe operation of San Juan through June of 2022 it is necessary for the owners to make certain capital investments. However, each capital investment is evaluated for whether it is essential for the safe and reliable operation of San Juan through June 2022. No capital investments are being made for purposes of extending the life of the plant beyond June 2022.

Q. HOW MUCH DOES PNM ESTIMATE IT WILL NEED TO MAKE IN CAPITAL INVESTMENTS FOR THE PERIOD BETWEEN JANUARY ~~2018~~ 2019 AND THE PROPOSED RETIREMENT OF THE PLANT IN JUNE 2022?

A. PNM anticipates that its share of capital costs for continued plant operations from January 1, 2019, to June 30, 2022 will total approximately $5.6 million. PNM Exhibit TGF-6 includes an itemization of the expenses that comprise this amount.

Q. WHY ARE THESE EXPENSES NECESSARY KNOWING A PLANT SHUTDOWN MAY OCCUR IN JUNE 2022?

which is defined as a PPA with a term of five years or more and for which the utility intends to seek rate recovery from New Mexico retail customers. (Rule 551.7(E) and 8(A)). Rule 551 also requires that a utility file an application for approval with the Commission within thirty days after the execution of a long-term PPA. (Rule 551.8(B)).

Q. HAS PNM COMPLIED WITH THESE PROVISIONS OF THE PPA RULE WITH RESPECT TO THE PPAS AND ESAS?

A. Yes. All of the agreements were executed on June 27, 2019 so PNM's Application is filed timely. In addition, under Section 6.1 of ~~the~~ each of the agreements, they become effective only after Commission approval.

Q. PLEASE BRIEFLY DESCRIBE THE PPAS AND ESAS.

A. I described the PPAs and ESAs in Section II of my testimony. To summarize:

Arroyo Solar PPA - The Arroyo Solar PPA is between PNM, as buyer, and Arroyo Solar as seller, for 300 MW_{AC} of solar energy from the Arroyo Solar Facility ("Arroyo Solar Project"). A copy of the Arroyo Solar PPA is attached as PNM Exhibit TGF-9.

Arroyo Storage ESA - The Arroyo Storage ESA is between PNM, as buyer, and Arroyo Storage as seller, for 40 MW_{AC} 4-hour battery storage from the Arroyo Storage battery system ("Arroyo Storage Project"). The Arroyo Storage Project will be charged from the Arroyo Solar Project for the first five years after

cycles per year. Under Section 8.1 of the Jicarilla Storage 1 ESA, PNM is required to pay a monthly capacity payment beginning on the Commercial Operation Date.

Q. PLEASE DESCRIBE THE INDIVIDUAL PRICING PNM WILL PAY UNDER THE PPAS AND ESAS, INCLUDING WHEN CHARGES BEGIN, ANY PRICE REOPENERS AND ANY PRICE ESCALATION PROVISIONS (RULE 551.8(D)(2)(C)).

A. ***Arroyo Solar PPA*** - The Solar Energy Output Payment Rate over the twenty-year term of the PPA is $18.65/MWh_{AC}$, which includes payment for metered energy, capacity, Deemed Delivered Energy, Ancillary Services, Environmental Attributes and RECs. This price will remain fixed over the term of the PPA with no escalations and cannot be reopened once the PPA has been approved by the Commission and is in effect. Charges will begin on the Commercial Operation Date as defined above and PNM will purchase test energy at the Test Energy Payment Rate, which is 50% of the Solar Energy Output Payment Rate.

Arroyo Storage ESA - The Arroyo Storage ESA has a monthly capacity payment over the twenty-year term of the ESA of $7.46/kw-mo (plus $0.50/kw-mo GRT), which includes payment for Energy Storage Capacity, Ancillary Services, and Environmental Attributes. This price will remain fixed over the term of the ESA with no escalations and cannot be reopened once the ESA has been approved by the Commission and is in effect. Charges will begin on the Commercial Operation Date ~~and PNM~~.

Jicarilla Solar 1 PPA - The Solar Energy Output Payment Rate over the twenty-year term of the PPA is $19.73/MWh$_{AC}$, which includes payment for metered energy, capacity, Deemed Delivered Energy, Ancillary Services, and RECs. This price will remain fixed over the term of the PPA with no escalations and cannot be reopened once the PPA has been approved by the Commission and is in effect. Charges will begin on the Commercial Operation Date and PNM will purchase test energy at the Test Energy Payment Rate, which is 50% of the Solar Energy Output Payment Rate.

Jicarilla Storage 1 ESA - The Jicarilla Storage 1 ESA has a monthly capacity payment over the twenty-year term of the ESA of $9.97/kw-mo (plus $0.69/kw-mo GRT), which includes payment for Energy Storage Capacity, Ancillary Services, and Environmental Attributes. This price will remain fixed over the term of the ESA with no escalations and cannot be reopened once the ESA has been approved by the Commission and is in effect. Charges will begin on the Commercial Operation Date.

Q. DO THE PPAS OR ESAS OBLIGATE PNM TO PAY ANY FIXED OR VARIABLE ADMINISTRATIVE COSTS, TRANSACTIONAL, OPERATION AND MAINTENANCE COSTS, OR ANY COSTS OTHER THAN FOR DELIVERED ENERGY (RULE 551.8(D)(2)(D))?

A. None of the PPAs or ESAs require PNM to pay any administrative costs, transactional, or operation and maintenance costs. For the Arroyo Solar PPA and the Jicarilla 1 PPA, PNM will pay for Deemed Delivered Energy which is energy

customer demand will be needed in June 2022 due to the loss of capacity from San Juan Units 1 and 4. Additionally, the increase of intermittent renewable energy supply requires sufficient planning reserves and operating reserves to maintain system reliability. See the direct testimony of PNM Witnesses Phillips and Wintermantel for further discussion on planning and system reliability.

Q. WHAT ARE THE ESTIMATED COSTS PNM WILL INCUR FOR THE PINON GAS PLANT BY ITS PROJECTED IN-SERVICE DATE?

A. The projected cost to plan and construct the Pinon Gas Plant are detailed in PNM Table TGF-7 below.

PNM Table TGF-7

Cost Category	Estimated 7 Unit Cost
7 Unit EPC Bid Price (7th unit option included)	$148,308,847~~$148,666,400~~
~~Taxes~~	~~$10,036,892~~
Spare GSU Transformer	$1,277,834
Performance Bond	$2,991,734~~$2,998,885~~
Subtotal - Total EPC Price	**$152,578,415~~$162,980,011~~**
Taxes	$9,752,289
Owner's Electrical Interconnection	$737,000
Offsite Water Supply and Waste Water Lines	$1,525,845
Owner's Costs	$5,112,088~~$5,115,638~~
AFUDC	$12,011,627
Total Owner's Contingency — 5% of EPC (Includes 0.8% Owner's Cost Contingency)	$8,149,000
Total Project Cost (7 Units)	**$189,865,264 ~~$190,519,121~~**

Q. WHAT IS PNM'S O&M COST ESTIMATE FOR THE PINON GAS PLANT?

A. Based on information from HDR, PNM estimates that annualized O&M costs will be ~~$892,500~~ $2,363,604 for year 2022. PNM uses a 1.5% annual escalation in its modeling process, and when applied to the O&M estimate for 2023 increases to ~~$905,888~~ $2,399,058 which is the estimate used by PNM Witness Monroy in his testimony.

Q. WHAT GENERAL RATEMAKING TREATMENT IS PNM REQUESTING THE COMMISSION APPROVE FOR THE PINON GAS PLANT?

A. PNM is requesting ratemaking treatment for $190.~~39~~ million for the Pinon Gas Plant, which includes the capitalized costs of the RFPs, to be included in PNM's rate base, subject to actual cost and the Commission's cost overrun rule in 17.3.580 NMAC as discussed by PNM Witness Fenton.

Q. WHAT IS YOUR OPINION CONCERNING THE REASONABLENESS OF THE COSTS OF THE PINON GAS PLANT?

A. The Pinon Gas Plant was selected as the result of a rigorous competitive procurement process. In my opinion, the estimated cost of the project is reasonable and in accord with industry norms.

Q. WHAT SITING AND PERMITTING ACTIVITIES NEED TO TAKE PLACE IN CONNECTION WITH THE PLANT?

Construction is anticipated to begin upon Commission approval and the Expected Commercial Operation Date for the project is March 31, 2022.

Q. WHAT IS THE ESTIMATED COST OF THE SANDIA STORAGE PROJECT?

A. PNM Table TGF-8 provides a summary itemization for the estimated cost of the Sandia Storage Project.

PNM Table TGF-8	
Cost Category	**Estimated 40 MW, 2hr Cost**
EPC Price (Sandia)	$37,199,126 ~~$39,593,820~~
Gross receipts tax	$2,394,694
Transmission	$4,000,000
AFUDC	$1,639,184
Owner's Cost	$3,224,908
Total - Total Project Cost	**$48,457,912**

Q. WHAT IS PNM'S O&M COST ESTIMATE FOR THE SANDIA STORAGE PROJECT?

A. Based on information from HDR using the as bid levelized cost of a capacity maintenance agreement, ongoing O&M cost is estimated at $358,087.

Q. IS PNM SEEKING RATEMAKING TREATMENT FOR THE SANDIA STORAGE PROJECT?

A. Yes. PNM is seeking ratemaking treatment for the Sandia Storage Project in the amount of ~~$49.8~~$48.9 million, which includes the capitalized cost of the RFP, subject to actual cost and the Commission's cost overrun rule.

Q. PLEASE DESCRIBE THE ZAMORA ENERGY STORAGE PROJECT.

A. The Zamora Energy Storage facility is a 30 MW, 2-hour energy storage facility that will be located near the Zamora Substation east of Albuquerque, New Mexico. Construction is anticipated to begin upon Commission approval. The Expected Commercial Operation Date for the facility is May 31, 2022.

Q. WHAT IS THE ESTIMATED COST OF THE ZAMORA STORAGE PROJECT?

A. PNM Table TGF-9 provides a high-level summary of the estimated costs of the Zamora Storage Project.

PNM Table TGF-9	
Cost Category (Zamora)	**Estimated 30 MW, 2hr Cost**
EPC Price	$29,999,507~~$32,523,781~~
Gross receipts tax	$1,931,218
Transmission	$2,000,000
AFUDC	$1,346,485
Owner's Cost	$3,196,392~~$2,753,336~~
Total - Total Project Cost	**$38,473,602~~$38,623,602~~**

Q. WHAT IS PNM'S O&M COST ESTIMATE FOR THE ZAMORA STORAGE PROJECT?

A. Based on information from HDR using the as bid levelized cost of a capacity maintenance agreement, ongoing O&M cost is estimated at $287,075.

Q. IS PNM SEEKING RATEMAKING TREATMENT FOR THE ZAMORA STORAGE PROJECT?

A. Yes. PNM is seeking approval to include the Zamora Storage Project in its rate base at an estimated value of $38.99.0 million, including the capitalized cost of the RFP, or actual cost, subject to the cost overrun rule.

Q. DOES THE ENERGY TRANSITION ACT INCLUDE REQUIREMENTS RELATING TO CCNS FOR BATTERY STORAGE SYSTEMS?

A. It does, as discussed by PNM Witness Fenton, and the Sandia and Zamora Storage Projects satisfy these requirements as I discuss below.

Q. ARE THE COSTS OF THE SANDIA AND ZAMORA PROJECTS REASONABLE?

A. Yes. The estimated costs for these two projects are reasonable. Again, these projects were selected as a result of a competitive procurement process with proper vetting by experts to ensure the reasonableness of the costs.

Q. WHAT SITING AND PERMITTING ACTIVITIES NEED TO TAKE PLACE IN CONNECTION WITH THE SANDIA AND ZAMORA STORAGE PROJECTS?

A. The specific permits needed for the Sandia Storage Project and Zamora Storage Project in Appendix C of PNM Exhibit TGF-14 and PNM Exhibit TGF-15, respectively. The Sandia Storage Project is located at an existing PNM site adjacent to PNM's Sandia Substation and the Zamora Storage Project is located at a site adjacent to the Zamora Substation. PNM is in the process of securing an

Q PLEASE DESCRIBE HOW THE SANDIA AND ZAMORA ENERGY STORAGE PROJECTS WILL SUPPORT DIVERSIFICATION OF ENERGY RESOURCES AND ENHANCE GRID SECURITY.

A. The Sandia and Zamora energy storage projects are specifically designed as 2-hour systems to meet load ramps, short duration high peak periods, and respond to EIM market demands. This diversification offsets the need for additional flexible gas and also complements renewable penetration by providing a tool to manage curtailments, thus helping to integrate renewable energy into the grid.

Q PLEASE DESCRIBE HOW THE SANDIA AND ZAMORA ENERGY STORAGE PROJECTS WILL REDUCE GREENHOUSE GASES AND OTHER AIR POLLUTANTS RESULTING FROM POWER GENERATION.

A. The Sandia and Zamora Energy Storage projects by nature will reduce the need to operate a flexible gas resource during high load periods, during system disturbances, and to offset large changes in load demand.

Q PLEASE DESCRIBE HOW THE SANDIA AND ZAMORA ENERGY STORAGE PROJECTS WILL PROVIDE THE UTILITY DISCRETION TO OPERATE, MAINTAIN AND CONTROL ENERGY STORAGE TO ENSURE RELIABLE AND EFFICIENT SERVICE TO CUSTOMERS.

A. The utility-owned Sandia and Zamora Energy Storage projects allow the utility to charge and discharge on a 24/7 basis. This provides the utility the ability to, by

Roger W. Nagel

DIRECT TESTIMONY AND EXHIBITS OF ROGER NAGEL		
Document	**Page and Line**	**Explanation**
PNM Exhibit RWM-4	Pg. 19, Section 5.2	Add "Similarly, in September 2019, the commodity pricing and firm transport costs were updated to reflect pricing used in current modeling which again did not change the selection of the shortlisted respondents." at the end of the first paragraph.
PNM Exhibit RWM-4	Pg. 20 , Table 5.2-1	Updated all numbers on the table with September 2019 gas transportation cost.
PNM Exhibit RWM-4	Pg. 22, Section 5.4.1	Add "and for revenues on energy storage PPAs" at the end of the second bullet point, inside the parenthesis.

party transmission provider had accounted for the appropriate wheeling fees while others had not.

PNM solicited follow-up information and supporting data through the PowerAdvocate question and answer process to gain additional unsupplied information from the bidders and to try to validate supplied transmission cost information.

After first requesting bidders to submit this information and facilitating additional bidder discussions through follow-up information requests, PNM's Transmission Planning team reviewed the information submitted and provided an estimate of any required adjustments for interconnection costs, system upgrade, or wheeling fees as well as an estimation of the required timelines to implement these upgrades. These estimates included a review of the costs for electrical interconnection as well as transmission line and transmission system upgrades required to maintain system reliability and contingency requirements as a result of the project being added into the system. These estimated costs were completed by either referencing previous actual transmission studies or engineering estimates based on the experience of the PNM Transmission Planning group that performs these studies. These transmission costs were incorporated into the total delivered cost estimates considered in the bid evaluation. Permitting timelines associated with obtaining right of ways or easements for the transmission lines as well as any state or federal land (BLM) permitting timelines were also considered.

For EPC proposals located on existing PNM sites, HDR similarly worked with PNM personnel to provide an estimate of the electrical interconnection costs for each facility to tie into the existing site electrical switchyard.

5.2 Fuel Supply / Cost Analysis

For the natural gas fueled proposals, the cost of delivered fuel required adjustment for the specific sources of fuel and the infrastructure required to deliver the fuel to each applicable site. As a basis of natural gas commodity pricing, the Initial Screening utilized PNM's gas commodity forecasts from the 2017 IRP. As the Phase Two evaluation continued, the bid evaluation team deemed it more appropriate to update the natural gas commodity pricing to be consistent with the low range pricing forecast then being utilized for PNM's planning activities. As such, in August 2018, the updated commodity pricing was incorporated and bid rankings re-evaluated to confirm that the updated pricing did not change the selection of the shortlisted respondents. Similarly, in September 2019, the commodity pricing and firm transport costs were updated to reflect pricing used in current modeling which again did not change the selection of the shortlisted respondents.

The natural gas pricing utilized for the evaluation included a delivered commodity price, a firm transport cost, and a capital recovery component associated with the installation of any required infrastructure to deliver the gas to the noted site. This included any natural gas laterals and associated interconnection equipment. Estimates for this infrastructure were developed from prior quotes that PNM had received from past investigations by the PNM Wholesale Power Marketing department.

The first year, 2022 natural gas pricing for the various project locations were assumed as shown in Table 5.2-1.

Table 5.2-1. Summary of Delivered Natural Gas Pricing

Site Location	Commodity Price ($/MMBtu)[a]	Firm Transport Cost ($/MMBtu/day)[b]	Lateral/Infrastructure Cost ($/MMBtu)[c]
San Juan	~~$2.27~~$2.83	~~$0.18~~$0.12 to $0.35	~~$0.06 to $0.13 as a function of plant size and consumption~~
Reeves	~~$3.08~~$3.39	~~$0.18~~$0.10	~~$0.05 for gas turbines, $0.00 for reciprocating engines~~
Rio Bravo	~~$3.08~~$3.39	~~$0.18~~$0.10	~~$0.00 – existing infrastructure is sufficient~~
Rio Puerco	~~$3.08~~$3.39	$0.18	~~$0.01~~
Valencia	~~$2.56~~$2.83	~~$0.15~~$0.10	~~NA – Using Existing Lateral~~
La Luz	~~$2.27~~$2.83	~~$0.15~~$0.09	~~NA – Using Existing Lateral~~
Kirtland	~~$2.27~~$2.83	$0.10 to $0.18	~~$0.00 as these were BT or PPA proposals~~
Arizona	~~$2.43~~$2.83	$0.45[b]	~~$0.00 as these were BT or PPA proposals~~

[a] Source: PNM Spreadsheet entitled "Fuel Pricing Assumptions ~~8-23-18~~4-26-19 Monthly"
[b] Source: PNM file entitled "Gas assumptions.docx" dated April 6, 2018"
[c] ~~Estimated from prior quotations received by PNM~~

5.3 Emission Control Requirements

For EPC natural gas fueled projects, the Replacement Resource RFP and bid evaluation process requested the utilization of a selective catalytic reduction system (SCR) to control nitrogen oxide (NOx) emissions as well as an oxidation catalyst to control carbon monoxide (CO) and volatile organic compound (VOC) emissions.

However, upon further review, for a project that could be located at the San Juan Generating Station site, it was determined that there is the opportunity to reduce the cost of the facility and the cost to the ratepayers by "netting" emissions associated with the shutdown of the existing Units 1 and 4. In short, a Potential for Significant Deterioration (PSD) netting analysis is an option for offsetting the proposed emission increases due to the project.

A preliminary netting analysis was performed by PNM and assumed that the previous 5 years of actual emissions begins with January, 2015 assuming that for any new project at the San Juan Generating Station site, *"commencement of construction",* the Project start date for PSD purposes, will be in January, 2020. For PSD purposes, the last 5 years of operational data establishes the achievable reduction of emissions associated with the shutdown of the San Juan units.

A new project is only a "major modification" for a federal PSD regulated New Source Review (NSR) pollutant at an existing major stationary source if it causes two types of emissions increases: (1) a significant emissions increase, and (2) a significant net emissions increase. The first step looks at actual to projected potential emission increases due to the project, which by themselves would require a PSD permit

periodic investments associated with major maintenance activities. For BESS alternatives, levelized costs over the life of the project were utilized as a basis of comparison.

PPA Projects:

For renewable projects, first year costs were developed as a fixed price that was valid for the term of the PPA agreement. This is consistent with the RFP's request for firm pricing for the duration of the PPA term. If PPA pricing was proposed as an escalating value, the cost was levelized by the bid evaluation team and applied as a fixed value for the term of the agreement.

For natural gas fired projects, first year costs were developed in accordance with the pricing structure proposed by the bidder.

More detail on the build-up of these costs is offered below.

5.4.1 Costs Considered

Throughout all of the bid evaluation phases, an assessment of the total delivered cost of energy was developed and further refined. The methodology utilized for each of the bid structures is as described in the following sections. In all cases, the total delivered cost was developed to account for:

- Project capital cost
- New Mexico Gross Receipts Tax (for EPC and BT options and for revenues on energy storage PPAs)
- Project fixed and variable operations and maintenance costs
- Equipment start charges, as applicable
- Fuel supply to the project site
- Required transmission interconnection costs
- Required transmission system upgrade costs or wheeling fees to allow for delivery to PNM's system
- Transmission system losses to PNM's system
- PNM's Owner's costs for oversight and management of the contract
- Cost of charging energy storage devices from the grid (for stand-alone battery alternatives)
- Adjustments for expected project dispatch

5.4.2 Capital Cost Assumptions

The capital costs utilized in the cost evaluation were generally as provided by the respondents for the EPC and BT proposals. Through clarification questions and through ongoing assessment, adjustments to the quoted capital costs were incorporated, as necessary, to account for the inclusion of New Mexico Gross Receipts Taxes, shortfalls or variations in project scope, as well as for transmission system and Owner's costs.

Nicholas Phillips

DIRECT TESTIMONY AND EXHIBITS OF NICHOLAS PHILLIPS		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 19, PNM Table NLP-1A	Update NPV ($2019) - Scenario 1 Column from "$5,922,647,735" to "$5,916", now shown in millions of dollars. Update NPV ($2019) - San Juan Continues Column from "$6,301,694,730" to "$6,315", now shown in millions of dollars; update Delta NPV - San Juan Continues Column from "$379,046,994" to "$399", now shown in millions of dollars. Scenario 1 changes result from natural gas transport change/capital cost changes and updates to reflect GRT. San Juan Continues scenario changes stem from adjustments to San Juan coal pricing update and ADIT update
Testimony	Pg. 19, PNM Table NLP-1A	Battery Storage, Solar and Wind resources for years 2023 through 2038 changed as a result of the aggregate of changes to natural gas transportation and GRT charges to the applicable resources.
Testimony	Pg. 20, PNM Table NLP-1B	Update Scenario 2 resource mix and MW; Update NPV ($2019) - Scenario 2 from "$5,943,995,328" to "$5,927", now shown in millions of dollars; update Delta NPV - Scenario 2 from "$21,347,592" to "$12", now shown in millions of dollars. Update NPV ($2019) - Scenario 3 from "$6,014,615,895" to "$6,024", now shown in millions of dollars; update Delta NPV - Scenario 3 from "$91,968,160" to "$108", now shown in millions of dollars. These changes stem for natural gas transport and GRT cost updates to EnCompass inputs.
Testimony	Pg. 20, PNM Table NLP-1B	Under the Scenario 2 column, Replace "Heavy Frame #1" with "Pinon Gas 11xLM6000s", replace "Pinon Gas 7xLM6000s" with "Solar PV Project #2" and add "Battery #8".
Testimony	Pg. 20, PNM Table NLP-1B	Under the leftmost column labeled "MW", Replace "196" with "422s", replace "268.8" with "100" and add "30" for the capacity of Battery #8.
Testimony	Pg. 20, PNM Table NLP-1B	Battery Storage, Solar and Wind resources for years 2023 through 2038 stem from changes to natural gas transport and GRT cost updates to EnCompass inputs.
Testimony	Pg. 33, PNM Table NLP-2	Update Scenario 2 Column, Scenario 3 Column, Scenario 4 Column, San Juan Continues Column. Changes stem from the aggregate of all modeling updates.

PNM Table NLP-1A

Year	Scenario 1	MW	San Juan Continues	MW
2022	Pinon Gas 7xLM6000s	269	Clenera Arroyo Solar PV	300
	Clenera Arroyo Solar PV	300	-	-
	Clenera Arroyo Battery Storage	40	-	-
	Primary Jicarilla Solar PV	50	-	-
	Primary Jicarilla Battery Storage	20	-	-
	Affordable Sandia Battery Storage	40	-	-
	Affordable Zamora Battery Storage	30	-	-
2023-2025	80 MW Battery Storage	80	10 MW Battery Storage	10
	0 MW Solar	0	0 MW Solar	0
	40 MW Wind	40	0 MW Wind	0
2026-2030	230 MW Battery Storage	230	190 MW Battery Storage	190
	110 MW Solar	110	380 MW Solar	380
	120 MW Wind	120	70 MW Wind	70
2031-2035	260 MW Battery Storage	260	280 MW Battery Storage	280
	240 MW Solar	240	80 MW Solar	80
	180 MW Wind	180	70 MW Wind	70
2036-2038	30 MW Battery Storage	30	50 MW Battery Storage	50
	220 MW Solar	220	10 MW Solar	10
	160 MW Wind	160	20 MW Wind	20
NPV ($2019M)	$5,916	-	$6,315	-
Delta NPV ($M)	$0	-	$399	-

PNM Table NLP-B

Year	Scenario 2	MW	Scenario 3	MW
2022	Pinon Gas 11xLM6000s	422	Clenera Arroyo Solar PV	300
	Solar PV Project #2	100	Clenera Arroyo Battery Storage	40
	Battery #8	30	Primary Jicarilla Solar PV	50
			Primary Jicarilla Battery Storage	20
			Solar PV Project #1	150
	-	-	Battery #1	40
	-	-	Battery #2	40
	-	-	Battery #3	40
	-	-	Battery #4	40
	-	-	Battery #5	40
	-	-	Battery #6	40
	-	-	Battery #7	40
	-	-	Affordable Sandia Battery Storage	40
	-	-	Affordable Zamora Battery Storage	30
2023-2025	30 MW Battery Storage	30	60 MW Battery Storage	60
	190 MW Solar	190	0 MW Solar	0
	20 MW Wind	20	0 MW Wind	0
2026-2030	230 MW Battery Storage	230	240 MW Battery Storage	240
	130 MW Solar	130	40 MW Solar	40
	160 MW Wind	160	40 MW Wind	40
2031-2035	270 MW Battery Storage	270	250 MW Battery Storage	250
	220 MW Solar	220	320 MW Solar	320
	190 MW Wind	190	270 MW Wind	270
2036-2038	30 MW Battery Storage	30	30 MW Battery Storage	30
	90 MW Solar	90	230 MW Solar	230
	160 MW Wind	160	100 MW Wind	100
NPV ($2019M)	$5,927		$6,024	
Delta NPV ($M)	$12		$108	

Q. WHAT DO YOU CONCLUDE FROM THIS ANALYSIS?

A. The EnCompass modeling confirmed what the previous analyses using the Strategist model indicated that the best course of action is to abandon PNM's remaining interest in the San Juan coal plant on or around June 30, 2022, and replace that capacity with a mixture of renewable energy resources, battery

Q. PLEASE SUMMARIZE THE RESULTS OF THE ANALYSES PERFORMED BY PNM, ASTRAPE, AND ASCEND.

A. The results of the modeling performed by both Astrape and Ascend reach the same conclusion: the portfolio that achieves reliability at lowest reasonable costs is the Scenario 1 portfolio consisting of 350 MW of new solar photovoltaic resources, 130 MW of battery storage and 280 MW of flexible gas turbines. PNM Table NLP-2 below summarizes the economic results from the analyses.

PNM Table NLP-2

Delta NPVs Millions	Scenario 1	Scenario 2	Scenario 3	Scenario 4	San Juan Continues
PNM NPV ($2019M)	$0	$12	$108	n/a	$399
Astrape NPV ($2023M)	$0	$44	$164	$781	n/a
Ascend NPV ($2019M)*	$0	$99	$43	$560	n/a

*Table does not include errata modeling by Ascend.

Q. DOES THE MODELING PEFORMED BY PNM, ASTRAPE, AND ASCEND PROVIDE A REASONABLE BASIS FOR THE COMMISSION TO DETERMINE THAT THE ECONOMICS OF REPLACING THE SAN JUAN COAL PLANT WITH NEW RESOURCES ARE MORE FAVORABLE FOR CUSTOMERS AND THE PUBLIC?

A. Yes. The resource planning modeling performed by PNM, Astrape and Ascend shows that the economics from the public and customer perspective favor closing and replacing the San Juan coal plant with a new, more diverse and flexible portfolio of replacement resources, and that this can be done under the

Nick Wintermantel

DIRECT TESTIMONY AND EXHIBITS OF NICK WINTERMANTEL		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 24, Ln. 21	Change "5" to "2".
Testimony	Pg. 24, Ln. 21	Change "2" to "1".
Testimony	Pg. 25, Ln. 1	Change "third" to "second".
Testimony	Pg. 25, PNM Table NW-7	This table was replaced as a result of modeling updates.
Testimony	Pg. 27, Ln. 3	Change "1 Frame machine" to "a combined solar/battery project consisting of 100 MW of solar and 30 MW of battery".
Testimony	Pg. 27, Ln. 20	Change "54" to "43".
Testimony	Pg. 27, Ln. 21	Change "156" to "164".
Testimony	Pg. 28, PNM Table NW-8	Various number changes as a result of modeling updates.
PNM Exhibit NW-2	Pg. 8, Last 3 Lines	Replace "Seven" with "Two", "3" with "1". And delete "The lowest cost combination consisted of all battery PPAs".
PNM Exhibit NW-2	Pg. 9, Table ES2	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 10, Second Bullet	Replace "7" with "11" and "1 Frame machine" with "a combined solar/battery project consisting of 100 MW of solar and 30 MW of battery."
PNM Exhibit NW-2	Pg. 11, Table ES3 and Table ES 4	Tables replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 18, PNM RFP Evaluation Image	Numbers were cut off of filed copy due to formatting word version software.
PNM Exhibit NW-2	Pg. 40, Figure 7	Numbers were cut off of filed copy due to formatting word version software.
PNM Exhibit NW-2	Pg. 52, Table 24	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 53, Line 6 & 7 of 2nd Paragraph	Replace "4,619" with "4,618", and "4,593" with "4,598".
PNM Exhibit NW-2	Pg. 53, Table 25	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 55, Ln. 2-3, Last Paragraph	Replace "Seven" with "Two", "3" with "1", and delete "The lowest cost combination consisted of all battery PPAs"
PNM Exhibit NW-2	Pg. 56, Table 27	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 56, Table 28	Table replaced as a result of updated modeling.

DIRECT TESTIMONY AND EXHIBITS OF NICK WINTERMANTEL		
Document	**Page and Line**	**Explanation**
PNM Exhibit NW-2	Pg. 57, 2nd Bullet	Replace "7" with "11", and replace "1 Frame machine" with "A combined solar/battery project consisting of 100 MW of solar and 30 MW of battery"
PNM Exhibit NW-2	Pg. 57, Final Paragraph	Replace "54" with "42, and "156" with "164"
PNM Exhibit NW-2	Pg. 58, Tables 29 & 30	Tables replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 59, Table 31	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 60, Table 32	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 61, Table 33	Table replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 64 to pg. 70 (of PDF)	All tables replaced as a result of updated modeling.
PNM Exhibit NW-2	Pg. 70 (of PDF)	Page is now blank due to change in pagination.

Q. AS A MODELER THAT LOOKS AT SYSTEM RELIABILITY AND RISKS WHAT IS YOUR OPINION OF THAT APPROACH TO LIMITING BATTERY SIZES AND OVERALL RESOURCES?

A. I support this approach. While the model is an excellent tool to compare reliability and costs, there are attributes and factors that must be considered that don't automatically translate in the model results and must be separately incorporated. One of these is the risk associated with development and deployment of new technology.

Q. HOW DID ASTRAPÉ INCORPORATE THIS CONSTRAINT?

A. The unconstrained optimal set of resources was modified to maintain smaller energy storage options and limit the energy storage to 130 MW. The Tier 1 and Tier 2 modeling approach demonstrated that the aeroderivative resources were the best capacity resource other than battery capacity and that 350 MW of solar was economic. Next, permutations with the least cost smaller battery offers (both PPA and ownership options) were simulated similar to the Tier 2 Modeling approach.

Q. WHAT WERE THE RESULTS OF THIS CONSTRAINED MODELING?

A. The results of this analysis are shown in PNM Table NW-7which sorts the replacement resource combinations that were simulated with these constraints. The top ~~5~~ 2 combinations are separated by an NPV of ~~2~~ 1 million meaning they are essentially equal from an economics basis. Given the other battery ownership benefits discussed by PNM Witness Kemp and the fact that the differences in

economics are negligible, the Company proposes the ~~third~~ second replacement resource combination on the list. With battery ownership, PNM will have more flexibility in the operation of those resources as more is learned about the operations through the 20 year period. This proposed plan includes 269 MW of aeroderivatives, 350 MW of solar, and 130 MW of battery. The 130 MW of battery consists of a 40 MW PPA, 20 MW PPA, 40 MW ownership option, and 30 MW ownership option. This combination is discussed by the Company as Scenario 1.

PNM Table NW-7 Constrained Replacement Resource Combinations Sorted by Least Cost

Resource Replacement Combination	LM6000	PPA Battery	Ownership Battery	Solar	Total NPV	NPV Fixed Costs	NPV Production Costs
	MW	MW	MW	MW	M$	M$	M$
Constrained – 5	307	60	40	350	$4,672	$463	$4,209
Constrained - 3 (Proposed Plan)	269	60	70	350	$4,673	$469	$4,205
Constrained – 7	269	60	70	370	$4,675	$481	$4,194
Constrained – 4	345	40	0	350	$4,677	$421	$4,256
Constrained – 2	307	100	0	350	$4,678	$460	$4,218
Constrained – 1	269	140	0	350	$4,680	$475	$4,205
Constrained – 8	269	100	40	350	$4,682	$478	$4,204
Constrained – 6	269	140	0	370	$4,683	$487	$4,196
Constrained – 10	345	60	0	350	$4,695	$448	$4,247
Constrained – 9	231	140	30	350	$4,700	$498	$4,202
Constrained – 11	231	100	70	350	$4,703	$501	$4,202
Constrained – 12	269	140	0	500	$4,706	$453	$4,253
Constrained – 14	345	0	40	350	$4,706	$445	$4,262
Constrained – 13	307	100	0	500	$4,710	$439	$4,271
Constrained – 15	345	40	0	500	$4,719	$420	$4,299
Constrained – 17	383	20	0	350	$4,721	$457	$4,265
Constrained – 16	345	60	0	350	$4,725	$469	$4,256
Constrained – 18	345	60	0	500	$4,736	$448	$4,288
Constrained – 19	383	40	0	350	$4,758	$494	$4,264

Scenario 2 - San Juan Location Preference Alternative Scenario – This scenario included the least cost resources in the San Juan Location which included ~~7~~ 11 aeroderivatives and ~~1 Frame machine.~~ a combined solar/battery project consisting of 100 MW of solar and 30 MW of battery.

Scenario 3 - No New Fossil Fuel Alternative Scenario – This scenario included the least cost battery projects that were less than 40 MW and renewable resources. It included 500 MW of solar and 11 battery projects summing to 410 MW. The 11 different battery projects included 7 PPA options and 4 ownership options.

Scenario 4 - All Renewable Replacement Scenario – This scenario includes all renewable capacity. This scenario includes all wind and solar PPA projects consisting of 1,200 MW of wind and 975 MW of solar.

Q. PLEASE SUMMARIZE THESE ADDITIONAL SCENARIOS AND THEIR COSTS COMPARED TO THE RECOMMENDED COMBINATION.

A. These scenarios were treated in the same manner as all the other combinations that were simulated as part of the Tier 1 and Tier 2 Modeling and battery constrained approach. The results are shown in PNM Table NW-8 below. Of the 4 replacement resource scenarios put forth by the Company, the proposed plan is the most economic. Scenario 2 has an NPV of $~~54~~ 43 million more than Scenario 1 while Scenario 3 has an NPV of $~~156~~ 164 million higher than Scenario 1. Scenario 4 is even more expensive due to all the renewable curtailment caused in that case but still does not meet reliability criteria. Scenario 3 is unreliable as well and

would require additional capacity making the costs in the below table for that scenario lower than what they would be if they were forced to be reliable.

PNM Table NW-8 Additional Scenarios Provided by the Company

Resource Replacement Combination	LM6000	Frame	PPA Battery	Owned Battery	Solar	Wind	Total NPV
	MW	MW	MW	MW	MW	MW	M$
Scenario 1 – Proposed Plan	269	0	60	70	350	140	$4,~~678~~ 673
Scenario 2 – SJ preferred	~~269~~423	~~1960~~	~~0~~30	0	~~0~~ 100	140	$4,~~732~~ 717
Scenario 3 – No Gas	0	0	260	150	500	140	$4,~~834~~ 837
Scenario 4 – All renewable	0	0	0	0	975	1,199	$5,~~452~~ 454

VI. ADDITIONAL CASE SUPPORT

Q. OUTSIDE OF THE REPLACEMENT RESOURCE EVALUATION, ARE YOU SUPPORTING ANY OTHER ANALYSIS AS PART OF THE OVERALL CASE?

A. Yes, Astrapé provided fuel outputs from the SERVM runs in the evaluation to PNM Witness Monroy for 2023. This 2023 data was provided for Scenarios 1 – 4 discussed above as well as the San Juan coal plant continues scenario.

Q. WITNESS MECHENBIER DESCRIBES ADDITIONAL ANALYSIS YOU PERFORMED ON SCENARIO 1 IN RELATION TO THE 650 MW EXPORT LIMIT. PLEASE EXPLAIN.

A. Within the SERVM simulations, Astrapé performed analysis on a few of the 8,760 hourly runs to see what percentage of hours the output of the 269 MW for

In May 2019, the Company received additional standalone storage ownership options. The original set of bids in the Tier 1 and Tier 2 Modeling did not include many ownership options. The utility owned bids were limited due to a lack of bidders having NM state contractor licenses. Because some original bidders were automatically rejected for that reason, PNM solicited additional utility owned battery proposals through a supplement to the original RFP in order to ensure a range of ownership battery options would be evaluated. These least cost offers were added to the least cost combination from the Tier 1 and Tier 2 modelling and did not improve the economics of this unconstrained set of replacement resources.

Risk Evaluation

As part of the Company's review, PNM had Enovation Partners review this least cost set of replacement resources and especially its energy storage resources. That review and analysis provided PNM with the recommendation that initial energy storage implementation should not be beyond 2% - 5% of the system peak load and that individual projects should be between 10 MW and no more than 40 MW. Enovation Partners further discusses its reasoning for this recommendation in Mr. Kemp's testimony.

With this recommendation, PNM requested that Astrapé provide further modeling that replaced the 170 MW of battery options in the least cost combination from the Tier 1 and Tier 2 modeling with smaller available projects of up to 40 MW. The Tier 1 and Tier 2 unconstrained modeling determined that the 350 MW of solar and aeroderivatives would provide the most economic combination of replacement resources. Using PPA and ownership battery options that were 40 MW and less, many permutations were developed to determine the least cost combination that met reliability. Some of the larger low cost PPAs options were re-priced to provide 40 MW projects. Total battery capacity ranging from 20 MW to 170 MW was simulated with battery project sizes that were less than or equal to 40 MW. These results are shown in Table ES2. ~~Seven~~ Two combinations were within ~~3~~ 1 million NPV of each other. ~~The lowest cost combination consisted of all battery PPAs.~~ Given other benefits of battery ownership and the fact that the delta in economics is negligible, PNM selected the combination that included seven

aeroderivatives consisting of 269 MW, a combined solar/battery project consisting of 300 MW of solar and 40 MW of battery, a combined solar/battery project consisting of 50 MW of solar and 20 MW of battery, and two standalone battery ownership projects consisting of 40 MW and 30 MW. This combination totals 269 MW[3] of gas, 350 MW of solar, and 130 MW of battery and is the Company's proposed plan and is also called Scenario 1.

Table ES2. Constrained Combinations Sorted by Least Cost

Resource Replacement Combination	LM6000	PPA Battery	Ownership Battery	Solar	Total NPV	NPV Fixed Costs	NPV Production Costs
	MW	MW	MW	MW	M$	M$	M$
Constrained – 5	307	60	40	350	$4,672	$463	$4,209
Constrained - 3 (Proposed Plan)	269	60	70	350	$4,673	$469	$4,205
Constrained – 7	269	60	70	370	$4,675	$481	$4,194
Constrained – 4	345	40	0	350	$4,677	$421	$4,256
Constrained – 2	307	100	0	350	$4,678	$460	$4,218
Constrained – 1	269	140	0	350	$4,680	$475	$4,205
Constrained – 8	269	100	40	350	$4,682	$478	$4,204
Constrained – 6	269	140	0	370	$4,683	$487	$4,196
Constrained – 10	345	60	0	350	$4,695	$448	$4,247
Constrained – 9	231	140	30	350	$4,700	$498	$4,202
Constrained – 11	231	100	70	350	$4,703	$501	$4,202
Constrained – 12	269	140	0	500	$4,706	$453	$4,253
Constrained – 14	345	0	40	350	$4,706	$445	$4,262
Constrained – 13	307	100	0	500	$4,710	$439	$4,271
Constrained – 15	345	40	0	500	$4,719	$420	$4,299
Constrained – 17	383	20	0	350	$4,721	$457	$4,265
Constrained – 16	345	60	0	350	$4,725	$469	$4,256
Constrained – 18	345	60	0	500	$4,736	$448	$4,288
Constrained – 19	383	40	0	350	$4,758	$494	$4,264

[3] The 269 MW represents summer net capacity output versus the nameplate capacity of 280 MW.

In addition to this modeling, the Company requested Astrapé run 3 additional scenarios to compare against the proposed plan. These were developed by PNM's resource planning department and respect the 40 MW battery size project limit. The scenarios include the following:

- Scenario 1 – This scenario is the proposed least cost plan from the modeling discussed above. It includes seven aeroderivatives consisting of 269 MW, a combined solar/battery project consisting of 300 MW of solar and 40 MW of battery, a combined solar/battery project consisting of 150 MW of solar and 20 MW of battery, and two standalone battery ownership projects consisting of 40 MW and 30 MW.

- Scenario 2 - San Juan Location Preference Alternative Scenario – This scenario included the least cost resources in the San Juan Location which included ~~7~~ 11 aero derivatives and a combined solar/battery project consisting of 100 MW of solar and 30 MW of battery. ~~1 Frame machine~~.

- Scenario 3 - No New Fossil Fuel Alternative Scenario – This scenario included the least cost battery projects that were less than 40 MW and renewable resources. It included 500 MW of solar and 11 battery projects summing to 410 MW. The 11 different battery projects included 7 PPA options and 4 ownership options.

- Scenario 4 - All Renewable Replacement Scenario – This scenario includes all renewable capacity. This scenario includes all wind and solar PPA projects consisting of 1,200 MW of wind and 975 MW of solar.

Table ES3 shows the results of that modeling. Of the 4 replacement scenarios put forth by the Company, the proposed plan is the most economic. The next table shows the reliability of the replacement scenarios compared to the proposed plan. This shows that additional capacity resources would be required for both

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Scenario 3 and 4 demonstrating that the economics shown in Table ES3 are conservative. The costs would increase to ensure reliability for these two scenarios.

Table ES3. Additional Scenarios Provided by the Company

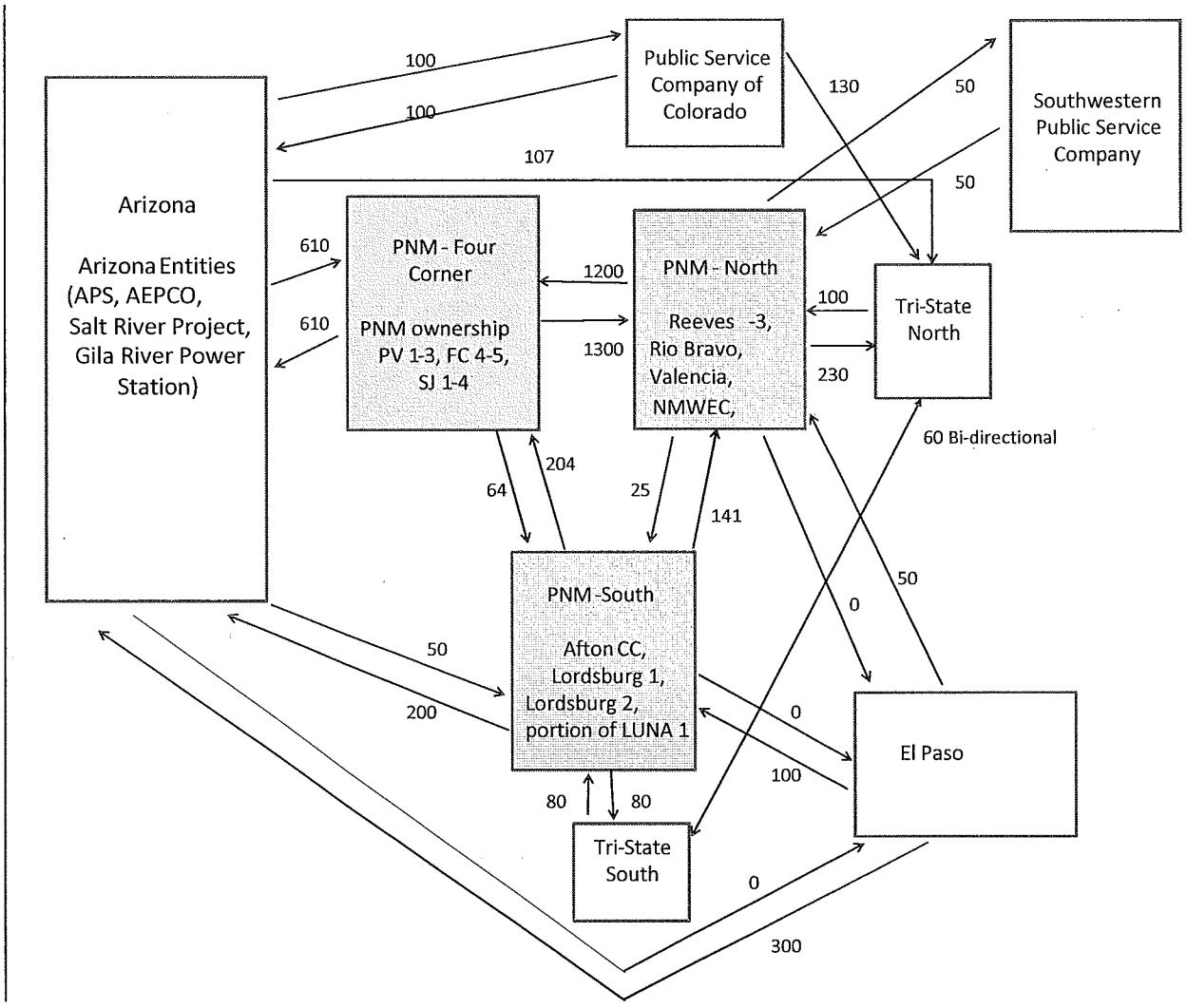
Resource Replacement Combination	LM6000	Frame	PPA Battery	Owned Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs
-	MW	MW	MW	MW	MW	MW	M$	M$	M$
Scenario 1 – Proposed Plan	269	0	60	70	350	140	$4,673	$469	$4,205
Scenario 2 – SJ preferred	423	0	30	0	100	140	$4,717	$441	$4,276
Scenario 3 – No Gas	0	0	260	150	500	140	$4,837	$640	$4,197
Scenario 4 – All renewable	0	0	0	0	975	1,199	$5,454	$97	$5,357

Table ES4. Reliability Metrics of Additional Scenarios Provided by the Company

Resource Replacement Combination	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
-	Events per Year					
Year	2023	2028	2033	2023	2028	2033
Scenario 1 – Proposed Plan	0.17	0.13	0.06	0.16	0.14	0.16
Scenario 2 – SJ preferred	0.13	0.06	0.04	0.14	0.16	0.15
Scenario 3 – No Gas	0.39	0.38	0.27	0.10	0.09	0.07
Scenario 4 – All renewable	5.70	2.48	1.01	3.45	0.73	0.19

Conclusion

Based on the evaluation performed by Astrapé, the proposed plan of replacement resources including 350 MW of solar, 130 MW of battery, and 269 MW of gas meets reliability criteria and provides reasonable costs given the technology constraints imposed. These replacement resources provide a diverse set of resources and take advantage of the lowest cost renewable, battery, and gas offers submitted into the RFP.



D. Load Modeling

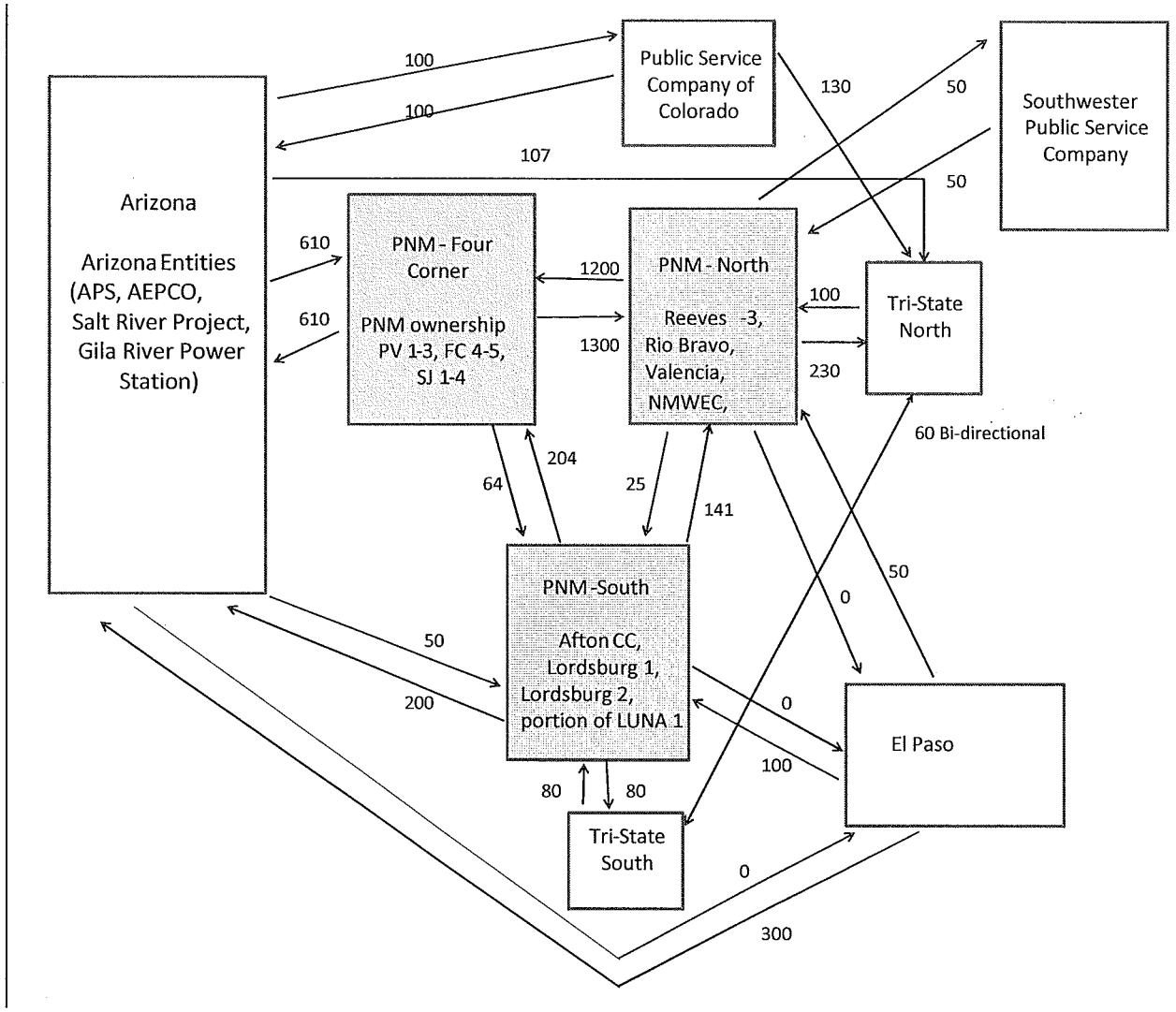
Table 5 displays the PNM annual peak forecast for 2023, 2028, and 2033 under normal weather conditions. This represents PNM's latest load forecast developed in May of 2019.

Table 5. 2023, 2028, and 2033

Year	Coincident System Peak* (MW)
2023	2,072
2028	2,159
2033	2,229

*EE and PV-DG removed from the forecast. Value includes Data Center Projections

Figure 7. Study Topology with Transmission Limits



*All transmission constraints are in MW

In addition to the constraints placed in the topology, the overall import capability into the PNM Balancing area was limited from external resources to 150 MW day ahead purchase and a 150 MW non-firm purchase.

The transfers within the PNM balancing area were based on the production cost of the resources. The cost of transfers between external regions and PNM are based on marginal costs with a $10/MWh profit margin. In cases where a region is short of resources, scarcity pricing is added to the marginal costs. As a

Table 24. Top 20 2023 Replacement Resource Combinations With No Technology or Project Size Constraints

Resource Replacement Combination #	Category	LM6000	Recips	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs
		MW	MW	MW	MW	MW	MW	M$	M$	M$
Tier 1 - 23	Gas/Battery/Renewable	269	0	0	150	350	140	$4,618	$412	$4,207
Tier 1 - 22	Gas/Battery/Renewable	269	0	0	150	300	140	$4,620	$412	$4,208
Tier 1 - 67	Gas/Battery/Renewable	77	0	196	150	350	140	$4,655	$431	$4,223
Tier 1 - 24	Gas/Battery/Renewable	269	0	0	150	500	140	$4,667	$412	$4,255
Tier 1 - 16	Gas/Battery/Renewable	423	0	0	0	0	140	$4,673	$414	$4,260
Tier 1 - 71	Gas/Battery/Renewable	0	0	392	0	0	140	$4,691	$393	$4,298
Tier 1 - 66	Gas/Battery/Renewable	115	0	196	150	300	140	$4,692	$475	$4,217
Tier 1 - 45	Gas/Battery/Renewable	154	101	0	150	350	140	$4,693	$479	$4,214
Tier 1 - 68	Gas/Battery/Renewable	77	0	196	150	500	140	$4,706	$431	$4,274
Tier 1 - 56	Gas/Battery/Renewable	0	85	196	150	350	140	$4,706	$472	$4,234
Tier 1 - 17	Gas/Battery/Renewable	423	0	0	0	300	140	$4,708	$424	$4,283
Tier 1 - 14	Battery/Renewable	0	0	0	410	650	140	$4,710	$468	$4,242
Tier 1 - 18	Gas/Battery/Renewable	423	0	0	0	350	140	$4,712	$424	$4,288
Tier 1 - 44	Gas/Battery/Renewable	154	118	0	150	300	140	$4,715	$505	$4,210
Tier 1 - 13	Battery/Renewable	0	0	0	450	500	140	$4,722	$531	$4,191
Tier 1 - 60	Gas/Battery/Renewable	269	0	196	0	0	140	$4,726	$462	$4,264
Tier 1 - 55	Gas/Battery/Renewable	0	101	196	150	300	140	$4,726	$498	$4,228
Tier 1 - 72	Gas/Battery/Renewable	0	0	392	0	300	140	$4,727	$404	$4,323
Tier 1 - 61	Gas/Battery/Renewable	231	0	196	0	300	140	$4,728	$441	$4,287

The full Tier 1 offer matrices showing all 81 options are included in the Appendix of the report. The results were insightful. The analysis shows that the 350 MW of solar is an optimal level given the submitted RFP offers. The lowest cost all battery/renewable case was substantially more expensive then the option that included both battery and gas. Filling the entire capacity need with battery is more expensive because it forces in the higher cost battery options which are more expensive than competing gas alternatives. The analysis shows that additional battery in addition to the least cost solar/battery combination should be further analyzed as part of the Tier 2 analysis. From a gas perspective, the aeroderivative options were more economic than either the frame or reciprocating engines in all cases.

The aeroderivatives and frame offers had similar fixed costs but the aeroderivatives provide more flexibility, especially given their low minimum capacity levels. The reciprocating engines provide more flexibility and slightly cheaper energy costs, but those benefits do not overcome the fixed cost premium on these offers.

Tier 2 Modeling was performed next around the best combination found in the Tier 1 Modeling. The Tier 2 resources included the next lowest cost wind resources, combined renewable/battery, and standalone battery options which were further down in HDRs evaluation ranking. Table 25 shows those combinations and results ranked. The top ranked combination added 20 MW of battery that was included in the next best priced combined solar/battery option which also allowed for one less aeroderivative to be selected in order to meet reliability criteria. The lowest NPV from the Tier 1 Modeling was 4,6189 million dollars (highlighted in gray in the table) versus an NPV of 4,5983 million dollars which was the least cost combination from the Tier 2 Modeling. As expected, the more expensive wind projects did not improve the economics.

Table 25. Tier 2 Results With No Technology or Project Size Constraints

Resource Replacement Combination #	Tier 1/Tier 2	LM6000	Recips	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs
Tier 2 - 1	Tier 2	231	0	0	170	370	140	$4,598	$419	$4,179
Tier 2 - 2	Tier 2	231	0	0	170	350	140	$4,600	$407	$4,192
Tier 1 - 23	Tier 1	269	0	0	150	350	140	$4,618	$412	$4,207
Tier 2 - 3	Tier 2	269	0	13	150	350	140	$4,624	$417	$4,207
Tier 2 - 5	Tier 2	231	0	0	190	350	140	$4,636	$444	$4,192
Tier 2 - 4	Tier 2	192	0	0	210	350	140	$4,648	$459	$4,189
Tier 2 - 6	Tier 2	192	0	0	210	500	140	$4,654	$438	$4,217
Tier 2 - 7	Tier 2	77	0	0	350	350	140	$4,664	$485	$4,178
Tier 2 - 8	Tier 2	192	0	0	250	350	140	$4,687	$511	$4,176
Tier 2 - 10	Tier 2	308	0	0	100	350	140	$4,690	$455	$4,235
Tier 2 - 9	Tier 2	192	0	0	200	350	140	$4,703	$483	$4,220
Tier 2 - 11	Tier 2	231	0	0	150	350	340	$4,708	$389	$4,319
Tier 2 - 12	Tier 2	192	0	0	150	350	540	$4,775	$377	$4,398

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unconstrained modeling determined that the 350 MW of solar and some level of the aeroderivatives would provide the most economic combination of replacement resources. Using the least cost PPA and ownership battery options including the combined solar/battery projects that were 40 MW and less, many permutations were developed to determine the least cost combination that met reliability. Some of the larger PPAs options were re-priced to provide 40 MW projects. These options are shown in Table 26 below.

Table 26. Battery Options for Constrained Modeling

Battery Configuration	Ownership/PPA	Duration (Hours)	Battery Size (MW)
Combined Solar/Battery	PPA	4	300 solar/40 battery
Combined Solar/Battery	PPA	4	50 solar/20 battery
Stand Alone Battery	PPA	4	40
Stand Alone Battery	PPA	4	40
Stand Alone Battery	PPA	4	40
Stand Alone Battery	PPA	4	40
Stand Alone Battery	Ownership	2	40
Stand Alone Battery	Ownership	2	30

Total combined battery options ranging from 20 MW to 170 MW were simulated and those results are shown in Table 27. ~~Seven~~ Two combinations were within ~~3~~ 1 million NPV of each other. ~~The lowest cost combination consisted of all battery PPAs.~~ Given that battery ownership is preferred and the differences in economics are negligible, PNM selected the combination that included 7 aeroderivatives consisting of 269 MW, combined solar/battery project consisting of 300 MW of solar and 40 MW of battery, combined solar/battery project consisting of 50 MW of solar and 20 MW of battery, and two standalone battery ownership projects consisting of 40 MW and 30 MW. This combination totals 269 MW of gas, 350 MW of solar, and 130 MW of battery and is referred to by the Company as Scenario 1 and the Company's proposed plan.

Table 27. Constrained Battery Combinations Sorted by Least Cost

Resource Replacement Combination	LM6000	PPA Battery	Ownership Battery	Solar	Total NPV	NPV Fixed Costs	NPV Production Costs
	MW	MW	MW	MW	M$	M$	M$
Constrained – 5	307	60	40	350	$4,672	$463	$4,209
Constrained - 3 (Proposed Plan)	269	60	70	350	$4,673	$469	$4,205
Constrained – 7	269	60	70	370	$4,675	$481	$4,194
Constrained – 4	345	40	0	350	$4,677	$421	$4,256
Constrained – 2	307	100	0	350	$4,678	$460	$4,218
Constrained – 1	269	140	0	350	$4,680	$475	$4,205
Constrained – 8	269	100	40	350	$4,682	$478	$4,204
Constrained – 6	269	140	0	370	$4,683	$487	$4,196
Constrained – 10	345	60	0	350	$4,695	$448	$4,247
Constrained – 9	231	140	30	350	$4,700	$498	$4,202
Constrained – 11	231	100	70	350	$4,703	$501	$4,202
Constrained – 12	269	140	0	500	$4,706	$453	$4,253
Constrained – 14	345	0	40	350	$4,706	$445	$4,262
Constrained – 13	307	100	0	500	$4,710	$439	$4,271
Constrained – 15	345	40	0	500	$4,719	$420	$4,299
Constrained – 17	383	20	0	350	$4,721	$457	$4,265
Constrained – 16	345	60	0	350	$4,725	$469	$4,256
Constrained – 18	345	60	0	500	$4,736	$448	$4,288
Constrained – 19	383	40	0	350	$4,758	$494	$4,264

Table 28 shows the reliability metrics for Scenario 1 – the Proposed Plan. Reliability metrics of the other combinations studied are included in the Appendix.

Table 28. Reliability Metrics for Scenario 1

Study Year	LOLE Cap	LOLE Flex	Renewable Curtailment MWh	Renewable Curtailment %
2023	0.17	0.16	298,699	7.01%
2028	0.13	0.14	264,481	5.02%
2033	0.06	0.10	306,120	4.49%

VI. Additional Scenarios to Compare to the Proposed Plan

The Company requested Astrapé run 3 additional scenarios to compare against the proposed plan. These were developed by PNM's resource planning department and respect the 40 MW battery size project limit. These included the following:

- Scenario 1 – This scenario is the proposed least cost plan from the modeling discussed above. It includes seven aeroderivatives consisting of 269 MW, a combined solar/battery project consisting of 300 MW of solar and 40 MW of battery, a combined solar/battery project consisting of 50 MW of solar and 20 MW of battery, and two standalone battery ownership projects consisting of 40 MW and 30 MW

- Scenario 2 - San Juan Location Preference Alternative Scenario – This scenario included the least cost resources in the San Juan Location which included ~~7~~ 11 aero derivatives and a combined solar/battery project consisting of 100 MW of solar and 30 MW of battery.~~1 Frame machine.~~

- Scenario 3 - No New Fossil Fuel Alternative Scenario – This scenario included the least cost battery projects that were less than 40 MW and renewable resources. It included 500 MW of solar and 11 battery projects summing to 410 MW. The 11 different battery projects included 7 PPA options and 4 ownership options.

- Scenario 4 - All Renewable Replacement Scenario – This scenario includes all renewable capacity. This scenario includes all wind and solar PPA projects consisting of 1,200 MW of wind and 975 MW of solar.

These scenarios were treated in the same manner as all the other combinations that were simulated as part of the Tier 1 and Tier 2 Modeling approach. Table 29 shows those results. Of the 4 replacement scenarios put forth by the Company, the proposed plan is the most economic. Scenario 2 has an NPV of ~~54~~43 million dollars more than Scenario 1 while Scenario 3 has an NPV of ~~156~~ 164 million dollars

higher than Scenario 1. The next table shows the reliability of the replacement scenarios compared to the proposed plan. This shows that additional capacity resources would be required for both Scenario 3 and 4 demonstrating that the economics shown in Table 29 are conservative. The costs would increase to ensure reliability. CO_2 emissions in millions tons are also included in the results below.

Table 29. Additional Scenarios Provided by the Company

Resource Replacement Combination	LM6000	Frame	PPA Battery	Owned Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023 CO_2
-	MW	MW	MW	MW	MW	MW	M$	M$	M$	Million tons
Scenario 1 – Proposed Plan	269	0	60	70	350	140	$4,673	$469	$4,205	2.9
Scenario 2 – SJ preferred	423	0	30	0	100	140	$4,717	$441	$4,276	3.1
Scenario 3 – No Gas	0	0	260	150	500	140	$4,837	$640	$4,197	2.7
Scenario 4 – All renewable	0	0	0	0	975	1,199	$5,454	$97	$5,357	2.5

Table 30. Reliability Metrics of Additional Scenarios Provided by the Company

Resource Replacement Combination	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
-	Events per Year					
Year	2023	2028	2033	2023	2028	2033
Scenario 1 – Proposed Plan	0.17	0.13	0.06	0.16	0.14	0.16
Scenario 2 – SJ preferred	0.13	0.06	0.04	0.14	0.16	0.15
Scenario 3 – No Gas	0.39	0.38	0.27	0.10	0.09	0.07
Scenario 4 – All renewable	5.70	2.48	1.01	3.45	0.73	0.19

VI. High Gas/ CO_2 Sensitivity

The top combinations in the Tier 1, Tier 2, and Battery Constrained Modeling were simulated under the High Gas/ CO_2 Sensitivity. The unconstrained Tier 1 and Tier 2 Modeling results are in Table 31. The top combination that appeared in the Base gas/CO_2 pricing also is the top ranked bid in the High Gas/CO_2

sensitivity. The best all battery/renewable combination was more competitive as expected in the High Gas/ CO_2 sensitivity.

Table 31. High Gas/ CO_2 Sensitivity: Tier 1 and Tier 2 Top Replacement Resource Combinations

Technology Type	LM6000	Recips	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs
	MW	MW	MW	MW	MW	MW	M$	M$	M$
Gas/Battery/Renewable	231	0	0	170	350	140	$5,199	$407	4,792
Battery/Renewable	0	0	0	410	650	140	$5,216	$468	4,748
Gas/Battery/Renewable	192	0	0	210	500	140	$5,222	$438	4,784
Gas/Battery/Renewable	269	0	0	150	350	140	$5,227	$412	4,816
Gas/Battery/Renewable	231	0	0	190	350	140	$5,231	$444	4,787
Gas/Battery/Renewable	77	0	0	350	350	140	$5,235	$485	4,750
Gas/Battery/Renewable	192	0	0	210	350	140	$5,239	$459	4,780
Battery/Renewable	0	0	0	410	700	140	$5,242	$468	4,774
Battery/Renewable	0	0	0	450	500	140	$5,251	$531	4,720
Gas/Battery/Renewable	269	0	0	150	500	140	$5,260	$412	4,848
Gas/Battery/Renewable	192	0	0	250	350	140	$5,269	$511	4,758
Gas/Battery/Renewable	192	0	0	200	350	140	$5,297	$483	4,814
Gas/Battery/Renewable	269	0	0	150	650	140	$5,302	$413	4,888
Gas/Battery/Renewable	308	0	0	100	350	140	$5,302	$455	4,847
Battery/Renewable	0	0	0	510	350	140	$5,362	$631	4,731
Gas/Battery/Renewable	0	271	0	150	350	140	$5,377	$561	4,817
Gas/Battery/Renewable	0	271	0	150	500	140	$5,410	$561	4,850
Battery/Renewable	0	0	0	530	300	140	$5,413	$668	4,744
Gas/Battery/Renewable	269	0	196	0	0	140	$5,422	$462	4,960
Gas/Battery/Renewable	0	271	0	150	650	140	$5,473	$562	4,911

The constrained modeling results for the High Gas/ CO_2 sensitivity are shown in Table 32. These results showed a similar pattern with there being small differences in the top few replacement resource combinations. This analysis shows that even under higher gas and CO_2, the proposed plan which provides a diverse resource set is robust.

Table 32. High Gas/ CO_2 Sensitivity: Constrained Resource Combinations

Resource Replacement Combination	LM6000	PPA Battery	Ownership Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs
	MW	MW	MW	MW	MW	M$	M$	M$
Constrained - 7	269	60	70	370	140	$5,272	$481	$4,791
Constrained - 3 - Proposed Plan	269	60	70	350	140	$5,274	$469	$4,806
Constrained - 5	307	60	40	350	140	$5,277	$463	$4,814
Constrained - 6	269	140	0	370	140	$5,278	$487	$4,791
Constrained - 1	269	140	0	350	140	$5,279	$475	$4,804
Constrained - 2	307	100	0	350	140	$5,281	$460	$4,821
Constrained - 8	269	100	40	350	140	$5,282	$478	$4,804
Constrained - 12	269	140	0	500	140	$5,286	$453	$4,833
Constrained - 9	231	140	30	350	140	$5,297	$498	$4,798
Constrained - 11	231	100	70	350	140	$5,300	$501	$4,799
Constrained - 4	345	40	0	350	140	$5,307	$421	$4,887
Constrained - 13	307	100	0	500	140	$5,308	$439	$4,869

The Company Scenario Modeling is in Table 33. Scenario 4 which includes all renewable was not simulated since there was no way to have that scenario solve from a reliability perspective. Scenario 1 is still the most economic among the scenarios even with the High Gas/ CO_2 future. As expected, Scenario 3 – No Gas improved while Scenario 2 – SJ preferred became less economic compared to Scenario 1.

Table 33. High Gas/ CO_2 Sensitivity: Additional Scenarios

Resource Replacement Combination	LM6000	Frame	PPA Battery	Owned Battery	Solar	Wind	Total NPV
	MW	MW	MW	MW	MW	MW	M$
Scenario 1 – Proposed Plan	269	0	60	70	350	140	$5,274
Scenario 2 – SJ preferred	423	0	30	0	100	140	$5,384
Scenario 3 – No Gas	0	0	260	150	500	140	$5,374

IX. Conclusions

Based on the evaluation performed by Astrapé, the proposed plan of replacement resources including 350 MW of solar, 130 MW of battery, and 269 MW of gas meets reliability criteria and provides reasonable costs given the technology constraints imposed. These replacement resources provide a diverse set of resources and take advantage of the lowest cost renewable, battery, and gas offers submitted into the RFP.

Renewable Only Replacement Resource Combinations

-	-	-	-	-	-	-	-	-	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
LM6000	Recip	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023	2028	2033	2023	2028	2033
MW	MW	MW	MW	MW	MW	M$	M$	M$	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year
0	0	0	0	0	1199	$4,959	$77	$4,882	5.82	2.47	1.38	2.47	0.40	0.06
0	0	0	0	975	0	$4,729	$20	$4,709	12.69	5.19	2.68	0.31	0.04	0.15
0	0	0	0	975	1199	$5,454	$97	$5,357	5.70	2.48	1.01	3.45	0.73	0.19

Base Load Replace Resource Combinations

-	-	-	-	-	-	-	-	-	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
LM6000	Recip	CC	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023	2028	2033	2023	2028	2033
MW	MW	MW	MW	MW	MW	M$	M$	M$	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year
0	0	445	0	300	140	$4,762	$561	$4,202	0.46	0.15	0.06	0.37	0.20	0.15

Tier 1 Modeling

-	-	-	-	-	-	-	-	-	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
LM6000	Recip	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023	2028	2033	2023	2028	2033
MW	MW	MW	MW	MW	MW	M$	M$	M$	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year
0	0	0	530	300	140	$4,848	$668	$4,179	0.11	0.21	0.24	0.11	0.10	0.07
0	0	0	530	350	140	$4,845	$668	$4,177	0.17	0.21	0.20	0.13	0.20	0.08
0	0	0	490	500	140	$4,810	$604	$4,206	0.14	0.13	0.16	0.13	0.17	0.08

Corrected

0	0	0	490	650	140	$4,854	$606	$4,248	0.11	0.08	0.09	0.15	0.16	0.08
0	0	0	490	700	140	$4,875	$606	$4,269	0.11	0.09	0.08	0.13	0.16	0.11
0	0	0	520	300	140	$4,949	$743	$4,206	0.23	0.31	0.34	0.10	0.16	0.09
0	0	0	520	350	140	$4,947	$743	$4,204	0.17	0.24	0.31	0.10	0.20	0.10
0	0	0	520	500	140	$4,971	$743	$4,228	0.15	0.15	0.19	0.15	0.15	0.10
0	0	0	480	650	140	$4,963	$678	$4,285	0.14	0.13	0.14	0.11	0.15	0.11
0	0	0	480	700	140	$4,981	$678	$4,303	0.11	0.13	0.12	0.18	0.15	0.11
0	0	0	530	300	140	$4,847	$668	$4,179	0.11	0.23	0.24	0.11	0.18	0.07
0	0	0	510	350	140	$4,808	$631	$4,177	0.14	0.17	0.20	0.14	0.23	0.06
0	0	0	450	500	140	$4,722	$531	$4,191	0.15	0.15	0.16	0.16	0.09	0.08
0	0	0	410	650	140	$4,710	$468	$4,242	0.23	0.16	0.10	0.17	0.16	0.16
0	0	0	410	700	140	$4,736	$468	$4,268	0.18	0.15	0.09	0.16	0.15	0.11
423	0	0	0	0	140	$4,673	$414	$4,260	0.20	0.10	0.05	0.16	0.18	0.18
423	0	0	0	300	140	$4,708	$424	$4,283	0.15	0.05	0.03	0.08	0.20	0.13
423	0	0	0	350	140	$4,712	$424	$4,288	0.12	0.04	0.03	0.08	0.18	0.13
384	0	0	0	500	140	$4,742	$399	$4,344	0.15	0.05	0.04	0.15	0.19	0.15
384	0	0	0	650	140	$4,801	$376	$4,425	0.17	0.06	0.03	0.08	0.22	0.10
384	0	0	0	700	140	$4,836	$376	$4,460	0.17	0.05	0.03	0.16	0.19	0.11
269	0	0	150	300	140	$4,620	$412	$4,208	0.16	0.07	0.04	0.09	0.13	0.13
269	0	0	150	350	140	$4,618	$412	$4,207	0.16	0.08	0.03	0.17	0.18	0.14
269	0	0	150	500	140	$4,667	$412	$4,255	0.10	0.04	0.04	0.16	0.17	0.12
269	0	0	150	650	140	$4,730	$413	$4,316	0.11	0.05	0.02	0.12	0.12	0.16
269	0	0	150	700	140	$4,776	$413	$4,363	0.10	0.04	0.04	0.11	0.12	0.10
0	423	0	0	0	140	$4,856	$601	$4,255	0.22	0.09	0.06	0.11	0.16	0.10
0	406	0	0	300	140	$4,869	$587	$4,282	0.16	0.07	0.04	0.11	0.16	0.07

0	406	0	0	350	140	$4,874	$587	$4,287	0.17	0.06	0.04	0.11	0.17	0.11
0	389	0	0	500	140	$4,909	$563	$4,346	0.15	0.05	0.03	0.11	0.12	0.10
0	389	0	0	650	140	$4,988	$565	$4,423	0.14	0.05	0.02	0.10	0.15	0.08
0	389	0	0	700	140	$5,026	$565	$4,461	0.12	0.07	0.03	0.12	0.14	0.08
0	271	0	150	300	140	$4,770	$561	$4,209	0.17	0.07	0.06	0.09	0.11	0.07
0	271	0	150	350	140	$4,772	$561	$4,211	0.15	0.09	0.05	0.11	0.14	0.08
0	271	0	150	500	140	$4,822	$561	$4,261	0.11	0.06	0.04	0.13	0.14	0.09
0	271	0	150	650	140	$4,892	$562	$4,329	0.11	0.05	0.03	0.09	0.11	0.10
0	271	0	150	700	140	$4,930	$562	$4,368	0.16	0.05	0.03	0.10	0.13	0.07
231	237	0	0	0	140	$4,855	$597	$4,258	0.10	0.07	0.04	0.08	0.15	0.08
192	220	0	0	300	140	$4,849	$569	$4,279	0.13	0.06	0.05	0.09	0.12	0.08
192	203	0	0	350	140	$4,832	$544	$4,288	0.16	0.06	0.03	0.11	0.16	0.10
192	203	0	0	500	140	$4,890	$544	$4,346	0.14	0.06	0.03	0.11	0.17	0.09
192	203	0	0	650	140	$4,969	$545	$4,424	0.15	0.05	0.01	0.09	0.13	0.11
192	203	0	0	700	140	$5,007	$545	$4,462	0.16	0.04	0.03	0.10	0.18	0.08
154	118	0	150	300	140	$4,715	$505	$4,210	0.18	0.07	0.07	0.11	0.14	0.07
154	101	0	150	350	140	$4,693	$479	$4,214	0.23	0.08	0.06	0.11	0.11	0.07
154	101	0	150	500	140	$4,741	$479	$4,262	0.16	0.06	0.04	0.11	0.14	0.08
154	118	0	150	650	140	$4,827	$506	$4,320	0.11	0.04	0.03	0.08	0.12	0.13
154	118	0	150	700	140	$4,875	$506	$4,369	0.15	0.04	0.03	0.09	0.13	0.07
0	271	196	0	0	140	$4,875	$611	$4,264	0.16	0.06	0.05	0.07	0.14	0.09
0	220	196	0	300	140	$4,839	$544	$4,295	0.17	0.06	0.07	0.09	0.16	0.09
0	220	196	0	350	140	$4,843	$544	$4,299	0.17	0.05	0.04	0.08	0.13	0.09
0	220	196	0	500	140	$4,901	$544	$4,357	0.15	0.04	0.03	0.08	0.14	0.09
0	203	196	0	650	140	$4,956	$520	$4,436	0.16	0.05	0.03	0.09	0.10	0.09

0	203	196	0	700	140	$4,994	$520	$4,474	0.14	0.05	0.04	0.10	0.16	0.08
0	101	196	150	300	140	$4,726	$498	$4,228	0.11	0.08	0.06	0.09	0.13	0.07
0	85	196	150	350	140	$4,706	$472	$4,234	0.15	0.07	0.05	0.08	0.12	0.07
0	85	196	150	500	140	$4,758	$472	$4,285	0.13	0.05	0.04	0.08	0.09	0.07
0	68	196	150	650	140	$4,794	$448	$4,346	0.15	0.05	0.04	0.09	0.14	0.11
0	68	196	150	700	140	$4,841	$448	$4,394	0.15	0.06	0.04	0.08	0.15	0.05
269	0	196	0	0	140	$4,726	$462	$4,264	0.19	0.07	0.04	0.12	0.17	0.13
231	0	196	0	300	140	$4,728	$441	$4,287	0.13	0.04	0.04	0.12	0.18	0.11
231	0	196	0	350	140	$4,734	$441	$4,293	0.16	0.04	0.02	0.12	0.17	0.11
231	0	196	0	500	140	$4,793	$441	$4,352	0.14	0.04	0.02	0.13	0.16	0.12
192	0	196	0	650	140	$4,860	$430	$4,430	0.18	0.05	0.02	0.16	0.15	0.11
192	0	196	0	700	140	$4,901	$430	$4,470	0.17	0.06	0.03	0.15	0.18	0.10
115	0	196	150	300	140	$4,692	$475	$4,217	0.10	0.05	0.03	0.10	0.16	0.13
77	0	196	150	350	140	$4,655	$431	$4,223	0.15	0.09	0.05	0.13	0.14	0.16
77	0	196	150	500	140	$4,706	$431	$4,274	0.12	0.06	0.05	0.15	0.14	0.13
77	0	196	150	650	140	$4,768	$433	$4,336	0.13	0.04	0.03	0.11	0.12	0.16
77	0	196	150	700	140	$4,816	$433	$4,383	0.10	0.05	0.03	0.10	0.12	0.09
0	0	392	0	0	140	$4,691	$393	$4,298	0.40	0.13	0.08	0.12	0.17	0.15
0	0	392	0	300	140	$4,727	$404	$4,323	0.24	0.09	0.05	0.14	0.15	0.12
0	0	392	0	350	140	$4,731	$404	$4,328	0.23	0.07	0.05	0.13	0.18	0.11
0	0	392	0	500	140	$4,792	$404	$4,389	0.21	0.05	0.04	0.13	0.12	0.10
0	0	392	0	650	140	$4,873	$405	$4,468	0.18	0.08	0.03	0.16	0.15	0.09
0	0	392	0	700	140	$4,914	$405	$4,509	0.17	0.04	0.03	0.18	0.14	0.05
0	0	392	150	300	140	$4,774	$539	$4,235	0.04	0.02	0.01	0.10	0.15	0.11
0	0	392	150	350	140	$4,777	$539	$4,238	0.05	0.03	0.01	0.11	0.16	0.13

0	0	392	150	500	140	$4,828	$539	$4,289	0.03	0.01	0.01	0.12	0.13	0.12
0	0	392	150	650	140	$4,891	$541	$4,351	0.05	0.01	0.01	0.11	0.09	0.16
0	0	392	150	700	140	$4,942	$541	$4,401	0.04	0.01	0.01	0.13	0.09	0.07

Tier 2 Modeling

-	-	-	-	-	-	-	-	-	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
LM6000	Recip	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023	2028	2033	2023	2028	2033
MW	MW	MW	MW	MW	MW	M$	M$	M$	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year
231	0	0	150	350	340	$4,708	$389	$4,319	0.16	0.08	0.06	0.18	0.16	0.14
192	0	0	150	350	540	$4,775	$377	$4,398	0.19	0.06	0.08	0.17	0.15	0.10
192	0	0	200	350	140	$4,703	$483	$4,220	0.23	0.17	0.08	0.13	0.22	0.16
308	0	0	100	350	140	$4,690	$455	$4,235	0.18	0.07	0.05	0.14	0.14	0.16
231	0	0	170	350	140	$4,600	$407	$4,192	0.19	0.10	0.05	0.14	0.18	0.20
192	0	0	210	500	140	$4,654	$438	$4,217	0.18	0.09	0.05	0.12	0.15	0.18
77	0	0	350	350	140	$4,664	$485	$4,178	0.21	0.15	0.13	0.11	0.13	0.15
192	0	0	250	350	140	$4,687	$511	$4,176	0.11	0.08	0.04	0.11	0.17	0.20
231	0	0	190	350	140	$4,636	$444	$4,192	0.16	0.09	0.05	0.14	0.16	0.16
192	0	0	210	350	140	$4,648	$459	$4,189	0.17	0.13	0.06	0.15	0.17	0.12
269	0	13	150	350	140	$4,624	$417	$4,207	0.16	0.06	0.04	0.14	0.14	0.15

Battery Constrained Modeling Combinations

-	-	-	-	-	-	-	-	-	LOLE Cap	LOLE Cap	LOLE Cap	LOLE Flex	LOLE Flex	LOLE Flex
LM6000	Recip	Frame	Battery	Solar	Wind	Total NPV	NPV Fixed Costs	NPV Production Costs	2023	2028	2033	2023	2028	2033
MW	MW	MW	MW	MW	MW	M$	M$	M$	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year	Events Per year
345	0	0	40	500	140	$4,719	$420	$4,299	0.14	0.07	0.04	0.13	0.20	0.22
345	0	0	40	350	140	$4,706	$445	$4,262	0.24	0.09	0.05	0.08	0.16	0.12
307	0	0	100	350	140	$4,678	$460	$4,218	0.16	0.07	0.04	0.13	0.22	0.27
345	0	0	60	350	140	$4,695	$448	$4,247	0.21	0.05	0.04	0.14	0.14	0.11
307	0	0	100	350	140	$4,672	$463	$4,209	0.15	0.09	0.04	0.19	0.18	0.26
269	0	0	140	500	140	$4,706	$453	$4,253	0.15	0.07	0.04	0.13	0.21	0.15
307	0	0	100	500	140	$4,710	$439	$4,271	0.14	0.04	0.05	0.12	0.18	0.13
269	0	0	140	350	140	$4,682	$478	$4,204	0.17	0.11	0.06	0.16	0.14	0.15
383	0	0	20	350	140	$4,721	$457	$4,265	0.16	0.05	0.04	0.14	0.13	0.17
383	0	0	40	350	140	$4,758	$494	$4,264	0.13	0.05	0.02	0.08	0.19	0.16
345	0	0	60	350	140	$4,725	$469	$4,256	0.17	0.06	0.05	0.08	0.15	0.13
345	0	0	40	350	140	$4,677	$421	$4,256	0.22	0.08	0.04	0.16	0.17	0.18
345	0	0	60	500	140	$4,736	$448	$4,288	0.11	0.05	0.03	0.13	0.17	0.18
231	0	0	170	350	140	$4,700	$498	$4,202	0.20	0.12	0.07	0.12	0.13	0.11
231	0	0	170	350	140	$4,703	$501	$4,202	0.16	0.13	0.09	0.10	0.12	0.13
269	0	0	140	350	140	$4,680	$475	$4,205	0.15	0.08	0.06	0.15	0.12	0.19
269	0	0	130	350	140	$4,673	$469	$4,205	0.17	0.13	0.06	0.16	0.14	0.16

Henry E. Monroy

DIRECT TESTIMONY AND EXHIBITS OF HENRY MONROY		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 4, Ln. 15	Changed "83" to "80". Changed to reflect the updated total contained in PNM Table HEM-1.
Testimony	Pg. 5, Ln. 3 of Table HEM-1	Change "(11)" to "(10)". Increase in carrying charges on SJCC severance and job training. Prior amount was calculated on an annual spend of job training. Correction was made to be consistent with Ron Darnell Testimony to show severance and job training payments forecasted for April 2020 (Refers to Table HEM-9).
Testimony	Pg. 5, Ln. 4 of Table HEM-1	Change "47" to "48". Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M. Also correction to estimated capital investment (refers to Table HEM-11).
Testimony	Pg. 5, Ln. 5 of Table HEM-1	Change "(49)" to "(48)". Updated fuel from Astrape to address corrections discussed by PNM Witness Wintermantel. GRT added to battery PPA demand charges.
Testimony	Pg. 5, Ln. 6 of Table HEM-1	Change "(83)" to "(80)". Total in PNM Table HEM-1 was updated as result of above referenced changes in numbers.
Testimony	Pg. 5, Ln. 10	Change "83" to "80". Changed to reflect the updated total contained in PNM Table HEM-1.
Testimony	Pg. 5, Ln. 12	Change "61" to "59". Increased costs for replacement power.
Testimony	Pg. 42, Ln. 4 of Table HEM-9	Change "0.3" to "0.7". Increase in carrying charges on SJCC severance and job training. Prior amount was calculated on an annual spend of job training. Correction was made to be consistent with Ron Darnell Testimony to show severance and job training payments forecasted for April 2020 (Refers to Table HEM-1).
Testimony	Pg. 42, Ln. 5 of Table HEM-9	Change "(10.7)" to "(10.3)". Changed to reflect the updated total contained in PNM Table HEM-9.
Testimony	Pg. 47, Ln. 10	Add "SJCC severance and" between "state agencies and for" and "job training dollars.".
Testimony	Pg. 47, Ln. 10-13	Delete "PNM is not aware of..... Charges as incurred".
Testimony	Pg. 52, Ln. 13	Change "33.0" to "34.4". Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M. Also correction to estimated capital investment (refers to Table HEM-1).
Testimony	Pg. 52, Ln. 20	Change "190.9" to "190.3". Correction to estimated capital investment.
Testimony	Pg. 53, Ln. 15	Change "190.9" to "190.3". Correction to estimated capital investment.
Testimony	Pg. 53, Ln. 20	Change "17.0" to "18.5". Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M.

DIRECT TESTIMONY AND EXHIBITS OF HENRY MONROY		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 55, Ln. 3	Change "39.0" to "38.9". Correction to estimated capital investment.
Testimony	Pg. 55, Ln. 15	Change "39.0" to "38.9". Correction to estimated capital investment.
Testimony	Pg. 59, Ln. 1 of Table HEM-11	Change "33.0" to "34.4".Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M. Also correction to estimated capital investment (refers to Table HEM-1).
Testimony	Pg. 59, Ln. 5 of Table HEM-11	Change "47.1"to "48.5". Changed to reflect the updated total contained in PNM Table HEM-11.
Testimony	Pg. 59, Ln. 16	Change "190.9" to "190.3". Correction to estimated capital investment.
Testimony	Pg. 59, Ln. 17	Change "39.0" to "38.9". Correction to estimated capital investment.
Testimony	Pg. 60, Ln. 16	Change "18.8" to "19.0". Add GRT on demand charges.
Testimony	Pg. 62, Ln. 2	Change "5.1" to "5.3". Add GRT on demand charges.
Testimony	Pg. 63, Ln. 3 of Table HEM-12	Change "(11)" to "(10)". Increase in carrying charges on SJCC severance and job training. Prior amount was calculated on an annual spend of job training. Correction was made to be consistent with Ron Darnell Testimony to show severance and job training payments forecasted for April 2020 (Refers to Table HEM-9).
Testimony	Pg. 63, Ln. 6 of Table HEM-12	Change "(83)"to "(80)". Change "(79)"to "(78)". Change "(81)"to "(75)". Change "12"to "26". Sum of table updated.
Testimony	Pg. 63, Ln. 6 of Table HEM-12	Change "47" to "48". Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M. Also corrected estimated capital investment (refers to Table HEM-11).
Testimony	Pg. 63, Ln. 6 of Table HEM-12	Change "58" to "52". Change to portfolio due to modeling changes.
Testimony	Pg. 63, Ln. 6 of Table HEM-12	Change "(49)" to "(48)". Updated Fuel discussed by PNM Witness Wintermantel. Added GRT to Battery PPA demand charges.
Testimony	Pg. 63, Ln. 6 of Table HEM-12	Change "(56)" to "(49)". Change to portfolio due to modeling changes.
PNM Exhibit HEM-2	Pg. 1 , Ln. 10	A corrected exhibit is being provided as a result of a change from "1" to "2" on line 10. Increase in carrying charges on SJCC severance and job training. Prior Amount was calculated on an annual spend of job training. Correction was made to be consistent with Ron Darnell Testimony to show

DIRECT TESTIMONY AND EXHIBITS OF HENRY MONROY		
Document	**Page and Line**	**Explanation**
		severance and job training payments forecasted for April 2020.
PNM Exhibit HEM-12	Pg. 1, Ln. 25	A corrected exhibit is being provided as a result of a change from "195,249" to "1,455,436" on line 25. Increase in carrying charges on SJCC severance and job training. Prior amount was calculated on an annual spend of job training. Correction was made to be consistent with Ron Darnell Testimony to show severance and job training payments forecasted for April 2020.
PNM Exhibit HEM-13	Pg. 1, Col D, Ln. 14	A corrected exhibit is being provided as a result of a correction to the text changed "Unamortized Balance in Rate Base" to "None" on line 14.
PNM Exhibit HEM-16	Pg. 1, Ln. 39	A corrected exhibit is being provided as a result of a change from "33,032,771" to "34,437,830" on line 39. Increased 2023 O&M for Pinon Gas Plant. Original estimate excluded variable and fixed O&M. Also correction to estimated capital investment
PNM Exhibit HEM-17	Pg. 1, Ln. 36	A corrected exhibit is being provided as a result of a change from "5,885,381 to 5,864,507" on line 36. Correction to estimated capital investment.
PNM Exhibit HEM-19	Pg. 1, Ln. 14	A corrected exhibit is being provided as a result of an addition of GRT to demand charges which added lines 15 & 16 to the table updating the total capacity costs from "3,580,800" to "3,822,504".
PNM Exhibit HEM-21	Pg. 1, Ln. 14	A corrected exhibit is being provided as a result of an addition of GRT to demand charges which added lines 15 & 16 to the table updating the total capacity costs from "2,392,800 to "2,557,305" on line 14.

Parts VIII and IX of my testimony present revenue requirements specific to the continued operation of the San Juan coal plant compared with the proposed replacement power resources reflected in PNM's recommended Scenario 1. This comparison demonstrates a substantial quantifiable net benefit to customers resulting from approval of PNM's Consolidated Application.

Part X of my testimony provides comparable revenue requirements for PNM's Scenarios 2, 3 and 4, as described by PNM Witness Fallgren.

II. CUSTOMER IMPACTS OF CONSOLIDATED APPLICATION

Q. HAS PNM CALCULATED THE IMPACT TO 2023 REVENUE REQUIREMENTS FOR CUSTOMERS AS THE RESULT OF THE EARLY RETIREMENT OF THE SAN JUAN COAL PLANT?

A. Yes. PNM has estimated that the impacts to the 2023 revenue requirement is a benefit to customers of $803 million as the result of the abandonment of the San Juan coal plant. PNM Table HEM–1 provides a summary of the impacts to the 2023 revenue requirements. PNM Witness Settlage provides customer bill impacts based on the impacts to the 2023 revenue requirements.

PNM Table HEM-1
Summary of Impacts to 2023 Revenue Requirements
$ in millions

1	(94)	Savings from San Juan coal plant - Continue Operations
2	23	Energy Transition Charge - Securitization
3	(10~~1~~)	Other Costs Not Included in Energy Transition Charge
4	4~~8~~7	New Owned Resources - Non-Fuel Included in Scenario 1
5	(4~~8~~9)	Fuel Savings Net, Due to Change in Resources
6	(80~~3~~)	Total

Q. HAS PNM IDENTIFIED CUSTOMER BENEFITS FROM FINANCING THE ABANDONMENT OF THE SAN JUAN COAL PLANT USING SECURITIZATION COMPARED TO TRADITIONAL RATE RECOVERY?

A. Yes. Financing the abandonment of the San Juan coal plant using securitization saves customers an estimated additional $22 million in 2023. These savings are generated by achieving a favorable credit rating under securitization to finance the undepreciated investment, which is lower than PNM's traditional weighted average cost of capital. Without securitization, the savings to customers of $80~~3~~ million would have been lowered by $22 million and would only have been $59~~61~~ million. Please see PNM Exhibit HEM–2.

Q. HOW DID PNM ESTIMATE THE SAVINGS FROM CLOSURE OF THE SAN JUAN COAL PLANT?

A. PNM projected the 2023 non-fuel revenue requirements associated with the continued operations of the coal plant. PNM utilized 2023 as this is the first full

PNM expects to incur and recover from customers that will remain after the abandonment of the San Juan coal plant, and one-time costs for recovery of stranded inventory balances, replacement power request for proposals ("RFP") and regulatory approval of replacement power resources costs, and external legal counsel costs associated with contractual due diligence and negotiations to exit the San Juan coal plant; and (3) carrying charges accumulated on advanced payments made to employees affected by the abandonment (severance and job training) and payments to state agencies pursuant to Section 16 of the ETA. Please see PNM Table HEM-9 below for estimate of 2023 revenue requirements associated with these items.

PNM Table HEM-9
2023 Revenue Requirement for Costs Associated with Abandonment not Recovered in Energy Transition Charge

	$ in millions	
1	(12.6)	ADIT Benefits Related to Abandonment
2	0.6	Ongoing Costs Related to San Juan coal plant
3	0.9	One-time Costs Related to San Juan coal plant
4	0.~~73~~	Carrying Charges on advanced payments
5	(10.~~37~~)	Total

A. Accumulated Deferred Income Taxes Created by Abandonment

Q. PLEASE EXPLAIN THE ADIT RELATED TO ABANDONMENT OF THE SAN JUAN COAL PLANT THAT WILL REMAIN IN BASE RATES.

A. At the time of abandonment, the San Juan coal plant will be retired for tax purposes, resulting in a write-off of the remaining tax basis in the facility at that time. PNM will also remove the net book value associated with the San Juan coal

between when these payments are made and proceeds from the energy transition bonds are received. PNM is proposing to collect these carrying charges in PNM's next general rate case, as a component of its cost of service studies, and not collect these carrying charges as part of the Energy Transition Charge as PNM does not believe these carrying charges are eligible to be classified as energy transition costs pursuant to the ETA. PNM is proposing to recover these carrying charges over 3 years, and PNM will not request to include the unamortized balance of carrying charges in rate base. Please see PNM Exhibit HEM-12 for an estimate of carrying charges on the advanced payments to state agencies and for SJCC severance and job training dollars. ~~PNM is not aware of the specific timing of the severance payments for SJCC employees, so it has not estimated the carrying charges related to those payments, but PNM intends to calculate and request recovery for those carrying charges as incurred~~.

VII. REQUESTED APPROVALS FROM THE COMMISSION TO ESTABLISH REGULATORY ASSETS AND LIABILITIES

Q. CAN YOU PLEASE SUMMARIZE THE REQUESTED REGULATORY ASSETS AND LIABILITIES THE COMPANY IS REQUESTING IN ITS CONSOLIDATED ABANDONMENT APPLICATION?

A. Yes. PNM is requesting that the Commission authorize PNM to establish regulatory assets and liabilities for the purposes stated in my testimony. PNM Exhibit HEM-13 summarizes the requested regulatory assets and liabilities that PNM is seeking Commission authority to establish.

with the PPAs in rate base and will reflect the amortization of these costs as an operating expense in its cost of service studies. These costs were necessary to acquire the replacement resources under the PPA, therefore, aligning recovery of these costs over the life of the PPA matches the cost recovery over the period that customers receive the benefit of the PPA. See PNM Exhibit HEM-15.

B. PNM-Owned Resources included in Scenario 1

Q. WHAT IS THE 2023 ANNUAL REVENUE REQUIREMENT FOR THE 280 MW OF PINON GAS PLANT REPLACEMENT RESOURCES PNM IS PROPOSING TO REPLACE A PORTION OF THE SAN JUAN COAL PLANT?

A. PNM estimates the 2023 annual retail revenue requirement for the 280 MW of Pinon Gas Plant to be $34.4~~33.0~~ million. Please see PNM Exhibit HEM-16. The retail revenue requirement includes a return on rate base, utilizing PNM's most currently approved WACC, including net plant and associated ADIT, depreciation expense, gas transportation, O&M, property taxes, income taxes and revenue tax.

Q. WHAT IS THE ESTIMATED COST OF THE 280 MW PINON GAS PLANT REPLACEMENT RESOURCE?

A. Construction and construction-related costs are estimated to be $190.3~~9~~ million, including AFUDC of $12.0 million calculated using the formula prescribed in the FERC Uniform System of Accounts. Actual AFUDC rates will be calculated

based on actual capital costs as funds are expended on the project. A detailed description of the construction and construction-related costs is provided in the testimony of PNM Witness Fallgren.

Q. WHAT IS THE USEFUL LIFE USED FOR MODELING DEPRECIATION EXPENSE FOR THE 280 MW OF PINON GAS PLANT REPLACEMENT RESOURCE?

A. PNM has modeled an 18-year useful life when calculating depreciation expense in order to model the retirement of the new gas generation by 2040.

Q. WHAT RATE TREATMENT IS PNM REQUESTING FOR THE 280 MW PINON GAS PLANT REPLACEMENT RESOURCE?

A. PNM is requesting that the Commission grant PNM a CCN to construct, own and operate the plant and authorize PNM to include the actual cost of the plant up to the certificated estimated cost of $190.39 million in PNM's total rate base in future ratemaking proceedings as the capital cost for the facility. PNM is requesting authority to recover in future ratemaking proceedings the actual operating expenses incurred for O&M, property taxes, gas transportation costs, and depreciation expenses for the 280 MW Pinon Gas Plant. PNM estimates that these costs in 2023 will total $18.5~~17.0~~ million. O&M expenses include the materials and services necessary to operate the facility as discussed in more detail by PNM Witness Fallgren. Property taxes were estimated based on the current property tax rate of 2.45%. Gas transportation costs were estimated based on a cost of $0.150

Q. WHAT IS THE ESTIMATED COST OF THE ZAMORA 30 MW BATTERY STORAGE FACILITY REPLACEMENT RESOURCE?

A. Construction and construction-related costs are estimated to be $38.9~~39.0~~ million, including AFUDC of $1.3 million calculated using the formula prescribed in the FERC Uniform System of Accounts. Actual AFUDC rates will be calculated based on actual capital costs as funds are expended on the project. A detailed description of the construction and construction-related costs is provided in the testimony of PNM Witness Fallgren.

Q. WHAT RATE TREATMENT IS PNM REQUESTING FOR THE ZAMORA 30 MW BATTERY STORAGE FACILITY REPLACEMENT RESOURCE?

A. PNM is requesting that the Commission grant PNM a CCN to construct, own and operate the battery storage facility and authorize PNM to include the actual cost of the facility up to the certificated estimated cost of $38.9~~39.0~~ million in PNM's total rate base in future ratemaking proceedings as the capital cost for the facility.

PNM is requesting authority to recover in future ratemaking proceedings the actual operating expenses incurred for O&M, property taxes, and depreciation expenses for the Zamora 30 MW battery storage facility. PNM estimates that these costs in 2023 will total $2.7 million. O&M expenses include the materials and services necessary to operate the facility as discussed in more detail by PNM Witness Fallgren. Property taxes were estimated based on the current property tax

Q. PLEASE SUMMARIZE THE 2023 NON-FUEL REVENUE REQUIREMENTS RELATED TO OWNED RESOURCES INCLUDED IN SCENARIO 1?

A. Please see PNM Table HEM-11 for a breakout of the 2023 non-fuel revenue requirement related to the utility-owned replacement resources. In addition, PNM has included the retail revenue requirement related to the required transmission network upgrades associated with the Arroyo Solar/Battery PPA. I discuss the transmission network upgrades associated with the Arroyo Solar/Battery PPA later in my testimony.

PNM Table HEM-11
2023 New Owned Resources - Non-Fuel Included in Scenario 1

$ in millions

		Total 2023 Retail Revenue Requirement	PNM Exhibit Reference
1	280 MW Pinon Gas Plant	34.4~~3.0~~	HEM-16
2	40 MW Sandia	6.9	HEM-18
3	30 MW Zamora	5.9	HEM-17
4	Transmission Arroyo Solar Project PPA	1.3	HEM-20
5	Total	48.5~~7.1~~	

Q. PLEASE SUMMARIZE THE RATEMAKING PRINCIPLES AND TREATMENT THAT PNM IS REQUESTING FOR THE 280 MW GAS AND BATTERY STORAGE FACILITIES.

A. PNM is requesting that the Commission establish a Certificated Estimated Cost, including AFUDC, of $190.3~~9~~ million for the proposed 280 MW Pinon Gas Plant, $38.9~~39.0~~ million for the proposed Zamora 30 MW battery storage facility and $48.9

million for the proposed Sandia 40 MW battery storage facility, in accordance with Rule 17.3.580 NMAC, and to authorize PNM, pursuant to NMSA 1978, 62-9-1(B), to include the actual cost of construction, up to the Certificated Estimated Cost, in total company rate base in future ratemaking proceedings as the capital cost for the facility. PNM is also requesting that the Commission authorize PNM to recover in future ratemaking proceedings the reasonable costs above of O&M, property taxes, gas transportation and associated depreciation expenses.

C. Revenue Requirements for PPAs in Scenario 1

Q. WHAT IS THE 2023 REVENUE REQUIREMENT FOR THE ARROYO 300 MW OF PPA SOLAR GENERATION PAIRED WITH THE40 MW OF BATTERY STORAGE REPLACEMENT RESOURCES PNM IS PROPOSING TO REPLACE THE SAN JUAN COAL PLANT?

A. PNM estimates the 2023 retail revenue requirement for the Arroyo 300 MW PPA solar generation paired with 40 MW of battery storage to be $\underline{19.0}\sout{18.8}$ million. The revenue requirement includes the purchase of energy from the solar developer at the contracted price of $18.65/MWh and capacity payment for the 40 MW of battery storage at $7.46/kW-month. Please see PNM Exhibit HEM-19 and the direct testimony of PNM Witness Fallgren for further detail on the 300 MW solar and 40 MW battery PPA.

A. PNM estimates the 2023 retail revenue requirement for the Jicarilla 50 MW PPA solar generation paired with 20 MW of battery storage to be $5.3~~5.1~~ million. The revenue requirement includes the purchase of energy from the solar developer at the contracted price of $19.73/MWh and capacity payment for the 20 MW of battery storage at $9.97/kW-month. Please see PNM Exhibit HEM-21 and the direct testimony of PNM Witness Fallgren for further detail on the 50 MW solar and 20 MW battery PPA.

Q. WHAT PROPOSED RATEMAKNG IS PNM SEEKING IN REGARD TO THE PPAS INCLUDED IN SCENARIO 1?

A. PNM is proposing that the energy costs under the PPAs will be recovered through PNM's FPPCAC. PNM is proposing that the demand charges under the PPAs, initially flow through PNM's FPPCAC, until such time that PNM reflects the abandonment of SJGS in its base rates. At that time, PNM proposes the demand charges of the PPAs will be recovered through its base rates and not through its FPPCAC.

X. SUMMARY OF OTHER SCENARIOS

Q. PLEASE SUMMARIZE THE REVENUE REQUIREMENT IMPACTS FOR THE OTHER SCENARIOS DISCUSSED BY PNM WITHNESS FALLGREN.

A. As described by PNM Witness Fallgren, in addition to Scenario 1, PNM analyzed three other scenarios. Please see PNM Table HEM-12 for a summary of customer impacts in 2023 based on the various resource portfolios reflected in each of the additional scenarios described by PNM Witness Fallgren. As discussed in more detail by PNM Witness Phillips, although the 2023 revenue requirements for Scenario 1, 2 and 3 are relatively close, over the 20-year planning horizon, Scenario 1 results in the preferred option for customers.

PNM Table HEM-12
Summary of Impacts to 2023 Revenue Requirement for Scenarios*

$ in millions

		Scenario 1	Scenario 2	Scenario 3	Scenario 4
1	Savings from Closure of San Juan coal plant- Non Fuel	(94)	(94)	(94)	(94)
2	Energy Transition Charge – Securitization	23	23	23	23
3	Other Costs Not Included in Energy Transition Charge	(101)	(101)	(101)	(101)
4	2023 New Owned Resources - Non-Fuel	487	528	3026	13-
5	Fuel Costs/(Savings), net, due to change in resources	(489)	(4956)	(246)	94
6	Net, 2023 Revenue Requirement Impacts (Savings)/Cost	(803)	(789)	(7581)	2612

* Please see the direct testimony of PNM Witness Fallgren and Phillips for the complete analysis and evaluation of each scenario

XI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

GCG#525660

	A	B	C	D	E	F
1	**PNM Exhibit HEM-2**					
2	**PNM Securitization vs Traditional Recovery**					
3	**Corrected**					
4	*($ in millions)*					
5			**Securitization**	**Traditional Recovery**	**(Savings)/Cost**	
6			Revenue Requirement	Revenue Requirement	Revenue Requirement	
7		**Recovery of Abandonment Costs**	2023	2023	2023	
8		Return On and Return of Abandonment Costs	23	45	(22)	
9		ADIT related to Regulatory Asset for Abandonment Costs	(13)	(12)	(0)	
10		Recovery of One-Time Costs	2	1	1	
11		Ongoing O&M (Decommomissioning, Property tax, insurance, other)	1	1	-	
12		Total	13	34	(22)	
13						
14	**Assumptions:**					
15	1	Return on and Return of Abandonment costs				
16		- Securitization includes annual bond payment recovered from customers through Energy Transition Charge				
17		- Traditional recovery includes full return on and return of regulatory asset				
18		+ Regulatory asset includes undepreciated investment of San Juan coal plant, PNM severances, job training, coal mine reclamation and plant decommissioning				
19						
20	2	ADIT related Abandonment of San Juan coal plant				
21		- Securitization includes ADIT calculated by multiplying average bond principal balance times the combined statutory tax rate of 25.4%				
22		- Traditional recovery includes ADIT calculated by multiplying average regulatory asset balance times the combined statutory tax rate of 25.4%				
23		- Both recovery scenarios include ADIT and amortization of Excess Deferred Income Tax Liability associated with the San Juan coal plant.				
24						
25	3	Recovery of One-Time Costs				
26		- Please see PNM Exhibit HEM-11				
27						
28	4	Ongoing O&M (Decommissioning, Property tax, insurance, other)				
29		- Both recovery scenarios account for ongoing O&M associated with maintenance, property tax and property insurance premiums				

Corrected

	A	B	C	D	E	F
1	**PNM Exhibit HEM-12 (Corrected)**					
2	**Carrying Charges on Payments in Advance of Energy Transition Bonds**					
3						
4						
5	**Section 16 Payments (25% prefunding):**	2019	2020	2021	2022*	Total Incurred Carrying Charges
6	Spend @ 1/1/2021			4,951,467		
7	Accumulated Spend + Carrying Charge			4,951,467	5,307,973	
8	After Tax WACC			7.20%	7.20%	
9	Carrying Charge			356,506	191,087	547,593
10	Ending Accumulated Spend			5,307,973	5,499,060	
11						
12						
13	**Job Training (San Juan coal plant):**	2019	2020	2021	2022*	Total Incurred Carrying Charges
14	Spend During The Year	336,000	336,000	336,000	336,000	1,344,000
15	Accumulated Spend + Carrying Charge	336,000	672,000	1,056,384	1,468,444	
16	After Tax WACC	7.20%	7.20%	7.20%	7.20%	
17	Carrying Charge	-	48,384	76,060	52,864	177,308
18	Ending Accumulated Spend	336,000	720,384	1,132,444	1,521,308	
19						
20						
21	**Job Training & Severance (San Juan Coal Company):**	2019	2020	2021	2022*	Total Incurred Carrying Charges
22	Spend During The Year	-	8,880,000	-	-	8,880,000
23	Accumulated Spend + Carrying Charge	-	8,880,000	9,306,240	9,976,289	
24	After Tax WACC	7.20%	7.20%	7.20%	7.20%	
25	Carrying Charge	-	426,240	670,049	359,146	1,455,436
26	Ending Accumulated Spend	-	9,306,240	9,976,289	10,335,436	
27						
28	**Total Carrying Costs**	**-**	**474,624**	**1,102,615**	**603,097**	**2,180,336**
29						
30				Amortization Period (Years)		3
31				**Annual Amortization**		**726,779**
32						
33	*2022 Carrying charges are based on half year due to San Juan coal plant retirement in June 2022					

Corrected

	A	B	C	D	E	F	G	H
1	**PNM Exhibit HEM-13**							
2	**Summary of Regulatory Assets and Liabilities**							
3	**(Corrected)**							
4							Recovered In	
5	Regulatory Asset/Liability	Testimony Section	Carrying Charges Applied Before Recovery	Carrying Charges Applied After Recovery	Amortization Period	Estimated Amount (in Millions)	ETC	Base Rates
6	Upfront Financing costs	III B	None	None	N/A	8.7	x	
7	San Juan coal plant NBV Undepreciated Asset	III C	None	None	N/A	283.0	x	
8	Underground Coal Mine True-up	III C	None	None	N/A	9.4	x	
9	Plant Decommissioning	III D	None	None	N/A	19.2	x	
10	Job Training & Severance Expense PNM/PNMR Services/SJCC	III F	Approved After-tax WACC	None	N/A	20.0	x	
11	Advanced Payments to State Agencies (Section 16 ETA)	III F	Approved After-tax WACC	None	N/A	19.8	x	
12	Regulatory Asset/Liability Pursuant to (Section 4, Part B(10))	V	Approved After-tax WACC	Unamortized Balance in Rate Base	TBD	TBD		x
13	Regulatory Liability Pursuant to (Section 4 Part B(11))	V	Approved After-tax WACC	Unamortized Balance in Rate Base	TBD	TBD		x
14	Carrying Charges on Payments in Advance of Energy Transition Bonds	V	Approved After-tax WACC	None	3	0.9		x
15	One time costs - Obsolete Inventory	VI	Approved After-tax WACC	Unamortized Balance in Rate Base	25	6.3		x
16	One time costs - External Legal Costs Associated with Closure of San Juan coal plant	VI	Approved After-tax WACC	Unamortized Balance in Rate Base	25	1.2		x
17	RFP and Regulatory Approval Costs Allocated to PPA's	IX	Approved After-tax WACC	Unamortized Balance in Rate Base	20	0.8		x

Corrected

	A	B	C	D
1	**PNM Exhibit HEM-16 Pinon 280 MW Gas Generation**			
2	**2023 Estimated Annual Revenue Requirement**			
3	**Corrected**			
4				**As Corrected**
5				**2023**
6				**Revenue Requirement**
7				
8	**Generation Facilities***			191,609,369
9	**Land**			12,052
10	**Total Capital Investment**			191,621,421
11	**Accumulated Reserve**			(10,626,820)
12				
13	**Net Book Value Plant in Service**			180,994,600
14			*(Line 10+ Line 11)*	
15	**ADIT**			(2,029,842)
16				
17	**Average Rate Base**			$ 178,964,759
18			*(Line 13 + Line 15)*	
19				
20	**WACC**			7.20%
21				
22	**Return on Rate Base**			$ 12,879,345
23			*(Line 17 x Line 20)*	
24				
25	**Depreciation Expense**			10,705,570
26				
27	**Income Taxes**			2,905,360
28				
29	**Property Tax**			1,478,123
30				
31	**O&M**			2,399,058
32				
33	**Gas Transportation**			3,896,120
34				
35	**Subtotal**			$ 34,263,575
36			*(Line 22 + Line 25 + Line 27 + Line 29 + Line 31+ Line 33)*	
37				
38	**Revenue Tax @ 0.508573%**			174,255
39	**Annualized Non-Fuel Revenue Requirement**			**$ 34,437,830**
40			*(Line 35 + Line 38)*	
41				
42	*Cost includes $0.4M related to RFP and regulatory approval process costs as shown in HEM-15			

	A	B	C	D
1	**PNM Exhibit HEM-17 Zamora 30 MW Battery**			
2	**2023 Estimated Annual Revenue Requirement**			
3	**Corrected**			**As Corrected**
4				**2023**
5				**Revenue Requirement**
6				
7	**Generation Facilities***			39,689,305
8	**Land**			500,000
9	**Total Capital Investment**			40,189,305
10	**Accumulated Reserve**			(2,434,602)
11				
12	**Net Book Value Plant in Service**			37,754,704
13			*(Line 9 + Line 10)*	
14	**ADIT**			(1,945,621)
15				
16	**Average Rate Base**			$ 35,809,082
17			*(Line 12 + Line 14)*	
18				
19	**WACC**			7.20%
20				
21	**Return on Rate Base**			$ 2,577,030
22			*(Line 16 x Line 19)*	
23				
24	**Depreciation Expense**			1,975,286
25				
26	**Income Taxes**			581,334
27				
28	**Property Tax**			409,802
29				
30	**O&M**			291,381
31				
32	**Subtotal**			$ 5,834,833
33			*(Line 21 + Line 24 + Line 26 + Line 28 + Line 30)*	
34				
35	**Revenue Tax @ 0.508573%**			29,674
36	**Annualized Non-Fuel Revenue Requirement**			**$ 5,864,507**
37			*(Line 32 + Line 35)*	
38				
39	*Cost includes $0.4M related to RFP and regulatory approval process costs as shown in HEM-15			

	A	B	C
1	**PNM Exhibit HEM-19 Arroyo 300 MW Solar/Battery PPA**		
2	**2023 Estimated Annual Revenue Requirement**		
3	**Corrected**		
4			**As Corrected**
5		**Purchased Power Agreement**	**2023**
6		***Arroyo: Solar PPA***	
7		*Annual Sales (MWh)*	813,433
8		*Price ($/MWh)*	18.65
9		*Energy* *(Line 7 x Line 8)*	$ 15,170,526
10			
11		***Arroyo: Battery PPA***	
12		*Battery Size (KW)*	40,000
13		*Capacity Price ($/kW-month)*	$7.46
14		Capacity Cost *(Line 12 x Line 13)* x 12 months	$ 3,580,800
15		Estimated Gross Reciepts Tax (GRT) Rate Applied to Capacity Cost	6.75%
16		Estimated GRT on Capacity Charge	241,704
17		Total Capacity Cost (including GRT)	$ 3,822,504
18			
19		*WREGIS cost per MWh*	$ 0.01
20		*WREGIS fees* *(Line 7 x Line 16)*	8,134
21			
22		***Total Arroyo: Solar/Battery*** *(Line 9 + Line 14 + Line 17)*	**$ 19,001,164**

Corrected

	A	B	C
1	**PNM Exhibit HEM-21 Jicarilla 50 MW Solar/ 20 MW Battery PPA**		
2	**2023 Estimated Annual Revenue Requirement**		
3	**Corrected**		
4			**As Corrected**
5		**Purchased Power Agreement**	**2023**
6		**Jicarilla: Solar PPA**	
7		Annual Sales (MWh)	136,457
8		Price ($/MWh)	19.73
9		Energy/REC Cost *(Line 7 x Line 8)*	$ 2,692,291
10			
11		**Jicarilla: Battery PPA**	
12		Battery Size (KW)	20,000
13		Capacity Price ($/kW-month)	$ 9.97
14		Capacity Cost (Line 12 x Line 13) x 12 months	$ 2,392,800
15		Estimated Gross Reciepts Tax (GRT) Rate Applied to Capacity Cost	6.88%
16		Estimated GRT on Capacity Charge	164,505
17		Total Capacity Cost (including GRT)	$ 2,557,305
18			
19		WREGIS cost per MWh	$ 0.01
20		WREGIS fees *(Line 7 x Line 16)*	$ 1,365
21			
22		**Total Jicarilla: Solar/Battery**	**$ 5,250,960**

Corrected

Michael J. Settlage

DIRECT TESTIMONY AND EXHIBITS OF MICHAEL SETTLAGE		
Document	**Page and Line**	**Explanation**
Testimony	Pg. 26, Ln. 6-8	Change "83" to "80".
Testimony	Pg. 26, Ln. 16	Change "25.08" to "24.27".
Testimony	Pg. 26, Ln. 18	Change "$7.11" to "6.87".
Testimony	Pg. 26, Ln. 20-21	Change "186.50" to "181.46".
PNM Exhibit MJS-6	Pg. 1	Replace page. Various numbers in exhibit were updated as a result of the corrections and changes to modeling and cost information.
PNM Exhibit MJS-7	Pg. 1-4	Replace pages. Various numbers in exhibit were updated as a result of the corrections and changes to modeling and cost information.
PNM Exhibit MJS-8	Pg. 1	Replace page. Various numbers in exhibit were updated as a result of the corrections and changes to modeling and cost information.

Q. WHAT EFFECT WILL THE RETIREMENT OF SAN JUAN COAL PLANT AND THE APPROVAL OF SCENARIO 1 HAVE ON THE RATES THAT PNM'S CUSTOMERS PAY?

A. PNM Exhibit MJS-6 shows the individual and overall impact to the revenue requirements of each customer class that result from the retirement of San Juan coal plant and the implementation of Scenario 1. The revenue requirement associated with this charge for every customer class is reduced and the total revenue requirement decreases by $8~~03~~ million.

Q. HAVE YOU ASSESSED THE IMPACTS ON CUSTOMER BILLS AT A VARIETY OF KWH USAGES?

A. Yes. PNM Exhibit MJS-7, page 1 shows the 2023 impact of Scenario 1 over a variety of usage levels for the Residential and Small Power Classes for the planned replacement portfolio. Together, these classes comprise over 90% of all PNM customers. For residential customers, the approximate impact ranges from an increase of $1.90 per month to a decrease of $~~25.08~~24.27 per month depending upon kWh use. The impact on the average residential bill of about 600 kWh is a savings of approximately $~~7.11~~6.87 per month.

For Small Power customers, the impact approximately ranges from an increase of $4.15 per month to a decrease of $~~186.50~~181.46 per month depending upon kWh use.

PNM
San Juan Coal Plant Adandonment withScenario 1
Net impact of Securitization and Replacement

Line	Consolidated Customer Class	[A] Savings from Closure of San Juan coal plant Non Fuel ($)	[B] Energy Transition Charge Securitization ($)	[C] Other Costs Not Included in Energy Transition Charge ($)	[D] Scenario 1 Non Fuel ($)	[E] Scenario 1 Net Fuel Impact ($)	[F] A+B+C+D+E Net Impact ($)
1	1 - Residential	($51,369,471)	$12,548,110	($5,653,191)	$26,606,923	($18,514,879)	($36,382,506)
2	2 - Small Power	($10,904,281)	$2,663,608	($1,200,012)	$5,647,895	($5,559,308)	($9,352,098)
3	3B - General Power	($14,540,897)	$3,551,930	($1,600,220)	$7,531,488	($9,430,429)	($14,488,128)
4	3C - General Power Low LF	($2,044,975)	$499,530	($225,049)	$1,059,199	($1,212,843)	($1,924,138)
5	4B - Large Power	($8,540,732)	$2,086,259	($939,904)	$4,423,690	($6,283,645)	($9,254,331)
6	5B - Lg. Svc. (8 MW)	($447,947)	$109,421	($49,296)	$232,015	($384,343)	($540,150)
7	10 - Irrigation	($300,895)	$73,500	($33,113)	$155,849	($139,196)	($243,855)
8	11B - Wtr/Swg Pumping	($754,431)	$184,286	($83,025)	$390,759	($1,013,475)	($1,275,886)
9	15B - Universities 115 kV	($465,526)	$113,715	($51,231)	$241,120	($428,597)	($590,519)
10	30B - Manuf. (30 MW)	($2,466,461)	$602,487	($271,433)	$1,277,509	($2,003,279)	($2,861,178)
11	33B - Lg. Svc. (Station Power)	($20,055)	$4,899	($2,207)	$10,388	($18,868)	($25,844)
12	35B - Lg. Svc. (3 MW)	($1,400,176)	$342,024	($154,089)	$725,224	($1,216,128)	($1,703,146)
13	36B - SSR - Renew. Energy Res.	($172,976)	$42,253	($19,036)	$89,593	($1,267,913)	($1,328,078)
14	6 - Private Lighting	($49,016)	$11,973	($5,394)	$25,388	($83,696)	($100,745)
15	20 - Streetlighting	($141,925)	$34,668	($15,619)	$73,510	($260,778)	($310,143)
		($93,619,764)	$22,868,663	($10,302,819)	$48,490,550	($47,817,376)	($80,380,745)

Corrected

PNM Exhibit MJS-6
Page 1 of 1

San Juan Coal Plant Abandonment

PNM
Scenario 1
Comparison of Existing vs Securitization and Replacement

A	B	C	D	E	F	G	H	I
							B+C+D+E+F+G	H-B

Residential Schedule 1A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 1 Non Fuel ($)	Scenario 1 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
1	0	$7.11	$0.00	$1.90	$0.00	$0.00	$0.00	$9.01	$1.90
2	50	$12.21	($0.79)	$1.90	($0.06)	$0.41	($0.29)	$13.38	$1.17
3	100	$17.30	($1.59)	$1.90	($0.12)	$0.82	($0.57)	$17.74	$0.44
4	150	$22.40	($2.38)	$1.90	($0.19)	$1.23	($0.86)	$22.11	($0.29)
5	200	$27.49	($3.18)	$1.90	($0.25)	$1.65	($1.15)	$26.47	($1.02)
6	250	$32.59	($3.97)	$1.90	($0.31)	$2.06	($1.43)	$30.83	($1.75)
7	300	$37.68	($4.77)	$1.90	($0.37)	$2.47	($1.72)	$35.20	($2.48)
8	400	$47.87	($6.35)	$1.90	($0.49)	$3.29	($2.29)	$43.93	($3.94)
9	500	$59.73	($7.94)	$1.90	($0.62)	$4.11	($2.86)	$54.32	($5.40)
10	600	$73.25	($9.53)	$1.90	($0.74)	$4.94	($3.44)	$66.38	($6.87)
11	700	$86.77	($11.12)	$1.90	($0.86)	$5.76	($4.01)	$78.44	($8.33)
12	750	$93.54	($11.92)	$1.90	($0.93)	$6.17	($4.29)	$84.48	($9.06)
13	800	$100.30	($12.71)	$1.90	($0.99)	$6.58	($4.58)	$90.51	($9.79)
14	900	$113.82	($14.30)	$1.90	($1.11)	$7.41	($5.15)	$102.57	($11.25)
15	1,000	$129.03	($15.89)	$4.97	($1.23)	$8.23	($5.73)	$119.38	($9.65)
16	1,200	$159.46	($19.06)	$4.97	($1.48)	$9.87	($6.87)	$146.89	($12.58)
17	1,600	$220.32	($25.42)	$4.97	($1.97)	$13.17	($9.16)	$201.90	($18.42)
18	2,000	$281.18	($31.77)	$4.97	($2.47)	$16.46	($11.45)	$256.91	($24.27)

Small Power Schedule 2A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 1 Non Fuel ($)	Scenario 1 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
19	0	$15.77	$0.00	$4.15	$0.00	$0.00	$0.00	$19.92	$4.15
20	500	$68.22	($5.62)	$4.15	($0.62)	$2.91	($2.86)	$66.18	($2.04)
21	1,000	$120.67	($11.23)	$4.15	($1.23)	$5.82	($5.73)	$112.44	($8.23)
22	1,500	$173.12	($16.85)	$4.15	($1.85)	$8.73	($8.59)	$158.70	($14.41)
23	2,000	$225.56	($22.46)	$4.15	($2.47)	$11.63	($11.45)	$204.96	($20.60)
24	3,000	$330.46	($33.69)	$4.15	($3.70)	$17.45	($17.18)	$297.49	($32.97)
25	4,000	$435.36	($44.93)	$4.15	($4.94)	$23.27	($22.90)	$390.01	($45.35)
26	5,000	$540.26	($56.16)	$4.15	($6.17)	$29.09	($28.63)	$482.53	($57.72)
27	7,000	$750.05	($78.62)	$4.15	($8.64)	$40.72	($40.08)	$667.58	($82.47)
28	9,000	$959.84	($101.08)	$4.15	($11.10)	$52.36	($51.54)	$852.63	($107.22)
29	12,000	$1,274.54	($134.78)	$4.15	($14.81)	$69.81	($68.71)	$1,130.19	($144.34)
30	15,000	$1,589.23	($168.47)	$4.15	($18.51)	$87.26	($85.89)	$1,407.76	($181.46)

Corrected

San Juan Coal Plant Abandonment

PNM
Scenario 2
Comparison of Existing vs Securitization and Replacement

Residential Schedule 1A

A	B	C	D	E	F	G	H	I
							B+C+D+E+F+G	H-B
Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 2 Non Fuel ($)	Scenario 2 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
1	0	$7.11	$0.00	$1.90	$0.00	$0.00	$0.00	$9.01	$1.90
2	50	$12.21	($0.79)	$1.90	($0.06)	$0.44	($0.29)	$13.41	$1.20
3	100	$17.30	($1.59)	$1.90	($0.12)	$0.89	($0.59)	$17.80	$0.50
4	150	$22.40	($2.38)	$1.90	($0.19)	$1.33	($0.88)	$22.19	($0.21)
5	200	$27.49	($3.18)	$1.90	($0.25)	$1.78	($1.17)	$26.58	($0.91)
6	250	$32.59	($3.97)	$1.90	($0.31)	$2.22	($1.47)	$30.97	($1.62)
7	300	$37.68	($4.77)	$1.90	($0.37)	$2.67	($1.76)	$35.36	($2.32)
8	400	$47.87	($6.35)	$1.90	($0.49)	$3.56	($2.35)	$44.14	($3.73)
9	500	$59.73	($7.94)	$1.90	($0.62)	$4.45	($2.93)	$54.59	($5.14)
10	600	$73.25	($9.53)	$1.90	($0.74)	$5.34	($3.52)	$66.70	($6.55)
11	700	$86.77	($11.12)	$1.90	($0.86)	$6.23	($4.11)	$78.82	($7.96)
12	750	$93.54	($11.92)	$1.90	($0.93)	$6.67	($4.40)	$84.87	($8.66)
13	800	$100.30	($12.71)	$1.90	($0.99)	$7.12	($4.69)	$90.93	($9.37)
14	900	$113.82	($14.30)	$1.90	($1.11)	$8.01	($5.28)	$103.05	($10.77)
15	1,000	$129.03	($15.89)	$4.97	($1.23)	$8.90	($5.86)	$119.91	($9.12)
16	1,200	$159.46	($19.06)	$4.97	($1.48)	$10.68	($7.04)	$147.53	($11.94)
17	1,600	$220.32	($25.42)	$4.97	($1.97)	$14.24	($9.38)	$202.75	($17.57)
18	2,000	$281.18	($31.77)	$4.97	($2.47)	$17.80	($11.73)	$257.97	($23.21)

Small Power Schedule 2A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 2 Non Fuel ($)	Scenario 2 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
19	0	$15.77	$0.00	$4.15	$0.00	$0.00	$0.00	$19.92	$4.15
20	500	$68.22	($5.62)	$4.15	($0.62)	$3.15	($2.93)	$66.35	($1.87)
21	1,000	$120.67	($11.23)	$4.15	($1.23)	$6.29	($5.86)	$112.78	($7.89)
22	1,500	$173.12	($16.85)	$4.15	($1.85)	$9.44	($8.80)	$159.21	($13.91)
23	2,000	$225.56	($22.46)	$4.15	($2.47)	$12.58	($11.73)	$205.63	($19.93)
24	3,000	$330.46	($33.69)	$4.15	($3.70)	$18.87	($17.59)	$298.49	($31.97)
25	4,000	$435.36	($44.93)	$4.15	($4.94)	$25.16	($23.46)	$391.35	($44.01)
26	5,000	$540.26	($56.16)	$4.15	($6.17)	$31.46	($29.32)	$484.21	($56.05)
27	7,000	$750.05	($78.62)	$4.15	($8.64)	$44.04	($41.05)	$669.93	($80.12)
28	9,000	$959.84	($101.08)	$4.15	($11.10)	$56.62	($52.78)	$855.64	($104.20)
29	12,000	$1,274.54	($134.78)	$4.15	($14.81)	$75.49	($70.37)	$1,134.22	($140.32)
30	15,000	$1,589.23	($168.47)	$4.15	($18.51)	$94.37	($87.97)	$1,412.79	($176.43)

Corrected

San Juan Coal Plant Abandonment

PNM
Scenario 3
Comparison of Existing vs Securitization and Replacement

A	B	C	D	E	F	G	H	I
							B+C+D+E+F+G	H-B

Residential Schedule 1A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 3 Non Fuel ($)	Scenario 3 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
1	0	$7.11	$0.00	$1.90	$0.00	$0.00	$0.00	$9.01	$1.90
2	50	$12.21	($0.79)	$1.90	($0.06)	$0.22	($0.15)	$13.33	$1.13
3	100	$17.30	($1.59)	$1.90	($0.12)	$0.45	($0.29)	$17.65	$0.35
4	150	$22.40	($2.38)	$1.90	($0.19)	$0.67	($0.44)	$21.97	($0.43)
5	200	$27.49	($3.18)	$1.90	($0.25)	$0.90	($0.58)	$26.29	($1.20)
6	250	$32.59	($3.97)	$1.90	($0.31)	$1.12	($0.73)	$30.60	($1.98)
7	300	$37.68	($4.77)	$1.90	($0.37)	$1.35	($0.87)	$34.92	($2.76)
8	400	$47.87	($6.35)	$1.90	($0.49)	$1.80	($1.17)	$43.56	($4.31)
9	500	$59.73	($7.94)	$1.90	($0.62)	$2.25	($1.46)	$53.86	($5.87)
10	600	$73.25	($9.53)	$1.90	($0.74)	$2.70	($1.75)	$65.83	($7.42)
11	700	$86.77	($11.12)	$1.90	($0.86)	$3.15	($2.04)	$77.80	($8.97)
12	750	$93.54	($11.92)	$1.90	($0.93)	$3.37	($2.19)	$83.78	($9.75)
13	800	$100.30	($12.71)	$1.90	($0.99)	$3.60	($2.33)	$89.77	($10.53)
14	900	$113.82	($14.30)	$1.90	($1.11)	$4.05	($2.62)	$101.74	($12.08)
15	1,000	$129.03	($15.89)	$4.97	($1.23)	$4.49	($2.91)	$118.46	($10.58)
16	1,200	$159.46	($19.06)	$4.97	($1.48)	$5.39	($3.50)	$145.78	($13.68)
17	1,600	$220.32	($25.42)	$4.97	($1.97)	$7.19	($4.66)	$200.42	($19.90)
18	2,000	$281.18	($31.77)	$4.97	($2.47)	$8.99	($5.83)	$255.07	($26.12)

Small Power Schedule 2A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 3 Non Fuel ($)	Scenario 3 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
19	0	$15.77	$0.00	$4.15	$0.00	$0.00	$0.00	$19.92	$4.15
20	500	$68.22	($5.62)	$4.15	($0.62)	$1.59	($1.46)	$66.27	($1.95)
21	1,000	$120.67	($11.23)	$4.15	($1.23)	$3.18	($2.91)	$112.61	($8.05)
22	1,500	$173.12	($16.85)	$4.15	($1.85)	$4.77	($4.37)	$158.96	($14.15)
23	2,000	$225.56	($22.46)	$4.15	($2.47)	$6.35	($5.83)	$205.31	($20.26)
24	3,000	$330.46	($33.69)	$4.15	($3.70)	$9.53	($8.74)	$298.00	($32.46)
25	4,000	$435.36	($44.93)	$4.15	($4.94)	$12.71	($11.66)	$390.70	($44.66)
26	5,000	$540.26	($56.16)	$4.15	($6.17)	$15.89	($14.57)	$483.40	($56.86)
27	7,000	$750.05	($78.62)	$4.15	($8.64)	$22.24	($20.40)	$668.79	($81.26)
28	9,000	$959.84	($101.08)	$4.15	($11.10)	$28.60	($26.22)	$854.18	($105.67)
29	12,000	$1,274.54	($134.78)	$4.15	($14.81)	$38.13	($34.97)	$1,132.26	($142.27)
30	15,000	$1,589.23	($168.47)	$4.15	($18.51)	$47.66	($43.71)	$1,410.35	($178.88)

Corrected

San Juan Coal Plant Abandonment

PNM
Scenario 4
Comparison of Existing vs Securitization and Replacement

A	B	C	D	E	F	G	H	I
							B+C+D+E+F+G	H-B

Residential Schedule 1A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 4 Non Fuel ($)	Scenario 4 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
1	0	$7.11	$0.00	$1.90	$0.00	$0.00	$0.00	$9.01	$1.90
2	50	$12.21	($0.79)	$1.90	($0.06)	$0.11	$0.56	$13.93	$1.72
3	100	$17.30	($1.59)	$1.90	($0.12)	$0.23	$1.12	$18.84	$1.54
4	150	$22.40	($2.38)	$1.90	($0.19)	$0.34	$1.68	$23.76	$1.36
5	200	$27.49	($3.18)	$1.90	($0.25)	$0.46	$2.25	$28.67	$1.18
6	250	$32.59	($3.97)	$1.90	($0.31)	$0.57	$2.81	$33.59	$1.00
7	300	$37.68	($4.77)	$1.90	($0.37)	$0.69	$3.37	$38.50	$0.82
8	400	$47.87	($6.35)	$1.90	($0.49)	$0.92	$4.49	$48.34	$0.47
9	500	$59.73	($7.94)	$1.90	($0.62)	$1.15	$5.62	$59.83	$0.11
10	600	$73.25	($9.53)	$1.90	($0.74)	$1.37	$6.74	$73.00	($0.25)
11	700	$86.77	($11.12)	$1.90	($0.86)	$1.60	$7.86	$86.16	($0.61)
12	750	$93.54	($11.92)	$1.90	($0.93)	$1.72	$8.42	$92.74	($0.79)
13	800	$100.30	($12.71)	$1.90	($0.99)	$1.83	$8.99	$99.32	($0.97)
14	900	$113.82	($14.30)	$1.90	($1.11)	$2.06	$10.11	$112.49	($1.33)
15	1,000	$129.03	($15.89)	$4.97	($1.23)	$2.29	$11.23	$130.40	$1.37
16	1,200	$159.46	($19.06)	$4.97	($1.48)	$2.75	$13.48	$160.11	$0.65
17	1,600	$220.32	($25.42)	$4.97	($1.97)	$3.66	$17.97	$219.53	($0.79)
18	2,000	$281.18	($31.77)	$4.97	($2.47)	$4.58	$22.47	$278.95	($2.23)

Small Power Schedule 2A

Line No.	kWh Use	Existing Monthly Bill ($)	Savings from Closure of San Juan coal plant Non Fuel ($)	Energy Transition Charge Securitization ($)	Other Costs Not Included in Energy Transition Charge ($)	Scenario 4 Non Fuel ($)	Scenario 4 Net Fuel Impact ($)	New Monthly Bill ($)	Net Impact ($)
19	0	$15.77	$0.00	$4.15	$0.00	$0.00	$0.00	$19.92	$4.15
20	500	$68.22	($5.62)	$4.15	($0.62)	$0.81	$5.62	$72.56	$4.34
21	1,000	$120.67	($11.23)	$4.15	($1.23)	$1.62	$11.23	$125.20	$4.53
22	1,500	$173.12	($16.85)	$4.15	($1.85)	$2.43	$16.85	$177.84	$4.73
23	2,000	$225.56	($22.46)	$4.15	($2.47)	$3.24	$22.47	$230.49	$4.92
24	3,000	$330.46	($33.69)	$4.15	($3.70)	$4.86	$33.70	$335.77	$5.31
25	4,000	$435.36	($44.93)	$4.15	($4.94)	$6.48	$44.93	$441.05	$5.69
26	5,000	$540.26	($56.16)	$4.15	($6.17)	$8.10	$56.16	$546.34	$6.08
27	7,000	$750.05	($78.62)	$4.15	($8.64)	$11.33	$78.63	$756.90	$6.85
28	9,000	$959.84	($101.08)	$4.15	($11.10)	$14.57	$101.09	$967.47	$7.63
29	12,000	$1,274.54	($134.78)	$4.15	($14.81)	$19.43	$134.79	$1,283.32	$8.79
30	15,000	$1,589.23	($168.47)	$4.15	($18.51)	$24.29	$168.49	$1,599.17	$9.94

Corrected

PNM
Scenario 1
Comparison of Securitization to Traditional Rate Recovery

Line	Consolidated Customer Class	[A] Energy Transition Charge Revenue Requirement ($)		[B] Traditional recovery Revenue Requirement ($)		[C] A-B Net Impact on Revenue Reqirement ($)
1	1 - Residential	$6,894,920		$18,743,289		($11,848,370)
2	2 - Small Power	$1,463,596		$3,978,669		($2,515,073)
3	3B - General Power	$1,951,710		$5,305,569		($3,353,858)
4	3C - General Power Low LF	$274,481		$746,154		($471,674)
5	4B - Large Power	$1,146,355		$3,116,275		($1,969,920)
6	5B - Lg. Svc. (8 MW)	$60,124		$163,443		($103,319)
7	10 - Irrigation	$40,387		$109,788		($69,401)
8	11B - Wtr/Swg Pumping	$101,261		$275,271		($174,010)
9	15B - Universities 115 kV	$62,484		$169,858		($107,374)
10	30B - Manuf. (30 MW)	$331,054		$899,943		($568,889)
11	33B - Lg. Svc. (Station Power)	$2,692		$7,318		($4,626)
12	35B - Lg. Svc. (3 MW)	$187,935		$510,885		($322,951)
13	36B - SSR - Renew. Energy Res.	$23,217		$63,114		($39,897)
14	6 - Private Lighting	$6,579		$17,884		($11,305)
15	20 - Streetlighting	$19,049		$51,784		($32,735)
16	**Total**	**$12,565,844**		**$34,159,245**		**($21,593,401)**

Corrected

PNM Exhibit MJS-8
Page 1 of 1

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW MEXICO'S ABANDONMENT OF SAN JUAN GENERATING STATION UNITS 1 AND 4	))))	**Case No. 19-00018-UT**
IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW MEXICO'S CONSOLIDATED APPLICATION FOR APPROVALS FOR THE ABANDONMENT, FINANCING, AND RESOURCE REPLACEMENT FOR SAN JUAN GENERATING STATION PURSUANT TO THE ENERGY TRANSITION ACT	)))))))	**Case No. 19-00195-UT**

CERTIFICATE OF SERVICE

I hereby certify that **Public Service Company of New Mexico's List of Errata to the July 1, 2019 Prefiled Direct Testimony** were mailed first-class, postage-paid, or emailed to those persons at the email addresses and hand-delivered on September 20, 2019 as shown below:

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