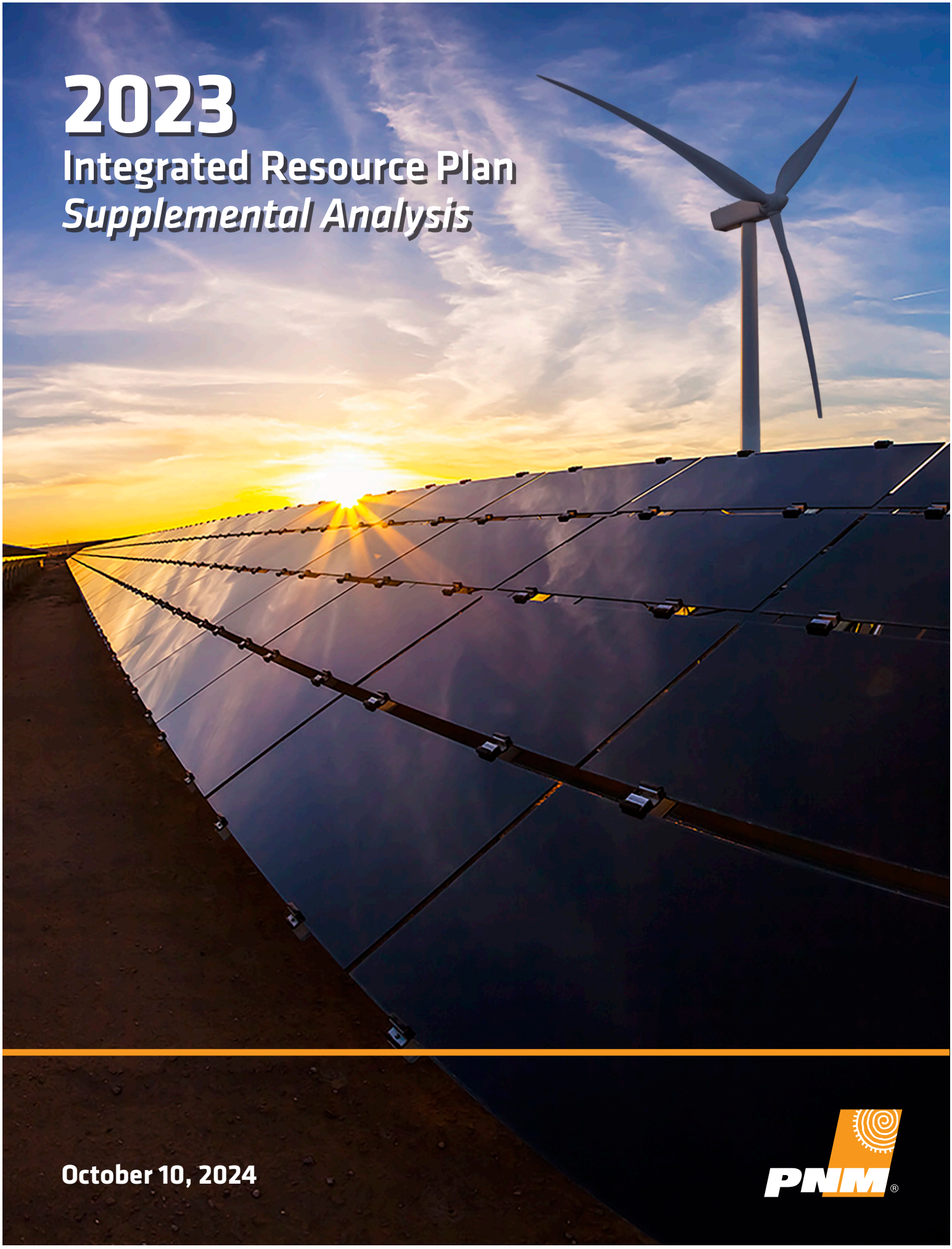
2023
Integrated Resource Plan
Supplemental Analysis



October 10, 2024

PNM®

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PNM assumes no obligation to update this information, except to the extent the events or circumstances constitute material changes in the Integrated Resource Plan that are required to be reported to the New Mexico Public Regulation Commission pursuant to Rule 17.7.3.10 of the New Mexico Administrative Code

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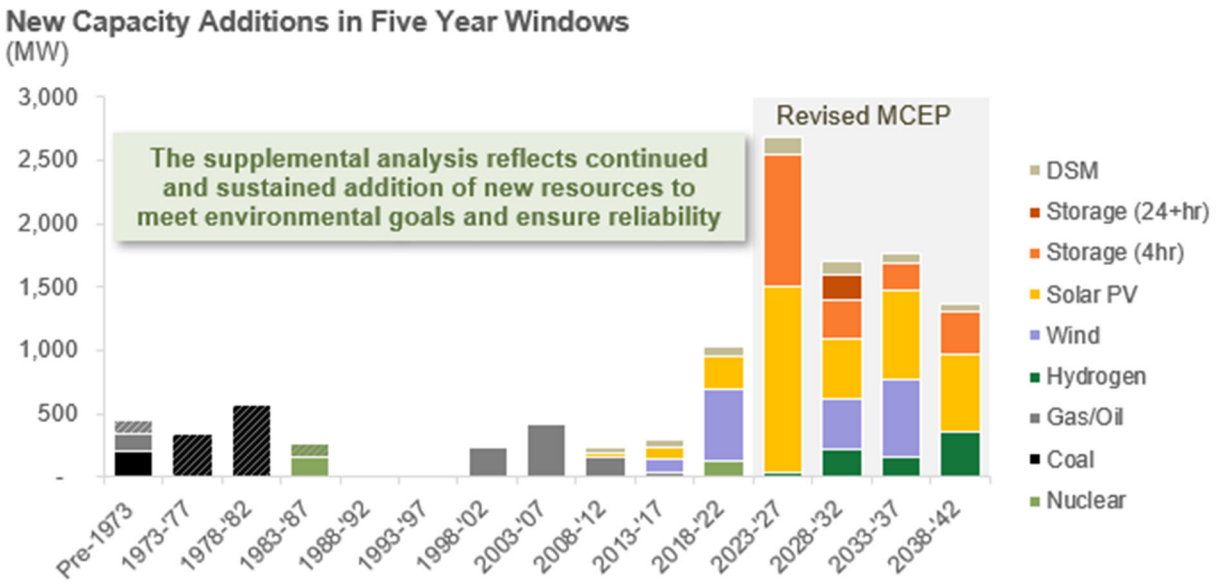
Executive Summary

On December 15, 2023 PNM filed its 2023 Integrated Resource Plan ("IRP") which defined plans to achieve a carbon-free portfolio by 2040. The IRP was later docketed in Case No. 23-00409-UT. On April 4, 2024 the New Mexico Public Regulatory Commission ("NMPRC") accepted PNM's Statement of Need and Action plan pursuant to the IRP Rule.

On May 15, 2024 PNM filed a Notice of Material Event due to an update of PNM's demand and energy load forecast. PNM's updated load forecast reflected an increase in both the energy and demand levels that were above the Current Trends & Policy scenario ("CTP") load forecast studied in PNM's IRP and the High Economic Growth ("HEG") forecast (for its first five years). Since the updated demand and energy projections exceed the range of future energy and demand analyses that quantified PNM's Statement of Need ("SON"), PNM considers the revised load forecast to be of sufficient magnitude to trigger the Material Event requirements of the IRP Rule. Given the load forecast updates, PNM believes its identified resource needs would increase and may be understated. Therefore, additional system modeling was performed to quantify the expected resource needs and issue a revised Most Cost-Effective Portfolio ("MCEP") and SON accordingly.

PNM's supplemental system modeling shows that projected capacity additions identified in PNM's Revised MCEP and Revised SON have moderately increased or have been shifted earlier in time to meet the increased system needs. Figure 1 illustrates the new capacity additions included in the Revised MCEP.

Figure 1. Historical and Projected Capacity Additions in the Revised Most Cost-Effective Portfolio

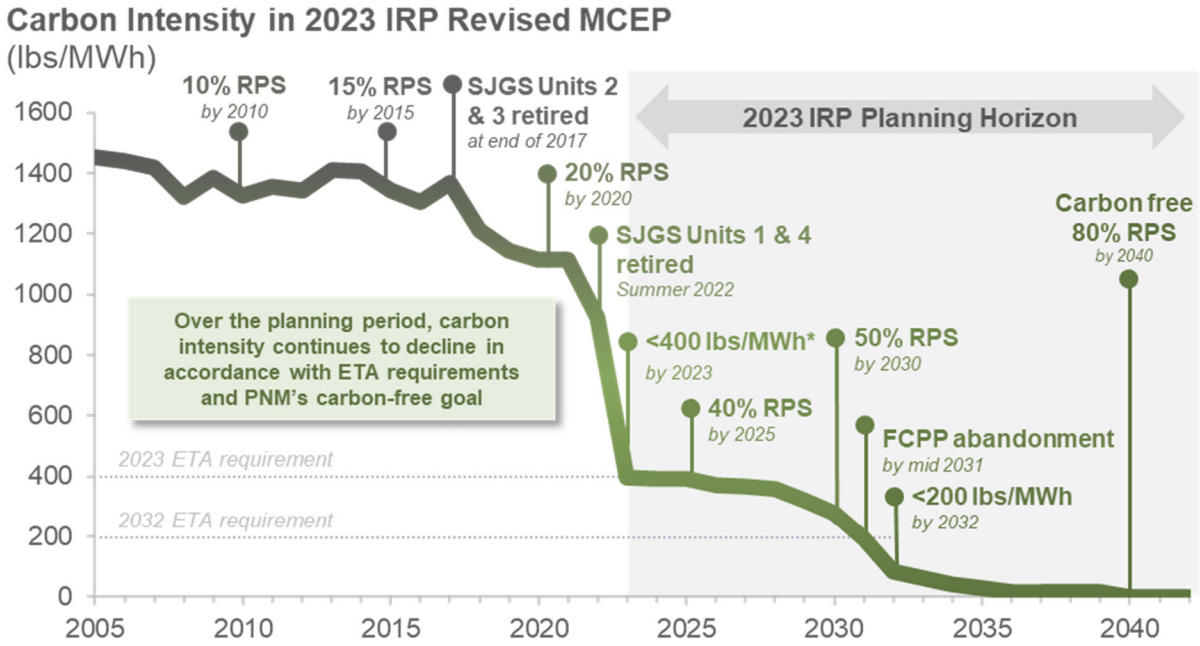


Timing of resource additions based on date each plant entered PNM's portfolio. DSM data included beginning in 2008. Bars with hashed lines indicate resources no longer in PNM's portfolio. Future hydrogen resources will likely operate using natural gas fuel until PNM transitions to a fully carbon-free portfolio in 2040.

As discussed in the 2023 IRP, PNM's system still requires low-cost carbon-free resources, dynamic balancing resources and firm generating resources to reliably meet customer energy and demand requriements over the next 20-years. Collectively, these resources also enable PNM to meet renewable portfolio and emission requirements set forth in the Energy Transition Act ("ETA") and the Renewable Energy Act ("REA"). The projected annual carbon intensity of PNM's Revised MCEP is shown in

Figure 2.

Figure 2. Carbon Intensity over time under PNM's Revised MCEP



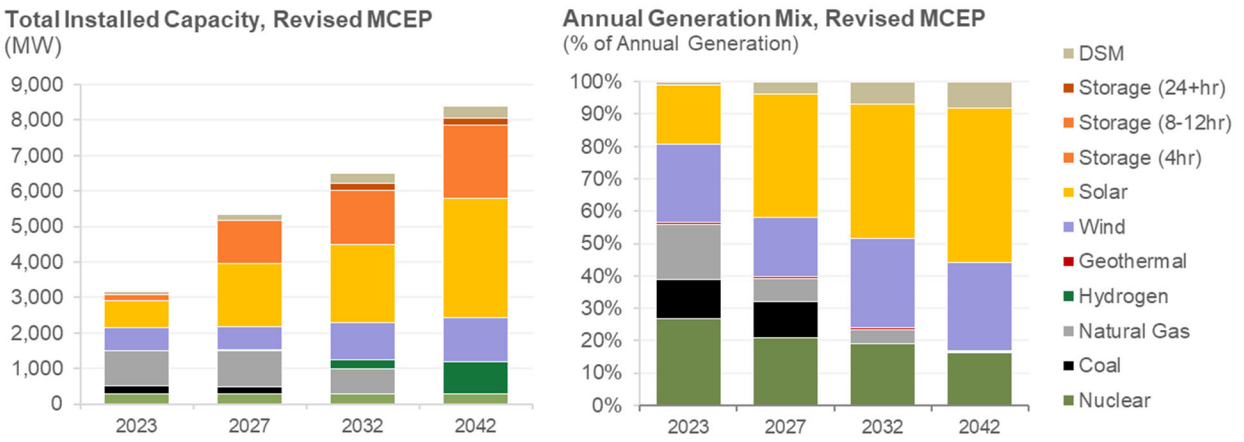
Reported carbon intensity is calculated from modeling results by dividing total emissions from PNM internal generation by total annual energy requirements. Actual outcomes may vary depending on final rules adopted by the NMPRC. Delays of replacement resources for SJGS and PVNGS may also have an impact on PNM's ability to meet ETA carbon intensity requirements in 2023 and 2024.

Developing the Revised Most Cost-Effective Portfolio

PNM's Revised MCEP seeks to balance three main objectives: maintaining affordability to customers, ensuring system reliability, and mitigating environmental impacts. By leveraging the scenario and sensitivity modeling in PNM's IRP, the additional modeling focused on the best performing scenarios to help determine the best resource mix for customers. A wide range of possiblities were evaluated including analyzing risk factors and reliablity performance of scenarios. The resulting Revised MCEP is illustrated in Figure 3. in terms of installed capacity and generation mix. Resource additions over the study horizon include increasing low-cost carbon-free resources as coal and gas resources are expected to exit the portfolio. Resources that provide critical capacity needs to the system such as short and long-duration storage are

increasingly added as PNM approaches 2040. Dispatchable resources that utilize non-carbon emitting fuels are critical to PNM being able to transistion to a carbon-free portfolio.

Figure 3. Installed capacity & annual generation mix of the Revised MCEP at four key milestones: (1) present day; (2) at the end of PNM's Action Plan window; (3) after the planned 2031 exit from Four Corners; and (4) at the end of the planning horizon.



Revised Statement of Need

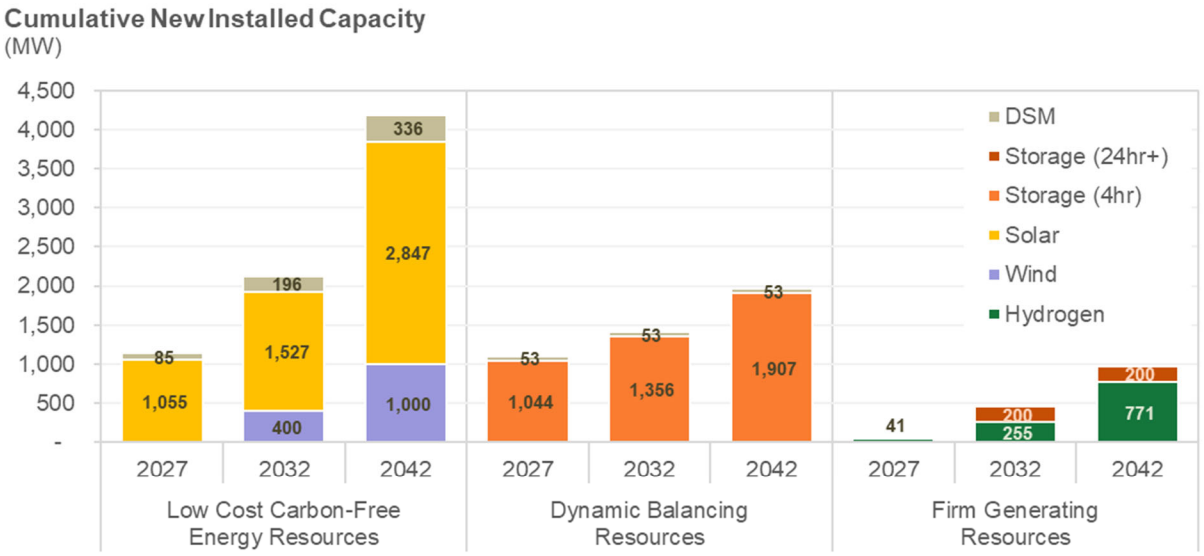
Figure 4 shows the new resource needs in the Revised MCEP at three key milestones: 2027 (at the end of the action plan window), 2032 (following the exit from Four Corners Power Plant ("FCPP") in mid-2031 and the end of the depreciable life of Reeves Generating Station in late-2030) and at the end of the planning horizon in 2042.

Between now and 2027, PNM estimates it will need approximately 1,100 MW of low-cost carbon-free resources and 1,100 MW of dynamic balancing resources and 40 MW of firm generating resources. Some of these resources are already in development or will be procured through active resource solicitations.

Between 2028 and 2032, PNM resource needs are expected to grow by an incremental 1,000 MW of low-cost carbon-free resources, 300 MW of dynamic balancing resources and 400 MW of firm generating resources.

Between 2033 and 2042, the Revised MCEP identifies an additional 2,100 MW of low-cost carbon-free resources, 600 MW of dynamic balancing resources and 500 MW of firm generating resources.

Figure 4. Summary of future resource needs in the Revised Most Cost-Effective Portfolio



Cumulative figures reflect all new resource additions beginning in 2024, inclusive of projects under development:

Solar PV:	*Atrisco (300 MW), Quail Ranch (100 MW), San Juan (200 MW), Sky Ranch (190 MW), TAG I (140 MW), Community Solar (125 MW)*
Storage:	*Atrisco (300 MW), Quail Ranch (100 MW), Route 66 (50 MW), San Juan (100 MW), Sandia (60 MW), Sky Ranch I (50 MW), Sky Ranch II (100 MW), TAG I (50 MW), distribution-level storage (12 MW)*
DSM:	*2024 & 2025 approved DSM programs*

The Revised MCEP is defined by the most optimal mix of resources to meet the forecasted needs of the system, however, there are many uncertainties that could change the composition of the portfolio. Given these uncertainties, PNM evaluated a wide range of possibilities for the future to understand the potential outcomes and influencing factors that may lead to PNM changing course from the Revised MCEP. Flexibility to adjust the plan as conditions evolve is a key strategy to manage risk going forward. Table 1 shows the range of cumulative additions based on the four scenarios reviewed in this supplemental analysis for each resource type through the IRP study window.

Table 1. Ranges of new capacity additions across the planning period

	Ranges of Cumulative New Installed Capacity (MW)		
	Through Action Plan Window (2027)	**Through Mid Term (2032)**	**Through Planning Horizon (2042)**
Low-cost carbon-free energy resources	1,100	1,600 - 2,400	3,100 - 3,900
Dynamic balancing resources	1,100	1,100 - 1,700	1,600 - 2,300
Firm generating resources	0 - 100	0 - 700	300 - 1,200
All resources	2,200	3,200 - 4,500	5,600 - 7,200

Ranges shown informed by results across four scenarios (All Technologies, Base Technologies + CT, Base Technologies + LDES, and Base Technologies + CT + LDES) across all sensitivities excluding Stable ED (high load growth). Resource needs under a high load growth future could be considerably higher. The "All Resources" row represents the minimum and maximum capacity identified for the scenarios which is a blend of the resource types and not a direct sum based on the minimum and maximum of the resource types.

Although the Revised MCEP defines the most optimal resource portfolio, actual resources procured by PNM to meet the needs of PNM's customers while balancing planning objectives will ultimately be determined by a combination of market forces, technological advances, and industry trends. These market drivers will directly affect the types, timing and amounts of new resources PNM procures through future competitive solicitations. PNM's planning and procurement processes are adaptive and iterative by design, and neither the presence nor the absence of any specific type of resource in the Revised MCEP precisely defines future procurements to meet customer needs. The Revised MCEP, coupled with the diverse outcomes from the studied alternative scenarios and futures, informs the expected path forward to meeting its objectives while preserving the ability to adjust to evolving market circumstances.

1 Introduction

On December 15, 2023, PNM submitted its 2023 IRP, outlining strategies to align with the State of New Mexico's policy to reduce carbon emissions and to achieve a company goal of a carbon-free portfolio by 2040. This IRP was subsequently filed under Case No. 23-00409-UT. On April 4, 2024, the NMPRC approved PNM's SON and AP in accordance with the IRP Rule.

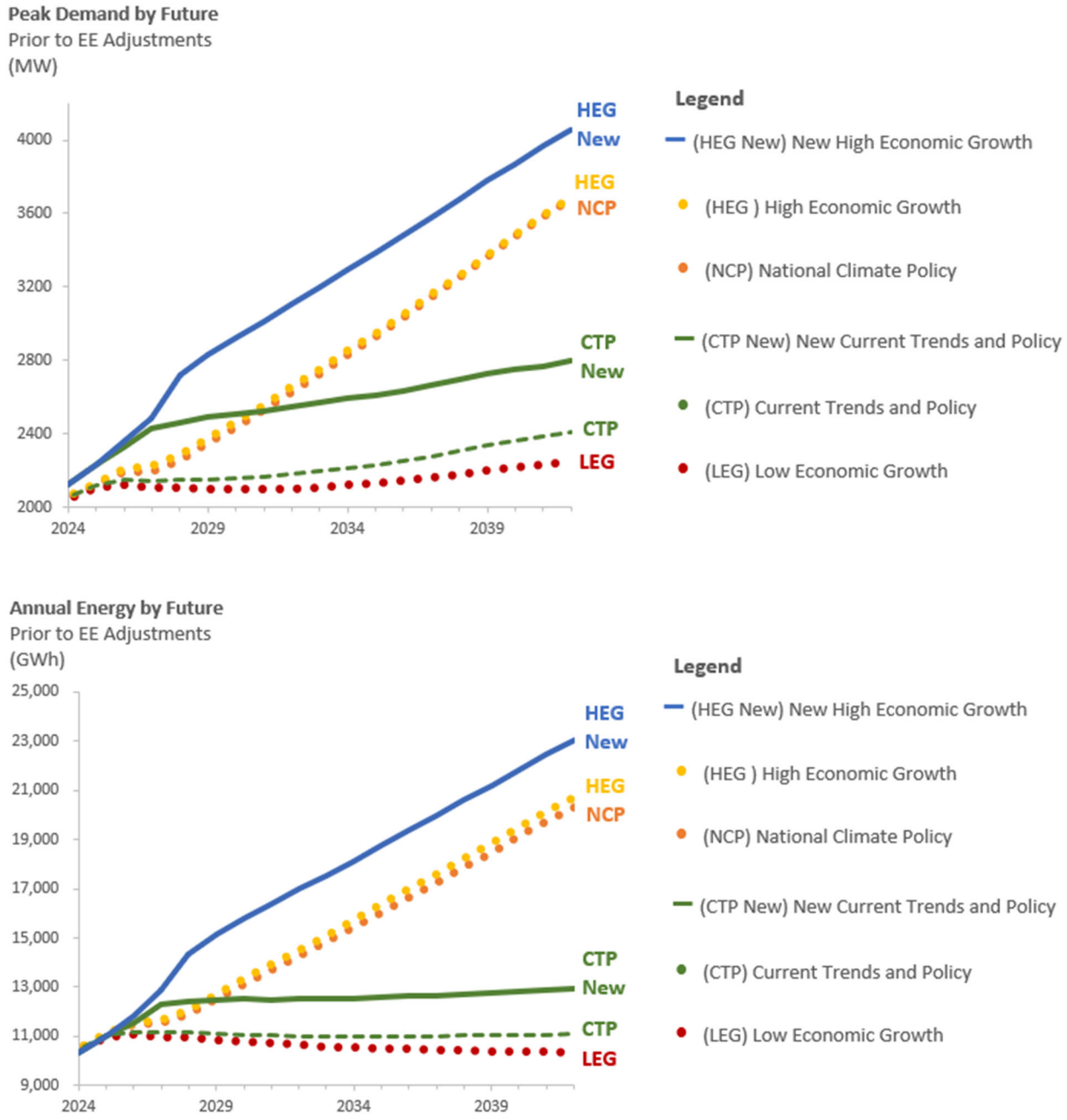
On May 15, 2024, PNM reported a material event due to updated demand and energy load forecasts. The new load forecast indicated an increase in energy and demand projections beyond the CTP scenario and the HEG demand forecast within the first five years of the planning window. Since these updated projections surpassed the range of future energy and demand analyses that supported PNM's SON in this timeframe, PNM determined it warranted additional analysis on the 2023 IRP to re-affirm the MCEP, and the findings identified in the SON and any changes, if applicable, to the AP. The purpose of this supplemental analysis is to identify any changes to the SON resulting from the MCEP which informs subsequent RFPs recognized in the AP. Specifically, the SON will identify the types of resources and ranges of sizes of resources that PNM will need in the future to continue to provide reliable electric service at the lowest possible costs while meeting regultory and environmental objectives. This supplemental analysis is prepared in accordance with applicable rules and regulations and industry standard planning principles.

2 Load Forecast

PNM uses statistically adjusted, end-use models to predict future loads, accounting for factors such as weather, economic and population growth, appliance saturation, energy efficiency, and the adoption of new technologies like electric vehicles and behind the meter solar. PNM annually evaluates the actual load to the current load forecast to determine if adjustments are necessary to the predictive model in the near term. For IRP purposes, current forecast results are compared against the ranges of forecasts used in the last accepted Integrated Resource Plan to evaluate the trends and conclusions that were used to develop the MCEP and subsequent SON and AP. Because the load forecast is an essential part of the resource planning process, any changes to the forecast can impact the MCEP and progress through the development of the SON and AP.

During the 2nd quarter of 2024, PNM's load forecasting department revised its long-term demand and energy forecast. A comparison of the new forecasts against the forecasts studied in the 2023 IRP are shown in Figure 5 PNM's new energy and demand forecasts in the near term exceed both the CTP and the HEG forecasts as studied in the 2023 IRP. The new forecast is defined as the new Current Trends and Policy ("CTP New") future. As depicted in Figure 5, the CTP New load growth accelerates during the first several years and slows down and crosses back over the HEG scenario to level out thereafter. Comparably, the CTP New demand forecast exceeds the CTP scenario studied in the 2023 IRP from the beginning and rises to exceed both the HEG and NCP scenarios until 2030. Although both HEG and NCP forecasts are ultimately higher than the CTP New forecast, the near-term timeframe ultimately has the greatest impact on the SON and AP. In addition to the CTP New forecast, a new High Economic Growth ("HEG New") forecast was created to show increased energy and demands above and beyond what is included in the CTP New future. These new forecasts have been included in PNM's supplemental analysis for the 2023 IRP to determine what the impact on the MCEP would be and any associated changes with SON and AP already approved. For details concerning the changes in the load forecast see Appendix B.

Figure 5. Forecasts of Annual Energy and Peak Demand by Future



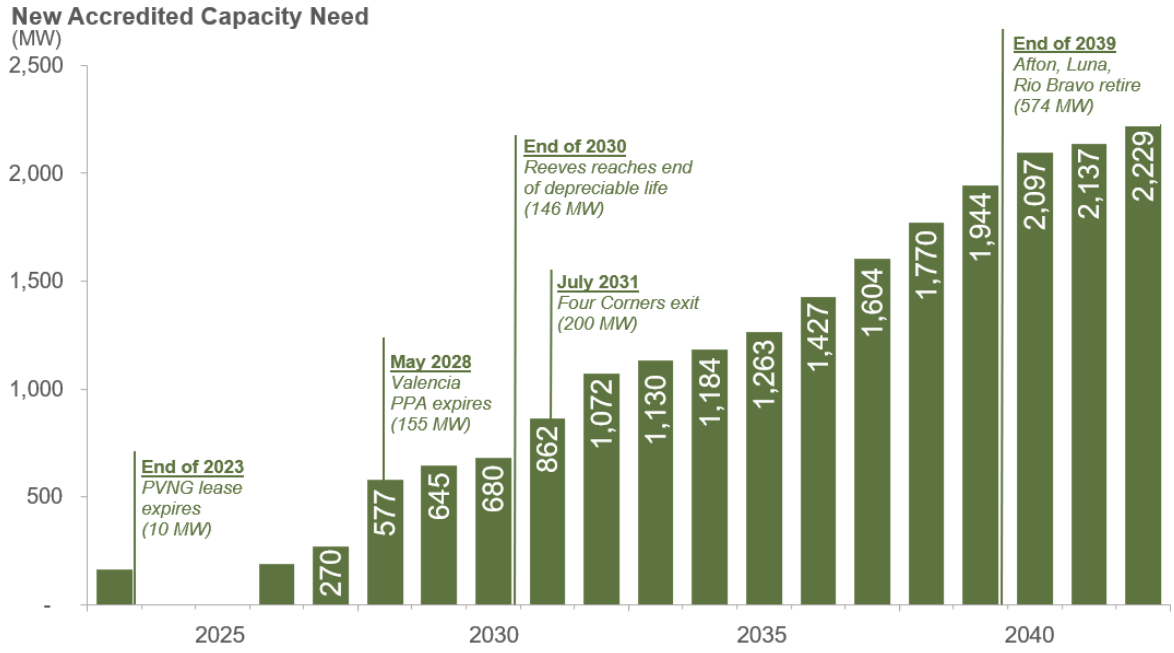
3 Supplemental Portfolio Analysis

This section presents the model results based on the analysis framework detailed in Appendix C. It provides an overview of the portfolio outcomes for the scenarios examined, including installed capacity, costs, carbon emissions, resource adequacy, and typical hourly operations. A summary of all the analysis results can be found in Appendix F.

3.1 Portfolio Composition

PNM's analytical approach that consists of framework of scenarios, futures, and sensitivities serve to focus the analysis so that modeling results provide insight to the most important questions. How each of these pieces fit into the analysis, and what specific scenarios, futures, and sensitivities are tested and described in Appendix C. The existing and approved resources, summarized in Table 2, are sufficient to meet most of PNM's near-term capacity needs. Increased capacity is required due to load growth and ongoing changes in the resource portfolio which include: (1) expiration of the Valencia PPA in 2028; (2) Reeves reaching the end of its depreciable life in 2030; and (3) PNM's plans to exit FCPP in 2031 when the current operating agreement expires. Thereafter, capacity needs continue to increase to support load growth. By the end of 2039, additional natural gas units will be retired to continue the transition to a carbon-free system. This growing capacity need is summarized in Figure 6.

Figure 6. Timeline of PNM's growing capacity needs



Today, most reliability needs are met with thermal resources, such as gas and nuclear. As new low-cost, carbon-free, and energy-limited resources like solar and storage are added, their share of the total contribution to system reliability continue to increase. Table 2 shows the resources and their capacity contributions to the system.

Table 2. Load and Resources of PNM's existing system

Description	Notes	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Forecasted System Peak	**(1)**	**2,206**	**2,175**	**2,299**	**2,377**	**2,427**	**2,562**	**2,617**	**2,647**	**2,682**	**2,724**	**2,744**	**2,787**	**2,837**	**2,864**	**2,918**	**2,949**	**3,003**	**3,038**	**3,072**	**3,092**
EUEA Energy Efficiency		-28	-49	-65	-68	-68	-68	-66	-66	-66	-66	-36	-34	-34	-15	-15	-	-	-	-	-
Net System Peak	**(2)**	**2,178**	**2,127**	**2,234**	**2,309**	**2,359**	**2,494**	**2,552**	**2,581**	**2,616**	**2,658**	**2,708**	**2,754**	**2,803**	**2,848**	**2,902**	**2,949**	**3,003**	**3,038**	**3,072**	**3,092**
PRM Requirement	(3)	12%	12%	12%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Total Requirement		**2,439**	**2,382**	**2,502**	**2,678**	**2,736**	**2,893**	**2,960**	**2,994**	**3,035**	**3,084**	**3,141**	**3,194**	**3,251**	**3,304**	**3,367**	**3,421**	**3,483**	**3,524**	**3,564**	**3,587**
Existing Resource (Accredited Capacity)																					
Nuclear	(4)	292	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
Coal	(4)	160	160	160	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	(4) (6)	968	968	968	968	968	818	818	818	677	677	677	677	677	565	454	343	232	121	121	121
Geothermal	(4)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	-
Wind	(5)	132	132	132	132	132	132	132	132	132	132	132	132	112	112	112	112	112	112	112	50
Solar	(5)	46	86	85	106	105	105	104	103	103	102	101	101	100	99	96	95	95	94	94	90
Storage (4hr)	(5)	144	526	526	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813
Demand Response	(5)	23	23	23	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Short Term Contracts		508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Resources		**2,278**	**2,475**	**2,602**	**2,490**	**2,466**	**2,316**	**2,315**	**2,314**	**2,172**	**2,011**	**2,011**	**2,010**	**1,989**	**1,877**	**1,763**	**1,651**	**1,539**	**1,428**	**1,427**	**1,357**
Capacity Surplus (Shortfall)		**-162**	**93**	**100**	**-189**	**-270**	**-577**	**-645**	**-680**	**-862**	**-1,072**	**-1,130**	**-1,184**	**-1,263**	**-1,427**	**-1,604**	**-1,770**	**-1,944**	**-2,097**	**-2,137**	**-2,229**

Notes
1. "Forecasted System Peak" does not include impacts of energy efficiency, which is shown below as a load adjustment.
2. "Net System Peak" includes impacts of all load-modifying resources, including energy efficiency.
3. For the years 2023-2025, a 12% PRM requirement is maintained; thereafter, the portfolio transitions to 16%.
4. Accredited capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention.
5. Accredited capacity for non-firm resources (renewables, storage) reported using " Effective Load carrying Capability" (ELCC) convention.
6. Firm capacity from natural gas units retiring by 2040 declines over four years to allow gradual transition to carbon-free portfolio. In certain scenarios, some units may be converted to hydrogen.

3.1.1 Capacity Mix

Figure 7 and Figure 8 compare four portfolios at two key future milestones: 2032, after the exit from FCPP and the end of Reeves' depreciable life, and 2040, marking the final transition to a carbon-free energy mix. By 2032, carbon-free generation resources will constitute 53-58% of the total nameplate capacity, achieving a 71-88% reduction in carbon emissions compared to today's portfolio. While the portfolio compositions are generally similar across scenarios, there are slight differences in specific resource types.

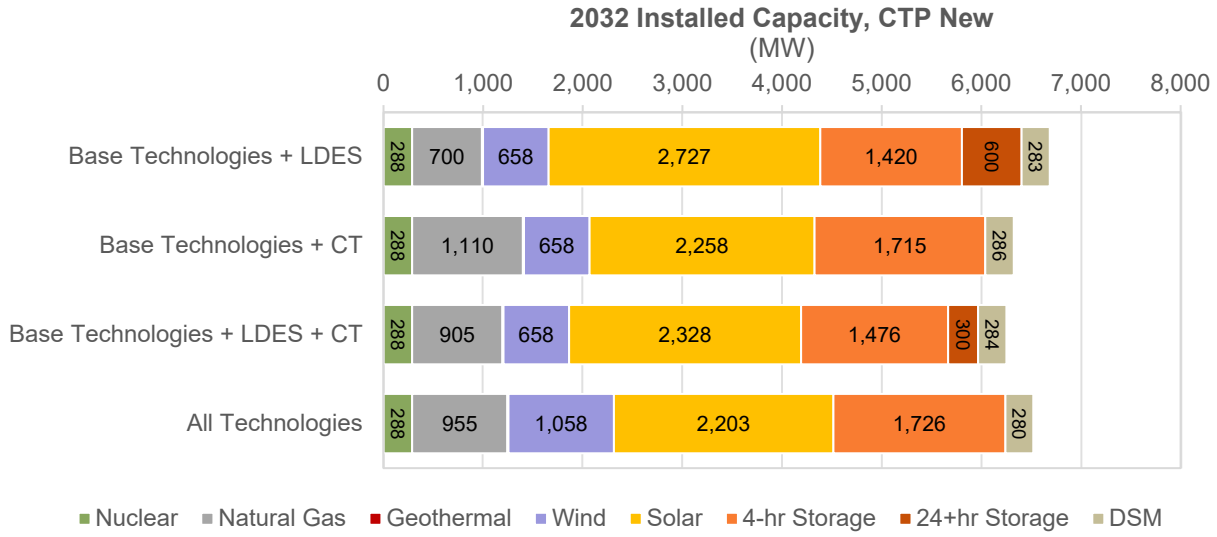
All portfolios include incremental additions of solar and four-hour storage resources, which complement each other by allowing energy storage to shift daytime solar production to evening and nighttime hours.

Incremental demand side management ("DSM") bundles are included in all portfolios, highlighting the importance of customer programs for managing peak demand and providing clean energy.

The "All Technologies" scenario, which considers wind as an eligible technology before 2033, includes incremental wind resources in the 2032 portfolio, underscoring the potential importance of resource diversity.

Several scenarios feature long-duration (24+ hour) storage resource additions (300 and 600 MW) to meet capacity needs due to plant retirements, replacing some shorter-duration storage resources.

Figure 7. Total installed capacity across scenarios in 2032 - CTP New



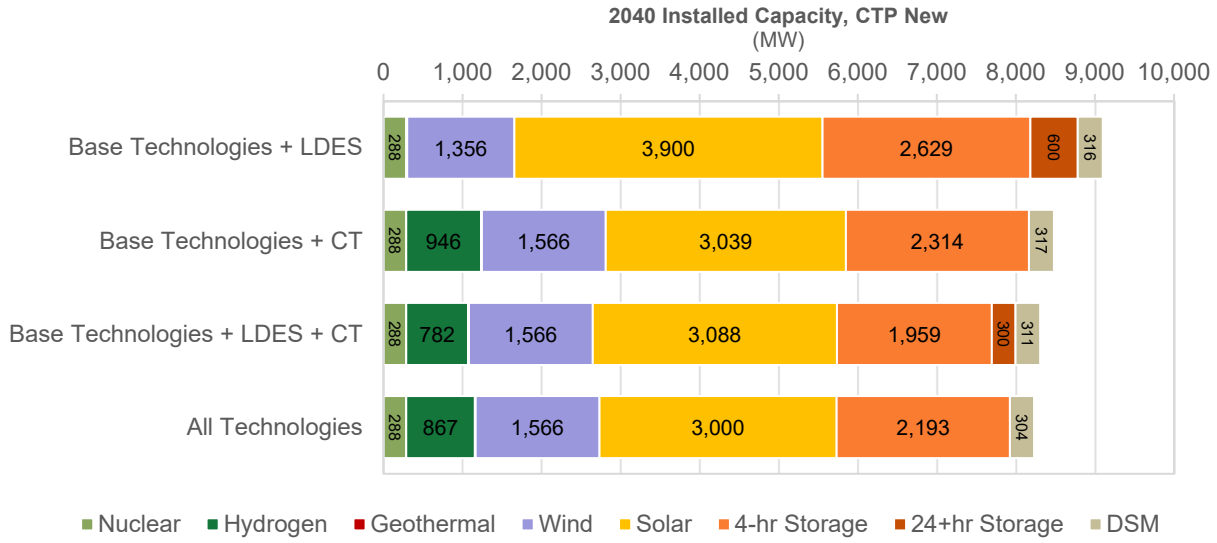
By 2040, the four portfolios take different paths to achieve PNM's carbon-free goal:

All portfolios include incremental additions of solar, wind, storage, and DSM, but the Base Technologies + LDES scenario has higher capacity additions than the others. This reflects the challenge of meeting a strict reliability standard with limited options and few firm resources.

The Base Technologies + LDES scenario relies heavily on long-duration storage for reliability. Unlike other scenarios that use hydrogen-fueled combustion turbines for firm resources, this scenario uses 600 MW of new long-duration storage, along with PNM's share of PVNGS, which is common across all scenarios.

The Base Technologies + CT, Base Technologies + LDES + CT, and All Technologies scenarios have relatively similar resource mixes, all including hydrogen-ready combustion turbines to meet part of the need for firm resources.

Figure 8. Total installed capacity across scenarios in 2040 - CTP New

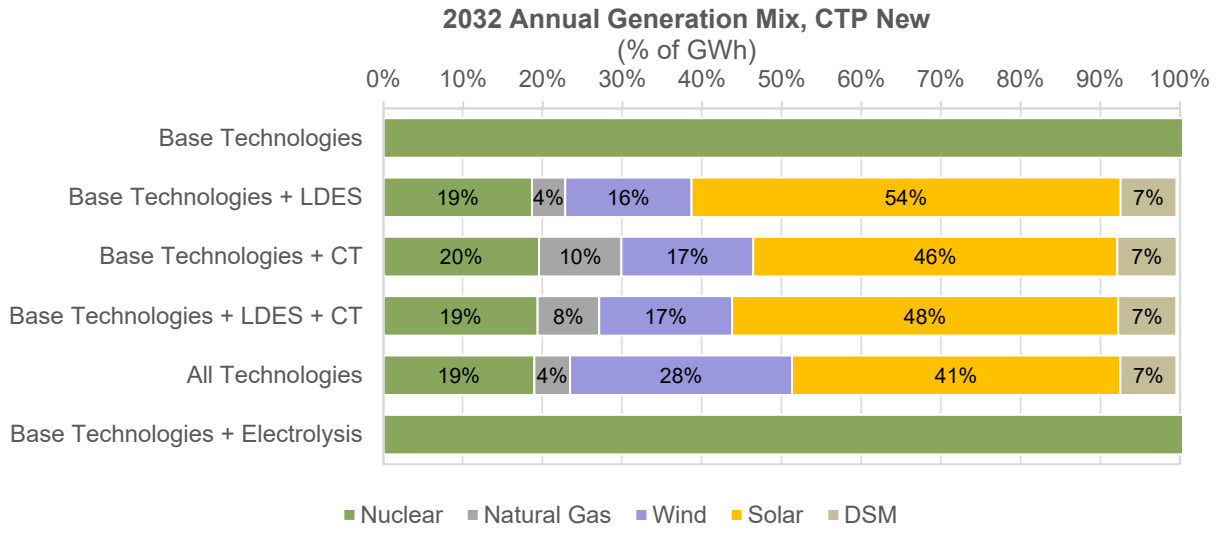


3.1.2 Energy Mix

Figure 9 and Figure 10 illustrate the annual energy mix of four different portfolios at two key milestones. By 2032, all portfolios achieve over 90% carbon-free generation, comprising nuclear, wind, solar, and demand-side resources, with the remaining 5-10% from natural gas. While the scenarios are similar, there are some notable differences:

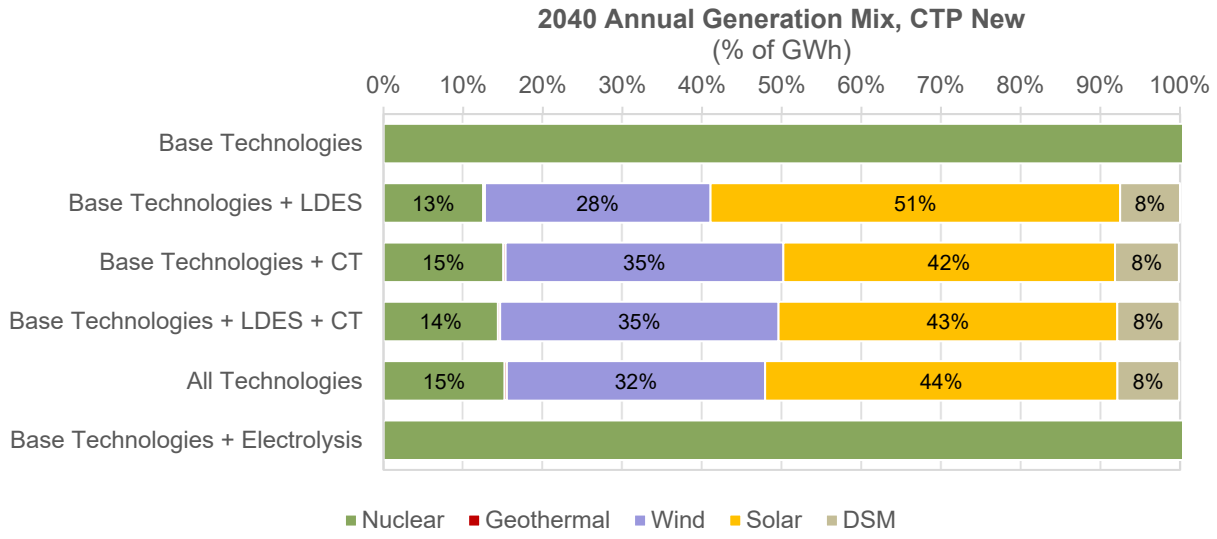
The All Technologies scenario relies more on wind, facilitated by faster transmission availability, which mainly replaces solar as a carbon-free energy source.

Figure 9. Annual generation mix across all scenarios in 2032 - CTP New



The transition from 2032 to 2040 marks the final shift to a carbon-free energy mix. During this period, the remaining natural gas in the generation mix is replaced by additional renewable energy sources and, in some scenarios, hydrogen combustion.

Figure 10. Annual generation mix across all scenarios in 2040 - CTP New



3.1.3 Cost Comparison

In creating a Revised MCEP, PNM seeks to develop a plan that limits customers' costs while within emission requirements and meeting RPS goals. The primary cost metric considered is the Net Present Value of Revenue Requirements ("NPV"), which reflects the total cost of generation plus associated transmission over the planning period (2023-2042), discounted back to the start

of the study horizon. Cost results for all four scenarios analyzed in the supplemental analysis are shown in Table 3.

Table 3. NPV across scenarios (2023-2042)

Metric	Load Forecast	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
Total NPV ($M)	CTP New	$11,987	$10,882	$11,111	$10,763
Incremental NPV* ($M)		$1,224	$119	$348	$0
Total NPV ($M)	HEG New	$18,303	$16,553	$16,093	$15,717
Incremental NPV* ($M)		$2,586	$836	$376	$0

Table Notes

* Incremental NPV measured relative to least cost scenario (All Tech)

Observations from the four scenarios simulated among the CTP New and HEG New are:

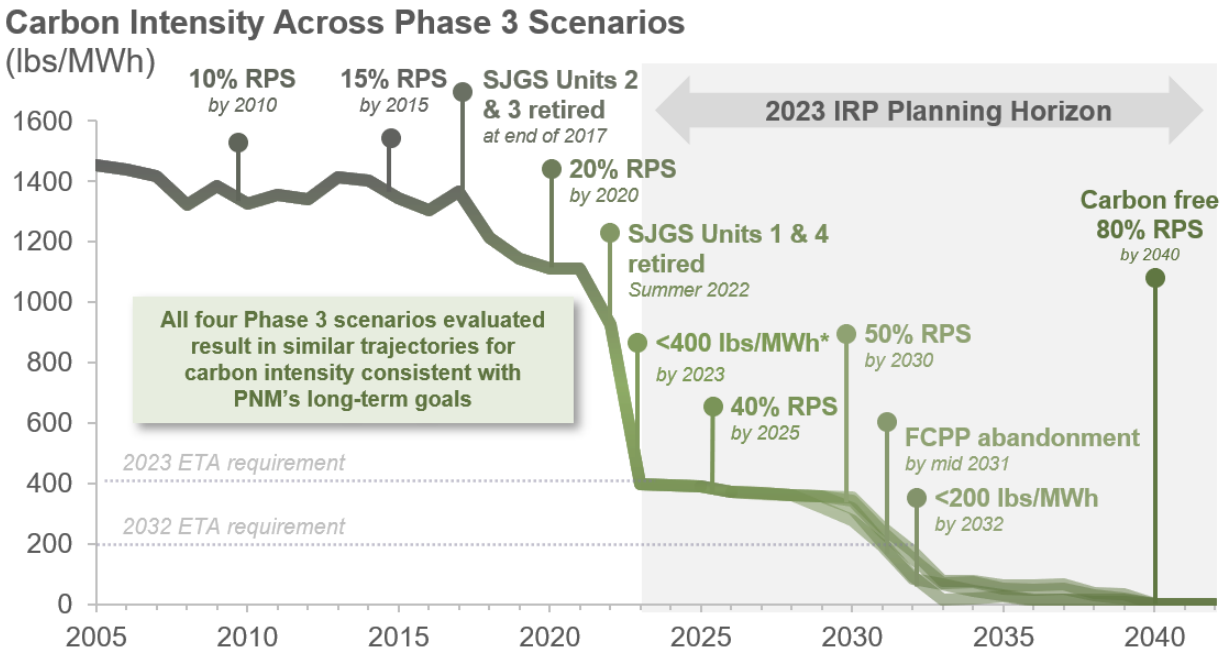
- The All Technologies scenario results in the lowest cost portfolio under both futures mainly because it included the broadest range of technology options for customers.
- Base Tech + LDES and Base + LDES + CT scenarios resulted in portfolios that included large storage systems (>200 MW); however, they were not cost competitive with the All-Tech scenario under the CTP New forecast.
- While the Base Tech + CT scenario resulted in a portfolio that was cost competitive in the CTP New future, the diversity of the All Technologies portfolio that includes a combination of earlier renewable resources and dispersed long-duration storage additions has a lower cost to customers.
- The All Technology scenario allowed wind resources to be built sooner than all other scenarios, and correspondingly included additions in the portfolio prior to 2030. This implies the system requirements would be best served with such resources if they can be attained in that timeframe.

3.1.4 Environmental Metrics

Greenhouse Gas Emissions

Despite the differences in future resource mixes, all scenarios studied in this phase achieve similar greenhouse gas emissions reductions over the planning horizon. The trajectories of greenhouse gas emissions across the four scenarios are shown in Figure 11. Any small differences between cases are mainly due to the timing of new resource additions but do not reflect any sizable difference in the favorability of one scenario over another with respect to the potential for emissions reductions.

Figure 11. Annual carbon intensity across the four scenarios



Reported carbon intensity is calculated from LTCE modeling results by dividing total emissions from PNM internal generation by total annual energy requirements. Actual outcomes may vary depending on final rules adopted by the NMPRC. Delays of replacement resources for SJGS and PVNGS may also have an impact on PNM's ability to meet ETA carbon intensity requirements in 2023 and 2024.

Each portfolio includes sufficient carbon-free generation to achieve key statutory milestones as required by the ETA; specifically:

- In 2024 and all years thereafter, the emissions intensity of all portfolios generally remains below 400 lbs./MWh. The achievement of this milestone is facilitated by the shutdown of SJGS in 2022 and the recent and future planned renewable and storage additions.
- Beginning in 2032, the first full year after PNM's exit from FCPP, all portfolios meet the emissions intensity requirement of 200 lbs./MWh. The elimination of coal from the resource mix and the reliance on natural gas generators primarily for reliability allow all portfolios to achieve very low levels of carbon emissions.
- By 2040, all portfolios are carbon free.

3.1.5 Resource Adequacy Analysis

To ensure that the Revised MCEP meets standards for reliability, Strategic Energy Risk Valuation Modeling ("SERVM") analysis was performed to capture the Loss of Load Expectation ("LOLE") for each scenario at key points in time when major events such as planned retirements impact the portfolio. The changes to the load forecast which precipitated this supplemental analysis did not affect any of the underlying assumptions on the existing portfolio; therefore, the key times for reliability modeling in the 2023 IRP are unchanged.

Table 4 summarizes the LOLE statistics across the four scenarios modeled in this analysis. In 2032, all four portfolios using the CTP New exceed than the 0.1 LOLE standard and produce a LOLE under the 0.1 days per year target. Under the HEG New scenario, the results for 2032 show that most scenarios except for Base Tech + LDES required a reduction of four-hour batteries. Similar result show in 2040, under the increased load forecast (CTP New) all scenarios continue to produce a LOLE at or better than the standard. However, by 2040 under HEG New all scenarios require adjustments to meet the standard. For additional reliability analysis see Appendix D.

Table 4. Loss of load expectation across the four scenarios

Metric	Load Forecast	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
2032 Loss of Load Expectation (LOLE, days/yr.)	CTP New	0.04	0.03	0.06	0.04
2040 Loss of Load Expectation (LOLE, days/yr.)	CTP New	0.10	0.09	0.07	0.08
2032 Loss of Load Expectation (LOLE, days/yr.)	HEG New	0.10[A]	0.10	0.08	0.13
2040 Loss of Load Expectation (LOLE, days/yr.)	HEG New	0.10[B]	0.10[B]	0.10[B]	0.10[B]

Table Notes

To align reliability performance with the other portfolios and the planning standard, this portfolio was adjusted by removing four-hour battery storage capacity until the portfolio achieved a 0.1 LOLE.

To align reliability performance with the other portfolios and the planning standard, this portfolio was adjusted by adding four-hour battery storage capacity until the portfolio achieved a 0.1 LOLE.

3.1.1.1 Role of Gas & Hydrogen Resources

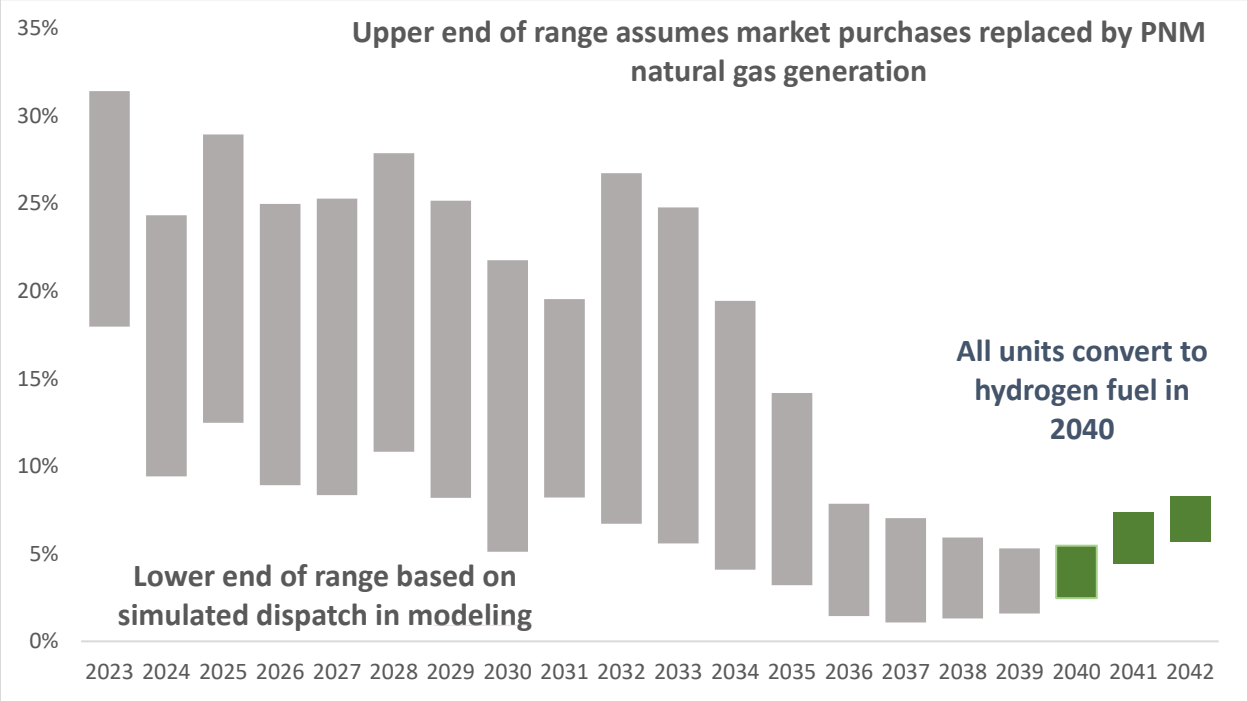
Natural gas generation resources are essential for PNM to maintain resource adequacy throughout most of the planning horizon. PNM's existing natural gas resources, along with additional hydrogen-ready combustion turbines in some scenarios, provide the flexibility to operate at full capacity when needed for reliability, while remaining available when nuclear, renewables, and energy storage are sufficient to meet PNM's loads. This type of firm resource is crucial for ensuring reliability without hindering progress towards PNM's 2040 carbon-free goals.

The All Technologies scenario illustrates the evolving role of natural gas and hydrogen resources in PNM's portfolio. Figure 12 shows the potential capacity factors for these resources, with the lower end based on modeled dispatch and the upper end assuming market purchases are replaced by PNM's own thermal generation.

As PNM approaches a carbon-free energy portfolio by 2040, the average capacity factors of natural gas resources decline. This reduction in natural gas utilization, despite an increase in overall capacity in this scenario, demonstrates how PNM can continue to lower carbon intensity over time while relying on firm natural gas generators for reliability over the broad range of operating conditions. By 2040, when natural gas resources transition to hydrogen, or a non-

carbon emitting fuel, their average capacity factor is expected to be below 10%, meaning they would only operate during the most constrained conditions to maintain system reliability.

Figure 12. CTP New Average capacity factors of natural gas & hydrogen generation in All Technologies scenario



3.1.6 Alternative Futures & Sensitivities

In addition to the portfolios presented above, sensitivity analysis was conducted for each scenario under the New Current Trends and Policy future, exploring portfolio changes under different Futures. For more details on sensitivities and futures.

Similar to the 2023 IRP, resource adequacy evaluations of portfolios led to adjustments to several portfolios. This approach allows for meaningful relative comparisons among the various scenarios tested. Details of this adjustment, including results before and after the change, are provided in Appendix E.

3.1.6.1 Alternative Futures

This analysis considers two futures: CTP New, and HEG New. Comparing each portfolio across these futures is beneficial for two main reasons: 1) it helps PNM determine if different investment portfolios would be more cost-effective under alternative futures, and 2) it highlights the relative cost impacts of various external factors beyond PNM's control.

Table 5 shows the NPV results for all scenarios and futures modeled. Unsurprisingly, the total NPV results are highly sensitive to assumptions about load growth. In the HEG New future, which assumes significant load growth, the NPV is much higher due to the need for additional resources.

Table 5. Total NPV (2023-2042) across all scenarios & futures, $ millions

Future	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
Current Trends & Policy (CTP New)	$11,987	$10,882	$11,111	$10,763
High Economic Growth (HEG New)	$18,303	$16,553	$16,093	$15,717

Comparing different scenarios within a single future provides valuable insights. Table 6 shows the incremental NPV relative to the lowest cost scenario for each future. Across the two futures, the All Technologies scenario emerges as the least costly.

The key observation from the analysis is that the All Technologies scenario is the lowest cost in high load growth cases, which highlights the effectiveness of an “all-of-the-above” strategy that includes a wide range of technologies compatible with PNM’s goals. This scenario outperforms others by moderate to significant margins due to its ability to leverage many complementary solutions.

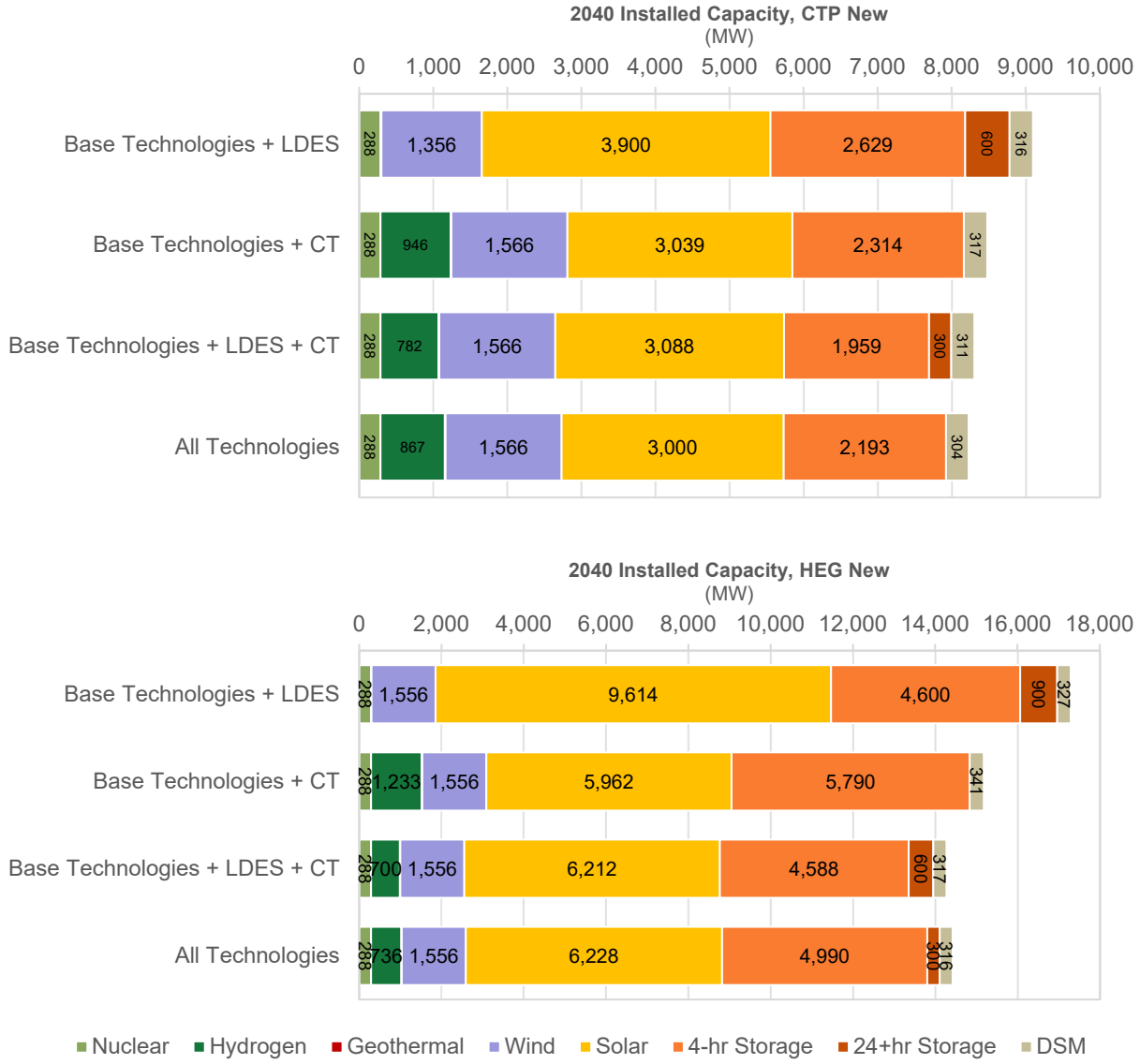
Table 6. Incremental or Delta NPV (2023-2042) relative to the lowest cost scenario for each future, $ millions

Future	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
Current Trends & Policy (CTP New)	+$1,223.3	+$118.8	+$347.7	-
High Economic Growth (HEG New)	+$2,585.7	+$836.0	+$376.5	-

The key observation from the analysis is that the All Technologies scenario is the lowest cost in high load growth cases, which highlights the effectiveness of an “all-of-the-above” strategy that includes a wide range of technologies compatible with PNM’s goals. This scenario outperforms others by moderate to significant margins due to its ability to leverage many complementary solutions.

Table 6 illustrates the total installed capacity in 2040 for all scenarios. The varying levels of load growth in different futures lead to significant differences in the amount of resources needed to meet reliability and clean energy goals. In most scenarios, the New HEG New future doubles the resource additions compared to the CTP New scenario. Despite these differences in resource development levels, the relative resource mixes across different scenarios remain similar. All scenarios heavily depend on wind, solar, and storage resources. In scenarios permitting new hydrogen-ready combustion turbines (CTs), they are selected in small quantities to ensure sufficient capacity is available to the system, and in turn offers higher reliability. Additionally, small amounts of long-duration storage resources are typically chosen when available.

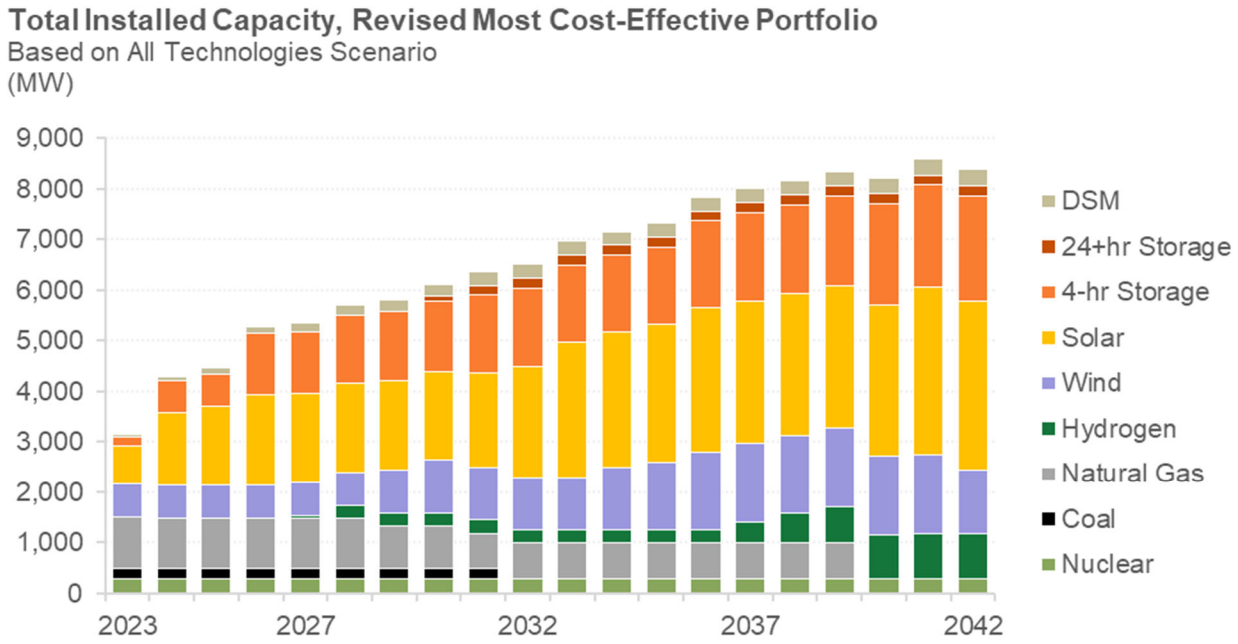
Figure 13. Total 2040 installed capacity across scenarios and futures



3.2 Revised Most Cost-Effective Portfolio (MCEP)

PNM studied four scenarios for this supplemental analysis that informs the MCEP. Among the scenarios studied, the All Technologies scenario shown below in Figure 4. has been selected as the Revised MCEP for the 2023 IRP. This portfolio of resources balances the addition of mature technologies with targeted investments in emerging technologies assumed to be deployed by the early 2030's. The optimized resource mix is expected to provide reliable service at a low cost to customers and its diversified mix helps to mitigate many of the risks explored both quantitively in this supplemental analysis and qualitatively in the 2023 IRP. Table 7 summarizes installed capacity for the Revised MCEP through the study window. Appendix A provides details on the loads and resources associated with the MCEP.

Figure 14. PNM's Revised Most Cost-Effective Portfolio



The Revised MCEP portfolio also includes 11 MW of existing geothermal not visible in the graph

Table 7. Revised Most Cost-Effective Portfolio (Nameplate Capacity, MW)

Resource Type	Category	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	FGR	200	200	200	200	200	200	200	200	200	0	0	0	0	0	0	0	0	0	0	0
Contract	FGR	508	293	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Natural Gas	FGR	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	0	0	0
Hydrogen CT	FGR	0	0	0	0	41	255	255	255	255	255	255	255	255	255	419	583	724	867	898	898
Nuclear	FGR	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	FGR	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	CFR	762	1,438	1,570	1,783	1,774	1,766	1,757	1,749	1,872	2,203	2,675	2,667	2,725	2,858	2,824	2,816	2,808	3,000	3,322	3,356
Wind	CFR	658	658	658	658	658	658	858	1,058	1,058	1,058	1,058	1,258	1,356	1,556	1,556	1,556	1,556	1,556	1,556	1,250
Storage (4hr)	DBR	170	620	632	1,214	1,214	1,347	1,387	1,387	1,526	1,526	1,526	1,526	1,526	1,711	1,743	1,743	1,782	1,993	2,012	2,077
Storage (8-12hr)	DBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage (24+hr)	DBR/FGR	0	0	0	0	0	0	0	100	200	200	200	200	200	200	200	200	200	200	200	200
DSM	CFR/DBR	69	96	117	135	174	197	215	235	258	280	260	262	280	274	279	274	288	304	315	314
Total		**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,724**	**5,818**	**6,130**	**6,368**	**6,521**	**6,974**	**7,167**	**7,341**	**7,853**	**8,020**	**8,171**	**8,358**	**8,220**	**8,602**	**8,394**

**CFR = Carbon-free energy resources, DBR = Dynamic balancing resources, FGR = Firm generating resources*

4 Conclusion

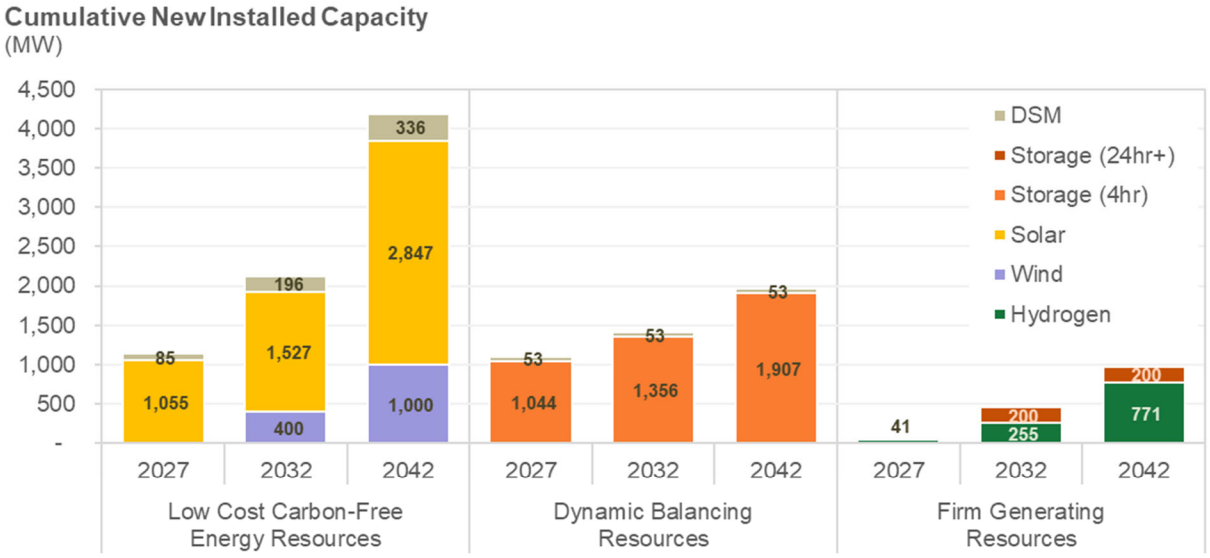
4.1 Statement of Need

This supplemental analysis identifies a need for between 5,600 and 7,200 MW of incremental resource additions through 2042 based on the four scenarios reviewed. This total amount of future capacity needed is nearly twice as much as exists in PNM's portfolio today and must be constructed and integrated at an unprecedented pace to achieve PNM's goal of a carbon-free electric system. Consistent with the 2023 IRP, this supplemental analysis balances the objectives in the IRP to maintain reliability, minimize cost, and mitigate the impact to the environment.

Based on what PNM knows today and its projections for the future, the revised Most Cost-Effective Portfolio reflects resources that would best fulfill future resource needs. Figure 15 summarizes the new resource needs in the Revised MCEP at three key milestones: 2027, at the end of the Action Plan window; 2032, after exit from Four Corners and the end of the depreciable life of Reeves; and 2042, at the end of the planning horizon.

- Between now and 2027, PNM estimates it will meet its needs with approximately 1,100 MW of low-cost carbon-free resources and 1,100 MW of dynamic balancing resources and 40 MW of firm generating resources. Some of these resources are already in development or will be procured through active resource solicitations.
- Between 2028 and 2032, PNM resource needs are expected to grow by an incremental 1,000 MW of low-cost carbon-free resources, 300 MW of dynamic balancing resources and 400 MW of firm generating resources.
- Between 2033 and 2042, the Revised MCEP identifies an additional 2,100 MW of low-cost carbon-free resources, 600 MW of dynamic balancing resources and 500 MW of firm generating resources.

Figure 15. Summary of future resource needs in the Revised MCEP



Cumulative figures reflect all new resource additions beginning in 2024, inclusive of projects under development:

Solar PV: *Atrisco (300 MW), Quail Ranch (100 MW), San Juan (200 MW), Sky Ranch (190 MW), TAG I (140 MW), Community Solar (125 MW)*

Storage: *Atrisco (300 MW), Quail Ranch (100 MW), Route 66 (50 MW), San Juan (100 MW), Sandia (60 MW), Sky Ranch I (50 MW), Sky Ranch II (100 MW), TAG I (50 MW), distribution-level storage (12 MW)*

DSM: *2024 & 2025 approved DSM programs*

The Revised MCEP is defined by the most optimal mix of resources to meet the projected needs of the system, however there are many uncertainties that could change the composition of the portfolio. Given these uncertainties, PNM evaluated a wide range of future conditions to understand the potential outcomes and influencing factors that may lead to PNM changing course from the Revised MCEP. Flexibility to adjust the plan as conditions evolve will be a key strategy to manage these risks. Table 8 shows the range of cumulative additions based on the four scenarios reviewed in this supplemental analysis for each resource type through the IRP study window.

Table 88. Ranges of new capacity additions across the planning period

	Ranges of Cumulative New Installed Capacity (MW)		
	Through Action Plan Window (2027)	**Through Mid Term (2032)**	**Through Planning Horizon (2042)**
Low-cost carbon-free energy resources	1,100	1,600 - 2,400	3,100 - 3,900
Dynamic balancing resources	1,100	1,100 - 1,700	1,600 - 2,300
Firm generating resources	0 - 100	0 - 700	300 - 1,200
All resources	2,200	3,200 - 4,500	5,600 - 7,200

Ranges shown informed by results across four scenarios (All Technologies, Base Technologies + CT, Base Technologies + LDES, and Base Technologies + CT + LDES) across all sensitivities excluding Stable ED (high load growth). Resource needs under a high load growth future could be considerably higher. The “All Resources” row represents the minimum and maximum capacity identified for the scenarios which is a blend of the resource types and not a direct sum based on the minimum and maximum of the resource types.

Specific resources that will be procured via future resource solicitations to meet those needs are expected to include a diverse mix of technologies. Many of these resources are commercially available today, but transitioning to a carbon free portfolio will be very challenging without maturity of non-carbon emitting capacity resources by the early 2030's. PNM will continue to explore innovative solutions including long-duration storage and hydrogen fuels as they approach commercial viability. Ultimately, the specific portfolio of resources that best meets the needs of PNM's customers and achieves its goals will be determined by a combination of market forces, timing of technological advances, and industry trends that cannot be perfectly predicted today. Further, specific decisions around procurement of new resources will occur through competitive solicitations to ensure customers benefit from the lowest cost available options. PNM's planning and procurement processes must be adaptive and iterative by design, and neither the presence nor the absence of any specific type of resource in the Revised MCEP is a prescriptive determination of what will be procured. This Revised MCEP, coupled with the diverse outcomes in alternative plausible portfolios, informs the SON that is intended to further progress towards decarbonization while preserving optionality to adjust to changing market circumstances.

Appendices

Appendix A. MCEP Loads and Resources Tables

This appendix presents loads and resources tables for the portfolio identified as MCEP in the IRP: the All-Technologies scenario. For completeness, both the nameplate capacity and the accredited capacity of each resource in the portfolio are provided; the accredited capacity is used to show how each resource contributes to the planning reserve margin.

In addition, this appendix also includes a version of the loads and resources table without any new resources beyond PNM's existing portfolio. The resource needs identified in this table align with those shown in Section 3 of this supplemental analysis. Note that the accredited capacity for renewables and storage shown in the existing resource table will differ from that shown in the Revised MCEP table because accredited capacity attributed to each resource is adjusted as new resources are added to the portfolio.

Public Service Company of New Mexico
2023 Integrated Resource Plan
Most Cost Effective Portfolio (All Technologies Scenario)
Loads & Resources Table - Nameplate Capacity

Line No.	Nameplate Capacity (MW) Description	Notes	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	SoN Classification
(1)	EUEA Energy Efficiency	(A)	37	63	85	85	85	85	82	82	82	82	45	42	42	19	19	-	-	-	-	-	CFR
(2)	Incremental Energy Efficiency	(A)	-	-	-	18	37	60	81	101	123	145	162	168	185	202	207	221	236	252	263	261	CFR
(3)	**Total Energy Efficiency (MW)**		**37**	**63**	**85**	**103**	**121**	**145**	**163**	**183**	**205**	**227**	**208**	**210**	**227**	**221**	**226**	**221**	**236**	**252**	**263**	**261**	
(4)	Peak Saver		11	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(Existing)
(5)	Power Saver		22	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(Existing)
(6)	Peak Saver Extension		-	-	-	-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	DBR
(7)	Power Saver Extension		-	-	-	-	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	DBR
(8)	DR Expansion		-	-	-	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	DBR
(9)	**Total Demand Response (MW)**		**33**	**33**	**33**	**33**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	
(10)	*Total Demand Response Additions (MW)*	*(B)*	-	-	-	-	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	*53*	
(11)	Four Corners		200	200	200	200	200	200	200	200	200												(Existing)
(12)	**Total Coal Resources (MW)**		**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	-	-	-	-	-	-	-	-	-	-	-	
(13)	Palo Verde Unit 1	(C)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	(Existing)
(14)	Palo Verde Unit 2		134	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	(Existing)
(15)	Palo Verde Unit 3		134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	(Existing)
(16)	**Total Nuclear Resources (MW)**		**298**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	
(17)	Afton		235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	-	-	-	(Existing)
(18)	La Luz	(D)	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	(Existing)
(19)	Lordsburg	(D)	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	(Existing)
(20)	Luna		190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	-	-	-	(Existing)
(21)	Reeves		146	146	146	146	146	146	146	146	-	-	-	-	-	-	-	-	-	-	-	-	(Existing)
(22)	Rio Bravo		149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	-	-	-	(Existing)
(23)	Valencia PPA		155	155	155	155	155	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(Existing)
(24)	Generic Hydrogen-Ready Thermal	(D)	-	-	-	-	41	255	255	255	255	255	255	255	255	255	419	583	724	741	771	771	FGR
(25)	**Total Natural Gas Resources (MW)**		**1,002**	**1,002**	**1,002**	**1,002**	**1,043**	**1,101**	**1,101**	**1,101**	**955**	**955**	**955**	**955**	**955**	**955**	**1,119**	**1,283**	**1,424**	**867**	**898**	**898**	
(26)	*Total Natural Gas Additions (MW)*	*(B)*	-	-	-	-	*41*	*255*	*255*	*255*	*255*	*255*	*255*	*255*	*255*	*255*	*419*	*583*	*724*	*741*	*771*	*771*	
(27)	Dale Burgett		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	(Existing)
(28)	**Total Geothermal Resources (MW)**		**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	
(29)	Casa Mesa Wind		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	(Existing)
(30)	La Joya Wind 1		165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	-	(Existing)
(31)	La Joya Wind 2		141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	-	(Existing)
(32)	New Mexico Wind Energy Center		200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	(Existing)
(33)	Red Mesa Wind Energy Center		102	102	102	102	102	102	102	102	102	102	102	102	-	-	-	-	-	-	-	-	(Existing)
(34)	Generic Wind		-	-	-	-	-	-	200	400	400	400	400	600	800	1,000	1,000	1,000	1,000	1,000	1,000	1,000	CFR
(35)	**Total Wind Resources (MW)**		**658**	**658**	**658**	**658**	**658**	**658**	**858**	**1,058**	**1,058**	**1,058**	**1,058**	**1,258**	**1,356**	**1,556**	**1,556**	**1,556**	**1,556**	**1,556**	**1,556**	**1,250**	
(36)	*Total Wind Additions (MW)*	*(B)*	-	-	-	-	-	-	*200*	*400*	*400*	*400*	*400*	*600*	*800*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	
(37)	PNM Existing Utility-Owned Solar	(E)	151	150	149	147	146	145	144	143	142	142	141	140	139	138	137	136	135	134	134	113	(Existing)
(38)	Arroyo Solar	(E)	291	289	287	283	281	279	277	275	273	271	269	267	264	262	260	258	256	254	252	250	(Existing)
(39)	Britton Solar	(E)	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42	41	41	(Existing)
(40)	Encino North Solar	(E)	50	50	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	(Existing)
(41)	Encino Solar	(E)	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42	41	41	(Existing)
(42)	Jicarilla I Solar	(E)	50	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	(Existing)
(43)	NMRD Solar	(E)	28	28	28	28	27	27	27	27	27	26	26	26	26	26	25	25	25	25	25	1	(Existing)
(44)	Route 66 Solar	(E)	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42	(Existing)
(45)	Solar Direct Solar I	(E)	48	47	47	46	46	46	45	45	45	44	44	43	43	43	-	-	-	-	-	-	(Existing)
(46)	Atrisco Solar	(E)	-	300	299	297	296	294	293	291	290	288	287	285	284	282	281	280	278	277	275	274	CFR
(47)	San Juan Solar	(E)	-	193	191	189	187	186	185	183	182	180	179	178	176	175	174	172	171	168	168	168	CFR
(48)	Sky Ranch I Solar	(E)	-	190	190	183	182	181	179	178	177	175	174	173	171	170	169	167	166	165	164	162	CFR
(49)	TAG I Solar	(E)	-	-	140	139	139	138	137	137	136	135	134	134	133	132	132	131	131	130	129	129	CFR
(50)	Community Solar	(E)	-	-	-	124	124	123	123	122	121	121	120	119	119	118	118	117	117	116	116	115	CFR
(51)	Quail Ranch Solar	(E)	-	-	-	100	99	99	98	98	97	97	96	96	95	95	94	94	93	93	92	92	CFR
(52)	Generic Solar	(E)	-	-	-	-	-	-	-	-	132	472	952	952	1,019	1,161	1,178	1,178	1,178	1,380	1,709	1,792	CFR
(53)	**Total Solar Resources (MW)**		**762**	**1,438**	**1,569**	**1,772**	**1,761**	**1,750**	**1,739**	**1,727**	**1,848**	**2,176**	**2,646**	**2,635**	**2,690**	**2,821**	**2,784**	**2,774**	**2,763**	**2,953**	**3,273**	**3,304**	
(54)	*Total Solar Additions (MW)*	*(B)*	-	*683*	*820*	*1,032*	*1,026*	*1,020*	*1,014*	*1,008*	*1,135*	*1,468*	*1,943*	*1,937*	*1,998*	*2,134*	*2,145*	*2,139*	*2,133*	*2,328*	*2,653*	*2,732*	

Public Service Company of New Mexico
2023 Integrated Resource Plan
Most Cost Effective Portfolio (All Technologies Scenario)
Loads & Resources Table - Nameplate Capacity

Line No.	Nameplate Capacity (MW) Description	Notes	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	SoN Classification
(55)	Arroyo BESS		150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	(Existing)
(56)	Jicarilla I BESS		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	(Existing)
(57)	Atrisco BESS		-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	DBR
(58)	San Juan BESS		-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	DBR
(59)	Sky Ranch I BESS		-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	DBR
(60)	Distribution BESS		-	-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	DBR
(61)	Quail Ranch BESS		-	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	DBR
(62)	Route 66 BESS		-	-	-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	DBR
(63)	Sandia BESS		-	-	-	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	DBR
(64)	Sky Ranch BESS		-	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	DBR
(65)	TAG I BESS		-	-	-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	DBR
(66)	Generic Battery (4hr)		-	-	-	222	222	355	395	395	534	534	534	534	534	719	751	751	790	1,001	1,020	1,085	DBR
(67)	Generic Long Duration Storage (24+hr)		-	-	-	-	-	-	-	100	200	200	200	200	200	200	200	200	200	200	200	200	FGR
(68)	**Total Storage Resources (MW)**		**170**	**620**	**632**	**1,214**	**1,214**	**1,347**	**1,387**	**1,487**	**1,726**	**1,726**	**1,726**	**1,726**	**1,726**	**1,911**	**1,943**	**1,943**	**1,982**	**2,193**	**2,212**	**2,277**	
(69)	*Total Storage Additions (MW)*	*(B)*	-	*450*	*462*	*1,044*	*1,044*	*1,177*	*1,217*	*1,317*	*1,556*	*1,556*	*1,556*	*1,556*	*1,556*	*1,741*	*1,773*	*1,773*	*1,812*	*2,023*	*2,042*	*2,107*	
(70)	**Generic Capacity Resources (MW)**		**508**	**293**	**420**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
(71)	**Total Installed Capacty (MW)**		**3,678**	**4,605**	**4,897**	**5,281**	**5,349**	**5,553**	**5,799**	**6,108**	**6,344**	**6,494**	**6,944**	**7,135**	**7,307**	**7,816**	**7,981**	**8,129**	**8,313**	**8,172**	**8,553**	**8,342**	
							SoN Yr 1					**SoN Yr 2**										**SoN Yr 3**	
(72)	Low-Cost Carbon Free Additions	(F)	-	709	868	1,098	1,111	1,129	1,341	1,555	1,703	2,059	2,514	2,710	2,989	3,336	3,352	3,361	3,369	3,580	3,916	3,994	CFR
(73)	Balancing Resource Additions	(G)	-	450	462	1,044	1,097	1,230	1,269	1,269	1,408	1,408	1,408	1,408	1,408	1,593	1,625	1,625	1,665	1,875	1,894	1,960	DBR
(74)	Firm Resource Additions	(G)	-	-	-	-	41	255	255	355	455	455	455	455	455	455	619	783	924	941	971	971	FGR
(75)	**Cumulative New Installed Capacity (MW)**		-	**1,159**	**1,330**	**2,143**	**2,249**	**2,613**	**2,865**	**3,179**	**3,566**	**3,922**	**4,377**	**4,574**	**4,852**	**5,384**	**5,596**	**5,769**	**5,958**	**6,396**	**6,782**	**6,925**	

Notes
A. "Installed capacity" of energy efficiency reflects peak load reductions
B. "Total Additions" are shown relative to 2023 capacity, do not account for retirements
C. Palo Verde Unit 1 capacity reflects ownership share only; leased capacity expired January 15, 2023
D. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel
E. Reported capacity for solar PV includes impacts of degradation
F. Listed totals differ slightly from values reported in the Statement of Need for 2027, 2032, and 2042 due to gradual degradation of solar PV capacity
G. Listed totals are fully aligned with values reported in Statement of Need

Public Service Company of New Mexico
2023 Integrated Resource Plan
Most Cost Effective Portfolio (All Technologies Scenario)
Loads & Resources Table - Accredited Capacity

Line No.	Loads and Accredited Capacity (MW) Description		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
(1)	**Forecasted System Peak Demand (MW)**	(A)	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
(2)	EUEA Energy Efficiency		-28	-49	-65	-68	-68	-68	-66	-66	-66	-66	-36	-34	-34	-15	-15	-	-	-	-	-
(3)	Incremental Energy Efficiency		-	-	-	-14	-29	-48	-65	-81	-99	-116	-130	-134	-148	-162	-166	-177	-189	-202	-211	-209
(4)	**Net System Peak Demand (MW)**	(B)	2,178	2,127	2,234	2,294	2,330	2,446	2,487	2,501	2,518	2,542	2,578	2,619	2,655	2,686	2,736	2,772	2,814	2,836	2,862	2,882
(5)	Peak Saver	(C)	8	8	8	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Power Saver	(C)	15	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	Peak Saver Extension	(C)	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
(8)	Power Saver Extension	(C)	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
(9)	DR Expansion	(C)	-	-	-	-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(10)	**Total Demand Response (MW)**		23	23	23	23	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
(11)	Four Corners	(D)	160	160	160	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-
(12)	**Total Coal Resources (MW)**		160	160	160	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-
(13)	Palo Verde Unit 1	(D)	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
(14)	Palo Verde Unit 2	(D)	131	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
(15)	Palo Verde Unit 3	(D)	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
(16)	**Total Nuclear Resources (MW)**		292	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
(17)	Afton	(D) (E)	230	230	230	230	230	230	230	230	230	230	230	230	230	184	138	92	46	-	-	-
(18)	La Luz	(D) (F)	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
(19)	Lordsburg	(D) (F)	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
(20)	Luna	(D) (E)	184	184	184	184	184	184	184	184	184	184	184	184	184	147	111	74	37	-	-	-
(21)	Reeves	(D)	141	141	141	141	141	141	141	141	-	-	-	-	-	-	-	-	-	-	-	-
(22)	Rio Bravo	(D) (E)	141	141	141	141	141	141	141	141	141	141	141	141	141	113	85	56	28	-	-	-
(23)	Valencia PPA	(D)	150	150	150	150	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(24)	Generic Hydrogen-Ready Thermal	(D) (F)	-	-	-	-	40	247	247	247	247	247	247	247	247	247	406	564	702	719	748	748
(25)	**Total Natural Gas/Hydrogen Resources (MW)**		968	968	968	968	1,007	1,065	1,065	1,065	924	924	924	924	924	813	860	908	934	840	869	869
(26)	Dale Burgett	(D)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	-
(27)	**Total Geothermal Resources (MW)**		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	-
(28)	Casa Mesa Wind	(C)	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	10	10
(29)	La Joya Wind 1	(C)	33	33	33	33	33	33	33	33	33	33	33	32	31	28	28	28	28	28	-	-
(30)	La Joya Wind 2	(C)	28	28	28	28	28	28	28	28	28	28	28	27	27	24	24	24	24	24	-	-
(31)	New Mexico Wind Energy Center	(C)	40	40	40	40	40	40	40	40	40	40	40	39	38	34	34	34	34	34	39	39
(32)	Red Mesa Wind Energy Center	(C)	21	21	21	21	21	21	21	20	20	20	20	20	-	-	-	-	-	-	-	-
(33)	Generic Wind	(C)	-	-	-	-	-	-	21	61	61	61	61	99	134	159	159	159	159	159	178	178
(34)	**Total Wind Resources (MW)**		132	132	132	132	132	132	154	193	193	193	193	227	239	255	255	255	255	255	226	226
(35)	PNM Existing Utility-Owned Solar	(C)	9	9	9	9	9	9	9	9	9	26	25	25	24	24	24	24	23	30	24	24
(36)	Arroyo Solar	(C)	17	17	17	17	17	17	17	16	16	49	47	47	46	45	45	45	44	57	53	52
(37)	Britton Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	7	7	7	7	9	9	9
(38)	Encino North Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	8	8	10	9	9
(39)	Encino Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	7	7	7	7	9	9	9
(40)	Jicarilla I Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	8	7	10	9	9
(41)	NMRD Solar	(C)	2	2	2	2	2	2	2	2	2	5	5	5	4	4	4	4	4	6	0	0
(42)	Route 66 Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	7	7	10	9	9
(43)	Solar Direct Solar I	(C)	3	3	3	3	3	3	3	3	3	8	8	8	7	7	-	-	-	-	-	-
(44)	Atrisco Solar	(C)	-	18	18	18	18	18	17	17	17	54	52	52	52	52	52	52	52	67	63	62
(45)	San Juan Solar	(C)	-	11	11	11	11	11	11	11	11	33	31	31	31	30	30	30	29	38	36	35
(46)	Sky Ranch I Solar	(C)	-	11	11	11	11	11	11	11	11	32	31	30	30	29	29	29	29	37	35	34
(47)	TAG I Solar	(C)	-	-	-	8	8	8	8	8	8	25	24	24	24	24	24	24	24	31	29	29
(48)	Community Solar	(C)	-	-	-	7	7	7	7	7	7	23	22	22	22	22	22	22	22	28	26	26
(49)	Quail Ranch Solar	(C)	-	-	-	6	6	6	6	6	6	18	17	17	17	16	16	16	16	21	20	19
(50)	Generic Solar	(C)	-	-	-	-	-	-	-	-	8	86	167	167	178	201	204	204	205	310	361	373
(51)	**Total Solar Resources (MW)**		46	86	85	106	105	105	104	103	111	399	467	466	474	493	488	487	486	672	692	697

Public Service Company of New Mexico
2023 Integrated Resource Plan
Most Cost Effective Portfolio (All Technologies Scenario)
Loads & Resources Table - Accredited Capacity

(52)	Arroyo BESS	(C)	127	127	127	124	124	122	122	122	118	95	95	95	95	95	94	94	94	79	79	78
(53)	Jicarilla I BESS	(C)	17	17	17	17	17	16	16	16	16	13	13	13	13	13	13	13	13	11	11	10
(54)	Atrisco BESS	(C)	-	254	254	249	249	245	243	243	236	191	191	191	191	189	189	189	188	158	158	156
(55)	San Juan BESS	(C)	-	85	85	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(56)	Sky Ranch I BESS	(C)	-	42	42	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(57)	Distribution BESS	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Quail Ranch BESS	(C)	-	-	-	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(59)	Route 66 BESS	(C)	-	-	-	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(60)	Sandia BESS	(C)	-	-	-	50	50	49	49	49	47	38	38	38	38	38	38	38	38	32	32	31
(61)	Sky Ranch BESS	(C)	-	-	-	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(62)	TAG I BESS	(C)	-	-	-	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(63)	Generic Battery (4hr)	(C)	-	-	-	184	184	290	320	320	421	340	340	340	340	453	472	472	494	527	537	566
(64)	Generic Long Duration Storage (24+hr)	(C)	-	-	-	-	-	-	-	95	190	190	190	190	190	190	190	190	190	190	190	190
(65)	**Total Energy Storage Resources (MW)**		**144**	**526**	**526**	**998**	**998**	**1,089**	**1,115**	**1,210**	**1,383**	**1,153**	**1,153**	**1,153**	**1,153**	**1,262**	**1,278**	**1,278**	**1,297**	**1,233**	**1,243**	**1,267**
(66)	**Generic Capacity Resources (MW)**		**508**	**293**	**420**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(67)	**Total Accredited Capacity (MW)**		**2,278**	**2,475**	**2,602**	**2,674**	**2,724**	**2,872**	**2,919**	**3,053**	**3,091**	**2,990**	**3,058**	**3,091**	**3,111**	**3,143**	**3,202**	**3,248**	**3,293**	**3,321**	**3,352**	**3,376**
(68)	**Reserve Margin (MW)**		100	348	368	380	394	426	432	552	574	448	481	472	457	457	466	477	479	484	490	493
(69)	**Reserve Margin (%)**		5%	16%	16%	17%	17%	17%	17%	22%	23%	18%	19%	18%	17%	17%	17%	17%	17%	17%	17%	17%

Notes
A. "Forecasted System Peak Demand" does not include impacts of energy efficiency, which is shown below as a load adjustment
B. "Net System Peak Demand" includes impacts of all load modifying reosurces, including energy efficiency
C. Accredited capacity for non-firm resources (renewables, storage) reported using "Effective Load Carrying Capability" (ELCC) convention
D. Accredited capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention
E. Firm capacity from natural gas units retiring by at end of 2039 assumed to decline over four years to allow gradual transition to carbon-free portfolio
F. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

Public Service Company of New Mexico
2023 Integrated Resource Plan
Existing Resources Only
Loads & Resources Table - Nameplate Capacity

Line No.	Nameplate Capacity (MW) Description	Notes	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
(1)	EUEA Energy Efficiency	(A)	37	63	85	85	85	85	82	82	82	82	45	42	42	19	19	-	-	-	-	-
(2)	Incremental Energy Efficiency	(A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(3)	**Total Energy Efficiency (MW)**		**37**	**63**	**85**	**85**	**85**	**85**	**82**	**82**	**82**	**82**	**45**	**42**	**42**	**19**	**19**	-	-	-	-	-
(4)	Peak Saver		11	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	Power Saver		22	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Peak Saver Extension		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	Power Saver Extension		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(8)	DR Expansion		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	**Total Demand Response (MW)**		**33**	**33**	**33**	**33**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	*Total Demand Response Additions (MW)*	*(B)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Four Corners		200	200	200	200	200	200	200	200	200											
(12)	**Total Coal Resources (MW)**		**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	-	-	-	-	-	-	-	-	-	-	-
(13)	Palo Verde Unit 1	(C)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(14)	Palo Verde Unit 2		134	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
(15)	Palo Verde Unit 3		134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
(16)	**Total Nuclear Resources (MW)**		**298**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**	**288**
(17)	Afton		235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	-	-	-
(18)	La Luz	(D)	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
(19)	Lordsburg	(D)	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
(20)	Luna		190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	-	-	-
(21)	Reeves		146	146	146	146	146	146	146	146	-	-	-	-	-	-	-	-	-	-	-	-
(22)	Rio Bravo		149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	-	-	-
(23)	Valencia PPA		155	155	155	155	155	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(24)	Generic Hydrogen-Ready Thermal	(D)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(25)	**Total Natural Gas Resources (MW)**		**1,002**	**1,002**	**1,002**	**1,002**	**1,002**	**846**	**846**	**846**	**700**	**700**	**700**	**700**	**700**	**700**	**700**	**700**	**700**	**126**	**126**	**126**
(26)	*Total Natural Gas Additions (MW)*	*(B)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(27)	Dale Burgett		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(28)	**Total Geothermal Resources (MW)**		**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**
(29)	Casa Mesa Wind		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(30)	La Joya Wind 1		165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	-
(31)	La Joya Wind 2		141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	-
(32)	New Mexico Wind Energy Center		200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
(33)	Red Mesa Wind Energy Center		102	102	102	102	102	102	102	102	102	102	102	102	-	-	-	-	-	-	-	-
(34)	Generic Wind		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(35)	**Total Wind Resources (MW)**		**658**	**658**	**658**	**658**	**658**	**658**	**658**	**658**	**658**	**658**	**658**	**658**	**556**	**556**	**556**	**556**	**556**	**556**	**556**	**250**
(36)	*Total Wind Additions (MW)*	*(B)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(37)	PNM Existing Utility-Owned Solar	(E)	151	150	149	147	146	145	144	143	142	142	141	140	139	138	137	136	135	134	134	113
(38)	Arroyo Solar	(E)	291	289	287	283	281	279	277	275	273	271	269	267	264	262	260	258	256	254	252	250
(39)	Britton Solar	(E)	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42	41	41
(40)	Encino North Solar	(E)	50	50	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42
(41)	Encino Solar	(E)	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42	41	41
(42)	Jicarilla I Solar	(E)	50	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42
(43)	NMRD Solar	(E)	28	28	28	28	27	27	27	27	27	26	26	26	26	26	25	25	25	25	25	1
(44)	Route 66 Solar	(E)	49	48	48	47	47	47	46	46	45	45	45	44	44	44	43	43	43	42	42	42
(45)	Solar Direct Solar I	(E)	48	47	47	46	46	46	45	45	45	44	44	43	43	43	-	-	-	-	-	-
(46)	Atrisco Solar	(E)	-	300	299	297	296	294	293	291	290	288	287	285	284	282	281	280	278	277	275	274
(47)	San Juan Solar	(E)	-	193	191	189	187	186	185	183	182	180	179	178	176	175	174	172	171	168	168	168
(48)	Sky Ranch I Solar	(E)	-	190	190	183	182	181	179	178	177	175	174	173	171	170	169	167	166	165	164	162
(49)	TAG I Solar	(E)	-	-	140	139	139	138	137	137	136	135	134	134	133	132	132	131	131	130	129	129
(50)	Community Solar	(E)	-	-	-	124	124	123	123	122	121	121	120	119	119	118	118	117	117	116	116	115
(51)	Quail Ranch Solar	(E)	-	-	-	100	99	99	98	98	97	97	96	96	95	95	94	94	93	93	92	92
(52)	Generic Solar	(E)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(53)	**Total Solar Resources (MW)**		**762**	**1,438**	**1,569**	**1,772**	**1,761**	**1,750**	**1,739**	**1,727**	**1,716**	**1,705**	**1,694**	**1,682**	**1,671**	**1,660**	**1,606**	**1,596**	**1,585**	**1,573**	**1,564**	**1,512**
(54)	*Total Solar Additions (MW)*	*(B)*	-	*683*	*820*	*1,032*	*1,026*	*1,020*	*1,014*	*1,008*	*1,002*	*997*	*991*	*985*	*979*	*973*	*967*	*961*	*955*	*948*	*944*	*940*

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Loads & Resources Table - Nameplate Capacity

Line No.	Nameplate Capacity (MW) Description	Notes	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
(55)	Arroyo BESS		150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
(56)	Jicarilla I BESS		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(57)	Atrisco BESS		-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
(58)	San Juan BESS		-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(59)	Sky Ranch I BESS		-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(60)	Distribution BESS		-	-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
(61)	Quail Ranch BESS		-	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(62)	Route 66 BESS		-	-	-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(63)	Sandia BESS		-	-	-	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
(64)	Sky Ranch BESS		-	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(65)	TAG I BESS		-	-	-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(66)	Generic Battery (4hr)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(67)	Generic Long Duration Storage (24+hr)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(68)	**Total Storage Resources (MW)**		**170**	**620**	**632**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**	**992**
(69)	*Total Storage Additions (MW)*	*(B)*	-	*450*	*462*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*	*822*
(70)	**Generic Capacity Resources (MW)**		**508**	**293**	**420**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(71)	**Total Installed Capacty (MW)**		**3,678**	**4,605**	**4,897**	**5,041**	**4,997**	**4,830**	**4,816**	**4,805**	**4,648**	**4,436**	**4,388**	**4,374**	**4,261**	**4,227**	**4,173**	**4,143**	**4,133**	**3,546**	**3,538**	**3,179**

Notes
A. "Installed capacity" of energy efficiency reflects peak load reductions
B. "Total Additions" are shown relative to 2023 capacity, do not account for retirements
C. Palo Verde Unit 1 capacity reflects ownership share only; leased capacity expired January 15, 2023
D. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel
E. Reported capacity for solar PV includes impacts of degradation

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Loads & Resources Table - Accredited Capacity

Line No.	Loads and Accredited Capacity (MW) Description		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
(1)	**Forecasted System Peak Demand (MW)**	**(A)**	**2,206**	**2,175**	**2,299**	**2,377**	**2,427**	**2,562**	**2,617**	**2,647**	**2,682**	**2,724**	**2,744**	**2,787**	**2,837**	**2,864**	**2,918**	**2,949**	**3,003**	**3,038**	**3,072**	**3,092**
(2)	EUEA Energy Efficiency		-28	-49	-65	-68	-68	-68	-66	-66	-66	-66	-36	-34	-34	-15	-15	-	-	-	-	-
(3)	Incremental Energy Efficiency		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4)	**Net System Peak Demand (MW)**	**(B)**	**2,178**	**2,127**	**2,234**	**2,309**	**2,359**	**2,494**	**2,552**	**2,581**	**2,616**	**2,658**	**2,708**	**2,754**	**2,803**	**2,848**	**2,902**	**2,949**	**3,003**	**3,038**	**3,072**	**3,092**
(5)	Peak Saver	(C)	8	8	8	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Power Saver	(C)	15	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	Peak Saver Extension	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(8)	Power Saver Extension	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	DR Expansion	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	**Total Demand Response (MW)**		**23**	**23**	**23**	**23**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Four Corners	(D)	160	160	160	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-
(12)	**Total Coal Resources (MW)**		**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	-	-	-	-	-	-	-	-	-	-	-
(13)	Palo Verde Unit 1	(D)	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
(14)	Palo Verde Unit 2	(D)	131	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
(15)	Palo Verde Unit 3	(D)	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
(16)	**Total Nuclear Resources (MW)**		**292**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**	**282**
(17)	Afton	(D) (E)	230	230	230	230	230	230	230	230	230	230	230	230	230	184	138	92	46	-	-	-
(18)	La Luz	(D) (F)	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
(19)	Lordsburg	(D) (F)	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
(20)	Luna	(D) (E)	184	184	184	184	184	184	184	184	184	184	184	184	184	147	111	74	37	-	-	-
(21)	Reeves	(D)	141	141	141	141	141	141	141	141	-	-	-	-	-	-	-	-	-	-	-	-
(22)	Rio Bravo	(D) (E)	141	141	141	141	141	141	141	141	141	141	141	141	141	113	85	56	28	-	-	-
(23)	Valencia PPA	(D)	150	150	150	150	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(24)	Generic Hydrogen-Ready Thermal	(D) (F)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(25)	**Total Natural Gas/Hydrogen Resources (MW)**		**968**	**968**	**968**	**968**	**968**	**818**	**818**	**818**	**677**	**677**	**677**	**677**	**677**	**565**	**454**	**343**	**232**	**121**	**121**	**121**
(26)	Dale Burgett	(D)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	-
(27)	**Total Geothermal Resources (MW)**		**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	-
(28)	Casa Mesa Wind	(C)	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	10	10
(29)	La Joya Wind 1	(C)	33	33	33	33	33	33	33	33	33	33	33	32	31	28	28	28	28	28	-	-
(30)	La Joya Wind 2	(C)	28	28	28	28	28	28	28	28	28	28	28	27	27	24	24	24	24	24	-	-
(31)	New Mexico Wind Energy Center	(C)	40	40	40	40	40	40	40	40	40	40	40	39	38	34	34	34	34	34	39	39
(32)	Red Mesa Wind Energy Center	(C)	21	21	21	21	21	21	21	20	20	20	20	20	-	-	-	-	-	-	-	-
(33)	Generic Wind	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(34)	**Total Wind Resources (MW)**		**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**128**	**105**	**96**	**96**	**96**	**96**	**96**	**49**	**49**
(35)	PNM Existing Utility-Owned Solar	(C)	9	9	9	9	9	9	9	9	9	26	25	25	24	24	24	24	23	30	24	24
(36)	Arroyo Solar	(C)	17	17	17	17	17	17	17	16	16	49	47	47	46	45	45	45	44	57	53	52
(37)	Britton Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	7	7	7	7	9	9	9
(38)	Encino North Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	8	8	10	9	9
(39)	Encino Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	7	7	7	7	9	9	9
(40)	Jicarilla I Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	8	7	10	9	9
(41)	NMRD Solar	(C)	2	2	2	2	2	2	2	2	2	5	5	5	4	4	4	4	4	6	0	0
(42)	Route 66 Solar	(C)	3	3	3	3	3	3	3	3	3	8	8	8	8	8	8	7	7	10	9	9
(43)	Solar Direct Solar I	(C)	3	3	3	3	3	3	3	3	3	8	8	8	7	7	-	-	-	-	-	-
(44)	Atrisco Solar	(C)	-	18	18	18	18	18	17	17	17	54	52	52	52	52	52	52	52	67	63	62
(45)	San Juan Solar	(C)	-	11	11	11	11	11	11	11	11	33	31	31	31	30	30	30	29	38	36	35
(46)	Sky Ranch I Solar	(C)	-	11	11	11	11	11	11	11	11	32	31	30	30	29	29	29	29	37	35	34
(47)	TAG I Solar	(C)	-	-	-	8	8	8	8	8	8	25	24	24	24	24	24	24	24	31	29	29
(48)	Community Solar	(C)	-	-	-	7	7	7	7	7	7	23	22	22	22	22	22	22	22	28	26	26
(49)	Quail Ranch Solar	(C)	-	-	-	6	6	6	6	6	6	18	17	17	17	16	16	16	16	21	20	19
(50)	Generic Solar	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(51)	**Total Solar Resources (MW)**		**46**	**86**	**85**	**106**	**105**	**105**	**104**	**103**	**103**	**313**	**300**	**299**	**296**	**292**	**284**	**283**	**281**	**362**	**330**	**324**

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(52)	Arroyo BESS	(C)	127	127	127	124	124	122	122	122	118	95	95	95	95	95	94	94	94	79	79	78
(53)	Jicarilla I BESS	(C)	17	17	17	17	17	16	16	16	16	13	13	13	13	13	13	13	13	11	11	10
(54)	Atrisco BESS	(C)	-	254	254	249	249	245	243	243	236	191	191	191	191	189	189	189	188	158	158	156
(55)	San Juan BESS	(C)	-	85	85	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(56)	Sky Ranch I BESS	(C)	-	42	42	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(57)	Distribution BESS	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Quail Ranch BESS	(C)	-	-	-	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(59)	Route 66 BESS	(C)	-	-	-	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(60)	Sandia BESS	(C)	-	-	-	50	50	49	49	49	47	38	38	38	38	38	38	38	38	32	32	31
(61)	Sky Ranch BESS	(C)	-	-	-	83	83	82	81	81	79	64	64	64	64	63	63	63	63	53	53	52
(62)	TAG I BESS	(C)	-	-	-	41	41	41	41	41	39	32	32	32	32	32	31	31	31	26	26	26
(63)	Generic Battery (4hr)	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(64)	Generic Long Duration Storage (24+hr)	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(65)	**Total Energy Storage Resources (MW)**		**144**	**526**	**526**	**813**	**813**	**800**	**795**	**795**	**772**	**624**	**624**	**624**	**624**	**618**	**616**	**616**	**613**	**516**	**516**	**511**
(66)	**Generic Capacity Resources (MW)**		**508**	**293**	**420**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(67)	**Total Accredited Capacity (MW)**		**2,278**	**2,475**	**2,602**	**2,490**	**2,466**	**2,302**	**2,296**	**2,295**	**2,131**	**2,032**	**2,020**	**2,015**	**1,989**	**1,859**	**1,737**	**1,625**	**1,510**	**1,383**	**1,304**	**1,287**
(68)	**Reserve Margin (MW)**		100	348	368	181	107	-192	-255	-286	-485	-626	-688	-739	-814	-989	-1,165	-1,324	-1,493	-1,656	-1,768	-1,805
(69)	**Reserve Margin (%)**		5%	16%	16%	8%	5%	-8%	-10%	-11%	-19%	-24%	-25%	-27%	-29%	-35%	-40%	-45%	-50%	-54%	-58%	-58%

Notes
A. "Forecasted System Peak Demand" does not include impacts of energy efficiency, which is shown below as a load adjustment
B. "Net System Peak Demand" includes impacts of all load modifying reosurces, including energy efficiency
C. Accredited capacity for non-firm resources (renewables, storage) reported using "Effective Load Carrying Capability" (ELCC) convention
D. Accredited capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention
E. Firm capacity from natural gas units retiring by at end of 2039 assumed to decline over four years to allow gradual transition to carbon-free portfolio
F. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

Appendix B. Load Forecast Details

This appendix provides details surrounding the assumptions and development of our load forecast. Table B-1 summarizes the general assumptions used in each of the different load forecast scenarios developed for this supplemental analysis. Table B-2 and B-3 show our energy and peak demand forecasts across the range of scenarios and sensitivities considered in this supplemental analysis. These forecasts are shown in two ways: (1) with the effects of future energy efficiency embedded, and (2) with an adjustment to remove the effects of future energy efficiency to allow its treatment as a resource in the analysis. The 2023 IRP provides details behind the load forecasting approach (including data required by the IRP Rule).

Table B-1. Overview of assumptions used in load forecast future and the sensitivity performed for this supplemental analysis.

Future	Economic Forecast	Economic Dev Loads	BTM Solar	EV Adoption	Building Elec	TOU Pricing Impacts	Weather
Current Trends & Policy New	Mid	Revised	Mid	Revised	Mid	No	Normal
Sensitivity	**Economic Forecast**	**Economic Dev Loads**	**BTM Solar**	**EV Adoption**	**Building Elec**	**TOU Pricing Impacts**	**Weather**
High Economic Growth New	Mid	**High Growth + Stable**	Mid	Mid	Mid	No	Normal

Table B-2. Annual peak demand forecasts under various futures and sensitivities (MW)

Peak Demand - EE Embedded (MW)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Current Trends & Policy New	2,170	2,112	2,214	2,274	2,306	2,417	2,455	2,464	2,477	2,497	2,537	2,578	2,609	2,643	2,692	2,728	2,767	2,786	2,810	2,831
High Economic Growth New	2,170	2,110	2,215	2,342	2,470	2,645	2,778	2,865	2,947	3,040	3,146	3,258	3,363	3,470	3,590	3,696	3,803	3,895	3,994	4,074

Peak Demand - EE Removed (MW)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Current Trends & Policy New	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
High Economic Growth New	2,206	2,173	2,300	2,445	2,593	2,791	2,943	3,052	3,158	3,273	3,363	3,480	3,603	3,704	3,829	3,930	4,052	4,159	4,269	4,348

Table B-3. Annual energy demand under various futures and sensitivities (GWh)

Annual Energy - EE Embedded (GWh)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Current Trends & Policy New	10,018	10,339	10,982	11,372	11,501	12,405	12,489	12,517	12,518	12,534	12,562	12,614	12,711	12,825	12,930	12,999	13,075	13,151	13,211	13,267
High Economic Growth New	10,018	10,350	11,027	11,938	12,915	14,335	15,152	15,813	16,382	16,980	17,561	18,166	18,840	19,549	20,186	20,816	21,454	22,116	22,729	23,335

Annual Energy - EE Removed (GWh)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Current Trends & Policy New	10,101	10,500	11,222	11,695	11,910	12,906	13,081	13,202	13,295	13,408	13,429	13,552	13,726	13,841	14,004	14,055	14,186	14,322	14,434	14,470
High Economic Growth New	10,101	10,511	11,267	12,263	13,329	14,841	15,749	16,509	17,176	17,871	18,455	19,141	19,893	20,602	21,298	21,910	22,606	23,326	23,992	24,578

The new load forecasts are based on updates to the methodology for forecasting, updates to the historical data, an updated economic development forecast and improvement in electrical vehicle (EV) forecasting process for both the demand and energy forecasts. The following summarizes these changes as well as their impacts in comparison to the 2023 IRP forecasts.

10-year weather normalization

In preparation of the 2024 load forecast annual update, the load forecasting department determined a shift in methodology was necessary to move to a 10-year average weather normalization from a 20-year average to incorporate effects of more extreme weather. Previous load forecasts used for IRP purposes considered 20-year weather normalization due to the longer-term planning timeframe required in the IRP Rule. Forecasts based on 20-year historical weather data smooth out extreme weather events that have occurred in recent years which bring about under/over forecasting of the system peak demand and energy. If not accounted for properly, resource additions needed to meet system needs may be accelerated or delayed inefficiently. The move to a 10-year weather normalization allows more recent weather patterns/effects to predict future energy and demand needs. The impact of this change produces a slightly hotter peak day which results in an increase of the peak demand forecast by 50 MW in contrast to a 20-year normal average methodology. This methodology change is expected to improve forecasting for peak demand and decrease the divergence of the peak forecast variance seen over the past two years (see Table B-4.) For the energy forecast, the 10-year weather normalization results in a slight increase in energy sales for weather sensitive customer classes.

Table B-4. Comparison of peak demand forecasts to actual peak demands

	2019	2020	2021	2022	2023	2024
Actual Peak Demand (MW)	1,853	1,931	1,940	2,072	2,131	2,073
2017 IRP Forecast (MW)	1,926	1,961	1,999	2,033	2,053	2,071
2017 IRP Forecast Variance (%)	3.9%	1.6%	3.0%	-1.9%	-3.7%	-0.1%
2020 IRP Forecast (MW)	n/a	n/a	1,956	1,996	2,006	2,015
2020 IRP Forecast Variance (%)	n/a	n/a	0.8%	-3.7%	-5.9%	-2.8%

Composition of the Load Forecast

PNM develops projections for residential, small power, general power, and large power customer classes, including usage per customer and the number of customers in each class using historical sales and hourly load shapes. For the 2023 IRP, the forecast relied upon actual data through June 2022 in preparation for all the studies required to complete the IRP analysis. For the new forecast completed in May of 2024, the underlying historical data was updated through December 2023, incorporating an additional two summer peak periods. PNM observed record peak demands in 2022 and 2023. Notably, the July 2023 average summer peak demand was the highest ever recorded in the Albuquerque-metro area, which included the current all-time retail peak demand record achieved on July 18, 2023 (2,131 MW). This update revealed moderate increases in residential usage and strong growth in the commercial sectors over the 2023 IRP forecast. The

utilization of a 10-year normal period accounts for approximately 20% of the overall increase in the new forecast for peak demand. See Table B-5 below for more details.

Table B-5. Impacts of the new load forecast by customer class

Sector	% Change in Peak Demand Forecast from the 2023 IRP			
	2024	2026	2029	2042
Residential	6.4%	8.3%	13.5%	6.9%
Commercial	10.4%	12.6%	14.8%	28.1%
Industrial	(6.7%)	2.5%	7.4%	11.0%
Other	(0.9%)	(4.4%)	(5.4%)	(41%)
Total System	3.4%	7.1%	10.9%	11.6%

Economic Development

PNM has seen a steady number of inquiries for potential new customers exploring development or establishment in PNM's service territory. Considerations of these discussions as well as the increases to existing customers loads, based on their anticipated needs, have compelled PNM to adjust its expectations of the HEG future originally contemplated in the 2023 IRP. Some of these changes are reflected in the new base forecast; however, prospective new growth necessitates the consideration of a higher economic development scenario. Consequently, supplemental analysis of the HEG New forecast will be necessary to consider the potential for economic development at a higher level studied in the 2023 IRP. This HEG New future is shown in Figure 1B. with the solid blue line.

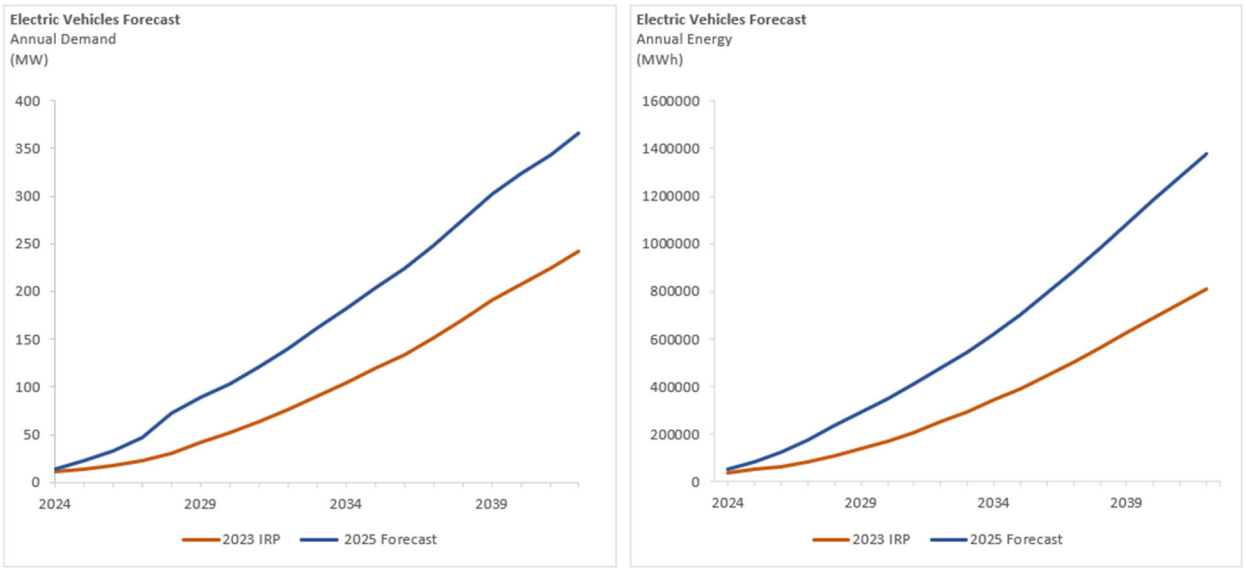
Electrical Vehicle Forecast

As discussed in the 2023 IRP, PNM is beginning to incorporate electrification-driven increases in the load forecast on a long-term planning basis. Efforts to improve this process and develop a balanced forecasting basis for EV adoption has prompted PNM to research other materials to capture the gains that EV are making. As a part of this effort, in late 2023 PNM started to account for not only national but regional and local EV adoption rates provided by the Electric Power Research Institute (EPRI) on a periodic basis. The EPRI data[1] serves mainly as a guideline to inform the EV adoption rates in New Mexico, as well as the increases to load based on the expected energy use. This is a feature that became available for use in the updated 2024 load forecast. Hence, the forecast data for EVs represents an enhancement to the prior EV forecast. Finally, the load growth expectations from EPRI are calibrated by Itron through energy use estimates for EV adoption in the PNM territory and are added to the group of end uses that are

[1] The EPRI study commissioned by PNM in 2023 provided estimates of charging energy use for passenger vehicles, light-duty commercial vehicles, and mid/heavy-duty vehicles.

not weather sensitive. The changes to the load forecast on a demand and energy basis are shown in Figure 1B.

Figure 1B. Comparison of 2023 IRP and new Electrical Vehicle Forecast



Forecast Adjustment for Stable Economic Development Loads

Similar to the approach taken in the 2023 IRP, PNM adjusted the load forecast to reflect increases for potential large economic development ("ED") projects. This load increase has been labeled as Stable ED impact and reflects: 1) ED projects that have a high likelihood of materializing over the planning period, and 2) the assumption that governmental policies will encourage domestic industries, previously abroad, to relocate to the US. The Stable ED load adjustment was applied only to the High Economic Growth New future. The impacts for Stable ED on the HEG New future are shown in Table B-6.

Table B-6. Impact of Stable Economic Development adjustment on HEG future

	Annual Energy (GWh)			Peak Demand (MW)		
Metric	**2023**	**2042**	**CAGR %**	**2023**	**2042**	**CAGR %**
High Economic Growth New (before Stable ED adjustment)	10,101	15,739	2.24	2,306	3,247	1.73
High Economic Growth New (after Stable ED adjustment)	10,101	24,578	4.55	2,306	4,348	3.22

Load Forecast Summary

Using the methodology described in the 2023 IRP the load forecasts were developed to encompass a wide range of possibilities. A summary of the changes in assumptions (from the

2023 IRP) for the load forecast futures used in this supplemental analysis is found in Table B-7. below. Additional details regarding the demand and energy forecasts are found in Tables B-2. and B-3.

Table B-7. Summary of assumptions used in load forecast futures.

Future	Economic Forecast	Economic Dev Loads	BTM Solar	EV Adoption	Building Elec	TOU Pricing Impacts	Weather
Current Trends & Policy New (CTP New)	Mid	New	Mid	New	Mid	No	10 yr. Normal
High Economic Growth New (HEG New)	Mid	High Growth + Stable ED	Mid	New	Mid	No	10 yr. Normal

Appendix C. Analytical Approach

Scenario Analysis Framework

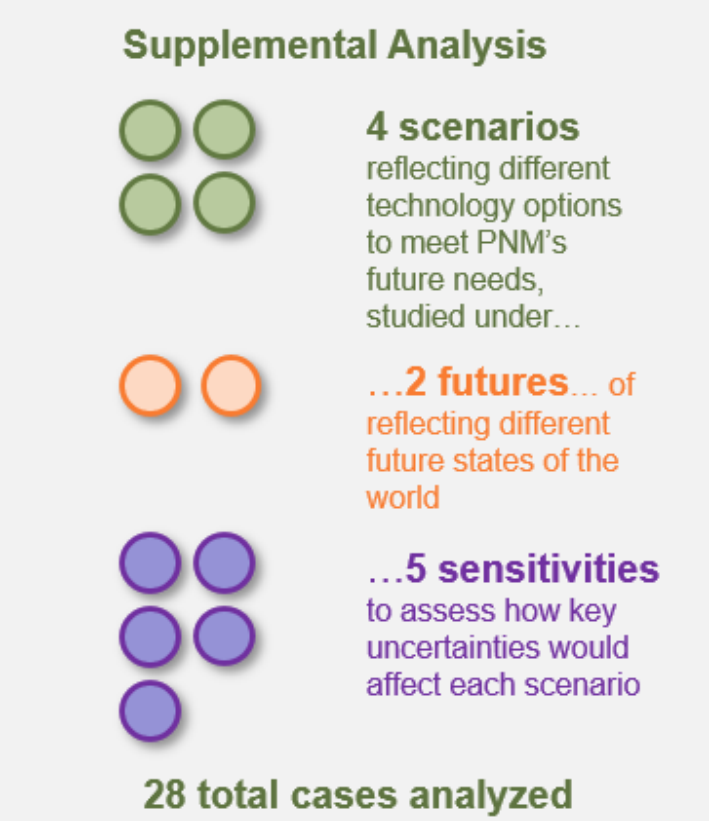
PNM's framework of scenarios, futures, and sensitivities serve to focus the analysis so that modeling results provide insight to the most important questions. This section describes how each of these pieces fit into the analysis, and what specific scenarios, futures, and sensitivities are tested.

For this supplemental analysis, PNM reviewed scenarios that were developed through the 2023 IRP process and evaluated the results to determine whether all scenarios would need to be re-evaluated. Of the six scenarios analyzed in the 2023 IRP, two scenarios were then screened out based upon the following:

Base Technologies, which limits new supply-side investments exclusively to variable renewable and storage resources, resulted in costs that were significantly higher than any of the other portfolios studied in the 2023 IRP. Incurring such high costs on behalf of customers would be irresponsible when lower cost options are available today; therefore, this scenario was not given further consideration; and Base Technologies + Electrolysis, which includes new hydrogen electrolysis infrastructure in the early 2030s, was not selected as the MCEP in the 2023 IRP due to the remaining unresolved questions regarding the infrastructure needs to support hydrogen deployment on a relatively short timescale and federal tax credits. While this scenario produced the lower cost results in the 2023 IRP, the low technology readiness level for hydrogen electrolysis and storage at grid scale eliminated this scenario from consideration in the supplemental analysis. PNM should remain active in exploring the viability of this scenario and technology in future IRPs.

The remaining 4 scenarios were then tested under several futures and sensitivities, which is illustrated in Figure 1C. The framework of scenarios, futures, and sensitivities ensures that the choice of MCEP is robust in a variety of futures and mitigates risks explored in sensitivities.

Figure 1C. Diagram of scenario analysis process



Scenarios

Supplemental Portfolio Analysis

The list of the four scenarios investigated in this supplemental analysis are shown in Table C-1, along with brief descriptions of their assumptions and purposes. Additional detail behind the rationale for the definition and design of each of these scenarios is discussed in Section 5 of PNM's 2023 IRP, following discussion of results of analysis from Phases 1 and 2.

Table C-1. Scenarios considered in supplemental analysis.

ID	Name	Description & Rationale for Inclusion
1	Base Technologies & Long-Duration Storage	Requested by stakeholders
2	Base Technologies & Hydrogen Ready CTs	Referent to 2020 IRP "Technology Neutral" scenario Least cost scenario among Stage One scenarios reliant exclusively on mature technologies
3	Base Technologies, Hydrogen-Ready CTs, and Long Duration Storage	Combination of Scenarios 2 and 3 Created to understand if synergies exist across limited range of technologies
4	All Resource Options	Combination of Scenarios 1 through 4 Created to understand if synergies exist across greater range of technologies

The set of technologies considered in each scenario is the primary determinant of the differences among them; Table C-2. shows the specific technology options considered in each of the different scenarios.

Table C-2. Resource options considered across scenarios.

Category	Resource Option	1	2	3	4
Demand-Side Resources	Energy Efficiency	✓	✓	✓	✓
	Demand Response	✓	✓	✓	✓
Renewable Resources	Solar PV	✓	✓	✓	✓
	Wind	✓	✓	✓	✓
Storage Resources	Lithium-Ion	✓	✓	✓	✓
	Flow	✓	-	✓	✓
	Pumped Hydro	✓	-	✓	✓
	Compressed Air	✓	-	✓	✓
	Liquid Air	✓	-	✓	✓
	Thermal	✓	-	✓	✓
	Iron-Air	✓	-	✓	✓
	H_2 Electrolysis	-	-	-	-
Thermal Resources	H_2-Ready CTs	-	✓	✓	✓
	Linear Generator	-	-	-	✓
	CCS Retrofit	-	-	-	✓

Futures

A **future** consists of a set of forecasts and projections that describe presumed combinations of potential system, market, and policy conditions during a 20-year planning horizon. The different forecast components that define a future can be found in the first column Table C-3. These range from customer-related factors including load forecast and adoption of end use electrification to broader factors such as the prices of gas, electricity, CO2, and technology capital costs.

Generally, PNM is not able to predict with certainty which future becomes reality. The **"Current Trends & Policy New"** future reflects the best estimates of the future state of the system and energy landscape based on knowledge at the time of the IRP's development. Specifically, in this future, PNM assumes:

- Continued economic and population growth within PNM's service territory consistent with trends as forecast by Woods and Poole, as well as modest levels of incremental customer solar and electrification.
- Future commodity pricing assumptions based on projections provided by PACE Global that are intended to represent a most likely outcome in gas and electric markets.
- Technology pricing and future technology cost declines developed based on bids provided to PNM and NREL's 2022 Annual Technologies Baseline (ATB); and
- Federal tax credits established by the Inflation Reduction Act available throughout the duration of the planning period (except for the 45V tax credit for hydrogen production, which is assumed to expire after 2032 as currently legislated).

The **"High Economic Growth New"** future reflects an alternative assumption of more aggressive future growth of the New Mexico economy. In addition to driving an increase in the growth of electric demands, this future assumes that rapid economic growth also leads to greater levels of customer adoption of solar resources and electric vehicles. In combination, these factors increase demand while reshaping daily usage patterns.

Table C-3. Definitions of Futures based on key assumptions.

Assumption	Current Trends & Policy New	High Economic Growth New
Load Forecast	Mid	**High**
BTM Solar Forecast	Mid	**High**
EV Adoption Forecast	Mid	**High**
Economic Development Forecast	New	**High Growth + Stable ED**
Gas Price Forecast	Mid	Mid
Carbon Price Forecast	Mid	Mid
Technology Cost Forecast	Mid	Mid

Sensitivities

A **"sensitivity"** is an analysis of the impact of varying a single input assumption within a defined scenario or future. The adjustment of a single assumption defines the impact of critical uncertainties or decision points. The sensitivities identify the key risk factors to the portfolio, quantifying the impact each has on the expected cost and selection of resources identified in each plan. Table C-4. lists the variables examined in the sensitivity analysis and the default assumptions for each under the New Current Trends & Policy Future.

Table C-4. Sensitivities modeled in the supplemental analysis.

Category	Sensitivity	Notes
Load Forecast	New CTP	Revised Load Forecast
	Hight Economic growth	Revised Load Forecast with Aggressive Economic development
Technology Costs	High Technology Costs	Quantifies impacts of higher and lower future cost trajectories for solar, wind, and energy storage upon resource selection and cost
	Low Technology Costs	
Commodity Prices	High Gas Prices	Quantifies impacts of higher and lower future prices for natural gas upon resource selection and cost
	Low Gas Prices	
Miscellaneous	10-yr Tax Credit Exp.	Explores impacts of a sooner expiration date for IRA tax credits

Appendix D. Reliability Analysis

Timing of Loss of Load Risk

Today, the most prevalent periods of reliability risk still occur in the late summer evenings, as the sun sets and demand for power is still high. As the system evolves, these patterns of loss of load risk will start to shift later in the evening and eventually may migrate to the winter season. Figure 1D. shows the incidence of loss of load segmented by month and time of day in the All Technologies scenario in 2040. In this scenario, the predominant periods of loss of load risk are (1) in the summer evenings, stretching all the way to the early morning hours; and (2) in the winter mornings before sunrise. The incidence of extended windows of loss of load risk in both periods is a result of the system's high degree of reliance on energy storage; in periods when loads are relatively high and renewable output is relatively low (i.e. outside of daylight hours), system reliability is dependent on the state of charge of energy storage resources. When the amount of energy stored in energy storage devices is exhausted, loss of load is the result. The timing of loss of load risk observed across the other scenarios is similar. In all cases, the summer overnight period and winter early morning period represent the times of year that are most likely to present reliability challenges.

Figure 1D. 2040 Share of loss of load hours by month and time of day (All Tech scenario)

Month	Hour of Day (MST)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0%	0%	0%		0%	2%	10%	9%															0%	0%
2				0%	1%	2%	4%	3%																
3																								
4																								
5																								
6																								
7			0%	1%	1%	1%													0%	1%	1%	0%		0%
8			0%	0%	0%	1%	1%													0%				
9	1%																			1%	1%	0%	1%	1%
10																								
11																								
12			1%	1%	2%	9%	25%	19%																

Alternative Reliability Metrics

Additional reliability metrics can help to characterize the nature of reliability risks when portfolios exhibit similar LOLE. While the LOLE indicates the frequency of unserved energy events, it only provides limited information about magnitude or duration. Metrics such as Expected Unserved Energy ("EUE") is useful to determine magnitude and Loss of Load Hours ("LOLH"). Table D-1. And D-2. Report a more complete set of reliability metrics across all scenarios.

Table D-1. 2032 Loss of load expectation across the four scenarios

Metric	Load Forecast	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
Loss of Load Expectation (LOLE, days/yr.)	CTP New	0.04	0.03	0.06	0.04
Expected Unserved Energy (EUE, MWh/yr.)	CTP New	7	5	11	8
Loss of Load Hours (LOLH, hrs./yr.)	CTP New	0.09	0.06	0.15	0.10

Table D-2. 2040 Loss of load expectation across all four scenarios

Metric	Load Forecast	Base Tech + LDES	Base Tech + CT	Base + LDES + CT	All Tech
Loss of Load Expectation (LOLE, days/yr.)	CTP New	0.10	0.09	0.07	0.08
Expected Unserved Energy (EUE, MWh/yr.)	CTP New	62	19	11	13
Loss of Load Hours (LOLH, hrs./yr.)	CTP New	0.31	0.44	0.19	0.24

The difference in performance between portfolios is also apparent in the size and duration of events experienced. Figure 2D. compares the frequency of events in the Base Technologies + LDES and All Technologies scenarios by their respective durations (in hours) and amount of load that is unserved during a specific event. As shown in Figure 2D, loss of load events in the All Technologies scenario (right) tends to be shorter in duration and less severe than in the Base Technologies + LDES scenario (left). Specifically, in the All Technologies scenario, 90% of events are projected to last three hours or less and require less than 500 MWh of load shed; in the Base Technologies + LDES, only 57% of events fall within this range. At the other end of the spectrum, 8% of events in the Base Technologies + LDES scenario result in over 2,000 MWh of load shed, while almost no events in the All Technologies scenario exceed this threshold.

The reliability analysis shows that portfolios with higher quantities of firm resources tend to lead to lower overall unserved energy and reliability events with smaller magnitude and shorter duration. This indicates that new firm resources are an important part of the portfolio not only because of the cost savings they produce but also because of their impact on the system's reliability performance over the broad range of potential operating conditions.

Furthermore, these findings shed light on the importance of critically evaluating the merits of reliability standards. Both the Base Technologies + LDES and All Technologies scenarios meet same frequency of loss load (LOLE of approximately 0.1 days per year) but yield different durations and magnitudes of loss of load events.

Figure 2D. Base Technologies + LDES vs All Technologies scenarios: frequency of reliability events by duration and unserved energy.

Base Technologies + LDES Scenario

Unserved energy per event (MWh)	Event Duration (hours) 1	2	3	4	5	6	7	8	9	10
0-250	20%	21%	4%	0%						
250-500	0%	5%	8%	1%						
500-750		0%	4%	4%	2%					
750-1000			3%	1%	2%	1%				
1000-1250			1%	3%	0%	0%				
1250-1500				0%	2%	2%				
1500-1750				0%	0%	1%	0%	0%		
1750-2000				1%	1%	1%			0%	
Over 2000					2%	2%	0%	2%	0%	1%

57% of events are 3 hours or less & smaller than 500 MWh

8% of events result in more than 2,000 MWh of load shed

All Technologies Scenario

Unserved energy per event (MWh)	Event Duration (hours) 1	2	3	4	5	6	7	8	9	10
0-250	23%	45%	13%							
250-500	0%	3%	6%							
500-750		1%	1%	3%	1%	1%				
750-1000				1%	1%	1%				
1000-1250				1%						
1250-1500				1%						
1500-1750										
1750-2000										
Over 2000										

90% of events are 3 hours or less & smaller than 500 MWh

Appendix E. Sensitivity Analysis

Sensitivity Results

Various load forecasts are applied to the CTP New future. These sensitivities assess the risks and impacts of individual forecast elements on the portfolio, including the resulting costs, environmental impacts, and reliability outcomes. Table E-3. and E-4, along with Figure 1E, display each sensitivity's NPV, present value of total emissions, and the range of portfolio builds for specific technologies across all sensitivities.

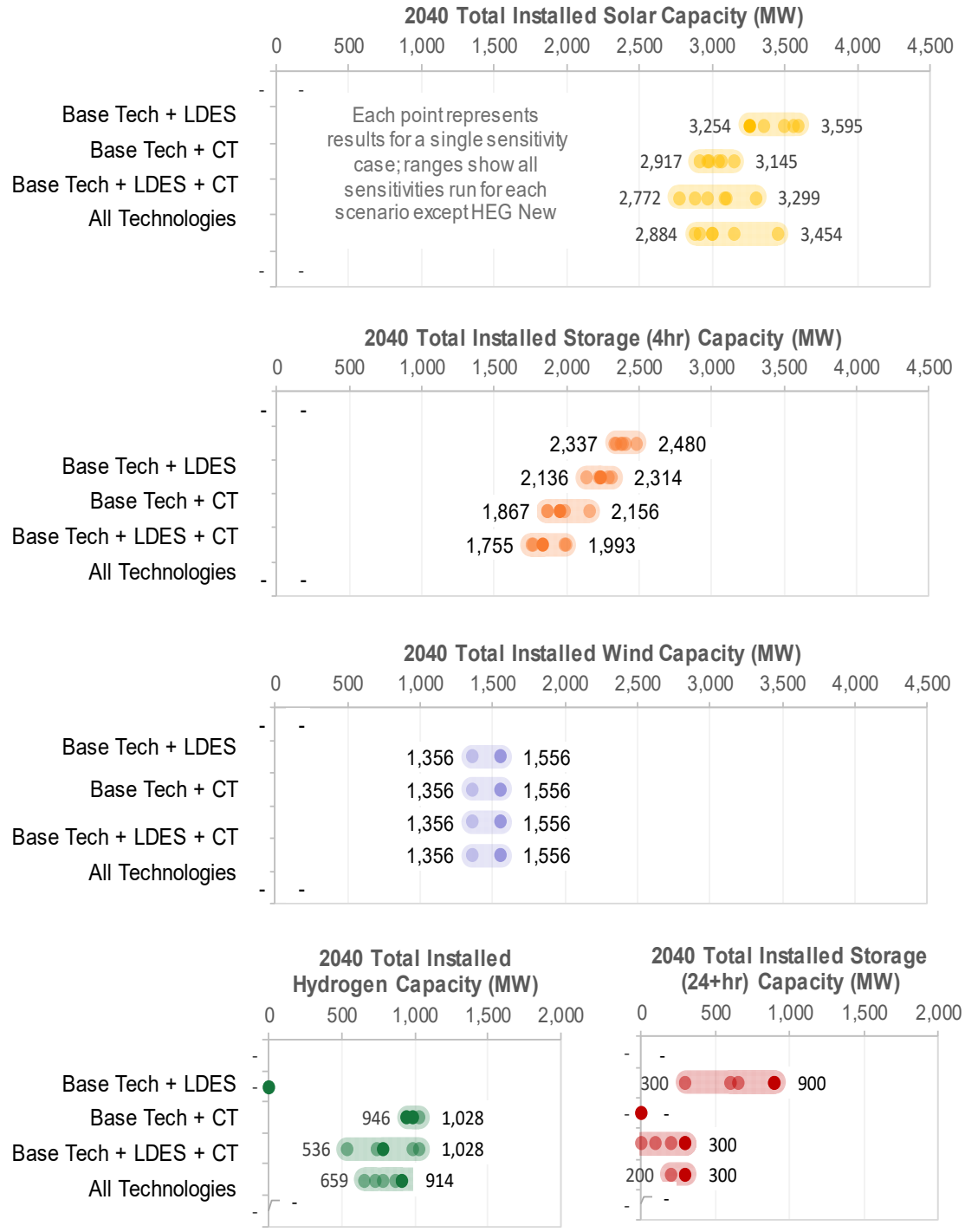
Table E-3. NPV for all sensitivities in $MM

Sensitivity	Base Tech + LDES	Base Tech + CT	Base Tech + LDES + CT	All Technologies
CTP New	$11,987	$10,882	$11,111	$10,763
High NG	$12,020	$11,187	$11,292	$10,959
High Tech Costs	$11,980	$11,399	$11,287	$11,106
Low NG	$11,804	$10,676	$10,583	$10,692
Low Tech Costs	$10,606	$10,623	$10,366	$10,386
High Economic Growth New	$18,303	$16,553	$16,093	$15,717
Tax credit 10-yr exp.	$12,436	$11,111	$11,409	$11,040

Table E-4. NPV Carbon Emissions for all sensitivities in Millions of Tons of CO2

Sensitivity	Base Tech + LDES	Base Tech + CT	Base Tech + LDES + CT	All Technologies
CTP New	15.10	16.67	16.30	15.04
High NG	14.71	16.70	15.62	15.22
High Tech Costs	15.83	16.73	16.33	15.06
Low NG	15.22	17.00	16.60	17.72
Low Tech Costs	15.68	16.82	16.22	14.79
High Economic Growth New	16.81	20.66	19.57	18.01
Tax credit 10-yr exp.	15.93	16.26	16.16	14.87

Figure 1E Total installed capacity ranges in 2040 across sensitivities



These results bolster PNM's confidence in the findings of the supplemental analysis and offers additional insights. Specifically:

In nearly all sensitivities, scenarios with the widest range of resource options yield the most favorable cost outcomes. Among the scenarios modeled, the All Technologies and Base Technologies + LDES + CT scenarios consistently show the lowest costs. Both scenarios include long-duration storage and hydrogen-ready CTs, along with solar, wind, storage, and DSM.

Scenarios with the widest range of resource options not only stand out for its cost-effectiveness but also for its environmental benefits, maintaining the lowest value of carbon emission output over time when compared to the other scenarios modeled. This ensures that the 2032 ETA carbon intensity requirement of less than 200 lbs/MWh per year is comfortably achieved. Additionally, it ensures a high level of reliability, with a LOLE of approximately 0.08 and EUE levels lower than most other scenarios. The duration of EUE events exceeding five hours is also significantly reduced in the All Technologies scenario, highlighting the robustness and efficiency in meeting energy demand for scenarios with a wide range of technologies.

The costs of fuel and carbon will decline as a portion of PNM's revenue requirement over time. As PNM transitions to a portfolio that eliminates reliance on carbon-emitting fossil fuels, these costs will decrease. Beyond 2030, as the portfolio's carbon intensity and fuel consumption decline, fuel and carbon prices will have a smaller impact on overall portfolio costs, despite future price uncertainties.

Appendix F. Summary Results of Each Portfolio

This appendix provides detailed summaries of the results of each scenario modeled in a standardized and consistent format. For scenarios evaluated in Phase 3, the tables in this section also explicitly show the impacts of the final reliability adjustments made to portfolios based on SERVM round-trip modeling (results included in the body of the report correspond to portfolios *after* final reliability adjustments):

The Four scenarios under the CTP future were simulated in SERVM in 2032 and 2040 to evaluate how closely they aligned with the LOLE standard of 0.1 days per year.
All Cases except the Base Technology with Long Duration Storage had 4-hour storage added in 2040.

Base Technology with Long Duration Storage Scenario required more 4-hour battery to be removed in 2032 than was available to be modified in the capacity expansion. So as a proxy the 300 MW of 4hour battery storage that was constructed was removed in 2032 and added back in 2040 to replicate the removal of resources observed in the SERVM analysis. This proxy did not match the SERVM calculations.

Table F-1. Reliability adjustments applied to Phase 3 scenarios based on SERVM analysis.

Phase 3 Scenario	Adjusted 2032 4 Hour Storage Capacity (MW)	Adjusted 2040 4 Hour Storage Capacity (MW)	Adjustment to PVRR ($ millions)
All – Technology - CTP	0	0	0
All – Technology – CTP - Stable ED High Load	0	1,198[1]	228
Base Technologies - CTP + all LDES + CT	0	0	0
Base Technologies – CTP + all LDES + CT - Stable ED High Load	0	1062[1]	193
Base Technologies – CTP + CT	0	0	0
Base Technologies – CTP + CT- Stable ED High Load	0	1,484[1]	293
Base Technologies - CTP + all LDES	0	0	0
Base Technologies – CTP + all LDES	-300[1, 2]	300[1, 2]	-336

[1] SERVM analysis was re-run prior to the completion of the Material Event Report and found these quantities were slightly less than what is shown in this appendix. Since it did not significantly change the outcome and trends of these numbers, simulations were not re-run. The SERVM analysis is a check to see how portfolios and their composition change the 16% reserve margin and a .1 LOLE portfolio performance.
[2] Base Technology with Long Duration Storage did not have enough 4-hour battery being constructed in 2032 to remove it out of the capacity expansion plan during this analysis. Since SERVM indicated that

capacity needed to be remove in 2032 (- 772 MW) and added back in 2040 (123 MW), Removing all the 4-hour storage in 2032 was removed and then added back in 2040 as a proxy.

Table F-2. Index of Detailed Scenario Results

Page	Phase	Scenario	Future	Sensitivity
51	Phase 3	All - Technology	Current Trends and Policy	CTP
52	Phase 3	All - Technology	Current Trends and Policy	High Natural Gas
53	Phase 3	All - Technology	Current Trends and Policy	High Technology Costs
54	Phase 3	All - Technology	Current Trends and Policy	Low Natural Gas
55	Phase 3	All - Technology	Current Trends and Policy	Low Technology Costs
56	Phase 3	All - Technology	Current Trends and Policy	Stable ED (High Load Case)
57	Phase 3	All - Technology	Current Trends and Policy	Tax credit 10-yr exp.
58	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	CTP
59	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	High Natural Gas
60	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	High Technology Costs
61	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	Low Natural Gas
62	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	Low Technology Costs
63	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	Stable ED (High Load Case)
64	Phase 3	Base Technologies + all LDES + CT	Current Trends and Policy	Tax credit 10-yr exp.
65	Phase 3	Base Technologies + CT	Current Trends and Policy	CTP
66	Phase 3	Base Technologies + CT	Current Trends and Policy	High Natural Gas
67	Phase 3	Base Technologies + CT	Current Trends and Policy	High Technology Costs
68	Phase 3	Base Technologies + CT	Current Trends and Policy	Low Natural Gas
69	Phase 3	Base Technologies + CT	Current Trends and Policy	Low Technology Costs
70	Phase 3	Base Technologies + CT	Current Trends and Policy	Stable ED (High Load Case)
71	Phase 3	Base Technologies + CT	Current Trends and Policy	Tax credit 10-yr exp.
72	Phase 3	Base Technologies + all LDES	Current Trends and Policy	CTP
73	Phase 3	Base Technologies + all LDES	Current Trends and Policy	High Natural Gas
74	Phase 3	Base Technologies + all LDES	Current Trends and Policy	High Technology Costs
75	Phase 3	Base Technologies + all LDES	Current Trends and Policy	Low Natural Gas
76	Phase 3	Base Technologies + all LDES	Current Trends and Policy	Low Technology Costs
77	Phase 3	Base Technologies + all LDES	Current Trends and Policy	Stable ED (High Load Case)
78	Phase 3	Base Technologies + all LDES	Current Trends and Policy	Tax credit 10-yr exp.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	CTP
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,763 million
20-Year NPV Carbon Emissions:	11.92 million tons
20-Year NPV Water Consumption:	6.27 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	17%	17%	21%	21%	17%	18%	17%	16%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	276	247	224	139	36	29	21	16	7	6	8	9	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,257	1,101	1,101	955	955	955	955	955	955	1,119	1,283	1,424	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	867	898	898
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,757	1,749	1,872	2,203	2,675	2,667	2,725	2,858	2,824	2,816	2,808	3,000	3,322	3,356
Wind	MW	658	658	658	658	658	658	858	1,058	1,058	1,058	1,058	1,258	1,356	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,347	1,387	1,387	1,526	1,526	1,526	1,526	1,526	1,711	1,743	1,743	1,782	1,993	2,012	2,077
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	100	200	200	200	200	200	200	200	200	200	200	200	200
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	235	258	280	260	262	280	274	279	274	288	304	315	314
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,724**	**5,818**	**6,130**	**6,368**	**6,521**	**6,974**	**7,167**	**7,341**	**7,853**	**8,020**	**8,171**	**8,358**	**8,220**	**8,602**	**8,394**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,179	1,155	1,155	567	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	762	1,109	791	493	687	563	467	342	268	120	105	146	197	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	53	54
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,422	2,302	2,072	2,151	2,267	2,321	2,310	2,472
Geothermal	GWh	66	55	51	54	54	55	51	53	55	54	45	43	43	38	42	46	46	43	45	10
Solar	GWh	1,671	3,192	3,480	4,140	4,153	4,359	4,211	4,048	4,365	5,166	5,754	5,648	5,656	5,949	6,054	6,052	6,185	6,751	7,295	7,214
Wind	GWh	2,205	2,063	1,960	1,990	2,020	2,059	2,805	3,494	3,486	3,491	3,298	3,964	4,557	5,262	5,344	5,392	5,231	4,950	4,240	4,153
4-hr Storage	GWh	-40	-113	-130	-272	-303	-338	-359	-368	-406	-437	-455	-458	-465	-539	-576	-586	-612	-708	-729	-770
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-75	-107	-169	-197	-235	-263	-253	-183	-182	-184	-167	-192	-203
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	693	785	882	874	946	1,023	1,023	1,082	1,063	1,120	1,179	1,231	1,211
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,623**	**11,299**	**11,621**	**11,790**	**11,793**	**11,924**	**12,083**	**12,610**	**13,240**	**13,901**	**13,940**	**14,081**	**14,251**	**14,383**	**14,252**	**14,142**
Net Purchases	GWh	991	855	1,013	1,074	1,287	1,608	1,460	1,413	1,502	1,484	1,346	942	486	-60	64	-26	-65	-61	182	329
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	High NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,959 million
20-Year NPV Carbon Emissions:	11.80 million tons
20-Year NPV Water Consumption:	6.37 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	20%	19%	19%	21%	17%	19%	18%	16%	16%	17%	17%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	354	306	312	284	278	271	265	249	148	41	23	16	14	11	10	12	13	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,166	1,010	1,010	864	864	864	864	864	905	1,110	1,274	1,356	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	782	782	782
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,791	1,850	1,842	2,206	2,214	2,736	2,728	2,719	2,917	2,866	2,858	2,861	3,146	3,450	3,467
Wind	MW	658	658	658	658	658	658	658	858	858	1,058	1,258	1,458	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,486	1,486	1,486	1,517	1,517	1,517	1,517	1,517	1,639	1,639	1,639	1,747	1,987	2,043	2,112
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	100	100	100	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	217	240	264	281	261	263	281	275	278	273	287	303	314	312
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,363**	**5,899**	**5,821**	**6,035**	**6,508**	**6,533**	**7,236**	**7,429**	**7,536**	**7,891**	**8,049**	**8,199**	**8,407**	**8,374**	**8,745**	**8,523**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,165	1,171	1,261	1,249	1,253	1,245	1,235	587	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,161	712	997	610	621	818	802	635	756	614	358	247	211	180	168	196	209	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	11	15
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,360	2,421	2,302	2,034	2,097	2,185	2,170	2,385	2,460
Geothermal	GWh	66	55	52	51	51	54	59	51	55	49	42	45	39	37	40	43	42	41	37	10
Solar	GWh	1,671	3,191	3,482	4,114	4,121	4,452	4,683	4,436	5,106	5,207	5,683	5,545	5,463	6,038	6,086	6,064	6,114	6,837	7,134	7,412
Wind	GWh	2,205	2,065	1,961	1,976	2,013	2,064	2,109	2,776	2,706	3,491	3,844	4,569	5,179	5,201	5,309	5,389	5,386	5,064	4,443	4,086
4-hr Storage	GWh	-40	-113	-130	-274	-304	-370	-379	-394	-412	-431	-440	-445	-453	-510	-536	-545	-593	-702	-742	-778
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-79	-72	-198	-226	-328	-368	-354	-365	-268	-243	-233	-215	-237	-240
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	608	707	805	890	882	953	1,030	1,030	1,084	1,065	1,121	1,178	1,229	1,210
Total Generation	**GWh**	**8,695**	**9,536**	**10,134**	**10,431**	**10,464**	**11,156**	**11,415**	**11,670**	**11,764**	**11,969**	**12,338**	**12,905**	**13,535**	**13,913**	**13,918**	**14,065**	**14,230**	**14,375**	**14,260**	**14,177**
Net Purchases	GWh	1,407	964	1,088	1,264	1,446	1,750	1,665	1,532	1,531	1,439	1,091	647	191	-73	86	-10	-44	-53	174	293
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	High Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,106 million
20-Year NPV Carbon Emissions:	11.98 million tons
20-Year NPV Water Consumption:	6.36 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	20%	19%	19%	22%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	283	246	228	131	28	27	21	14	17	17	16	13	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,339	1,183	1,183	1,037	1,078	1,078	1,078	1,078	1,242	1,406	1,488	1,488	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	914	914	914
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,783	1,774	1,766	1,757	1,749	1,909	2,196	2,325	2,316	2,324	2,389	2,580	2,884	3,037	3,002
Wind	MW	658	658	658	658	658	658	858	1,058	1,258	1,458	1,458	1,458	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,213	1,213	1,213	1,213	1,213	1,213	1,213	1,241	1,241	1,241	1,339	1,553	1,755	1,838	1,891
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	100	100	100	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	174	198	216	232	254	277	261	266	284	278	283	278	292	308	319	317
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,791**	**5,845**	**6,052**	**6,320**	**6,374**	**6,520**	**6,812**	**7,084**	**7,233**	**7,410**	**7,650**	**8,069**	**8,017**	**8,263**	**7,974**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,191	1,156	1,163	567	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	762	1,186	778	537	575	452	440	352	234	294	302	301	243	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	67	82
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,315	2,367	2,296	2,339	2,442	2,472
Geothermal	GWh	66	55	51	52	54	53	53	52	52	53	50	48	43	52	48	50	47	43	41	11
Solar	GWh	1,671	3,192	3,479	4,144	4,154	4,310	4,264	3,975	3,880	3,916	4,169	4,670	4,758	4,858	4,984	5,191	5,802	6,488	7,043	7,234
Wind	GWh	2,205	2,062	1,961	1,988	2,018	2,022	2,809	3,475	4,221	5,015	4,979	4,837	5,376	5,519	5,500	5,516	5,363	5,056	4,246	3,936
4-hr Storage	GWh	-40	-113	-130	-272	-302	-309	-314	-325	-320	-331	-342	-359	-365	-373	-384	-429	-524	-615	-659	-689
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-92	-87	-191	-207	-233	-274	-311	-291	-279	-272	-265	-256	-282	-289
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	419	512	602	684	777	873	877	958	1,036	1,036	1,095	1,076	1,132	1,189	1,241	1,222
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,332**	**11,622**	**11,770**	**11,921**	**12,146**	**12,236**	**12,592**	**13,198**	**13,399**	**13,580**	**13,799**	**14,095**	**14,263**	**14,140**	**13,979**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,575	1,458	1,432	1,374	1,262	1,193	959	528	442	424	255	91	59	294	491
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	Low NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,692 million
20-Year NPV Carbon Emissions:	12.94 million tons
20-Year NPV Water Consumption:	6.57 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	20%	18%	18%	21%	16%	17%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	397	365	347	309	296	284	276	249	174	49	38	27	17	6	5	6	8	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,298	1,142	1,142	996	996	996	996	996	996	1,160	1,324	1,488	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	914	914	914
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,757	1,749	1,740	1,989	2,442	2,434	2,688	3,002	2,997	2,989	2,981	3,000	3,354	3,369
Wind	MW	658	658	658	658	658	658	658	858	858	1,058	1,058	1,258	1,356	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,260	1,260	1,260	1,328	1,328	1,328	1,328	1,328	1,484	1,503	1,503	1,503	1,770	1,810	1,857
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	100	100	100	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	235	258	275	255	258	275	269	274	268	282	298	309	307
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,778**	**5,632**	**5,844**	**5,980**	**6,245**	**6,679**	**6,873**	**7,243**	**7,906**	**8,090**	**8,239**	**8,409**	**8,138**	**8,542**	**8,297**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,079	1,109	1,108	1,148	1,149	1,146	1,138	1,147	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,676	1,498	1,570	1,194	1,097	1,288	1,262	883	1,196	762	601	438	284	99	84	118	156	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	60	69
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,420	2,294	2,034	2,092	2,035	2,166	2,173	2,301
Geothermal	GWh	66	55	52	54	52	56	56	53	59	57	51	50	44	37	40	41	43	43	46	10
Solar	GWh	1,671	3,184	3,496	4,176	4,175	4,350	4,458	4,252	4,355	4,922	5,556	5,421	5,725	6,294	6,363	6,351	6,390	6,722	7,462	7,465
Wind	GWh	2,205	2,061	1,963	1,997	2,028	2,044	2,126	2,810	2,852	3,569	3,455	4,135	4,603	5,275	5,309	5,374	5,391	5,207	4,362	4,101
4-hr Storage	GWh	-40	-114	-130	-272	-303	-318	-324	-331	-344	-366	-389	-399	-402	-462	-489	-494	-504	-621	-647	-675
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-95	-91	-156	-238	-294	-296	-394	-411	-354	-343	-345	-274	-376	-320
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	693	785	870	863	934	1,011	1,011	1,070	1,046	1,102	1,162	1,213	1,194
Total Generation	**GWh**	**9,185**	**10,256**	**10,660**	**10,987**	**10,905**	**11,442**	**11,588**	**11,713**	**11,675**	**11,951**	**12,140**	**12,645**	**13,292**	**14,138**	**14,058**	**14,185**	**14,268**	**14,423**	**14,294**	**14,145**
Net Purchases	GWh	916	244	562	708	1,005	1,464	1,493	1,489	1,620	1,458	1,288	907	434	-297	-54	-130	-82	-101	140	325
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	Low Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,386 million
20-Year NPV Carbon Emissions:	11.74 million tons
20-Year NPV Water Consumption:	6.24 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	20%	19%	20%	21%	16%	17%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	269	242	224	151	22	17	12	7	4	3	4	3	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,084	928	928	782	782	782	782	782	782	946	1,110	1,233	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	659	659	659
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,757	1,749	1,748	2,603	3,086	3,078	3,091	3,082	3,031	3,023	3,271	3,454	3,539	4,157
Wind	MW	658	658	658	658	658	658	858	1,058	1,058	1,058	1,058	1,258	1,356	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,214	1,214	1,214	1,228	1,228	1,228	1,228	1,261	1,468	1,493	1,493	1,524	1,840	1,947	1,985
8-12hr Storage	MW	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
24+hr Storage	MW	-	-	-	-	-	100	100	100	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	170	194	212	228	251	273	253	256	273	267	273	266	280	296	307	305
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,359**	**5,815**	**5,869**	**6,077**	**6,166**	**6,843**	**7,307**	**7,501**	**7,663**	**8,055**	**8,198**	**8,347**	**8,764**	**8,704**	**8,908**	**9,256**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,170	1,145	1,152	567	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	767	988	716	490	832	335	266	189	108	60	43	59	56	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	2	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,357	2,412	2,294	1,987	2,046	1,956	1,999	2,148	2,239
Geothermal	GWh	66	55	51	52	54	59	60	55	61	50	42	43	39	37	43	44	45	43	45	12
Solar	GWh	1,671	3,190	3,479	4,143	4,158	4,569	4,454	4,166	4,124	5,934	6,745	6,658	6,602	6,589	6,643	6,624	7,240	7,825	8,195	8,368
Wind	GWh	2,205	2,065	1,961	1,990	2,017	2,110	2,870	3,530	3,593	3,406	3,126	3,873	4,486	5,208	5,332	5,363	5,088	4,763	4,122	4,008
4-hr Storage	GWh	-40	-113	-130	-272	-303	-294	-300	-312	-311	-346	-347	-350	-366	-444	-487	-487	-506	-645	-697	-729
8-12hr Storage	GWh	-	-	-	-	-	-190	-183	-168	-155	-268	-373	-384	-382	-376	-322	-311	-331	-287	-290	-265
24+hr Storage	GWh	-	-	-	-	-	-	-38	-39	-62	-231	-338	-368	-351	-298	-204	-188	-221	-179	-193	-226
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	407	500	590	672	764	861	853	925	1,002	1,002	1,061	1,037	1,093	1,153	1,204	1,185
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,621**	**11,278**	**11,681**	**11,841**	**11,774**	**12,116**	**12,271**	**12,943**	**13,550**	**14,072**	**14,096**	**14,187**	**14,420**	**14,677**	**14,537**	**14,592**
Net Purchases	GWh	991	855	1,013	1,074	1,289	1,628	1,399	1,361	1,522	1,292	1,158	609	176	-231	-93	-133	-233	-355	-103	-122
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	Stable ED
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$15,717 million
20-Year NPV Carbon Emissions:	13.63 million tons
20-Year NPV Water Consumption:	7.58 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	1,198 MW
20-Year NPV Rev Req:	$228 million

Final adjustments based on SERVM LOLP analysis

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,173	2,300	2,445	2,593	2,791	2,943	3,052	3,158	3,273	3,363	3,480	3,603	3,704	3,829	3,930	4,052	4,159	4,269	4,348
PRM	%	5%	16%	16%	16%	17%	17%	16%	18%	20%	16%	19%	16%	16%	16%	16%	16%	16%	17%	16%	16%
Carbon Intensity	lbs/MWh	395	315	317	297	304	266	248	212	135	40	20	28	32	35	33	38	36	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	289	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,166	1,216	1,060	1,060	914	914	914	914	914	1,005	1,096	1,269	1,310	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	736	818	824
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	2,100	2,096	2,087	2,320	3,075	3,839	4,026	4,033	4,316	4,586	4,673	4,921	6,162	6,821	7,479
Wind	MW	658	658	658	658	658	658	858	1,258	1,458	1,458	1,658	1,658	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,322	1,322	1,322	1,484	1,484	1,592	1,592	1,757	1,757	1,963	2,143	2,394	2,480	2,941	4,690	4,690	4,690
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	400	600	600	600	600	600	600	600	600	600	600	600	600
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	199	217	239	263	285	270	274	292	286	291	286	301	316	327	326
Total Capacity	**MW**	**3,678**	**4,602**	**4,899**	**5,400**	**5,595**	**6,294**	**6,514**	**7,028**	**7,647**	**8,224**	**9,337**	**9,529**	**9,657**	**10,205**	**10,822**	**11,164**	**11,928**	**14,360**	**15,112**	**15,468**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,243	1,248	1,177	1,158	1,161	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	832	1,118	1,002	1,413	1,492	1,512	1,057	1,186	819	441	640	750	919	955	1,167	1,115	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	422	371
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,276	2,330	2,411	2,297	2,150	2,330	2,296	2,125	2,246	2,406
Geothermal	GWh	66	56	52	56	55	59	62	60	54	55	43	45	47	50	52	54	59	55	56	12
Solar	GWh	1,671	3,191	3,488	4,324	4,430	5,592	5,654	5,465	5,852	7,722	9,051	9,616	9,969	10,823	11,701	11,826	12,753	15,388	16,789	17,683
Wind	GWh	2,205	2,065	1,966	2,043	2,108	2,134	2,934	4,397	5,113	5,051	5,463	5,512	5,482	5,569	5,570	5,598	5,539	5,105	4,152	3,951
4-hr Storage	GWh	-40	-113	-129	-295	-326	-325	-369	-380	-423	-459	-520	-537	-617	-698	-804	-847	-1,029	-1,286	-1,426	-1,638
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-154	-132	-136	-155	-385	-567	-580	-544	-550	-490	-458	-413	-487	-538	-520
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	514	605	704	802	899	902	984	1,061	1,061	1,120	1,103	1,160	1,218	1,270	1,252
Total Generation	**GWh**	**9,111**	**9,652**	**10,247**	**11,065**	**11,640**	**12,857**	**13,791**	**14,624**	**15,356**	**16,075**	**17,091**	**18,011**	**18,559**	**19,471**	**20,253**	**20,773**	**21,480**	**22,341**	**22,972**	**23,516**
Net Purchases	GWh	991	859	1,020	1,199	1,494	1,789	1,762	1,690	1,625	1,600	1,170	935	1,139	935	939	1,021	999	914	949	989
Total Supply	**GWh**	**10,101**	**10,511**	**11,267**	**12,263**	**13,134**	**14,646**	**15,554**	**16,314**	**16,981**	**17,676**	**18,260**	**18,946**	**19,698**	**20,407**	**21,192**	**21,794**	**22,480**	**23,255**	**23,921**	**24,505**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	All Technologies
Future:	Current Trends & Policy
Sensitivity:	Tax credit 10-yr exp.
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,040 million
20-Year NPV Carbon Emissions:	11.46 million tons
20-Year NPV Water Consumption:	6.21 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	17%	16%	17%	21%	16%	22%	20%	18%	16%	17%	17%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	253	231	216	123	21	2	4	6	8	7	9	11	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,043	887	887	741	741	741	741	741	823	1,028	1,192	1,274	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	726	771	800
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,916	1,907	1,899	1,890	1,888	3,017	3,008	3,000	2,991	2,940	2,932	2,924	2,914	2,908	2,858
Wind	MW	658	658	658	658	658	658	858	1,058	1,258	1,458	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,271	1,271	1,271	1,365	1,382	1,450	1,450	1,450	1,450	1,450	1,450	1,541	1,835	1,847	1,847
8-12hr Storage	MW	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
24+hr Storage	MW	-	-	-	-	-	-	-	-	200	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	232	249	266	247	250	268	262	267	262	276	293	305	305
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,884**	**5,938**	**6,146**	**6,503**	**6,635**	**7,812**	**7,807**	**7,714**	**7,781**	**7,941**	**8,092**	**8,271**	**8,024**	**8,286**	**7,959**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,161	1,143	1,153	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	762	782	573	368	441	323	38	70	93	134	119	156	183	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	22	53
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,360	2,425	2,303	2,072	2,211	2,296	2,367	2,472	2,472
Geothermal	GWh	66	55	51	52	55	57	53	54	53	52	36	38	41	41	47	50	51	51	52	12
Solar	GWh	1,671	3,192	3,478	4,143	4,152	4,859	4,647	4,319	4,187	4,238	6,295	6,416	6,484	6,617	6,654	6,503	6,648	6,894	6,965	6,928
Wind	GWh	2,205	2,062	1,962	1,990	2,020	2,056	2,799	3,463	4,176	4,975	4,477	4,560	4,494	4,556	4,716	4,775	4,656	4,585	4,397	4,290
4-hr Storage	GWh	-40	-113	-130	-272	-303	-314	-326	-336	-361	-374	-404	-419	-426	-442	-457	-466	-511	-634	-637	-640
8-12hr Storage	GWh	-	-	-	-	-	-126	-118	-107	-88	-86	-224	-219	-213	-206	-163	-145	-146	-126	-132	-143
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-60	-75	-312	-308	-302	-292	-230	-229	-224	-177	-162	-176
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	682	762	847	838	910	987	988	1,047	1,028	1,084	1,146	1,201	1,185
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,623**	**11,350**	**11,738**	**11,892**	**12,037**	**12,274**	**13,041**	**13,408**	**13,582**	**13,700**	**13,803**	**13,882**	**14,038**	**14,128**	**14,179**	**13,982**
Net Purchases	GWh	991	855	1,013	1,074	1,287	1,556	1,343	1,310	1,258	1,134	388	144	144	141	201	172	148	194	255	489
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	CTP
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,111 million
20-Year NPV Carbon Emissions:	12.30 million tons
20-Year NPV Water Consumption:	6.96 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	21%	19%	19%	21%	16%	20%	18%	17%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	262	258	245	155	64	28	30	22	23	21	14	8	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,166	1,010	1,010	905	905	905	905	905	905	1,069	1,192	1,356	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	782	782	782
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,776	1,946	2,216	2,328	3,042	3,127	3,118	3,146	3,095	3,086	3,078	3,088	3,366	3,451
Wind	MW	658	658	658	658	658	658	658	658	658	658	858	858	956	956	956	1,156	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,214	1,214	1,214	1,476	1,476	1,476	1,476	1,476	1,652	1,680	1,692	1,692	1,959	2,009	2,060
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	238	262	284	264	269	287	281	286	281	295	311	322	322
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,800**	**5,673**	**5,866**	**6,317**	**6,251**	**7,145**	**7,235**	**7,342**	**7,539**	**7,685**	**8,007**	**8,377**	**8,296**	**8,634**	**8,464**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,158	1,145	1,162	567	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	762	917	940	766	896	951	434	470	346	355	345	234	141	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	3	2
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,356	2,411	2,298	2,188	2,166	2,058	2,214	2,385	2,405
Geothermal	GWh	66	55	51	54	52	60	60	56	54	55	44	43	43	45	50	49	47	43	46	10
Solar	GWh	1,671	3,190	3,480	4,141	4,154	4,590	4,636	4,932	5,436	5,950	6,549	6,766	6,703	7,023	7,053	6,899	6,728	6,557	6,980	7,181
Wind	GWh	2,205	2,065	1,960	1,990	2,021	2,116	2,155	2,074	2,026	2,048	2,477	2,486	3,106	3,183	3,243	3,999	4,716	5,386	4,673	4,459
4-hr Storage	GWh	-40	-113	-130	-272	-303	-290	-297	-316	-397	-417	-433	-441	-451	-526	-548	-563	-571	-686	-721	-749
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-110	-121	-139	-119	-157	-185	-199	-199	-192	-152	-150	-146	-110	-134	-140
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	699	797	894	886	968	1,045	1,045	1,104	1,085	1,141	1,201	1,252	1,236
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,623**	**11,318**	**11,485**	**11,529**	**11,619**	**11,699**	**12,068**	**12,447**	**13,003**	**13,230**	**13,283**	**13,719**	**14,114**	**14,612**	**14,485**	**14,403**
Net Purchases	GWh	991	855	1,013	1,074	1,287	1,589	1,596	1,673	1,676	1,709	1,360	1,105	723	610	721	335	72	-290	-51	67
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	High NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,292 million
20-Year NPV Carbon Emissions:	11.91 million tons
20-Year NPV Water Consumption:	6.91 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	23%	21%	21%	21%	17%	21%	19%	18%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	354	306	312	284	278	264	252	255	152	59	22	26	22	23	22	11	6	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,051	1,051	905	905	905	905	905	905	1,069	1,192	1,356	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	782	782	782
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,961	2,032	2,443	2,595	3,088	3,079	3,071	3,107	3,056	3,048	3,040	3,096	3,530	3,527
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,156	1,156	1,156	1,356	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,213	1,213	1,213	1,466	1,466	1,466	1,466	1,466	1,612	1,637	1,665	1,665	1,958	1,987	2,049
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	174	198	216	238	262	284	265	270	287	281	287	282	296	311	322	322
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,841**	**5,899**	**5,993**	**6,533**	**6,508**	**7,381**	**7,377**	**7,484**	**7,661**	**7,804**	**8,142**	**8,512**	**8,303**	**8,777**	**8,530**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,165	1,171	1,261	1,249	1,264	1,252	1,258	589	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,161	712	997	610	622	690	610	672	803	885	342	399	329	357	341	182	104	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	2
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,289	2,347	2,412	2,303	2,088	2,086	2,091	2,275	2,415	2,472
Geothermal	GWh	66	55	51	51	51	58	57	55	52	52	38	40	38	41	45	44	44	39	42	11
Solar	GWh	1,671	3,192	3,481	4,116	4,122	4,553	4,956	5,042	5,696	6,249	6,359	6,450	6,367	6,646	6,721	6,580	6,184	6,404	6,862	7,002
Wind	GWh	2,205	2,064	1,962	1,974	2,013	2,107	2,086	2,036	1,959	1,953	3,113	3,162	3,807	3,846	3,972	4,697	5,408	5,363	4,649	4,459
4-hr Storage	GWh	-40	-113	-130	-274	-304	-288	-308	-321	-410	-427	-420	-431	-437	-502	-531	-550	-563	-685	-715	-752
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-110	-136	-142	-128	-162	-206	-213	-213	-196	-145	-139	-116	-102	-125	-125
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	419	512	602	702	799	896	888	970	1,047	1,047	1,106	1,087	1,144	1,201	1,252	1,236
Total Generation	**GWh**	**8,695**	**9,536**	**10,134**	**10,431**	**10,463**	**11,153**	**11,486**	**11,598**	**11,721**	**11,820**	**12,403**	**12,726**	**13,350**	**13,542**	**13,598**	**13,988**	**14,295**	**14,502**	**14,384**	**14,305**
Net Purchases	GWh	1,407	964	1,088	1,264	1,447	1,753	1,594	1,604	1,574	1,588	1,026	826	376	298	406	66	-109	-180	50	166
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	High Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,287 million
20-Year NPV Carbon Emissions:	12.65 million tons
20-Year NPV Water Consumption:	6.49 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	18%	16%	16%	16%	21%	17%	25%	24%	23%	17%	17%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	277	269	268	185	92	34	14	11	15	15	17	17	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,084	1,248	1,092	1,092	1,192	1,192	1,192	1,192	1,192	1,192	1,356	1,479	1,561	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	987	987	987
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,857	1,897	2,000	1,991	2,438	2,430	2,421	2,413	2,404	2,353	2,408	2,409	2,772	2,905	2,989
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,458	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,324	1,396	1,412	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,528	1,662	1,867	1,923	1,943
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	200	200	200	200	200	200	200	200	200	200
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	218	241	265	287	267	269	283	277	282	277	292	307	318	317
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,404**	**5,785**	**5,762**	**5,903**	**6,130**	**6,399**	**6,971**	**7,364**	**7,468**	**7,453**	**7,571**	**7,748**	**7,979**	**7,989**	**8,189**	**7,985**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,188	1,173	1,197	575	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	760	1,048	1,044	1,003	1,290	1,344	525	230	180	238	251	282	275	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	101	117
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,361	2,367	2,296	2,367	2,472	2,472
Geothermal	GWh	66	55	51	54	52	55	52	50	55	51	46	44	43	46	49	50	52	43	42	10
Solar	GWh	1,671	3,190	3,478	4,144	4,151	4,501	4,609	4,724	4,802	5,582	5,470	5,059	4,959	5,080	5,134	5,237	5,441	5,979	6,395	6,530
Wind	GWh	2,205	2,065	1,962	1,985	2,022	2,014	2,045	1,978	2,019	1,909	3,431	4,767	5,332	5,452	5,460	5,531	5,550	5,443	4,712	4,519
4-hr Storage	GWh	-40	-113	-130	-272	-302	-339	-368	-387	-418	-450	-453	-453	-461	-471	-492	-505	-560	-663	-694	-714
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-188	-195	-210	-183	-178	-183	-177	-172	-193	-204
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	611	711	809	906	898	969	1,038	1,038	1,097	1,078	1,134	1,191	1,243	1,223
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,352**	**11,534**	**11,573**	**11,491**	**11,716**	**12,024**	**12,781**	**13,307**	**13,502**	**13,681**	**13,858**	**14,011**	**14,222**	**14,078**	**13,955**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,555	1,546	1,630	1,804	1,692	1,405	771	419	338	323	197	175	100	356	515
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	Low NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,583 million
20-Year NPV Carbon Emissions:	13.42 million tons
20-Year NPV Water Consumption:	6.52 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	21%	17%	19%	18%	16%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	397	365	347	309	296	278	275	268	190	93	49	24	28	23	21	19	21	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,166	1,051	1,051	1,192	1,192	1,192	1,192	1,192	1,192	1,356	1,438	1,602	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,028	1,028	1,028
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,781	1,773	1,846	1,957	2,436	2,428	2,419	2,411	2,777	2,747	2,739	2,751	2,884	3,043	3,272
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,458	1,356	1,356	1,356	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,454	1,476	1,503	1,537	1,537	1,537	1,537	1,537	1,684	1,714	1,862	1,867	2,156	2,227	2,255
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	174	198	216	238	260	283	267	272	289	283	289	284	298	314	325	324
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,757**	**5,674**	**5,797**	**6,104**	**6,405**	**6,781**	**7,177**	**7,085**	**7,591**	**7,762**	**7,978**	**8,173**	**8,238**	**8,479**	**8,428**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,079	1,109	1,108	1,148	1,149	1,146	1,139	1,148	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,676	1,498	1,570	1,193	1,096	1,161	1,202	1,120	1,376	1,365	738	377	426	363	331	306	336	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	111	113
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,425	2,295	2,269	2,366	2,296	2,332	2,469	2,472
Geothermal	GWh	66	55	51	55	52	55	55	54	54	51	48	44	45	43	43	46	47	44	39	12
Solar	GWh	1,671	3,186	3,496	4,176	4,173	4,481	4,482	4,596	4,800	5,660	5,225	4,868	4,959	5,751	5,814	6,003	6,062	6,199	6,577	6,749
Wind	GWh	2,205	2,060	1,964	1,995	2,029	2,079	2,121	2,071	2,040	1,921	3,389	4,761	4,669	4,659	4,653	4,695	4,695	5,365	4,643	4,461
4-hr Storage	GWh	-40	-114	-130	-272	-303	-364	-378	-399	-417	-452	-462	-465	-475	-537	-567	-636	-650	-765	-808	-845
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	419	512	602	702	794	891	894	975	1,053	1,053	1,112	1,093	1,149	1,208	1,260	1,241
Total Generation	**GWh**	**9,185**	**10,256**	**10,660**	**10,987**	**10,906**	**11,438**	**11,591**	**11,588**	**11,573**	**11,810**	**12,128**	**12,921**	**13,103**	**13,626**	**13,655**	**13,874**	**13,936**	**14,431**	**14,290**	**14,203**
Net Purchases	GWh	916	244	562	707	1,004	1,468	1,489	1,614	1,722	1,598	1,300	631	623	214	349	181	251	-109	144	267
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	Low Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,366 million
20-Year NPV Carbon Emissions:	12.35 million tons
20-Year NPV Water Consumption:	6.29 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	19%	18%	18%	21%	16%	17%	16%	16%	16%	18%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	268	261	256	160	45	38	40	26	19	10	7	4	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,043	928	928	782	782	782	782	782	864	1,069	1,151	1,315	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	741	741	741
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,790	1,870	2,182	2,768	3,368	3,360	3,351	3,343	3,292	3,284	3,275	3,299	3,540	3,933
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	756	956	1,156	1,356	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,214	1,214	1,214	1,434	1,473	1,473	1,511	1,552	1,601	1,601	1,615	1,616	1,991	2,063	2,121
8-12hr Storage	MW	-	-	-	-	-	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
24+hr Storage	MW	-	-	-	-	-	-	-	-	100	99	98	97	96	95	94	93	92	91	90	90
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	235	258	280	264	269	287	281	284	279	293	309	320	320
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,777**	**5,706**	**5,805**	**6,313**	**6,759**	**7,343**	**7,376**	**7,523**	**7,840**	**8,196**	**8,478**	**8,847**	**8,686**	**9,010**	**9,154**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,167	1,155	1,170	573	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	762	972	966	897	954	674	578	611	405	307	171	118	62	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,360	2,416	2,295	2,070	2,064	1,944	2,052	2,302	2,440
Geothermal	GWh	66	55	51	55	53	59	61	58	57	54	43	45	44	45	45	45	41	43	46	13
Solar	GWh	1,671	3,190	3,477	4,144	4,153	4,602	4,699	4,835	5,554	6,823	7,560	7,692	7,667	7,656	7,486	7,326	7,072	7,220	7,587	7,787
Wind	GWh	2,205	2,065	1,963	1,986	2,021	2,120	2,152	2,107	2,067	1,970	1,745	1,751	2,364	3,141	3,906	4,618	5,302	5,343	4,635	4,418
4-hr Storage	GWh	-40	-113	-130	-272	-303	-289	-297	-309	-381	-428	-433	-457	-478	-506	-519	-533	-537	-700	-747	-784
8-12hr Storage	GWh	-	-	-	-	-	-212	-241	-273	-248	-365	-472	-484	-482	-474	-392	-395	-364	-236	-256	-290
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-155	-175	-234	-224	-238	-254	-262	-281	-275	-280	-267	-266
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	693	785	882	886	967	1,044	1,045	1,097	1,078	1,135	1,194	1,246	1,229
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,623**	**11,296**	**11,463**	**11,474**	**11,567**	**11,810**	**11,970**	**12,262**	**12,742**	**13,255**	**13,604**	**14,041**	**14,380**	**14,639**	**14,547**	**14,546**
Net Purchases	GWh	991	855	1,013	1,074	1,287	1,611	1,618	1,728	1,728	1,598	1,459	1,290	984	586	400	14	-194	-317	-113	-76
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	Stable ED
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$16,093 million
20-Year NPV Carbon Emissions:	14.43 million tons
20-Year NPV Water Consumption:	8.36 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	1,062 MW
20-Year NPV Rev Req:	$193 million

Final adjustments based on SERVM LOLP analysis

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,173	2,300	2,445	2,593	2,791	2,943	3,052	3,158	3,273	3,363	3,480	3,603	3,704	3,829	3,930	4,052	4,159	4,269	4,348
PRM	%	5%	16%	16%	16%	17%	17%	16%	16%	22%	20%	23%	21%	18%	16%	16%	16%	16%	18%	16%	16%
Carbon Intensity	lbs/MWh	395	315	317	297	304	260	254	256	163	93	51	34	30	35	33	42	38	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	289	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,166	1,207	1,092	1,133	1,028	1,028	1,028	1,028	1,028	1,028	1,069	1,274	1,274	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	700	741
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	2,217	2,471	2,742	3,209	3,726	4,121	4,113	4,171	4,402	4,580	4,673	4,937	6,146	6,921	7,460
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,458	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,322	1,322	1,322	1,458	1,540	1,676	1,676	1,700	1,700	1,700	1,919	2,228	2,253	2,724	4,488	4,783	5,104
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	600	600	700	700	700	700	700	700	700	700	700	700
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	218	241	265	287	271	276	293	287	293	288	302	317	328	327
Total Capacity	**MW**	**3,678**	**4,602**	**4,899**	**5,400**	**5,595**	**6,403**	**6,697**	**7,113**	**7,935**	**8,274**	**9,179**	**9,574**	**9,748**	**10,192**	**10,725**	**11,043**	**11,793**	**14,208**	**15,289**	**15,882**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,243	1,248	1,186	1,182	1,235	575	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	832	1,118	1,002	1,413	1,348	1,526	1,624	1,607	1,767	1,039	740	669	822	792	1,008	955	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	171	311	356
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,289	2,337	2,406	2,286	2,152	2,367	2,296	2,218	2,289	2,447
Geothermal	GWh	66	56	51	57	55	57	58	54	57	52	45	46	46	50	52	55	57	56	53	11
Solar	GWh	1,671	3,191	3,489	4,322	4,427	5,826	6,504	7,107	8,376	9,519	9,987	9,919	10,120	10,922	11,668	11,709	12,604	14,749	16,046	16,929
Wind	GWh	2,205	2,065	1,965	2,045	2,111	2,094	2,101	2,030	2,037	2,045	3,373	4,829	5,463	5,554	5,595	5,625	5,654	5,571	4,785	4,496
4-hr Storage	GWh	-40	-113	-129	-295	-326	-330	-382	-424	-466	-493	-506	-511	-528	-619	-743	-764	-940	-1,242	-1,390	-1,549
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-166	-179	-188	-327	-402	-525	-528	-527	-522	-473	-465	-433	-426	-440	-458
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	611	711	809	906	909	990	1,068	1,068	1,127	1,108	1,165	1,222	1,274	1,255
Total Generation	**GWh**	**9,111**	**9,652**	**10,247**	**11,065**	**11,640**	**12,900**	**13,788**	**14,445**	**15,028**	**15,768**	**16,611**	**17,822**	**18,716**	**19,560**	**20,170**	**20,643**	**21,358**	**22,319**	**22,927**	**23,487**
Net Purchases	GWh	991	859	1,020	1,199	1,494	1,746	1,765	1,869	1,953	1,907	1,649	1,124	982	846	1,011	1,140	1,107	905	975	1,007
Total Supply	**GWh**	**10,101**	**10,511**	**11,267**	**12,263**	**13,134**	**14,646**	**15,554**	**16,314**	**16,981**	**17,676**	**18,260**	**18,946**	**19,698**	**20,407**	**21,181**	**21,783**	**22,465**	**23,224**	**23,902**	**24,494**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES + CTs
Future:	Current Trends & Policy
Sensitivity:	Tax credit 10-yr exp.
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,409 million
20-Year NPV Carbon Emissions:	11.97 million tons
20-Year NPV Water Consumption:	6.36 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	17%	16%	16%	25%	17%	31%	30%	28%	22%	16%	17%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	285	254	252	246	155	52	14	6	8	10	9	11	13	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,043	887	887	782	782	782	782	782	782	782	946	1,110	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	536	536	536
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,904	1,896	1,992	2,239	2,727	3,064	3,055	3,046	3,038	2,987	2,979	2,971	2,961	2,954	2,910
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,458	1,356	1,356	1,356	1,356	1,356	1,356	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,214	1,284	1,305	1,324	1,486	1,487	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,868	1,953	2,006
8-12hr Storage	MW	-	-	-	-	-	300	300	300	600	600	600	600	600	600	600	600	600	600	600	600
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	235	258	275	255	258	272	263	268	263	277	295	306	306
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,886**	**5,761**	**5,896**	**6,522**	**6,828**	**7,853**	**8,247**	**8,151**	**8,133**	**8,088**	**8,238**	**8,408**	**8,216**	**8,505**	**8,208**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,161	1,152	1,167	569	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	762	791	846	751	889	770	211	87	121	155	149	182	213	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	20	41
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,360	2,425	2,303	2,062	2,168	2,164	2,367	2,472	2,472
Geothermal	GWh	66	55	51	54	54	57	59	55	53	50	43	40	42	44	47	49	50	50	51	12
Solar	GWh	1,671	3,192	3,481	4,143	4,150	4,837	4,850	5,008	5,434	6,448	6,866	6,500	6,573	6,714	6,767	6,611	6,670	6,781	6,722	6,801
Wind	GWh	2,205	2,062	1,959	1,988	2,022	2,063	2,109	2,048	2,012	1,919	3,187	4,548	4,483	4,557	4,689	4,772	4,773	4,763	4,731	4,545
4-hr Storage	GWh	-40	-113	-130	-272	-303	-317	-331	-349	-402	-436	-426	-433	-441	-455	-474	-483	-493	-648	-672	-689
8-12hr Storage	GWh	-	-	-	-	-	-123	-128	-136	-134	-186	-270	-298	-283	-258	-171	-149	-159	-129	-135	-146
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-266	-290	-286	-277	-224	-219	-230	-171	-146	-147
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	693	785	870	862	933	1,002	995	1,054	1,035	1,092	1,154	1,208	1,192
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,623**	**11,347**	**11,524**	**11,533**	**11,567**	**11,810**	**12,504**	**13,447**	**13,636**	**13,779**	**13,899**	**13,967**	**14,081**	**14,189**	**14,253**	**14,081**
Net Purchases	GWh	991	855	1,013	1,074	1,287	1,560	1,556	1,669	1,728	1,598	925	104	90	61	105	88	105	133	181	390
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	CTP
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,882 million
20-Year NPV Carbon Emissions:	12.83 million tons
20-Year NPV Water Consumption:	6.43 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	17%	17%	21%	17%	21%	19%	18%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	275	274	272	168	86	35	39	30	30	30	21	19	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,133	1,133	1,110	1,110	1,110	1,110	1,110	1,151	1,315	1,438	1,520	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	946	946	946
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,814	1,806	1,948	2,184	2,258	2,663	2,654	2,646	2,858	2,807	2,798	2,900	3,039	3,279	3,329
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,156	1,156	1,156	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,389	1,389	1,389	1,715	1,715	1,715	1,715	1,715	1,768	1,804	1,840	2,005	2,314	2,394	2,456
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	217	240	264	286	270	275	293	286	292	287	301	317	328	327
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,363**	**5,766**	**5,703**	**5,867**	**6,430**	**6,326**	**7,116**	**7,112**	**7,219**	**7,518**	**7,673**	**8,019**	**8,382**	**8,472**	**8,803**	**8,608**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,183	1,173	1,198	572	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	760	1,036	1,114	1,054	1,064	1,258	528	591	455	474	472	337	312	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	62	61
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,423	2,303	2,292	2,331	2,291	2,296	2,471	2,472
Geothermal	GWh	66	55	51	52	51	53	53	51	49	51	43	45	44	44	45	42	45	43	36	9
Solar	GWh	1,671	3,193	3,480	4,143	4,150	4,468	4,452	4,634	5,204	5,554	5,574	5,659	5,530	6,009	6,085	5,916	6,260	6,355	6,775	6,958
Wind	GWh	2,205	2,062	1,960	1,988	2,023	2,043	2,085	1,994	1,977	2,011	3,231	3,253	3,880	3,901	3,926	4,661	4,638	5,322	4,615	4,421
4-hr Storage	GWh	-40	-113	-130	-272	-302	-350	-360	-379	-479	-496	-523	-532	-532	-566	-597	-622	-698	-830	-873	-911
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	608	707	805	902	905	987	1,064	1,064	1,123	1,104	1,160	1,219	1,271	1,252
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,317**	**11,492**	**11,555**	**11,553**	**11,655**	**12,055**	**12,363**	**12,865**	**13,230**	**13,346**	**13,769**	**14,008**	**14,428**	**14,357**	**14,263**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,589	1,588	1,647	1,742	1,753	1,374	1,189	861	610	658	285	178	-105	77	207
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	High NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,187 million
20-Year NPV Carbon Emissions:	12.70 million tons
20-Year NPV Water Consumption:	6.45 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	21%	20%	22%	21%	20%	16%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	354	306	312	284	278	275	273	275	162	73	48	51	45	47	45	37	30	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,092	1,092	1,069	1,069	1,069	1,069	1,069	1,069	1,233	1,356	1,520	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	946	946	946
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,819	1,929	2,031	2,384	2,504	3,055	3,047	3,038	3,052	3,010	3,002	2,993	3,145	3,372	3,500
Wind	MW	658	658	658	658	658	658	658	658	658	658	858	858	956	956	956	1,156	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,388	1,393	1,411	1,842	1,842	1,842	1,842	1,842	1,948	1,984	1,999	1,999	2,292	2,374	2,421
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	218	241	265	287	271	276	293	287	293	288	302	318	329	328
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,363**	**5,771**	**5,790**	**5,933**	**6,717**	**6,659**	**7,395**	**7,391**	**7,498**	**7,612**	**7,775**	**8,100**	**8,470**	**8,557**	**8,877**	**8,744**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,165	1,171	1,261	1,249	1,254	1,248	1,256	594	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,161	712	997	610	621	871	913	957	926	1,078	719	770	663	709	699	569	473	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	62	62
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,289	2,348	2,413	2,303	2,289	2,327	2,294	2,269	2,472	2,472
Geothermal	GWh	66	55	51	51	51	53	51	49	51	48	39	43	40	48	49	48	48	38	32	10
Solar	GWh	1,671	3,190	3,483	4,112	4,123	4,449	4,619	4,728	5,514	5,940	6,306	6,396	6,307	6,578	6,660	6,479	6,227	6,320	6,693	6,912
Wind	GWh	2,205	2,066	1,961	1,978	2,012	2,036	2,029	1,963	1,912	1,937	2,437	2,435	3,040	3,117	3,152	3,907	4,615	5,283	4,615	4,411
4-hr Storage	GWh	-40	-113	-130	-274	-304	-351	-368	-389	-523	-543	-552	-566	-574	-628	-660	-677	-699	-821	-878	-909
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	611	711	809	906	909	990	1,068	1,068	1,127	1,108	1,164	1,223	1,275	1,256
Total Generation	**GWh**	**8,695**	**9,536**	**10,134**	**10,431**	**10,464**	**11,196**	**11,472**	**11,570**	**11,643**	**11,741**	**12,146**	**12,416**	**12,957**	**13,195**	**13,315**	**13,760**	**14,122**	**14,334**	**14,270**	**14,216**
Net Purchases	GWh	1,407	964	1,088	1,264	1,446	1,710	1,609	1,632	1,652	1,668	1,282	1,135	769	646	689	294	64	-12	163	255
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	High Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,399 million
20-Year NPV Carbon Emissions:	12.89 million tons
20-Year NPV Water Consumption:	6.46 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	17%	17%	21%	17%	19%	18%	16%	17%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	275	271	273	189	92	47	35	28	23	18	21	16	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,133	1,133	1,192	1,192	1,192	1,192	1,192	1,356	1,438	1,602	1,602	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,028	1,028	1,028
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,814	1,873	1,928	1,919	2,432	2,423	2,414	2,406	2,397	2,346	2,338	2,714	2,917	3,003	3,069
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,258	1,356	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,389	1,389	1,389	1,536	1,536	1,536	1,536	1,536	1,536	1,657	1,657	1,862	2,136	2,235	2,283
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	217	240	264	286	270	275	293	286	292	287	301	317	329	329
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,363**	**5,766**	**5,770**	**5,847**	**6,069**	**6,403**	**6,779**	**6,975**	**7,082**	**7,431**	**7,589**	**7,740**	**8,334**	**8,254**	**8,451**	**8,258**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,183	1,173	1,198	574	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	760	1,035	1,066	1,065	1,346	1,345	706	533	429	362	296	343	267	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	113	117
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,425	2,303	2,360	2,367	2,295	2,342	2,460	2,472
Geothermal	GWh	66	55	51	54	52	53	55	51	55	57	47	44	44	43	44	48	51	40	43	10
Solar	GWh	1,671	3,192	3,478	4,142	4,154	4,466	4,566	4,606	4,692	5,533	5,127	5,001	4,846	4,778	4,992	5,021	5,660	6,076	6,486	6,591
Wind	GWh	2,205	2,063	1,962	1,988	2,019	2,046	2,053	2,001	2,045	1,956	3,362	4,007	4,627	5,389	5,414	5,501	5,369	5,342	4,628	4,495
4-hr Storage	GWh	-40	-113	-130	-272	-302	-350	-365	-378	-415	-453	-463	-475	-472	-483	-549	-558	-653	-760	-807	-849
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	608	707	805	902	905	987	1,064	1,064	1,123	1,104	1,160	1,219	1,273	1,257
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,317**	**11,523**	**11,547**	**11,463**	**11,714**	**11,980**	**12,458**	**12,963**	**13,456**	**13,680**	**13,827**	**14,149**	**14,308**	**14,196**	**14,093**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,589	1,557	1,655	1,832	1,694	1,448	1,094	763	385	324	228	37	14	238	377
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	Low NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,676 million
20-Year NPV Carbon Emissions:	13.64 million tons
20-Year NPV Water Consumption:	6.58 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	17%	17%	21%	17%	17%	18%	17%	16%	17%	17%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	397	365	347	309	296	278	277	272	184	91	92	46	36	20	19	22	18	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,133	1,133	1,151	1,151	1,151	1,151	1,151	1,151	1,356	1,520	1,561	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	987	987	987
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,813	1,804	1,916	2,002	2,328	2,542	2,534	2,525	2,823	2,772	2,764	2,831	2,977	3,097	3,371
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,156	1,356	1,356	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,391	1,391	1,391	1,618	1,618	1,618	1,618	1,618	1,749	1,749	1,749	1,935	2,228	2,326	2,345
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	174	198	216	238	262	284	268	273	290	284	290	285	299	314	325	324
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,766**	**5,702**	**5,835**	**6,190**	**6,338**	**6,537**	**6,933**	**7,040**	**7,663**	**7,822**	**7,973**	**8,281**	**8,362**	**8,591**	**8,577**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,079	1,109	1,108	1,148	1,149	1,146	1,140	1,150	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,676	1,498	1,570	1,193	1,096	1,167	1,230	1,162	1,305	1,339	1,341	705	543	324	302	349	296	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	86	85
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,301	2,261	2,362	2,296	2,325	2,472	2,472
Geothermal	GWh	66	56	52	53	54	54	56	52	55	53	51	45	46	43	41	45	50	44	42	11
Solar	GWh	1,671	3,181	3,495	4,175	4,173	4,507	4,488	4,635	4,915	5,615	5,875	5,521	5,408	5,873	5,882	5,841	6,204	6,317	6,706	6,924
Wind	GWh	2,205	2,063	1,964	1,998	2,026	2,055	2,090	2,020	2,034	1,971	1,918	3,349	3,939	4,644	4,644	4,691	4,670	5,352	4,633	4,418
4-hr Storage	GWh	-40	-114	-130	-272	-303	-351	-361	-376	-439	-472	-487	-500	-508	-560	-579	-590	-677	-794	-846	-873
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	419	512	602	702	797	894	898	979	1,056	1,056	1,115	1,096	1,153	1,209	1,261	1,242
Total Generation	**GWh**	**9,185**	**10,256**	**10,660**	**10,987**	**10,906**	**11,457**	**11,614**	**11,641**	**11,593**	**11,773**	**11,892**	**12,459**	**12,911**	**13,680**	**13,666**	**13,795**	**13,991**	**14,488**	**14,355**	**14,279**
Net Purchases	GWh	916	244	562	707	1,004	1,449	1,467	1,561	1,702	1,636	1,537	1,093	815	160	338	260	195	-166	79	191
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	Low Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,623 million
20-Year NPV Carbon Emissions:	12.89 million tons
20-Year NPV Water Consumption:	6.45 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	17%	18%	17%	21%	17%	21%	19%	18%	16%	16%	17%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	274	273	272	174	88	36	40	31	33	32	24	21	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,207	1,133	1,133	1,151	1,151	1,151	1,151	1,151	1,192	1,356	1,520	1,561	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	987	987	987
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,801	1,797	1,908	2,140	2,365	2,861	2,852	2,844	2,891	2,840	2,832	2,918	3,060	3,239	3,433
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,156	1,156	1,156	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,418	1,418	1,418	1,635	1,635	1,635	1,635	1,635	1,705	1,742	1,742	1,934	2,239	2,331	2,365
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	174	198	216	236	258	275	256	258	276	270	275	270	284	300	311	309
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,362**	**5,782**	**5,722**	**5,853**	**6,341**	**6,384**	**7,260**	**7,254**	**7,361**	**7,514**	**7,669**	**8,020**	**8,352**	**8,442**	**8,723**	**8,644**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,180	1,171	1,195	574	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	762	1,032	1,103	1,061	1,146	1,294	552	610	477	515	507	387	346	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	83	83
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,290	2,349	2,417	2,300	2,242	2,254	2,249	2,238	2,467	2,472
Geothermal	GWh	66	55	51	52	52	53	54	53	50	52	40	42	41	44	44	43	46	43	37	10
Solar	GWh	1,671	3,192	3,477	4,143	4,156	4,462	4,459	4,602	5,091	5,626	5,732	5,854	5,759	6,016	6,081	5,886	6,232	6,383	6,722	6,913
Wind	GWh	2,205	2,062	1,963	1,988	2,018	2,056	2,091	2,016	1,983	1,955	3,183	3,210	3,842	3,899	3,920	4,657	4,639	5,310	4,615	4,411
4-hr Storage	GWh	-40	-113	-130	-272	-302	-356	-366	-384	-456	-479	-484	-499	-505	-544	-575	-587	-672	-802	-848	-878
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	419	512	602	696	788	873	865	937	1,014	1,014	1,073	1,054	1,110	1,167	1,219	1,199
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,306**	**11,482**	**11,535**	**11,535**	**11,695**	**12,177**	**12,503**	**13,046**	**13,243**	**13,293**	**13,694**	**13,950**	**14,372**	**14,297**	**14,211**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,600	1,598	1,667	1,760	1,714	1,251	1,049	680	597	711	360	236	-50	137	260
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	Stable ED
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$16,553 million
20-Year NPV Carbon Emissions:	15.68 million tons
20-Year NPV Water Consumption:	7.22 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	1,484 MW
20-Year NPV Rev Req:	$293 million

Final adjustments based on SERVM LOLP analysis

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,173	2,300	2,445	2,593	2,791	2,943	3,052	3,158	3,273	3,363	3,480	3,603	3,704	3,829	3,930	4,052	4,159	4,269	4,348
PRM	%	5%	16%	16%	16%	17%	17%	16%	16%	21%	23%	23%	21%	18%	16%	16%	16%	16%	17%	16%	16%
Carbon Intensity	lbs/MWh	395	315	317	297	304	274	275	272	170	108	76	52	49	66	80	87	69	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	289	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,166	1,330	1,256	1,256	1,274	1,274	1,274	1,274	1,274	1,397	1,643	1,807	1,807	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,233	1,315	1,315
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	2,383	2,585	2,796	3,240	3,883	3,875	3,866	3,857	3,849	3,888	4,182	4,726	5,872	6,447	7,020
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,458	1,556	1,556	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,316	1,316	1,594	1,704	1,889	2,615	2,615	2,615	2,615	2,615	2,615	2,615	2,672	3,198	5,790	6,031	6,498
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	141	186	214	235	263	290	308	293	297	316	310	312	307	321	341	352	350
Total Capacity	**MW**	**3,678**	**4,602**	**4,899**	**5,399**	**5,599**	**6,678**	**6,938**	**7,363**	**8,577**	**9,038**	**9,414**	**9,810**	**9,919**	**10,027**	**10,314**	**10,823**	**11,908**	**15,092**	**16,000**	**16,733**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,243	1,248	1,217	1,213	1,233	578	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	832	1,118	997	1,411	1,480	1,767	1,859	1,710	2,002	1,482	1,078	1,044	1,442	1,740	1,953	1,622	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	482	770	707
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,370	2,281	2,333	2,407	2,292	2,306	2,367	2,296	2,367	2,472	2,472
Geothermal	GWh	66	55	51	54	56	54	53	50	54	48	46	45	47	50	51	49	50	47	48	11
Solar	GWh	1,671	3,193	3,491	4,314	4,438	5,854	6,364	6,913	8,284	9,340	9,232	9,197	9,253	9,460	9,766	10,222	11,574	14,058	15,103	16,352
Wind	GWh	2,205	2,063	1,962	2,046	2,110	1,971	1,984	1,960	1,983	1,842	3,360	4,827	5,478	5,551	5,558	5,592	5,587	5,545	4,783	4,509
4-hr Storage	GWh	-40	-113	-129	-294	-324	-422	-465	-533	-741	-786	-802	-824	-839	-858	-880	-929	-1,145	-1,595	-1,720	-1,938
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	346	457	564	669	788	895	985	988	1,070	1,152	1,152	1,204	1,185	1,242	1,307	1,359	1,341
Total Generation	**GWh**	**9,111**	**9,652**	**10,247**	**11,070**	**11,687**	**13,086**	**13,953**	**14,567**	**15,124**	**15,802**	**16,585**	**17,726**	**18,543**	**19,090**	**19,743**	**20,438**	**21,227**	**22,211**	**22,816**	**23,454**
Net Purchases	GWh	991	859	1,020	1,194	1,495	1,609	1,650	1,796	1,906	1,808	1,607	1,147	1,082	1,245	1,360	1,266	1,171	932	993	985
Total Supply	**GWh**	**10,101**	**10,511**	**11,267**	**12,263**	**13,183**	**14,695**	**15,603**	**16,363**	**17,030**	**17,610**	**18,192**	**18,873**	**19,625**	**20,334**	**21,103**	**21,705**	**22,398**	**23,143**	**23,809**	**24,439**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + CT
Future:	Current Trends & Policy
Sensitivity:	Tax credit 10-yr exp.
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,111 million
20-Year NPV Carbon Emissions:	12.63 million tons
20-Year NPV Water Consumption:	6.38 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	21%	18%	26%	25%	23%	18%	17%	16%	16%	16%	17%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	285	277	275	274	166	79	20	13	17	22	21	25	29	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,043	1,248	1,133	1,133	1,069	1,069	1,069	1,069	1,069	1,069	1,233	1,356	1,520	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	987	1,069	1,069
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,857	1,848	1,944	2,106	2,205	3,070	3,061	3,053	3,044	2,993	2,985	2,977	2,967	2,961	2,911
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,258	1,156	1,156	1,156	1,156	1,156	1,356	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,213	1,324	1,341	1,358	1,863	1,863	2,000	2,000	2,000	2,000	2,000	2,000	2,011	2,230	2,230	2,230
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	200	217	240	264	286	270	275	293	286	292	287	301	318	329	327
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,363**	**5,785**	**5,697**	**5,833**	**6,460**	**6,381**	**7,767**	**7,963**	**7,870**	**7,856**	**7,974**	**8,084**	**8,265**	**8,157**	**8,444**	**8,086**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,230	1,188	1,177	1,200	571	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	760	1,049	1,117	1,082	1,041	1,167	303	208	268	343	345	397	461	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	117	153
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,284	2,333	2,414	2,299	2,211	2,357	2,295	2,367	2,472	2,472
Geothermal	GWh	66	55	51	52	51	53	54	51	50	53	38	37	39	41	44	45	44	46	46	12
Solar	GWh	1,671	3,192	3,478	4,145	4,150	4,499	4,489	4,604	5,181	5,596	6,328	6,305	6,365	6,471	6,508	6,436	6,517	6,539	6,490	6,538
Wind	GWh	2,205	2,063	1,962	1,986	2,023	2,017	2,055	1,987	2,008	2,053	3,105	3,873	3,797	3,863	3,883	3,925	3,930	4,585	4,540	4,337
4-hr Storage	GWh	-40	-113	-130	-272	-302	-339	-352	-371	-503	-527	-600	-616	-629	-646	-666	-681	-705	-805	-818	-823
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	517	608	707	805	902	905	986	1,064	1,064	1,123	1,104	1,161	1,222	1,274	1,254
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,624**	**11,352**	**11,516**	**11,556**	**11,514**	**11,617**	**12,363**	**13,125**	**13,319**	**13,435**	**13,448**	**13,582**	**13,703**	**14,026**	**14,121**	**13,943**
Net Purchases	GWh	991	855	1,013	1,073	1,286	1,555	1,565	1,646	1,781	1,792	1,009	370	350	349	499	415	426	239	256	470
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,372**	**13,495**	**13,669**	**13,783**	**13,947**	**13,998**	**14,129**	**14,265**	**14,377**	**14,413**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	**Base Technologies + all LDES**
Future:	**Current Trends & Policy**
Sensitivity:	**CTP**
Phase:	**Phase 3**

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	**$11,987 million**
20-Year NPV Carbon Emissions:	**11.81 million tons**
20-Year NPV Water Consumption:	**7.19 million gallons**

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	**0 MW**
20-Year NPV Rev Req:	**$0 million**
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	25%	22%	32%	30%	27%	23%	17%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	282	262	255	233	134	36	9	12	15	10	8	5	6	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,793	2,118	2,467	2,727	3,111	3,123	3,157	3,148	3,186	3,451	3,443	3,595	4,742	4,987
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	956	1,156	1,156	1,156	1,156	1,356	1,356	1,050
4-hr Storage	MW	170	620	632	1,214	1,257	1,257	1,318	1,321	1,321	1,321	1,321	1,321	1,321	1,321	1,321	1,473	1,756	2,337	2,497	2,746
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	700	699	898	897	896	895	894	893	892	891	890	890
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	198	216	238	260	283	267	272	289	283	289	284	298	316	327	328
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,680**	**5,631**	**5,981**	**6,606**	**6,687**	**7,655**	**7,671**	**7,619**	**7,803**	**7,845**	**8,257**	**8,545**	**8,794**	**10,113**	**10,299**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,226	1,158	1,144	1,161	567	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	737	913	905	588	605	533	136	180	230	161	134	87	94	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,090	2,052	2,030	2,030	1,896	1,923
Geothermal	GWh	66	55	51	52	55	59	59	54	56	56	45	46	48	47	52	52	57	36	35	10
Solar	GWh	1,671	3,192	3,476	4,144	4,183	4,597	4,698	5,268	6,094	6,863	7,092	7,197	7,359	7,218	7,465	8,034	8,152	7,452	9,020	9,229
Wind	GWh	2,205	2,062	1,964	1,989	2,026	2,122	2,158	2,023	2,022	2,020	3,264	3,302	3,175	3,924	4,027	3,955	4,009	4,589	3,675	3,553
4-hr Storage	GWh	-40	-113	-130	-272	-313	-299	-320	-352	-348	-371	-364	-372	-384	-387	-406	-473	-575	-833	-952	-1,070
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-103	-107	-136	-378	-433	-654	-655	-648	-650	-599	-627	-553	-450	-763	-678
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	419	512	602	701	794	891	893	974	1,053	1,053	1,112	1,094	1,152	1,215	1,268	1,253
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,624**	**11,326**	**11,507**	**11,604**	**11,773**	**11,932**	**12,708**	**13,034**	**13,259**	**13,669**	**13,874**	**14,174**	**14,366**	**14,038**	**14,179**	**14,220**
Net Purchases	GWh	991	855	1,013	1,074	1,286	1,581	1,574	1,599	1,522	1,476	721	518	467	172	130	-120	-180	-595	-622	-627
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**13,443**	**13,556**	**13,593**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	High NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$12,020 million
20-Year NPV Carbon Emissions:	11.42 million tons
20-Year NPV Water Consumption:	7.07 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	25%	22%	32%	30%	29%	23%	17%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	354	306	312	284	275	264	247	245	132	37	13	9	5	8	5	2	1	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	2,020	2,171	2,703	2,868	3,099	3,090	3,082	3,073	3,086	3,347	3,476	3,489	4,220	4,551
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,258	1,356	1,356	1,356	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,257	1,257	1,298	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,460	1,719	2,346	2,438	2,531
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	700	699	898	897	896	895	894	893	892	891	890	890
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	198	216	238	260	283	267	272	289	283	289	284	298	316	327	328
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,680**	**5,837**	**6,033**	**6,841**	**6,826**	**7,641**	**7,836**	**7,942**	**7,927**	**7,944**	**8,340**	**8,742**	**8,897**	**9,731**	**9,848**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,165	1,171	1,261	1,247	1,261	1,251	1,255	584	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,161	712	997	611	593	690	545	533	511	554	199	132	76	120	86	27	17	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,021	2,003	1,999	2,242	2,221	2,125
Geothermal	GWh	66	55	51	51	51	60	57	54	53	53	42	41	39	41	47	48	54	46	42	11
Solar	GWh	1,671	3,193	3,481	4,115	4,150	4,564	5,088	5,309	6,389	6,975	6,942	6,759	6,596	6,711	6,921	7,436	7,523	7,192	7,762	8,223
Wind	GWh	2,205	2,063	1,963	1,976	2,024	2,105	2,074	2,001	1,955	1,981	3,223	3,870	4,481	4,607	4,685	4,591	4,699	5,305	4,526	4,364
4-hr Storage	GWh	-40	-113	-130	-274	-313	-297	-331	-357	-357	-377	-362	-370	-377	-384	-407	-461	-574	-828	-889	-965
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-101	-128	-137	-423	-456	-633	-697	-702	-664	-565	-576	-484	-393	-412	-446
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	419	512	602	701	794	891	893	974	1,051	1,052	1,112	1,094	1,152	1,214	1,268	1,254
Total Generation	**GWh**	**8,695**	**9,536**	**10,134**	**10,430**	**10,460**	**11,161**	**11,525**	**11,655**	**11,867**	**11,996**	**12,600**	**13,070**	**13,590**	**13,786**	**13,900**	**14,162**	**14,385**	**14,778**	**14,518**	**14,565**
Net Purchases	GWh	1,407	964	1,088	1,264	1,449	1,745	1,555	1,547	1,428	1,412	829	482	136	55	104	-108	-199	-456	-426	-437
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,091**	**14,128**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	High Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,980 million
20-Year NPV Carbon Emissions:	11.93 million tons
20-Year NPV Water Consumption:	7.43 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	21%	21%	16%	27%	27%	26%	20%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	292	282	262	235	232	160	60	35	10	8	10	6	1	1	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	2,103	2,095	2,105	2,308	2,409	2,401	2,392	2,384	2,696	2,969	3,067	3,254	4,095	4,423
Wind	MW	658	658	658	658	658	658	658	658	658	658	858	1,258	1,356	1,356	1,356	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,213	1,256	1,256	1,294	1,294	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,504	1,772	2,379	2,425	2,544
8-12hr Storage	MW	-	-	-	-	-	-	-	150	300	300	300	300	300	300	300	300	300	300	300	300
24+hr Storage	MW	-	-	-	-	-	300	300	300	300	300	600	600	600	600	600	600	600	600	600	600
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	136	175	199	218	240	264	286	271	275	293	286	292	287	301	317	328	327
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,680**	**5,919**	**6,082**	**6,152**	**6,177**	**6,762**	**7,158**	**7,265**	**7,251**	**7,569**	**8,015**	**8,396**	**8,705**	**9,603**	**9,743**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,226	1,158	1,146	1,157	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	781	736	912	619	578	971	896	529	164	122	159	99	21	17	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,322	2,222	2,296	2,367	1,953	1,945
Geothermal	GWh	66	55	51	52	54	59	56	58	58	59	58	56	55	55	55	53	57	48	32	9
Solar	GWh	1,671	3,192	3,478	4,143	4,184	4,598	5,262	5,374	5,460	6,201	6,196	5,654	5,517	5,625	6,258	6,913	7,127	7,151	8,238	8,625
Wind	GWh	2,205	2,062	1,962	1,988	2,026	2,120	2,056	2,072	2,100	2,133	2,825	4,235	4,799	4,868	4,804	4,788	4,812	5,369	4,448	4,290
4-hr Storage	GWh	-40	-113	-130	-272	-313	-299	-335	-335	-340	-355	-358	-369	-384	-388	-390	-475	-588	-841	-944	-1,007
8-12hr Storage	GWh	-	-	-	-	-	-	-	-160	-212	-291	-156	-206	-212	-200	-291	-332	-312	-297	-416	-458
24+hr Storage	GWh	-	-	-	-	-	-103	-136	-136	-127	-168	-299	-255	-241	-258	-312	-276	-258	-99	-359	-376
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	329	422	514	608	708	806	903	906	987	1,065	1,065	1,124	1,105	1,162	1,220	1,272	1,253
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,622**	**10,625**	**11,326**	**11,645**	**11,612**	**11,644**	**11,752**	**11,996**	**12,628**	**13,146**	**13,230**	**13,669**	**14,020**	**14,314**	**14,917**	**14,223**	**14,281**
Net Purchases	GWh	991	855	1,013	1,073	1,285	1,580	1,436	1,590	1,651	1,656	1,432	924	580	611	335	35	-128	-595	-667	-688
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**13,556**	**13,593**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	Low NG
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$11,804 million
20-Year NPV Carbon Emissions:	12.62 million tons
20-Year NPV Water Consumption:	7.33 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	24%	20%	33%	31%	29%	25%	19%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	397	365	347	309	294	272	266	260	131	43	18	22	16	11	9	2	2	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,757	1,784	2,610	2,620	3,127	3,119	3,110	3,102	3,152	3,198	3,189	3,261	4,057	4,376
Wind	MW	658	658	658	658	658	658	658	658	658	658	858	858	956	1,156	1,156	1,356	1,356	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,258	1,258	1,322	1,345	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,481	1,764	2,389	2,435	2,512
8-12hr Storage	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	MW	-	-	-	-	-	300	300	300	600	600	900	900	900	900	900	900	900	900	900	900
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	197	215	238	260	282	262	265	282	276	281	276	290	308	320	320
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,680**	**5,598**	**5,670**	**6,748**	**6,579**	**7,567**	**7,561**	**7,668**	**7,853**	**7,909**	**8,211**	**8,500**	**8,713**	**9,567**	**9,656**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,079	1,109	1,108	1,148	1,149	1,146	1,138	1,147	566	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,676	1,498	1,570	1,194	1,075	1,077	1,081	1,010	556	642	281	334	240	176	144	41	39	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,426	2,303	2,109	2,100	2,049	2,069	2,127	2,014
Geothermal	GWh	66	55	51	55	54	60	63	60	55	56	51	52	49	48	53	47	51	37	43	10
Solar	GWh	1,671	3,186	3,497	4,175	4,205	4,634	4,665	4,691	6,312	6,687	7,449	7,527	7,385	7,264	7,495	7,320	7,481	7,398	7,594	8,257
Wind	GWh	2,205	2,060	1,963	1,997	2,034	2,136	2,167	2,142	1,979	2,039	2,621	2,637	3,197	3,957	4,045	4,719	4,742	5,345	4,556	4,362
4-hr Storage	GWh	-40	-114	-130	-272	-313	-301	-319	-336	-383	-395	-403	-408	-415	-423	-435	-471	-572	-844	-908	-975
8-12hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+hr Storage	GWh	-	-	-	-	-	-106	-106	-105	-248	-287	-489	-499	-480	-461	-439	-385	-321	-151	-240	-415
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	417	509	600	699	791	888	880	953	1,031	1,031	1,090	1,071	1,127	1,189	1,244	1,228
Total Generation	**GWh**	**9,185**	**10,256**	**10,660**	**10,987**	**10,911**	**11,520**	**11,655**	**11,604**	**11,989**	**12,005**	**12,687**	**12,957**	**13,433**	**13,895**	**14,062**	**14,441**	**14,596**	**15,043**	**14,417**	**14,480**
Net Purchases	GWh	916	244	562	708	999	1,386	1,425	1,598	1,306	1,403	742	595	293	-55	-58	-387	-410	-720	-801	-828
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**13,616**	**13,652**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	Low Tech Costs
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$10,606 million
20-Year NPV Carbon Emissions:	12.03 million tons
20-Year NPV Water Consumption:	6.34 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	18%	20%	19%	25%	18%	22%	21%	20%	17%	16%	16%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	282	267	261	256	150	47	18	14	10	9	1	1	1	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	465	465	465	465	465	465	465	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,766	1,765	1,850	2,354	2,627	3,638	3,629	3,621	3,612	3,561	3,553	3,545	3,563	4,568	4,807
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	858	956	1,156	1,356	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,258	1,258	1,258	1,258	1,258	1,258	1,258	1,258	1,258	1,258	1,371	1,539	1,752	2,405	2,512	2,834
8-12hr Storage	MW	-	-	-	-	-	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
24+hr Storage	MW	-	-	-	-	-	-	100	99	398	394	690	685	680	676	671	666	661	657	652	648
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	198	216	236	258	280	265	270	287	281	286	281	296	313	325	325
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,780**	**5,742**	**5,846**	**6,526**	**6,616**	**7,673**	**7,864**	**7,966**	**8,147**	**8,410**	**8,760**	**8,974**	**9,193**	**10,312**	**10,563**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,226	1,167	1,155	1,164	574	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	737	967	974	912	809	715	286	223	153	142	15	9	11	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,361	2,422	2,297	2,002	2,001	1,995	2,297	2,141	2,212
Geothermal	GWh	66	55	51	54	55	59	63	61	59	59	50	49	47	48	51	51	53	49	44	12
Solar	GWh	1,671	3,189	3,481	4,144	4,186	4,611	4,727	4,894	6,159	6,954	8,768	8,676	8,578	8,476	8,386	8,093	8,227	8,322	9,550	9,851
Wind	GWh	2,205	2,065	1,959	1,986	2,024	2,117	2,172	2,134	2,089	2,069	1,887	2,571	3,140	3,908	4,682	5,366	5,389	5,367	4,549	4,362
4-hr Storage	GWh	-40	-113	-130	-272	-313	-300	-304	-314	-325	-343	-357	-364	-371	-376	-429	-493	-589	-831	-945	-1,090
8-12hr Storage	GWh	-	-	-	-	-	-196	-204	-240	-302	-372	-455	-484	-479	-467	-399	-290	-220	-94	-137	-73
24+hr Storage	GWh	-	-	-	-	-	-	-84	-95	-564	-576	-1,231	-1,292	-1,335	-1,401	-1,311	-1,342	-1,318	-1,360	-1,387	-1,346
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	418	511	601	695	787	884	887	969	1,046	1,046	1,105	1,086	1,143	1,206	1,261	1,245
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,624**	**11,303**	**11,467**	**11,507**	**11,647**	**11,763**	**12,132**	**12,709**	**13,201**	**13,673**	**14,101**	**14,483**	**14,691**	**14,955**	**15,075**	**15,173**
Net Purchases	GWh	991	855	1,013	1,074	1,286	1,603	1,613	1,696	1,649	1,645	1,297	843	525	167	-97	-428	-505	-633	-641	-703
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,434**	**14,470**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	Stable ED
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$18,303 million
20-Year NPV Carbon Emissions:	12.94 million tons
20-Year NPV Water Consumption:	8.42 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	-$336 million

Final adjustments based on SERVM LOLP analysis

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,173	2,300	2,445	2,593	2,791	2,943	3,052	3,158	3,273	3,363	3,480	3,603	3,704	3,829	3,930	4,052	4,159	4,269	4,348
PRM	%	5%	16%	16%	16%	16%	18%	16%	16%	25%	33%	37%	34%	31%	25%	20%	18%	17%	17%	17%	16%
Carbon Intensity	lbs/MWh	395	315	317	297	292	257	243	217	95	26	24	23	20	20	17	20	19	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	289	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	2,196	2,477	3,196	5,237	5,480	5,472	5,463	5,455	5,446	5,395	5,387	5,738	9,579	11,032	11,682
Wind	MW	658	658	658	658	658	658	658	658	658	658	858	1,058	1,156	1,356	1,556	1,556	1,556	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,319	1,552	1,552	1,552	1,552	2,049	2,049	2,049	2,049	2,049	2,049	2,049	2,306	2,693	4,100	5,021	5,383
8-12hr Storage	MW	-	-	-	-	-	100	200	300	300	300	300	300	300	300	300	300	300	300	300	300
24+hr Storage	MW	-	-	-	-	-	300	300	300	600	900	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	138	182	207	225	247	273	296	281	284	302	296	301	297	311	327	338	337
Total Capacity	**MW**	**3,678**	**4,602**	**4,899**	**5,399**	**5,667**	**6,513**	**6,757**	**7,599**	**10,317**	**10,684**	**11,060**	**11,255**	**11,362**	**11,547**	**11,701**	**11,945**	**12,697**	**17,262**	**19,646**	**20,351**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,243	1,239	1,172	1,167	1,213	570	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	832	1,118	999	1,269	1,324	1,376	1,024	418	513	486	471	426	459	391	486	471	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,372	2,273	2,333	2,398	2,287	2,021	2,176	2,125	1,623	1,979	2,043
Geothermal	GWh	66	56	52	56	57	60	60	54	41	42	45	45	45	46	48	55	60	26	14	4
Solar	GWh	1,671	3,191	3,490	4,319	4,581	5,931	6,751	8,247	12,269	13,414	13,635	13,702	13,766	13,841	13,820	13,704	14,448	19,697	19,835	21,037
Wind	GWh	2,205	2,065	1,964	2,043	2,164	2,139	2,164	1,998	1,617	1,653	2,393	3,180	3,830	4,615	5,410	5,608	5,600	4,988	4,397	4,192
4-hr Storage	GWh	-40	-113	-129	-295	-371	-377	-391	-430	-575	-590	-602	-617	-631	-648	-678	-769	-919	-1,575	-1,990	-2,156
8-12hr Storage	GWh	-	-	-	-	-	-45	-137	-325	-412	-387	-384	-385	-384	-382	-365	-338	-330	-465	-426	-442
24+hr Storage	GWh	-	-	-	-	-	-112	-149	-172	-445	-668	-857	-850	-837	-834	-831	-607	-565	-1,125	-586	-784
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	339	447	543	636	736	841	943	946	1,026	1,103	1,104	1,165	1,148	1,205	1,262	1,316	1,297
Total Generation	**GWh**	**9,111**	**9,652**	**10,247**	**11,067**	**11,677**	**13,002**	**13,846**	**14,641**	**16,685**	**17,292**	**17,935**	**18,904**	**19,717**	**20,487**	**20,980**	**21,463**	**22,094**	**24,431**	**24,538**	**25,190**
Net Purchases	GWh	991	859	1,020	1,196	1,549	1,737	1,801	1,765	401	477	418	135	74	12	264	386	449	-1,113	-556	-621
Total Supply	**GWh**	**10,101**	**10,511**	**11,267**	**12,263**	**13,226**	**14,738**	**15,646**	**16,406**	**17,086**	**17,768**	**18,353**	**19,039**	**19,791**	**20,500**	**21,244**	**21,849**	**22,543**	**23,318**	**23,982**	**24,569**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Scenario Information

Scenario:	Base Technologies + all LDES
Future:	Current Trends & Policy
Sensitivity:	Tax credit 10-yr exp.
Phase:	Phase 3

Cost & Environmental Metrics

20-Year NPV Revenue Requirement:	$12,436 million
20-Year NPV Carbon Emissions:	11.92 million tons
20-Year NPV Water Consumption:	6.42 million gallons

Final Reliability Adjustments to Portfolio

2040 Storage (4hr) Capacity:	0 MW
20-Year NPV Rev Req:	$0 million
Final adjustments based on SERVM LOLP analysis	

Key Annual Metrics

Metric	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Peak load	MW	2,206	2,175	2,299	2,377	2,427	2,562	2,617	2,647	2,682	2,724	2,744	2,787	2,837	2,864	2,918	2,949	3,003	3,038	3,072	3,092
PRM	%	5%	16%	16%	16%	16%	16%	16%	16%	27%	18%	41%	39%	37%	32%	25%	20%	16%	16%	16%	16%
Carbon Intensity	lbs/MWh	395	315	316	293	282	255	253	247	152	45	9	6	8	11	9	12	13	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	MW	200	200	200	200	200	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-
Contract	MW	508	293	420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	1,002	1,002	1,002	1,002	1,002	1,002	846	846	700	700	700	700	700	700	700	700	700	-	-	-
Hydrogen	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	MW	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	762	1,438	1,570	1,783	1,774	1,888	1,879	1,946	2,241	2,673	3,401	3,393	3,384	3,376	3,325	3,317	3,308	3,353	4,349	4,604
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,258	1,156	1,156	1,156	1,156	1,156	1,556	1,556	1,250
4-hr Storage	MW	170	620	632	1,214	1,257	1,302	1,365	1,385	1,550	1,560	1,586	1,586	1,586	1,586	1,586	1,586	1,648	2,480	2,720	2,904
8-12hr Storage	MW	-	-	-	-	-	300	300	300	700	700	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
24+hr Storage	MW	-	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300
Electrolysis	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	69	96	117	135	174	199	217	239	263	285	270	274	292	286	291	287	301	319	331	331
Total Capacity	**MW**	**3,678**	**4,605**	**4,898**	**5,291**	**5,365**	**5,848**	**5,765**	**5,873**	**6,611**	**6,876**	**8,615**	**8,811**	**8,718**	**8,703**	**8,658**	**8,645**	**8,713**	**9,307**	**10,555**	**10,688**

Annual Generation by Resource Type

Resource Type	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Coal	GWh	1,103	1,159	1,152	1,236	1,226	1,161	1,151	1,163	568	-	-	-	-	-	-	-	-	-	-	-
Contract	GWh	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	1,577	828	1,095	782	737	802	854	776	856	678	138	99	125	168	149	193	207	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear	GWh	2,443	2,297	2,357	2,364	2,290	2,367	2,367	2,296	2,361	2,374	2,296	2,359	2,421	2,303	2,045	2,139	2,113	2,367	2,472	2,472
Geothermal	GWh	66	55	51	52	55	57	59	56	56	53	40	39	41	42	46	49	50	41	37	8
Solar	GWh	1,671	3,190	3,477	4,145	4,184	4,808	4,830	4,938	5,557	6,574	7,595	7,464	7,545	7,674	7,717	7,584	7,673	7,523	8,185	8,435
Wind	GWh	2,205	2,065	1,963	1,987	2,026	2,070	2,117	2,068	2,025	1,979	3,065	3,808	3,737	3,788	3,910	4,011	4,006	4,930	4,446	4,378
4-hr Storage	GWh	-40	-113	-130	-272	-313	-320	-344	-362	-416	-451	-451	-466	-473	-490	-507	-518	-552	-889	-1,021	-1,111
8-12hr Storage	GWh	-	-	-	-	-	-118	-114	-120	-217	-294	-533	-545	-521	-468	-351	-319	-307	-254	-270	-270
24+hr Storage	GWh	-	-	-	-	-	-	-	-	-	-	-321	-309	-307	-295	-231	-231	-235	-61	-71	-58
Electrolysis	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	87	165	244	326	419	515	605	705	802	899	902	983	1,061	1,062	1,122	1,105	1,164	1,228	1,282	1,267
Total Generation	**GWh**	**9,111**	**9,645**	**10,209**	**10,621**	**10,624**	**11,342**	**11,524**	**11,520**	**11,593**	**11,813**	**12,731**	**13,431**	**13,629**	**13,784**	**13,900**	**14,013**	**14,119**	**14,885**	**15,060**	**15,120**
Net Purchases	GWh	991	855	1,013	1,074	1,286	1,564	1,556	1,683	1,702	1,596	698	120	97	57	104	41	67	-563	-651	-666
Total Supply	**GWh**	**10,101**	**10,500**	**11,222**	**11,695**	**11,910**	**12,906**	**13,081**	**13,202**	**13,295**	**13,408**	**13,429**	**13,552**	**13,726**	**13,841**	**14,004**	**14,055**	**14,186**	**14,322**	**14,409**	**14,454**

Peak load does not include impact of future EE programs, which are modeled as a resource.
New "Hydrogen-Ready" resources operate using natural gas as a primary fuel through 2039, then convert to hydrogen-fueled operations in 2040
"DSM" includes demand response and energy efficiency.
Negative generation for energy storage resources reflects roundtrip losses.
Negative generation for electrolysis reflects energy required to produced hydrogen fuel with portfolio resources.
"Total Supply" matches the annual energy from the corresponding load forecast.
The impacts of final reliability adjustments on cost and portfolio metrics are reflected in results shown here.

Appendix G. Astrapé Updated Reliability Study

This Supplemental Analysis uses loss-of-load-probability modeling to develop a planning reserve margin requirement, to calculate ELCCs for renewables and storage, and to evaluate the reliability of select portfolios. This analysis, completed by Astrapé Consulting using the SERVM model, is summarized in the following report.

ASTRAPÉ CONSULTING
innovation in electric system planning

2023 Integrated Resource Plan Updated Expansion Portfolio Analysis

9/24/2024

PREPARED FOR

PNM Resources

PREPARED BY

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Astrapé Consulting

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EXECUTIVE SUMMARY

Astrapé conducted analysis that was used in the Public Service Company of New Mexico's (PNM) 2023 Integrated Resource Plan (IRP)[1]. After the filing of the 2023 IRP PNM saw its forecasted peak loads and energy increase significantly and as a result needed additional analysis from Astrapé. The additional work, detailed in this report, involved creating and simulating updated expansion planning portfolios in Astrapé's Strategic Energy Risk Valuation Model (SERVM). These portfolios were simulated with the intent to determine loss of load expectation (LOLE) as a metric for if they met PNM's reliability standards. PNM provided a unique expansion portfolio for four technology frameworks, two load scenarios, and two study years, resulting in 16 total portfolios to be simulated. The LOLE for each portfolio simulated in this effort is shown in Table 1 below.

Table 1: Expansion Portfolio Loss of Load Expectation Results

Technology	Load	Year	LOLE (days/year)
All Tech	Normal	2032	0.04
All Tech	Normal	2040	0.08
All Tech	High	2032	0.13
All Tech	High	2040	2.23
Base+CT	Normal	2032	0.03
Base+CT	Normal	2040	0.09
Base+CT	High	2032	0.10
Base+CT	High	2040	0.39
Base+LDES	Normal	2032	0.04
Base+LDES	Normal	2040	0.10
Base+LDES	High	2032	0.00
Base+LDES	High	2040	0.15
Base+CT+LDES	Normal	2032	0.06
Base+CT+LDES	Normal	2040	0.07
Base+CT+LDES	High	2032	0.08
Base+CT+LDES	High	2040	1.77

For the five portfolios that had LOLE farthest away from 0.1, Astrapé ran additional simulations to determine how much 4-hour battery would need to be added or removed to reach 0.1 LOLE. The results of this additional analysis are shown in Table 2 below.

[1] https://www.pnmforwardtogether.com/assets/uploads/PNM-2023-IRP-Report-corrected-2023-12-18.pdf

Table 2: 4HR Adjustments for 0.1 LOLE

Technology	Load	Year	4hr Adjustment for 0.1 (MW)
All Tech	High	2040	1,198
Base+CT	High	2040	1,484
Base+LDES	High	2032	(772)
Base+LDES	High	2040	123
Base+CT+LDES	High	2040	1,062

PORTFOLIO VERIFICATION

PORTFOLIO SUMMARIES

PNM provided Astrapé with multiple portfolios created through the expansion planning process. These portfolios represent different technology options available in the expansion planning process. Base technologies ("Base"), long-duration storage technologies ("LDES"), combustion turbines and similar technologies ("CT"), and all technologies available ("All Tech") portfolios were provided. Two load scenarios were analyzed, "Normal" and "High" load forecasts, as well as two study years, 2032 and 2040. The combination of every technology group, load forecast, and study year resulted in 16 unique portfolios to be simulated. Each portfolio resource mix is shown in Table 3 and Table 4 below.

Table 3: 2032 Expansion Portfolios

Unit Category	All Tech		Base + CT		Base + LDES		Base + CT + LDES	
Load	Normal	High	Normal	High	Normal	High	Normal	High
Wind	1,058	1,458	658	658	658	658	658	658
Combined Cycle	425	425	425	425	425	425	425	425
Solar	2,203	3,141	2,258	3,973	2,727	5,515	2,328	3,792
4 Hour Battery	1,526	1,592	1,715	2,615	1,420	2,049	1,476	1,676
Geothermal	11	11	11	11	11	11	11	11
Combustion Turbine	480	439	685	849	275	275	480	603

Nuclear	288	288	288	288	288	288	288	288
Demand Response	53	53	53	53	53	53	53	53
Energy Efficiency	227	233	233	256	230	244	231	234
Pumped Storage Hydro	-	300	-	-	600	900	300	600
Mainspring Linear Generator	50	50	-	-	-	-	-	-
CAES	200	300	-	-	-	-	-	-
Flow Battery	-	-	-	-	-	200	-	-
LAES	-	-	-	-	-	100	-	-
Peak Load Forecast	2,724	3,273	2,724	3,273	2,724	3,273	2,724	3,273

Table 4: 2040 Expansion Portfolios

Unit Category	**All Tech**		**Base + CT**		**Base + LDES**		**Base + CT + LDES**	
Load	Normal	High	Normal	High	Normal	High	Normal	High
Wind	1,556	1,556	1,556	1,556	1,356	1,556	1,556	1,556
Combined Cycle	-	-	-	-	-	-	-	-
Solar	3,000	6,228	3,039	5,962	3,900	9,614	3,088	6,212

4 Hour Battery	1,993	3,492	2,314	4,306	2,429	4,100	1,959	3,426
Geothermal	11	11	11	11	11	11	11	11
Combustion Turbine	700	536	946	1,233	-	-	782	700
Nuclear	288	288	288	288	288	288	288	288
Demand Response	53	53	53	53	53	53	53	53
Energy Efficiency	252	264	265	288	263	274	259	265
Pumped Storage Hydro	-	300	-	-	600	900	300	600
Mainspring Linear Generator	167	200	-	-	-	-	-	-
CAES	200	300	-	-	200	200	-	100
Flow Battery	-	-	-	-	-	200	-	-
LAES	-	-	-	-	-	100	-	-
Peak Load Forecast	3,038	4,159	3,038	4,159	3,038	4,159	3,038	4,159

RESULTS

All 16 of the portfolios were simulated in SERVM for the scenarios described above. LOLE outputs from the SERVM simulations for each of the portfolio/scenario combinations are in Table 5. An additional analysis was done on the five scenarios that were either too reliable or too unreliable assuming 0.1 LOLE as the target reliability metric. 4-hour storage was added or subtracted at varying levels, and the interpolated amount of the change in 4-hour storage needed for 0.1 LOLE was calculated. Generally, portfolios that contained 4-HR storage penetrations that were beyond the surface ELCCs developed needed corrections but portfolios that finished within the ELCC surface performed reasonably well. The results of this analysis are shown below in Table 6.

Table 5: Expansion Portfolio Loss of Load Expectation Results

Technology	Load	Year	LOLE (days/year)
All Tech	Normal	2032	0.04
All Tech	Normal	2040	0.08
All Tech	High	2032	0.13
All Tech	High	2040	2.23
Base+CT	Normal	2032	0.03
Base+CT	Normal	2040	0.09
Base+CT	High	2032	0.10
Base+CT	High	2040	0.39
Base+LDES	Normal	2032	0.04
Base+LDES	Normal	2040	0.10
Base+LDES	High	2032	0.00
Base+LDES	High	2040	0.15
Base+CT+LDES	Normal	2032	0.06
Base+CT+LDES	Normal	2040	0.07
Base+CT+LDES	High	2032	0.08
Base+CT+LDES	High	2040	1.77

Table 6: 4HR Adjustments for 0.1 LOLE

Technology	Load	Year	4hr Adjustment for 0.1 (MW)
All Tech	High	2040	1,198
Base+CT	High	2040	1,484
Base+LDES	High	2032	(772)
Base+LDES	High	2040	123
Base+CT+LDES	High	2040	1,062

For the “All Tech” and “Base + LDES” portfolios with normal load forecast, the distributions of EUE by month and hour of day for 2032 and 2040 study years are shown below in Table 7, Table 8, Table 9, and Table 10.

Table 7: All Tech 2032 EUE Distribution[2]

All Tech 2032		Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Hour of Day	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	3	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	4	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
	5	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
	6	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
	7	3%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
	8	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	19	0%	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	0%
	20	0%	0%	0%	0%	0%	0%	6%	2%	12%	0%	0%	0%
	21	0%	0%	0%	0%	0%	0%	2%	0%	10%	0%	0%	0%
	22	0%	0%	0%	0%	0%	0%	1%	0%	9%	0%	0%	0%
	23	0%	0%	0%	0%	0%	0%	0%	2%	6%	0%	0%	0%
	24	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%
Monthly Percentage of EUE		8%	14%	0%	0%	0%	0%	11%	7%	40%	0%	0%	19%

Table 8: Base + LDES 2032 EUE Distribution

Base + LDES 2032		Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Hour of Day	1	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
	2	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
	3	0%	0%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%
	4	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%
	5	1%	5%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
	6	4%	10%	0%	0%	0%	0%	2%	0%	0%	0%	0%	1%
	7	5%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
	8	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	19	0%	0%	0%	0%	0%	2%	1%	1%	0%	0%	0%	0%
	20	0%	0%	0%	0%	0%	6%	7%	7%	0%	0%	0%	0%
	21	0%	0%	0%	0%	0%	2%	1%	2%	0%	0%	0%	0%
	22	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%
	23	0%	0%	0%	0%	0%	2%	3%	0%	0%	0%	0%	0%
	24	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%
Monthly Percentage of EUE		11%	28%	0%	0%	0%	17%	28%	10%	0%	0%	0%	5%

[2] This portfolio has an LOLE of only 0.04 days/year. Heat maps of portfolios closer to 0.1 LOLE would likely be more representative.

Table 9: All Tech 2040 EUE Distribution

All Tech 2040		Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Hour of Day	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
	5	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%
	6	1%	8%	0%	0%	0%	0%	0%	1%	0%	0%	0%	9%
	7	8%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	34%
	8	4%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	20	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
	21	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
	22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	23	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
	24	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Monthly Percentage of EUE		16%	25%	0%	0%	0%	0%	2%	2%	4%	0%	0%	51%

Table 10: Base + LDES 2040 EUE Distribution

Base + LDES 2040		Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Hour of Day	1	1%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	0%
	2	1%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
	3	2%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
	4	2%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%
	5	3%	3%	0%	0%	0%	0%	7%	1%	0%	0%	0%	0%
	6	5%	7%	0%	0%	0%	0%	4%	2%	0%	0%	0%	1%
	7	8%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
	8	2%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	20	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
	21	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
	22	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
	23	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%	0%	0%
	24	1%	0%	0%	0%	0%	0%	4%	2%	1%	0%	0%	0%
Monthly Percentage of EUE		26%	23%	0%	0%	0%	0%	34%	8%	6%	0%	0%	3%