

PNM

2020-2040

Integrated Resource Plan

100% EMISSIONS
FREE
BY 2040

Reliability • Environment • Affordability

Moving to the next decade of emissions-free electricity

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Appendix A. Acronym List

ADMS	Advanced Distribution Monitoring System	LIHEAP	Low Income Home Energy Assistance Program
AMI	Advanced Metering Infrastructure	LOLE	Loss of load expectation
APS	Arizona Public Service Company	LOLH	Loss of load hours
ATB	Annual Technologies Baseline	MCEP	Most Cost-Effective Portfolio
BA	Balancing authority	MMBtu	Million British thermal units
BAA	Balancing authority area	MW	Megawatt
BTM	Behind the meter	MWh	Megawatt-hours
Btu	British thermal unit	NEM	Net energy metering
CAA	Clean Air Act	NERC	North American Electric Reliability Council
CAISO	California Independent System Operator	NPV	Net present value
CAES	Compressed Air Energy Storage	NMAC	New Mexico Administrative Code
CCGT	Combined cycle gas turbine	NMPRC	New Mexico Public Regulatory Commission
CCN	Certificate of Convenience & Necessity	NMVEC	New Mexico Wind Energy Center
COP	Conference of the Parties	NRC	Nuclear Regulatory Commission
CT	Combustion turbine	NTEC	Navajo Transitional Energy Company
DCS	Disturbance Control Standard	OATT	Open Access Transmission Tariff
DERMS	Distributed Energy Resource Management System	PNM	Public Service Co. of New Mexico
DG	Distributed generation	PNMR	PNM Resources, Inc.
DR	Demand response	PPA	Power Purchase Agreement
DSM	Demand Side Management	PRM	Planning Reserve Margin
EDAM	Extended Day-Ahead Market	PTC	Production tax credit
EE	Energy Efficiency	PV	Photovoltaic
EEA	Energy Emergency Alert	PVNGS	Palo Verde Nuclear Generating Station
EIM	Energy Imbalance Market	REC	Renewable Energy Certificate
EIP	Eastern Interconnection Project	RFI	Request for Information
ELCC	Effective load carrying capability	RFP	Request for Proposals
EPA	Environmental Protection Agency	RPS	Renewables Portfolio Standard
EPE	El Paso Electric Company	SERVM	Strategic Energy Risk Valuation Model
EPNG	El Paso Natural Gas Company	SCPPA	Southern California Public Power Authority
ETA	Energy Transition Act	SJGS	San Juan Generating Station
EUEA	Efficient Use of Energy Act 62-17 NMSA	SMR	Small modular reactor
EUE	Expected Unserved Energy	SPS	Southwestern Public Service Co.
EV	Electric vehicle	SRSG	Southwest Reserve Sharing Group
FCPP	Four Corners Power Plan	SWAT	Southwest Area Transmission
FERC	Federal Energy Regulatory Commission	TEP	Tucson Electric Power
GE	General Electric Company	TOD	Time of day
GHG	Greenhouse Gas	TSGT	Tri-State Generation and Transmission Association
GW	Gigawatt	UCAP	Unforced capacity
GWh	Gigawatt-hours	UCT	Utility cost test
HE	Hour ending	UNFCCC	United Nations Framework Convention on Climate Change
IPP	Independent Power Producer	WAPA	Western Area Power Administration
IRP	Integrated Resource Plan	WECC	Western Electric Reliability Council
ITC	Investment tax credit		
kW	Kilowatt		
kWh	Kilowatt-hours		
LADWP	Los Angeles Department of Water & Power		

Appendix B. Glossary of Terms

ACE Diversity Interchange: Power system control areas within three major (and essentially separate) areas of North America are interconnected electrically, thus enjoying vastly improved reliability and economy of operation compared to operating in isolation. Each must continually balance load, interchange, and generation to minimize adverse influence on neighboring control areas and interconnection frequency. This requires investment in control systems and the sacrifice of some fuel conversion efficiencies to achieve the objective of complying with minimum control performance standards set by the North American Electric Reliability Council (NERC). Control also increases wear and tear on machinery in the pursuit of these goals. Area control area (ACE) and area diversity interchange (ADI) offer a means of reducing this control burden without undue investment or sacrifice by any participant in a group. (Source: IEEE, <http://ieeexplore.ieee.org/Xplore/login.jsp?url=/iel1/59/8797/00387953.pdf?arnumber=387953>)

Aeroderivative: A type of gas turbine for electrical power generation

Availability factor: The ratio of the time a generating facility is available to produce energy at its rated capacity, to the total amount of time in the period being measured, as defined by the IRP Rule

Avoided costs: The incremental cost to a utility for capacity and/or energy that could be avoided if another incremental resource addition such as energy efficiency were added that deferred or eliminated the need for the original addition

Baseload: A resource that is most economically used by running at a capacity factor of 65% or greater on an annual basis. See also capacity factor.

Biomass resource: As defined by the IRP Rule, a recognized renewable resource type that uses renewable fuels such as agriculture or animal waste, small diameter timber, salt cedar and other phreatophyte or woody vegetation removed from river basins or watersheds, landfill gas and anaerobically digested waste biomass. See also renewable energy.

Cap and trade: A regulatory body sets a cap on emissions of a designated pollutant, and sells permits equivalent to a firm's emissions. Firms that need to increase their emission permits must buy them from those who require fewer permits.

Capacity factor: Actual energy generated over a certain time period divided by theoretical ability to generate electricity over that same time period. Capacity factor is most often referenced as an annual calculation.

Capacity uprate: The maximum power level at which a nuclear power plant may operate

Carbon dioxide: Carbon dioxide (CO₂) is an important greenhouse gas because it is thought to contribute to global warming. Although it is not currently a regulated pollutant, it is the subject of pending federal legislation seeking to make it a regulated pollutant. That legislation would seek to reduce its CO₂ production by penalizing power plants for their emission into the atmosphere. An NMPRC Order in Case No. 06-00448-UT requires that electric utilities use the following standardized prices for carbon emissions in their IRP filing: \$8, \$20, and \$40 per metric ton for their low, medium, and high price sensitivities, respectively.

Climate change: A significant change in measures of climate, including temperature, precipitation, or wind, that lasts for an extended period of time, resulting from natural factors or human activities that change the atmosphere's composition and the land surface

Combined cycle gas turbine: For electric generation, *combined cycle* refers to a gas turbine that generates electricity and heat in the exhaust used to make steam, which then drives a steam turbine to generate additional electricity.

Constrained transmission: A transmission system that can no longer accommodate additional capacity to meet demand is constrained.

Conventional resources: Coal, nuclear, and natural gas resources that have historically been the most commonly used to supply electricity (also referred to as *traditional resources*)

Crediting: A billing mechanism that credits distribution generation system owners for electricity they add to the grid. When a home or business is net-metered, electricity generated is credited against what electricity is consumed when the home or business electricity use exceeds the system's output. Customers are only billed for their "net" energy use.

Demand response (DR) : A resource comprising programs that compensate electricity users in exchange for the ability to interrupt or reduce their electric consumption when system demand is particularly high and/or system reliability is at risk.

Demand: Usage at a point in time, measured in MW or kW

Demand-side resources: As defined by the IRP Rule, energy efficiency, and load management, as those terms are defined in the Efficient Use of Energy Act

Dispatchability: The ability of a generating unit to increase or decrease generation, or to be brought online or shut down at the request of a utility's system operator

Distributed generation: Electric generation that is sited at a customer's premises, providing energy to the customer load at that site and/or providing electric energy for use by multiple customers in contiguous distribution substation areas. In this report, it refers to PNM customer-sited, renewable, distributed generation program for solar photovoltaic systems less than 10 kilowatts in size.

Duty cycle: Generating facility design that determines how a facility is operated. Duty cycle classifications for firm resources include baseload, intermediate, peaking. While the concept of "duty cycle" is not directly applicable to non-firm resources, these can nonetheless generally be classified as intermittent and storage.

EE Rule: Energy Efficiency Rule (17.7.2 New Mexico Administrative Code)

Effective load carrying capability (ELCC): a measure used to translate the contributions of **non-firm resources** towards resource adequacy into equivalent "perfect" capacity derived through loss of load probability modeling. The use of ELCC to account for the capacity contributions of non-firm resources allows our planning reserve margin requirement to capture the needs of our system (and the contributions these resource make towards them) across all conditions, and is therefore an essential component of our planning approach.

Emergency energy: Energy purchases to meet unserved load

Energy efficiency: Measures, including energy conservation measures or programs that target consumer behavior, equipment, or devices to result in a decrease in consumption of electricity without reducing the amount or quality of energy services, as defined by the IRP Rule

Energy: Usage over a period of time, measured in GWh, MWh, or kWh

EnCompass: the primary resource portfolio modeling software that PNM uses for resource plan optimization. The model includes both capacity expansion and production simulation functionality.

Equivalent availability: Typically referred to as *Equivalent Availability Factor (EAF)*, the proportion of hours in a given time period that a resource is available to generate at full capacity

Financial risk: Expected cost to the customer and the variability and uncertainty of future cost outcomes.

Firm resources: generating resources capability of producing stable, predictable output over sustained periods of time (absent forced outages), which typically include nuclear, coal, and natural gas. See also **non-firm resources**.

Fixed cost: Costs that are independent of output. See also **variable costs**.

Forced outage rate: Percentage of time a unit is not operational when it is expected to be in service

Geothermal: Electric generation fueled by heat from geologic formations, which qualifies as a renewable resource under 17.9.572 NMAC

Heat rate: The ratio of energy inputs used by a generating facility expressed in BTUs (British Thermal Units) to the energy output of that facility expressed in kilowatt-hours, as defined by the IRP Rule

Hydrogen-ready combustion turbine: a peaking resource that generates electricity through combustion of a blend of hydrogen and natural gas and that may be retrofit in the future to operate using 100% hydrogen fuel.

Intermediate: A resource that is most economically run at capacity factors between 20% and 65% of the time on an annual basis. See also **capacity factor**, **duty cycle**.

Independent Power Producer (IPP): Third party producers who sell capacity and/or energy to utilities

IRP Rule: Integrated Resource Plan for Electric Utilities, NMPRC Rule 17.7.3 New Mexico Administrative Code (17.7.3 NMAC).

Jurisdictional load: Case 3137 Stipulation identifies jurisdictional load as New Mexico retail load and wholesale firm requirement customers contracted prior to September 2, 2002.

Load duration curve: Illustration of the relationship between generating capacity requirements and capacity utilization. The load duration curve helps determine which type of resource best matches system load requirements.

Load and resources: A load and resources table shows annual balance between load and the resources to meet the load, and includes the reserve margin calculation

Load factor: Peak demand divided by average demand

Load forecasting: The prediction of the demand for electricity over the planning period for the utility, as defined by the IRP Rule

Load management: Measures or programs that target equipment or devices to decrease peak electricity demand or shift demand from peak to off-peak periods, as defined by the IRP Rule

Load-following resource: This resource has a response rate that can meet normal fluctuations in load.

Loss of load expectation (LOLE): A probabilistic measure of the expected frequency that a portfolio of resources would have insufficient capability to serve loads, as measured in number of days per year. *See also resource adequacy.*

Marginal cost: The highest system resource cost for the hour

Monte Carlo: Risk analysis technique utilizing multiple iterations calculated using random draws for sensitivity variables from a defined distribution for the variables

Most cost-effective resource portfolio: Those supply-side resources and demand-side resources that minimize the net present value of revenue requirements proposed by the utility to meet electric system demand during the planning period consistent with reliability and risk considerations, as defined by the IRP Rule.

Nameplate capacity: The rated output of an electrical generator; it can also refer to the rated capacity of a power plant.

Net present value: The difference between the present values of cash inflows and the present value of cash outflows

Network transmission service: The transmission of capacity and energy from network generating resources to PNM's load.

Non-firm resources: generating resources with limitations on their ability to produce sustained, constant production of energy, including wind and solar (whose intermittency and variability limit their production) and storage and demand response (whose limited duration affects their ability to produce power for sustained periods). *See also firm resources, effective load carrying capability.*

Non-spinning reserves: The extra generating capacity that is not currently synchronized with the system, but can become available after a short delay

Particulate matter: A complex mix of extremely small particles and liquid droplets, including acids, organic chemicals, metals, and soil and dust, creating particle pollution

Peak demand: Occurs when demand for energy is at its greatest

Peak shaving: A strategy used to reduce electricity use during times of peak demand, typically employed through demand response programs

Peaking: A resource that is most economically run at a capacity factor of less than 20%. *See also capacity factor, duty cycle.*

Photovoltaic: Solar generation that uses photovoltaic panels to convert sunlight directly to energy

Planning period: The future period for which a utility develops its IRP. For purposes of this rule, the planning period is 20 years, from 2021-2040.

Planning reserve margin (PRM): A measure of the amount of capacity in a portfolio in excess of a utility's peak demand. The capacity contributions of different types of resources towards this requirement are measured using effective load carrying capability (renewables, storage, and demand response) and unforced capacity (nuclear, coal, and gas). The use of these metrics allows the PRM to reflect supply needs across all hours of the year, not just during peak periods. *See also resource adequacy.*

Plug-in hybrids: Hybrid automobiles whose batteries are recharged by plugging into an electric socket

Point-to-point transmission service: Delivery of power from one location to another, without branching to other locations

Portfolio: A combination of resource additions/assets over the planning period that meet the reserve margin criteria

Public utility: As defined by the IRP Rule, public utility or utility has the same meaning as in the Public Utility Act, except that it does not include a distribution cooperative utility, as defined in the Efficient Use of Energy Act

Qualifying facilities: FERC established a new class of generating facilities that would receive special rate and regulatory treatment to support implementation of the Public Utility Regulatory Policies Act of 1978. Generating facilities fall into two categories: qualifying small power production facilities and qualifying cogeneration facilities.

Rate rider: According to State Statute 62-3-3-H, "Rate" means every rate, tariff, charge, or other compensation for utility service rendered or to be rendered by a utility and every rule, regulation, practice, act, requirement, or privilege in any way relating to such rate, tariff, charge, or other compensation and any schedule or tariff or part of a schedule or tariff thereof.

Reasonable Cost Threshold: A customer protection mechanism that limits the customer bill impact resulting from renewable energy procurements by utilities. It is the cost level established by the Commission above which a public utility shall not be required to add renewable energy to its electric energy supply portfolio pursuant to the renewable portfolio standard.

Resource Adequacy: The ability of a portfolio of resources to supply enough generation to meet demand across the year according to a predetermined reliability standard. PNM's standard for resource adequacy is based on a loss of load expectation of 0.2 days per year. To meet this standard, PNM plans to meet a minimum planning reserve margin requirement.

Regional Entity: According to NERC, "NERC works with eight regional entities to improve the reliability of the bulk power system. The members of the regional entities come from all segments of the electric industry: investor-owned utilities; federal power agencies; rural electric cooperatives; state, municipal and provincial utilities; independent power producers; power marketers; and end-use customers. These entities account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico."

Regional haze: According to the EPA, regional haze is visibility impairment that is produced by activity that emits fine particles and their precursors over a geographic area.

Reliability: The ability of the electric system to supply the demand and energy requirements of the customers when needed and to withstand sudden disturbances.

Renewable energy: As defined by the IRP Rule, electrical energy generated by means of a low or zero emissions generation technology with substantial long-term production potential and generated by use of renewable energy resources that may include solar, wind, hydropower, geothermal, fuel cells that are not fossil fueled, and biomass resources.

Renewable Energy Procurement Plan (REPP): PNM annual filing at the NMPRC that discusses plans to meet the Renewable Portfolio Standard set by the NMPRC.

Renewable resources: Generation resources that are based on a renewable fuel supply

Retail sales: The sale of energy to end users

Scenario: A combination of sensitivity values used to generate portfolios

Sensitivity: A variable that has a significant impact on risk evaluation

Solar photovoltaic: Electric generation that uses photovoltaic panels to convert sunlight directly to energy

Spinning reserves: Backup energy production capacity that can be available to a transmission system within 10 minutes and can operate continuously for at least two hours after being brought online

Spot prices: The price quoted for immediate settlement (payment) of a commodity

Total system costs: Total sum of annual costs for meeting the system's energy requirements with all resources

Unforced capacity: the nameplate capacity of a firm resource, derated by its expected forced outage rate; this metric is used to count the capacity of firm resources towards PNM's **planning reserve margin**

Variable costs: Costs that change with unit output. See also **fixed costs**.

Water intensity: A measure of the water resource needed to generate over a defined period

Wheeling: Transportation of electric power over transmission lines

Wind: Electric generation fueled by wind turbines

Appendix C. Load Forecast Details

This appendix provides details surrounding the assumptions and development of our load forecast. Table C-1 Table C-2 show our energy and peak demand forecasts across the range of scenarios and sensitivities considered in the IRP.¹ The subsequent sections provide details behind the load forecasting approach (including data required by the IRP Rule).

¹ The forecasts reported in these tables do not include the impacts of our future load-modifying energy efficiency programs, which are modeled separately as a resource in our IRP.

Summary of Load Forecasts

Table C-1. Annual energy forecasts under various futures and sensitivities (GWh)

Future/Sensitivity	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Current Trends & Policy	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560
+ Likely Econ Dev Loads	9,787	10,219	10,617	11,148	11,580	12,095	12,566	12,820	12,931	12,937	12,952	12,990	12,925	12,885	12,853	12,928	12,882	12,861	12,920	12,990
+ High Econ Dev Loads	9,788	10,310	10,897	11,894	13,049	14,363	15,252	15,810	16,026	16,031	16,046	16,093	16,020	15,980	15,947	16,031	15,976	15,956	16,015	16,093
+ No BTM PV	10,118	10,500	10,712	11,018	11,306	11,755	11,945	12,022	12,090	12,124	12,167	12,231	12,195	12,181	12,175	12,274	12,254	12,258	12,341	12,432
+ No Incremental BTM PV	9,843	10,226	10,438	10,743	11,031	11,481	11,671	11,747	11,815	11,850	11,893	11,956	11,921	11,907	11,900	11,999	11,980	11,984	12,067	12,157
+ Low BTM PV	9,790	10,146	10,334	10,615	10,880	11,307	11,475	11,530	11,578	11,592	11,616	11,659	11,606	11,575	11,551	11,632	11,597	11,586	11,653	11,728
+ High BTM PV	9,780	10,118	10,287	10,550	10,797	11,206	11,356	11,392	11,422	11,418	11,424	11,448	11,378	11,328	11,286	11,348	11,296	11,266	11,315	11,371
+ No Electric Vehicles	9,768	10,109	10,281	10,545	10,791	11,197	11,340	11,365	11,381	11,361	11,348	11,351	11,257	11,180	11,108	11,139	11,056	10,993	11,008	11,028
+ Low Electric Vehicles	9,783	10,128	10,303	10,572	10,824	11,237	11,389	11,425	11,454	11,448	11,450	11,470	11,394	11,337	11,287	11,340	11,279	11,239	11,278	11,322
+ High Electric Vehicles	9,790	10,140	10,322	10,600	10,862	11,287	11,455	11,512	11,564	11,583	11,613	11,664	11,620	11,599	11,587	11,680	11,658	11,660	11,742	11,832
+ TOU Rates	9,786	10,133	10,312	10,577	10,835	11,254	11,413	11,459	11,498	11,502	11,519	11,554	11,493	11,452	11,419	11,491	11,449	11,428	11,487	11,553
+ High Building Electrification	9,786	10,133	10,341	10,642	10,926	11,371	11,556	11,628	11,692	11,720	11,758	11,814	11,774	11,754	11,742	11,833	11,809	11,807	11,883	11,969
Low Economic Growth	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193
+ Likely Econ Dev Loads	9,693	10,036	10,348	10,794	11,140	11,571	11,980	12,179	12,234	12,179	12,134	12,112	11,986	11,885	11,792	11,806	11,699	11,618	11,615	11,623
+ High Econ Dev Loads	9,694	10,128	10,628	11,539	12,610	13,840	14,666	15,169	15,328	15,273	15,228	15,215	15,080	14,980	14,886	14,909	14,794	14,712	14,710	14,726
High Economic Growth	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387
+ Likely Econ Dev Loads	9,888	10,410	10,925	11,572	12,116	12,738	13,293	13,627	13,820	13,912	14,014	14,139	14,159	14,204	14,257	14,417	14,455	14,518	14,661	14,817
+ High Econ Dev Loads	9,889	10,502	11,205	12,317	13,586	15,007	15,978	16,617	16,914	17,007	17,109	17,242	17,254	17,299	17,351	17,520	17,549	17,612	17,755	17,920
Aggressive Env Regulation	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052
+ Likely Econ Dev Loads	9,785	10,211	10,632	11,187	11,641	12,180	12,676	12,957	13,095	13,127	13,169	13,236	13,200	13,190	13,188	13,294	13,279	13,289	13,379	13,483
+ High Econ Dev Loads	9,786	10,303	10,912	11,932	13,111	14,449	15,362	15,947	16,190	16,221	16,264	16,339	16,295	16,285	16,283	16,397	16,373	16,383	16,473	16,586

Annual energy forecasts do not reflect impacts of energy efficiency programs implemented during IRP horizon, which are modeled separately as a resource

Table C-2. Peak demand forecast under various futures and sensitivities (MW)

Future/Sensitivity	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Current Trends & Policy	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
+ Likely Econ Dev Loads	1,976	2,047	2,113	2,183	2,247	2,328	2,390	2,420	2,431	2,428	2,438	2,454	2,459	2,458	2,452	2,468	2,470	2,479	2,512	2,527
+ High Econ Dev Loads	1,976	2,059	2,149	2,276	2,423	2,602	2,711	2,774	2,796	2,793	2,798	2,809	2,809	2,808	2,801	2,815	2,815	2,825	2,859	2,873
+ No BTM PV	2,083	2,154	2,195	2,238	2,283	2,361	2,388	2,403	2,418	2,425	2,439	2,458	2,464	2,465	2,463	2,482	2,482	2,484	2,512	2,528
+ No Incremental BTM PV	1,995	2,065	2,107	2,149	2,195	2,273	2,300	2,314	2,329	2,337	2,351	2,369	2,375	2,379	2,380	2,403	2,407	2,413	2,444	2,464
+ Low BTM PV	1,977	2,039	2,073	2,108	2,146	2,217	2,240	2,252	2,264	2,270	2,282	2,299	2,304	2,304	2,302	2,321	2,325	2,332	2,363	2,382
+ High BTM PV	1,974	2,030	2,058	2,088	2,125	2,194	2,214	2,221	2,229	2,232	2,242	2,260	2,265	2,268	2,267	2,287	2,289	2,294	2,323	2,340
+ No Electric Vehicles	1,972	2,030	2,060	2,090	2,123	2,190	2,206	2,210	2,214	2,212	2,215	2,221	2,214	2,203	2,189	2,197	2,188	2,180	2,195	2,201
+ Low Electric Vehicles	1,975	2,034	2,065	2,096	2,131	2,201	2,221	2,228	2,237	2,239	2,246	2,258	2,257	2,254	2,252	2,269	2,268	2,269	2,293	2,308
+ High Electric Vehicles	1,976	2,036	2,068	2,101	2,140	2,213	2,237	2,249	2,263	2,270	2,284	2,303	2,314	2,322	2,329	2,355	2,364	2,377	2,413	2,438
+ TOU Rates	1,976	2,035	2,066	2,010	2,047	2,125	2,152	2,167	2,184	2,195	2,212	2,232	2,240	2,245	2,248	2,271	2,276	2,285	2,316	2,336
+ High Building Electrification	1,976	2,035	2,072	2,110	2,152	2,229	2,256	2,271	2,287	2,296	2,312	2,331	2,339	2,346	2,352	2,378	2,385	2,396	2,429	2,452
Low Economic Growth	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
+ Likely Econ Dev Loads	1,958	2,013	2,063	2,117	2,165	2,231	2,281	2,297	2,297	2,282	2,277	2,279	2,271	2,256	2,238	2,244	2,232	2,227	2,245	2,248
+ High Econ Dev Loads	1,958	2,025	2,099	2,210	2,342	2,505	2,601	2,652	2,662	2,646	2,639	2,636	2,623	2,606	2,585	2,589	2,577	2,573	2,592	2,593
High Economic Growth	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
+ Likely Econ Dev Loads	1,994	2,081	2,168	2,259	2,342	2,443	2,522	2,567	2,601	2,622	2,652	2,687	2,713	2,737	2,755	2,795	2,817	2,848	2,903	2,939
+ High Econ Dev Loads	1,994	2,093	2,204	2,351	2,519	2,717	2,842	2,922	2,960	2,974	3,000	3,036	3,063	3,083	3,101	3,140	3,162	3,194	3,250	3,284
Aggressive Env Regulation	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
+ Likely Econ Dev Loads	1,975	2,044	2,113	2,187	2,253	2,338	2,405	2,439	2,460	2,469	2,486	2,509	2,526	2,538	2,545	2,573	2,584	2,603	2,646	2,670
+ High Econ Dev Loads	1,975	2,055	2,149	2,279	2,430	2,612	2,725	2,793	2,819	2,820	2,834	2,858	2,873	2,885	2,891	2,918	2,929	2,949	2,993	3,016

Peak demand forecasts do not reflect impacts of energy efficiency programs implemented during IRP horizon, which are modeled separately as a resource

Forecast Model Overview

Our forecast of load in future years is based on a combination of statistical models that forecast annual, monthly and hourly load by customer class. To build models at an appropriately granular level, we start by adjusting base-year volumes to remove the influence of abnormal weather and by breaking out some loads at the appliance level. The models built on base year data are combined with forecasts of customer growth and energy usage to forecast energy volumes and shapes in future years.

The modeling framework captures the influence of economic growth, impacts of changes in end-use saturation and efficiency as well as impacts from the continued adoption of new technologies with specific focus on behind-the-meter solar generation systems (PV) and electric vehicles (EVs). Forecasts also include adjustments for expected energy growth related to PNM economic development efforts.

The methods used to forecast each customer class are summarized in Table C-3. We note here that forecasts for new data center and other potential large economic development loads are developed outside of the forecast methodology described here.

Table C-3. Summary of Modeling Methods

Name	Class	Rate	Use Per Customer	Use or Use Per Day	SAE	Solar	Usage Model	Customer Model	Sales Adjust
Residential	Res	1	Yes	Per Day	Yes	Yes	Regression	Elasticity	
Small Power	SP	2	Yes	Per Day	Yes	Yes	Regression	Elasticity	
General Power	GP	3	Yes	Per Day	Yes	Yes	Regression	Regression	
Large Power	LP	4	Yes	Per Day	Yes	Yes	Regression	Elasticity	
Large Power (>3MW)	LP	35		Per Day			Regression		EconDev
Large Service (>8MW)	LS	5		Use			Smoothing		EconDev
Large Service UNM	LS	15		Use		Yes	Regression		
Large Service (>30MW)	LS	30		Use			Smoothing		
Large Service Stn Pwr	LS	33		Use			Regression		
Irrigation	Irr	10		Per Day		Yes	Regression		
Water and Wastewater	Water	11		Per Day		Yes	Regression		
Private Area Lighting	PAL	6					Lamps		
Streetlights	SL	20					Lamps		

Models for the Res, SP, GP, and LP classes are configured to predict monthly use per customer per billing day. Forecasts from these models are then multiplied by the forecasted number of customers and the number of billing days in the month. These forecasting models include weather variables (HDD and CDD) and are used to develop the base-year weather adjustments.

The Statistically Adjusted End-Use (SAE) model used for the indicated classes captures the separate impacts on load of end uses split into heating, cooling, new technology, and other categories. The use of such a model accounts for changes in end-use saturation and end-use efficiency. The SAE model inputs are based on regional data developed by the Energy Information Administration. The regional inputs are modified to incorporate saturation information from PNM studies.

Within the LS class, simple models are used for each rate. These rates include the usage of one or two customers, and the models are either simple regression models with monthly constants and trends or smoothing models that detect the level and seasonal usage pattern and extrapolate that pattern.

Irrigation and Water models are also simple regression models that explain use per day based on monthly constants and trend terms. Finally, the lighting models are detailed fixture models with specific assumptions about the number of lighting fixtures and type of lamp in each fixture. Energy forecasts for the lighting model reflect specific assumptions about changes in lamp types toward more efficient LED lamp options.

Customer classes with metered solar data are indicated by the “solar” column. The presence of solar generation masks the actual energy use of the customer. To account for this, the monthly generation is added to monthly sales to provide an estimate of energy usage by end-use equipment and appliances at customer sites. Estimated monthly use (sales plus generation) is the variable to be explained by the regression models. Predicted and forecasted monthly sales are then calculated as the prediction for monthly use minus predicted solar generation. This allows proper alignment of energy use (the variable we are trying to explain) with the end-use drivers.

Energy sales and growth rates resulting from the modeling methods described above appear by class in Table C-4 and are visualized in Figure C-1. The table and figure exclude existing data centers and economic development loads.

Table C-4. Forecast Sales and Growth Rates by Class

Energy Sales in GWh					
Year	Residential	Commercial	Industrial	Other	Total
2010	3,367	2,887.1	2,202.2	632.9	9,088.9
2015	3,211	2,860.3	1,936.9	259.6	8,267.8
2020	3,176	2,855.1	1,773.3	231.1	8,035.5
2025	3,184	2,842.8	1,962.2	219.3	8,207.8
2030	3,258	2,815.9	2,010.1	215.2	8,298.7
2035	3,343	2,776.3	1,989.5	210.7	8,319.6
2040	3,513	2,783.4	1,987.5	206.9	8,490.7

Annual Growth Rate for Energy Sales					
Year Range	Residential	Commercial	Industrial	Other	Total
2010 to 2015	-0.94%	-0.19%	-2.53%	-16.32%	-1.88%
2015 to 2020	-0.22%	-0.04%	-1.75%	-2.30%	-0.57%
2020 to 2025	0.05%	-0.09%	2.04%	-1.04%	0.43%
2025 to 2030	0.46%	-0.19%	0.48%	-0.38%	0.22%
2030 to 2035	0.52%	-0.28%	-0.21%	-0.42%	0.05%
2035 to 2040	1.00%	0.05%	-0.02%	-0.36%	0.41%

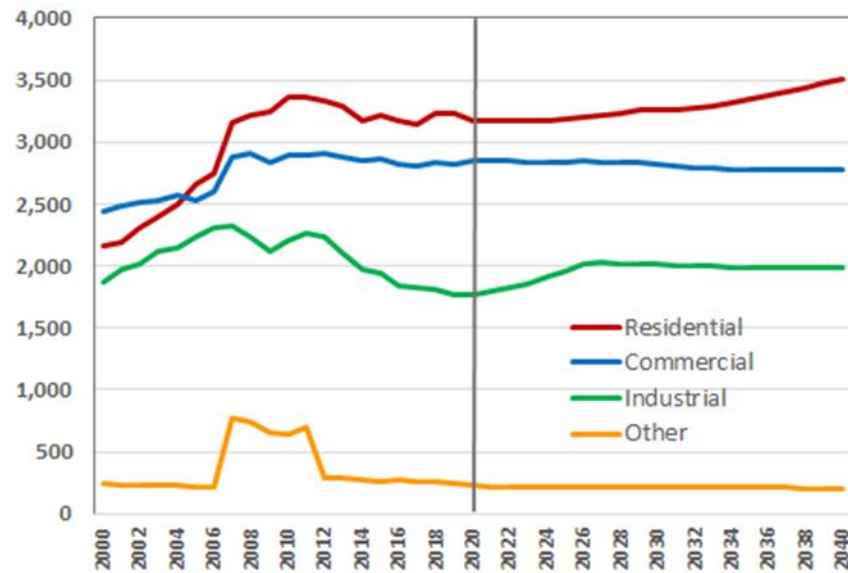
Commercial is Small Power + General Power

Industrial is Large Power + Transmission

Other is Irrigation, Water, and Lighting

Industrial excludes existing data centers and economic development loads

Figure C-1. Forecast Annual Sales by Class



Historical Sales by Class

Figure C-2 shows the load by class for the 2018 peak day. Historical loads at this level of disaggregation are estimated from a combination of measured system-level data and PNM load research data.

Table C-5 provides the annual class loads and coincident peak contribution for the same year. The table also shows the relative contribution of each class as a percentage of the total system. The peak occurs at 5 pm (hour beginning 17). At this time, residential usage is ramping upward while customer solar and business-related loads are ramping down. The inclusion of more customer-owned solar in future years is expected to drive this peak later into the evening.

Figure C-2. 2018 Peak Day Hourly Loads by Class (MW)

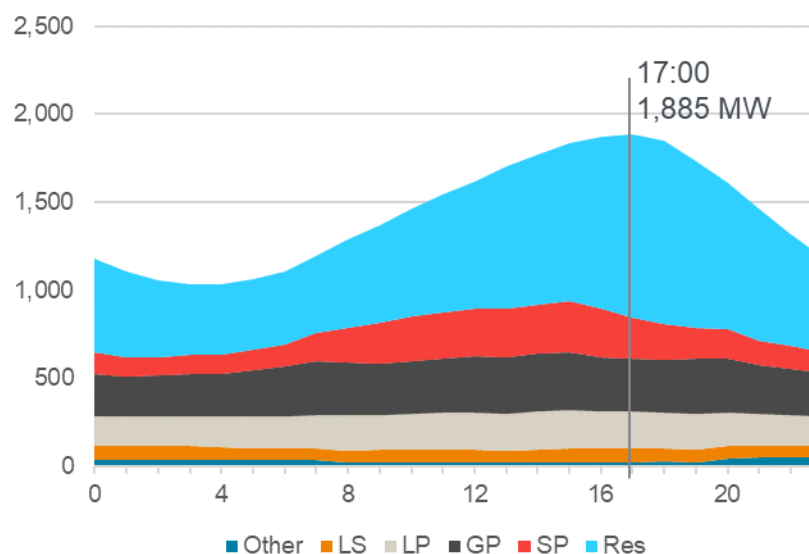


Table C-5. 2018 Annual Energy and Coincident Peak Contributions by Class

Class	Annual Energy (GWh)	Contribution to Annual Energy (%)	Coincident Peak (MW)	Contribution to Coincident Peak (%)
Residential	3,719	41.4%	1,039.0	55.1%
Small Power	1,117	12.4%	233.4	12.4%
General Power	1,973	22.0%	301.2	16.0%
Large Power	1,388	15.5%	210.3	11.2%
Large Service	571	6.4%	78.8	4.2%
Irrigation	26	0.3%	7.6	0.4%
Water & Wastewater	174	1.9%	14.2	0.8%
Other	10	0.1%	0.5	0.0%
TOTAL	8,978		1,885.0	

Annual Sales Forecast Elements

Forecast load is intended to represent a typical year under reasonable load growth. No actual year load data will correspond to a true typical year, so a series of adjustments are made to base year actual data to convert to a forecast year. Drivers of change from the base year data to a forecast year include the following:

- Deviation of base year weather from normal year weather
- Anticipated changes in the number of customers – typically in the residential and small commercial classes more than elsewhere
- Known new economic development loads that will change sales to large customer classes. As previously stated, uncertain economic development loads are layered on top of the load forecast outside of this framework
- Forecast growth in customer EV adoption
- Forecast increases in behind-the-meter solar generation capacity
- Changes in appliance and equipment efficiency reflecting codes and standards, technology improvements, and energy efficiency programs. These efficiency gains come from a wide range of end uses, including heating, cooling, water heating, cooking, refrigeration, and lighting. Efficiency changes are based on regional efficiency forecasts from EIA, modified to account for PNM efficiency program acceleration. Note that the impact of EE bundles selected by the IRP optimization model are subtracted from the load forecast apart from the forecast process described in this appendix.
- Other changes in equipment and appliance saturation levels, miscellaneous end-use load growth, and statistically estimated time trends

Hourly Load Forecast Elements

Forecasts of hourly load are based on historical load research data for the smaller classes and on the actual hourly loads of the larger classes. Hourly load research data for 2014 through 2019 give average sales per customer. Hourly sales per customer models are estimated for each class and are used to forecast future years. These forecasts represent what load shapes would be at 2018 levels of PV and EV adoption.

The hourly forecasts are generated using a normal weather scenario that includes normal HDD and CDD averages and as well as normal extremes. Within each season and month, the scenario uses a weather pattern based on the actual 2018 daily pattern, and this pattern is rotated to future years in a way that keeps the summer peak-producing weather on a Thursday in mid July, and the winter peak-producing weather on a Thursday in mid January.

The models of *monthly* utility sales by class are also forecasted without the influence of future PV and EV adoption beyond 2018 levels. These calendar month sales values are then used to scale the forecasted hourly profiles for each class so that the hourly values add up to the calendar month total. These scaled hourly loads are then modified by subtracting forecasted hourly loads for incremental PV adoption and by adding forecasted hourly loads for incremental EV adoption. The result is a forecast of hourly loads for each class at the customer meter.

In the next step, energy loss factors are applied to the hourly loads of each class, and these hourly loads with losses are added, providing a bottom-up estimate of the system load. The results of this process are compared directly to the measured system load for the years from 2017 to 2019 and a set of correction factors are estimated by month and hour. The final forecast of hourly system loads is generated by applying these correction factors to the bottom-up estimates.

The bottom-up hourly forecasting process provides a forecast of the date and time of the PNM system peak, and it also provides estimates of the class loads in the peak hour. As described earlier, hourly loads are forecasted at the meter for each class. These values are then augmented using a set of demand loss factors, which are described in more detail later on.

The bottom-up sum is then compared to the measured or forecasted peak value, and a correction factor is computed to bridge this gap. The gap is allocated to the “load-research” classes, since the hourly loads for these classes are estimated on a sample basis rather than a census basis. The gap is allocated proportional to the contribution of each class to the bottom-up total.

Economic Data and Customer Growth

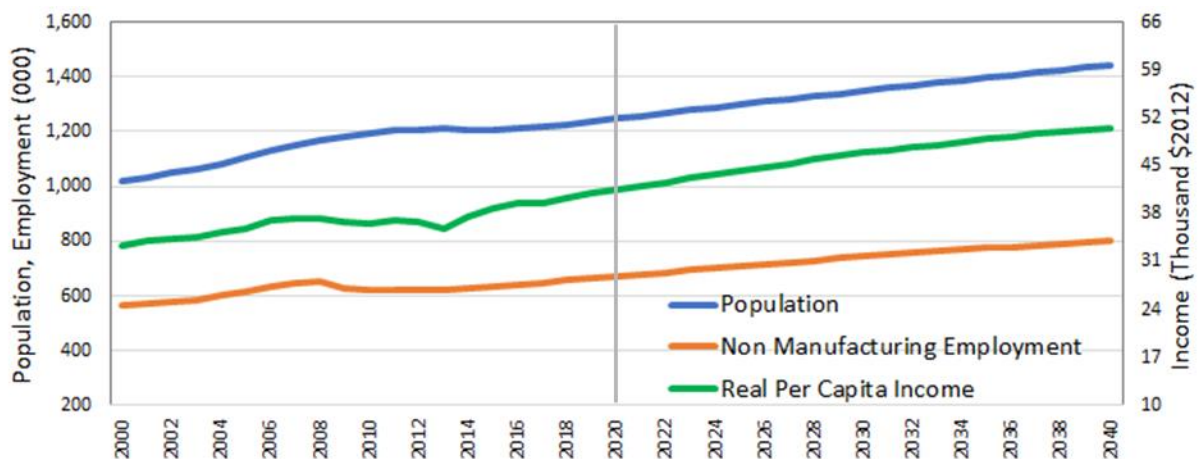
Economic data and forecasts were acquired from Woods and Pool for all counties in New Mexico, as well as state and national totals. We represent PNM North by Bernalillo, San Miguel, Sandoval, Santa Fe, Union, and Valencia counties. We represent PNM South by Grant, Hidalgo, Luna, and Otero counties.

The main variables used in modeling customer growth and use per customer are population, household size, non-manufacturing employment, and income per capita. Table C-6 provides historical and forecast growth rates for these variables, while Figure C-3 visualizes the data.

Table C-6. Summary Statistics for PNM Economic Variables

Year	Levels			Year Range	Growth Rates		
	Population	Non Mfg Employment	Real Income Per Capita		Population	Non Mfg Employment	Real Income Per Capita
2000	1,022	566.6	33,396				
2010	1,196	621.2	36,514	00 to 10	1.58%	0.92%	0.90%
2020	1,248	671.4	41,507	10 to 20	0.43%	0.78%	1.29%
2030	1,349	743.4	46,889	20 to 30	0.78%	1.02%	1.23%
2040	1,444	800.7	50,605	30 to 40	0.68%	0.74%	0.77%

Figure C-3. Economic Variables for PNM Counties



Starting with the residential class, a simple elasticity model is used to drive residential customer growth based on population growth in the PNM counties. The elasticity is computed from the historical ratio of the percentage growth in customers to the percentage growth in population in PNM counties. The time period of the elasticity calculation starts in March 2007, immediately after a major jump in the service territory size.

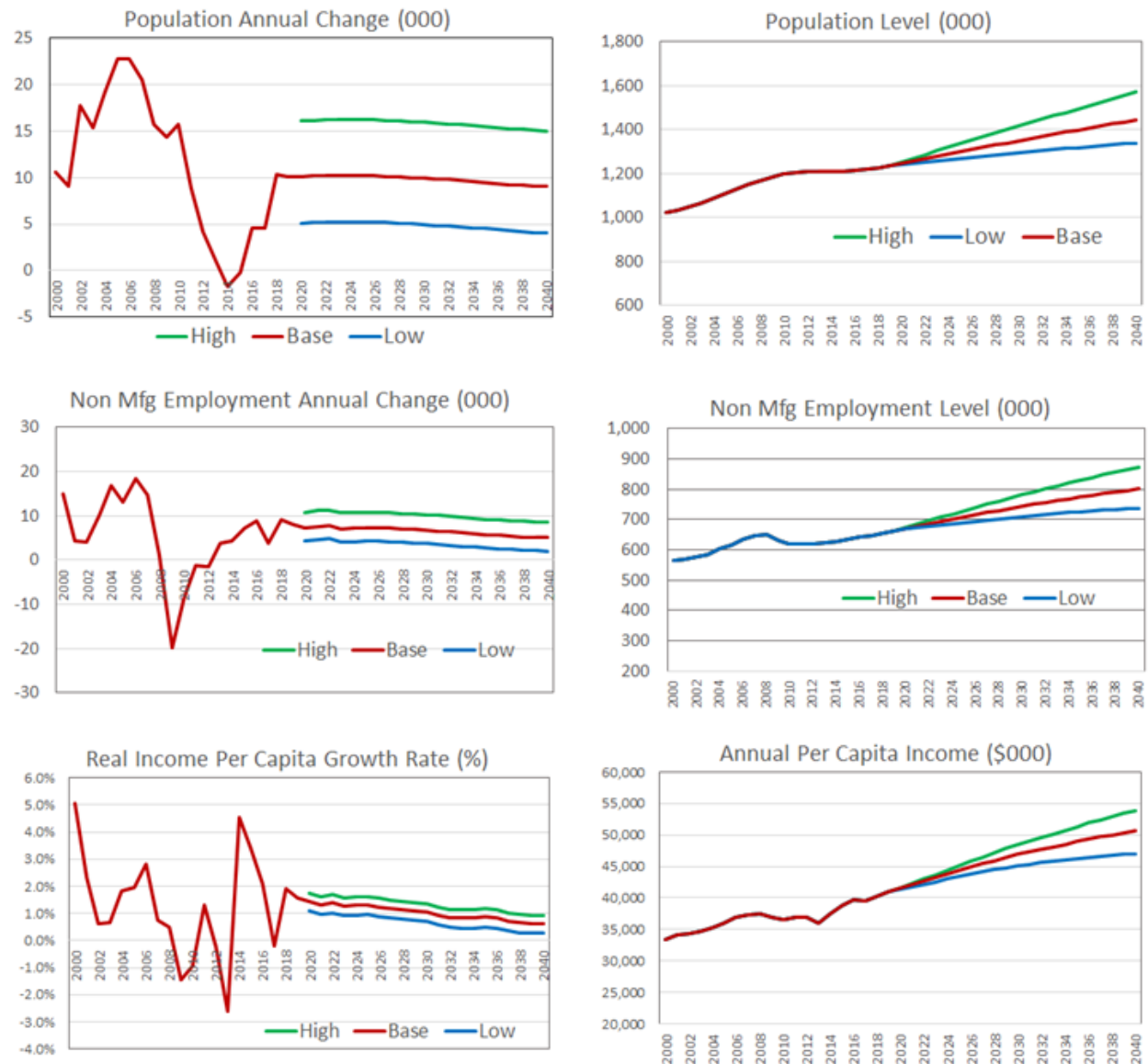
The factors selected to drive SP growth are residential customers and non-manufacturing employment. The time period for this calculation starts in 2012, to avoid the dislocation related to the 2008 recession.

For General Power (GP) a pair of regression models are used, one with residential customers as the explanatory variable and one with non-manufacturing employment as the explanatory variables. The customer forecasts for the GP class are an average of the two model forecasts.

For Large Power (LP) customers on rate 4, growth forecasts are based on Non-manufacturing Employment. For larger customers, data does not support estimation of a relationship because of frequent rate-class redefinitions and customer reclassifications. Instead an elasticity is chosen manually.

High and low sensitivities for each economic forecast are also developed and shown in Figure C-4.

Figure C-4. Economic Forecasts that Drive Load Forecast Sensitivities



Weather Data and Load Response

Hourly weather data were acquired from Accuweather for the years from 1999 to 2019. Data were provided for four weather stations: Albuquerque (KABQ), Alamagordo (KALM), Deming (KDMN), and Santa Fe (KSAF). For each station, two of the hourly data series are used in the analysis: hourly drybulb temperature (DBT) in degrees Fahrenheit and global horizontal irradiation (GHI) measured in Watts per square meter.

Temperature data were processed in the following steps:

- For each station, daily average temperature was computed by averaging the 24 hourly values for that day.

- For each day, cooling degrees with base temperatures of 55, 60, 65, 70, and 75 were computed from the average temperature values for each station. (Cooling Degrees are the number of degrees above the base value.)
- For each day, heating degrees with base temperatures of 60, 55, 50, 45, and 40 are computed from the average temperature values for each station. (Heating degrees are the number of degrees below the base value.)
- Daily cooling degree (CD) values are weighted across stations using shares of summer month energy as weights.
- Daily heating degree (HD) values are weighted across stations using shares of winter month energy as weights.
- The daily HD and daily CD values are weighted across billing cycles in each billing month to give heating degree day (HDD) and cooling degree day (CDD) values that capture the weather that corresponds to billed sales in each month. These variables are used in the monthly usage models for the weather sensitive classes.
- The daily HD and daily CD values are added across days in each calendar month to give monthly heating degree day (HDD) and cooling degree day (CDD) values. These values are used to simulate calendar month energy usage for the weather sensitive classes.

“Normal” weather values for monthly energy calculations are defined using an “Average-by-Date” method. This is standard practice in the industry and works well as long as the order of operations is structured to avoid aggregation bias. Starting with the daily average temperature values, steps in the process are as follows:

- Compute daily heating degree (HD) and cooling degree (CD) values for each weather station and each degree day base.
- For each degree day base, combine the daily HD and CD values across stations using volume-based station weights.
- For the 20-year period, average the values of each HD and CD variable for each day of the year across the years. (For each variable, average the 20 values for January 1, average the 20 values for January 2, and so on.)
- Place the average values on their respective dates for each year to be analyzed. Place the values on calendars for historical years to support weather normalization. Place the values on calendars for forecast years to support forecasting with normal weather.
- For calendar months, add the daily values across days in each month to create normal CDD and HDD values for each degree day base.
- For billing months, add the daily values across days in each billing cycle and then compute a weighted average of the billing cycle sums.

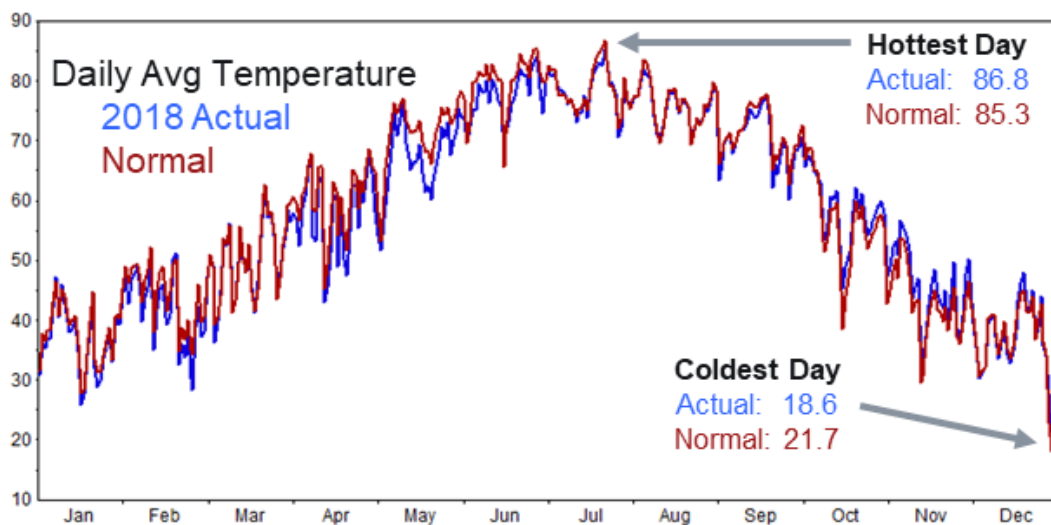
The average-by-date process is not appropriate for simulation of hourly loads. The results of the process do not represent extreme temperatures, which are required to produce class peak and system peak loads. To develop a weather scenario that represents typical extreme temperatures as well as typical average temperatures, a “Rank-And-Average” approach is used. Steps in this approach are as follows.

- Compute daily heating degree (HD) and cooling degree (CD) values for each weather station and each degree day base.

- For each degree day base, combine the daily HD and CD values across stations using volume-based station weights.
- Sort the HD and CD values for each year and season from hottest to coldest based on the weighted average temperature for each day.
- Average the sorted values across the 20 years. The first value is the average of the hottest days in each of the 20 years. The second value is the average of the second hottest days in each year. Continue through each season finishing with the average of the coldest days in each of the 20 years.
- Assign the values to each historical year based on the actual pattern of temperatures within the year. Assign the values to each forecast year using a representative pattern. In this case the order of temperatures in 2018 was chosen for the scenario.
- As the values are assigned to days in future years, rotate the data so that the peak days stay on the same day of the week and do not fall on a weekend day or a holiday.

Figure C-5 shows the result of these operations when the process is applied to 2018. In this case, the hottest day of the year was July 22, which was a Sunday. The second hottest day was July 21, which was a Saturday. The typical hottest day and second hottest day values were assigned to these days in 2018. In forecast years, these values were assigned to a Thursday in the late July. As the Figure shows, the adjustments for most days are relatively small, since each day is assigned a temperature from a typical day of the same rank. The daily cooling degree values (CD) and daily heating degree values (HD) that go with the average temperatures shown in the Figure are rotated to days in the forecast year calendar. These values are then used to generate hourly profile forecasts in a future year for each class.

Figure C-5. Normal Daily Scenario for Hourly Load Modeling



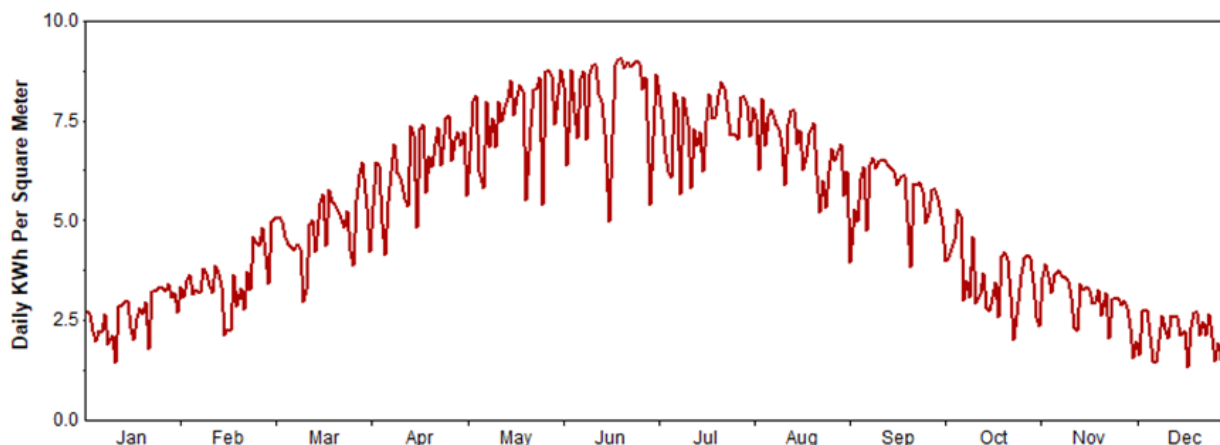
Behind-the-meter Solar Generation

To forecast the impact from behind-the-meter solar on load, we use historical data on installed capacity, historical monthly metered generation output by class, and hourly global horizontal irradiance (GHI). The capacity data is constructed from information gathered by PNM as part of the installation and approval process for new solar additions. Monthly generation data are

measured by generation meters that are required with each solar installation. Customer classes with metered BTM generation available are indicated by the “solar” column of Table C-3.

GHI data is obtained for four PNM weather stations from AccuWeather. This data indicates the solar energy striking a horizontal surface per unit area. This energy varies through the year based on the angle of the sun, cloud cover, and other atmospheric conditions. The summed GHI data for 2018 appears in Figure C-6.

Figure C-6. 2018 Daily GHI Sum



The GHI data and measured monthly generation data are used to estimate a daily solar model. Specifics of the model are as follows:

- The Y variable in the model is monthly generation per billing day divided by the monthly capacity
- The main X variable is average daily GHI over the billing cycle
- The model also includes monthly binary variables for the summer months and an annual binary variable to tie into the base-year values

This model is applied to a forecast of installed BTM PV capacity, such as the one included in Figure C-7. The use of monthly GHI-per-day values creates the monthly PV generation forecasts shown in Figure C-8. Similarly, use of daily GHI values creates daily generation forecasts, which are allocated into hours based on hourly GHI shares. For the non-residential group, rate level forecasts are also generated using equations that allocate non-residential capacity to rates based on the rate-level generation data.

Figure C-7. Solar Capacity in kW (AC)

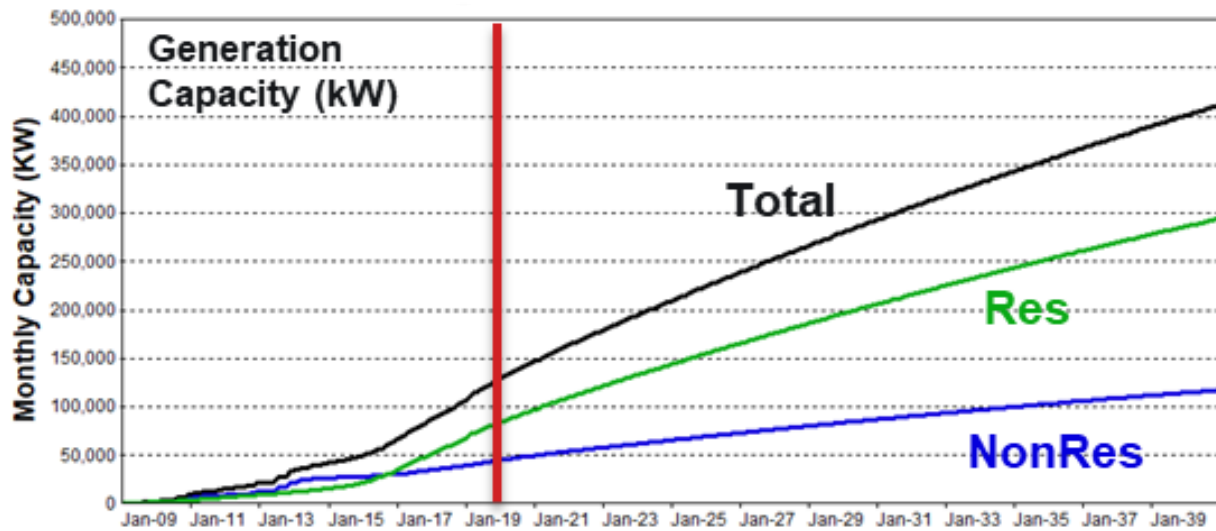
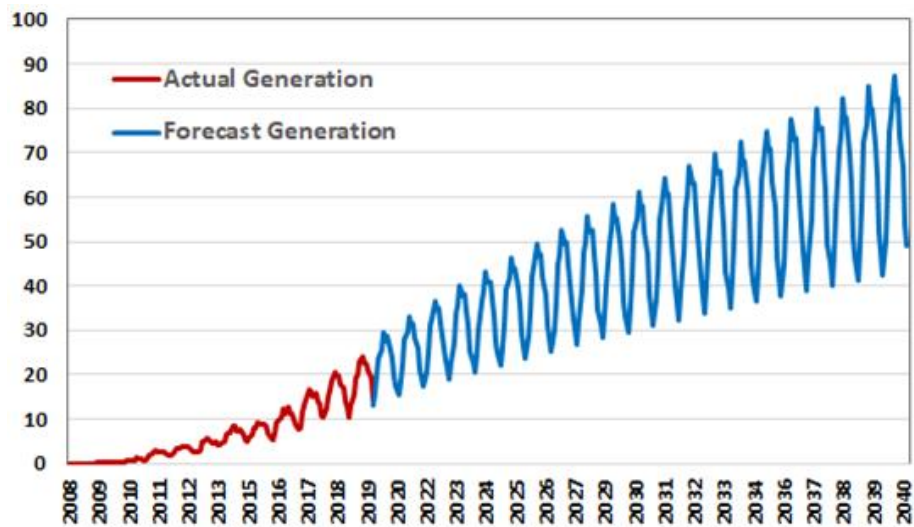
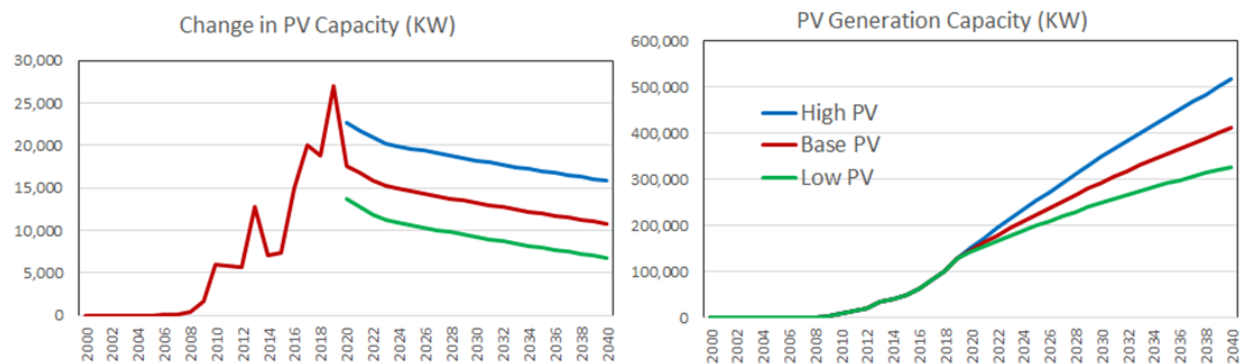


Figure C-8. Solar Generation History and Forecast



For model sensitivities, high and low PV adoption forecasts are developed in addition to the base forecast. These alternate forecasts appear in Figure C-9. As with the base forecast, daily shapes are multiplied by the total installed capacity to obtain the hourly impact in each year.

Figure C-9. Sensitivities on Solar Capacity (kW-AC)



Electric Vehicles Impact on Load

It is estimated that there were about 3,400 EVs in PNM territory in 2020. Future EV uptake is forecast based on a growing fraction of new vehicle sales being attributed to EVs. On a U.S.-wide basis, this fraction ramps up from about 3% today to 20% in 2030 and 35% by 2040. New Mexico EV adoption is forecast to lag the national average, accomplishing 41% of the U.S. new vehicle sales fractions, with 75% of New Mexico adoptions expected to be in PNM territory. The translation of U.S. EV sales to PNM area total vehicles and associated load appears in Table C-1.

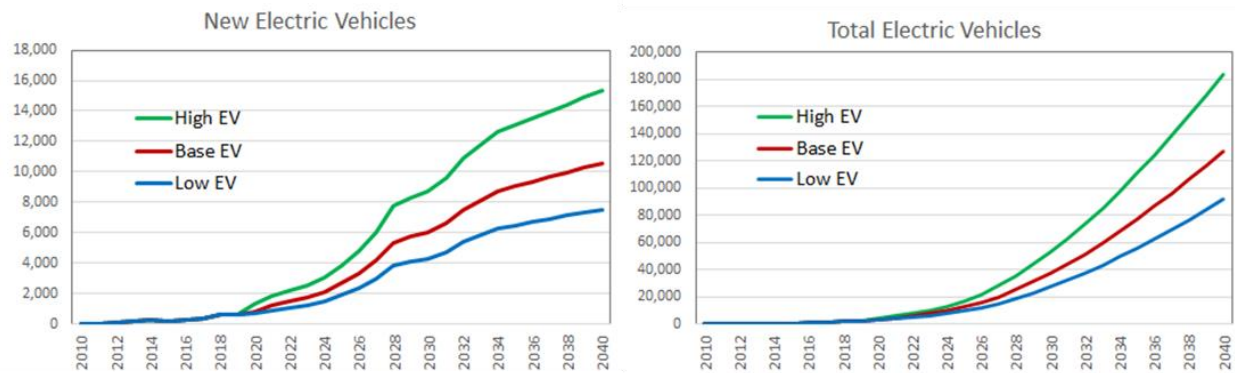
Table C-7. Calculations for Customer Models

Year	EV Share of New Vehicles (US)	EV Share of New Vehicles (NM)	Total Vehicles PNM Area	Annual MWh
2015	0.66%	0.30%	765	3,060
2020	3.04%	1.26%	3,443	13,772
2025	8.82%	4.07%	12,671	50,684
2030	20.00%	9.24%	37,207	148,828
2035	30.00%	13.86%	77,319	309,276
2040	35.00%	16.17%	127,083	508,332

Electric Vehicle adoptions forecasts are converted to annual load based on a multiplier of 4,000 kWh per vehicle. Annual energy is translated to hourly load using residential and non residential hourly charging profiles from Idaho National Laboratory. Charging is allocated between the two profiles with the assumption that 80% of charging occurs at home.

Given the uncertain nature of EV adoption and its potentially large impact, it is important to include high and low forecasts in addition to the base case. These alternate forecasts appear in Figure C-10. They predict a possible range 92,000 to 183,000 EVs in PNM territory by 2040.

Figure C-10. Sensitivities on EV adoption

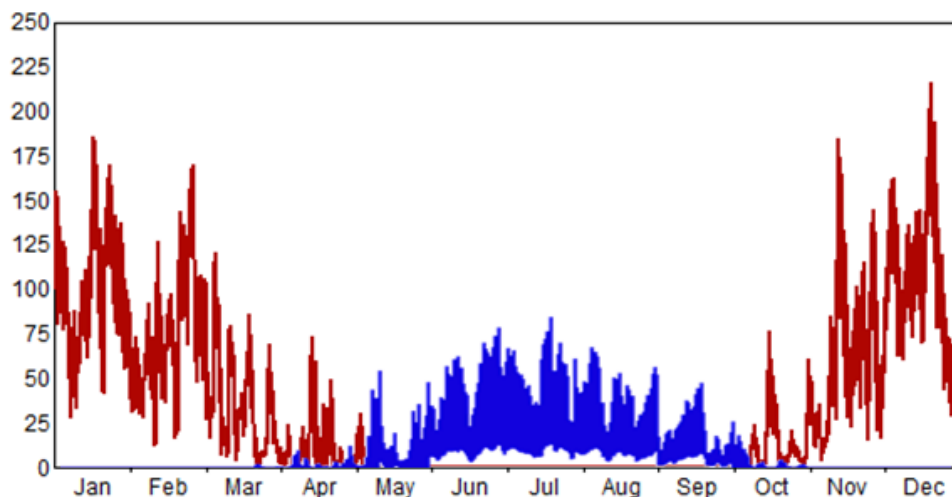


Electrified Heating Impact on Load

The forecast of new load from building electrification is based on a set of assumptions for heating and cooling technology adoption in new and existing homes. Starting in 2023, no new homes have natural gas or propane heating. This brings the electric share from 15% to 90%, with 80% of that increase coming in the form of heat pumps. Also, more new homes are expected to have central air or heat pump cooling instead of using evaporative cooling. Existing buildings are assumed to adopt heat pumps at a rate of 2% of the housing stock per year. Of these sites, 40% are assumed to use the heat pump to displace evaporative cooling load. Combined, these assumptions increase the share of electric heating in PNM territory from 15.5% in 2020 to 45% in 2040.

The impact of this electrification to total load is based on annual heat pump energy consumption of 2,400 kWh, with load research heating and cooling shapes providing hourly resolution to create hourly impacts. The hourly impact on 2040 load from this electrification appears in Figure C-11.

Figure C-11. 2040 Incremental Heating and Cooling Load (MW)

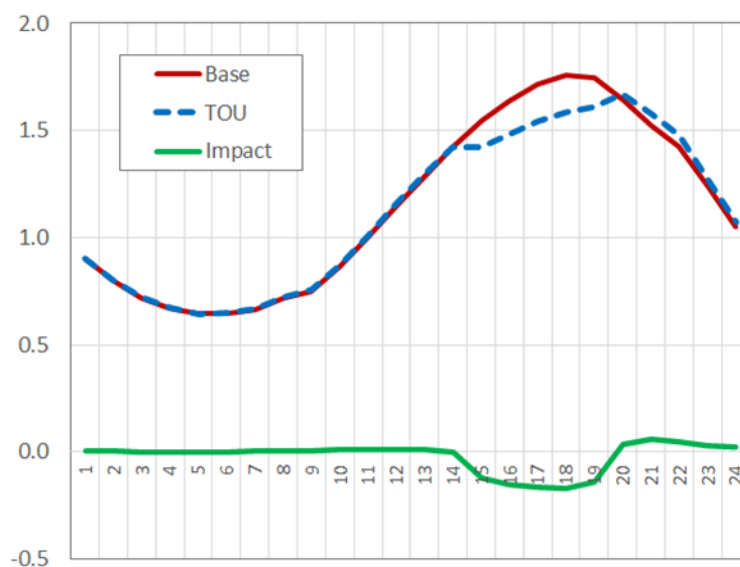


Time-of-Day Load Shaping

In one sensitivity, the possible impact of widespread time-of-day rate adoption is explored. The sensitivity assumes that mandatory TOD rates are rolled out in 2024, with 80% of customers on a simple TOD rate and 20% on a dynamic rate which is modeled to call peak events on summer

weekdays with temperature above 79 degrees F. Load shifting resulting from these rates is based on an ACEEE summary report compiling data from 50 pricing pilots: The simple TOD rate reduces customer peak usage by 7%, while the dynamic rate reduces customer peak usage by 21%. The net impact on the residential load shape is shown in Figure C-12 – the residential peak is reduced by 9.8%, and total energy by 1.8%.

Figure C-12. Average Residential Peak Day Load (kWh/customer)



Losses Calculation Methodology

Sales and demand at the meter were adjusted upward for energy losses based on loss multipliers. Loss studies for 2016, 2017, and 2018 provided estimates of energy losses for different parts of the transmission and distribution system: secondary voltage distribution losses, primary voltage distribution losses, substation losses, subtransmission losses and transmission losses. Energy losses were provided at the annual level. Demand losses were provided by month.

Loss estimates were converted to loss multipliers at each stage of the delivery system. The accumulated loss multipliers computed from each delivery voltage back to the generation source are shown in Table C-8. Note that these multipliers are not additive – each factor includes all relevant upstream losses back to the generator. For example, the loss factor for the substation level includes losses from generation to transmission, transmission to subtransmission, and subtransmission to substation.

Table C-8. Loss Multipliers

Voltage Level	Applicable Rate Classes	Demand Loss Factor (July)	Energy Loss Factor
Transmission	15B, 33B, 36B	1.034	1.036
Subtransmission	5B	1.035	1.039
Substation	30B, 35B	1.041	1.045
Primary Distribution	4B, 11B	1.075	1.058
Secondary Distribution	1A/B, 2A/B, 3B/C, 10A/B, 6, 20	1.099	1.077

Typical Week Forecasts

Figure C-13 through Figure C-16 show a typical week load profile on PNM's system in January, April, July, and October to illustrate the variability of load on the system caused by the season of the year as well as the differences in load variability during the day and week during those months.

Figure C-13. Hourly system load shapes for a typical week in January

Typical Week Hourly Load, January
(MW)

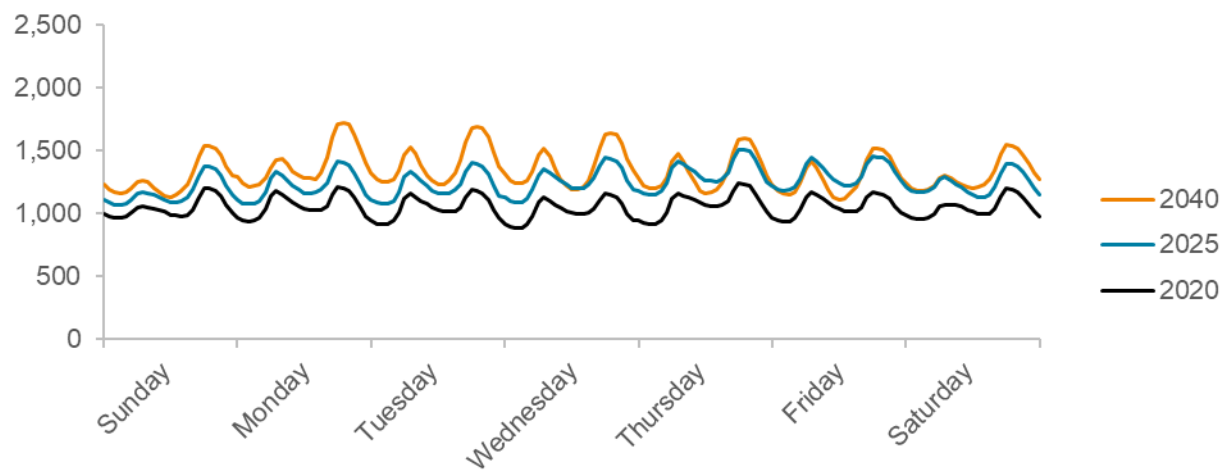


Figure C-14. Hourly system load shapes for a typical week in April

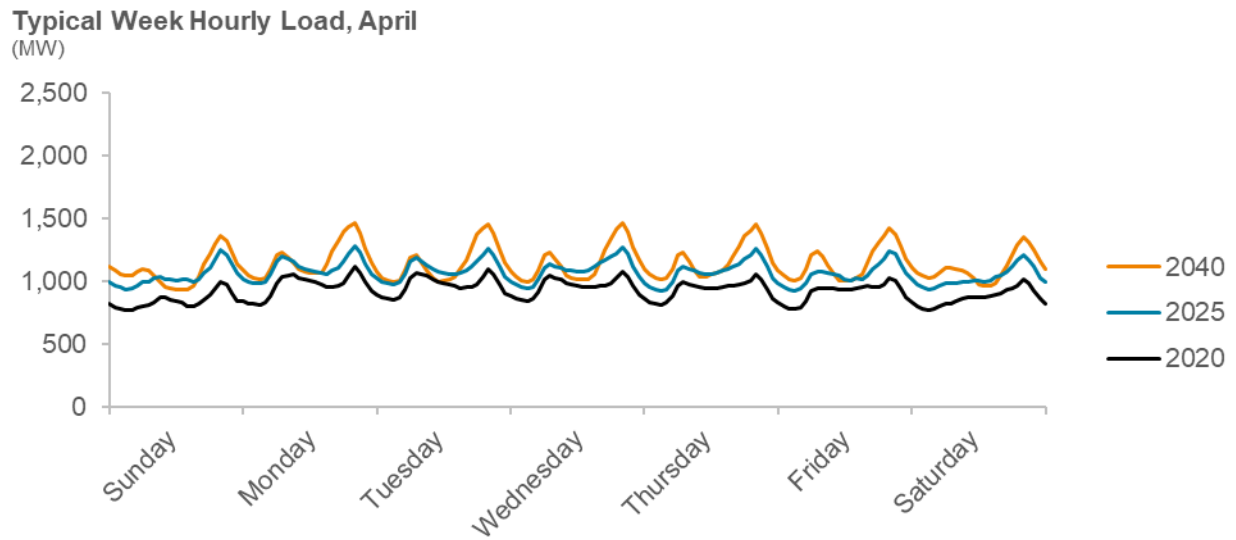


Figure C-15. Hourly system load shapes for a typical week in July

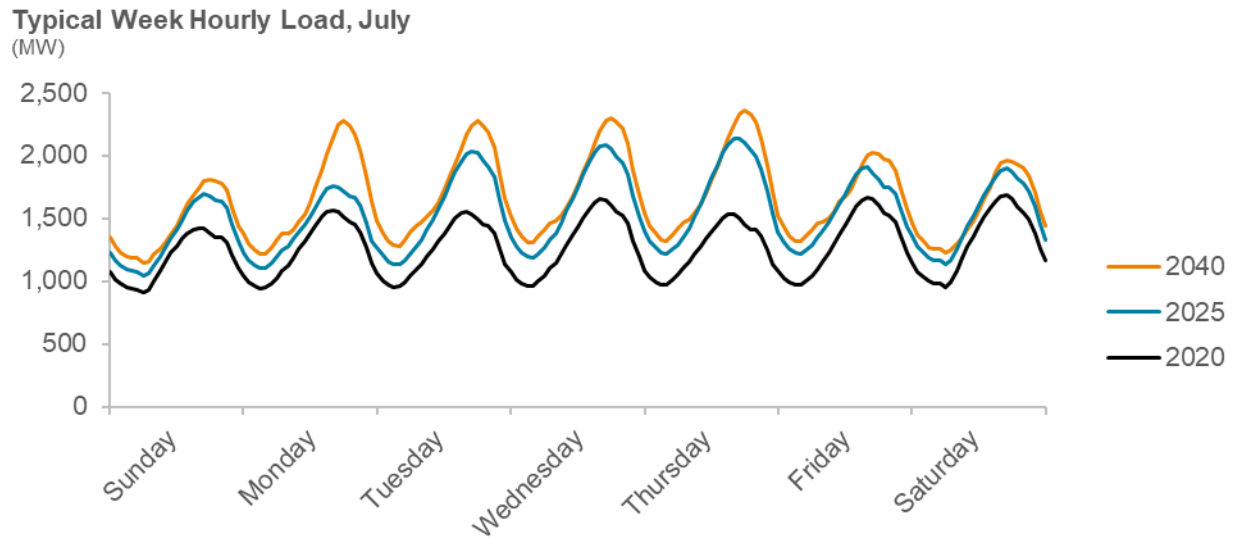
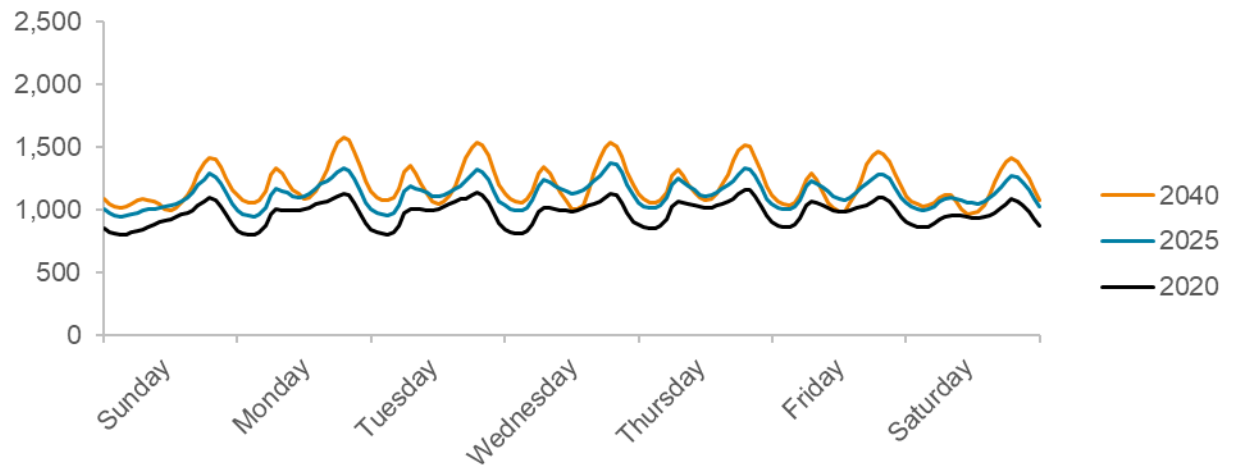


Figure C-16. Hourly system load shapes for a typical week in October

Typical Week Hourly Load, October
(MW)





PNM Integrated Resource Plan Forecast Scenarios

Stuart McMenamin

David Simons

Itron, Inc.

August 25, 2020

Itron Background



Itron enables utilities and cities to safely, securely and reliably deliver critical infrastructure solutions at scale, all around the globe.



Dr. J. Stuart McMenamin directs Itron's Forecasting and Load Research division. He has over 40 years of experience in the energy forecasting field and is a nationally recognized expert in statistical and end-use forecasting for electric utilities.



David Simons is a Consultant in the Itron Forecasting division. He has been with Itron for 7 years and works with utilities around the world on short-term and long-term forecasting solutions.

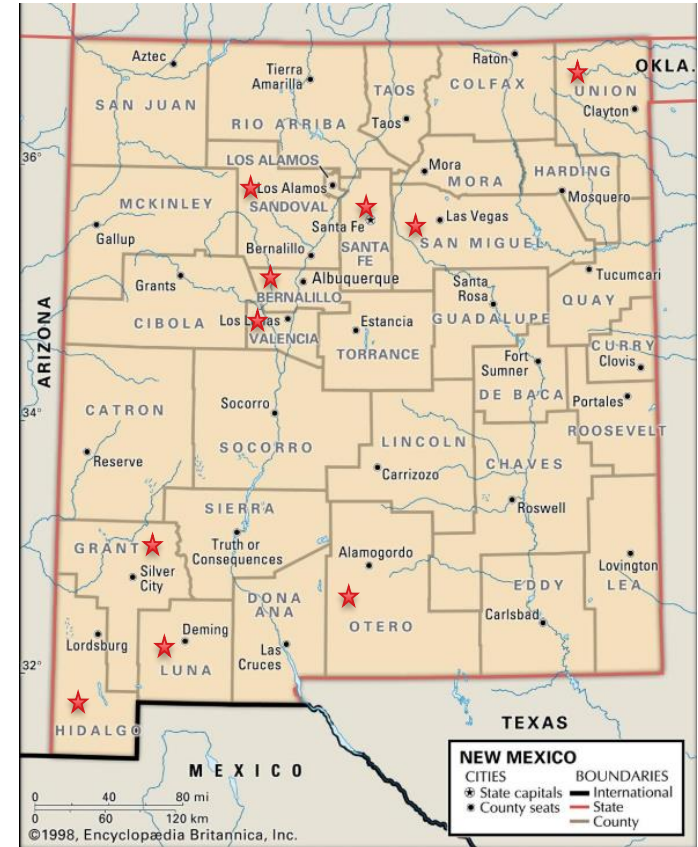
Agenda

- » Economic Data and Forecasts
- » Weather Data and Normal Weather
- » Behind the Meter PV Data and Forecasts
- » Electric Vehicle Forecast
- » Other Scenario Inputs
- » Energy Modeling and Forecasts
 - Customer growth forecast
 - Statistically Adjusted End Use (SAE) Method
 - Use per customer models
 - Energy and peak forecast summary
- » Hourly System Load and Peak Demand Forecasts
 - Bottom-up load shape and peak demand forecast
- » Forecast Scenarios

Economic Data and Forecasts

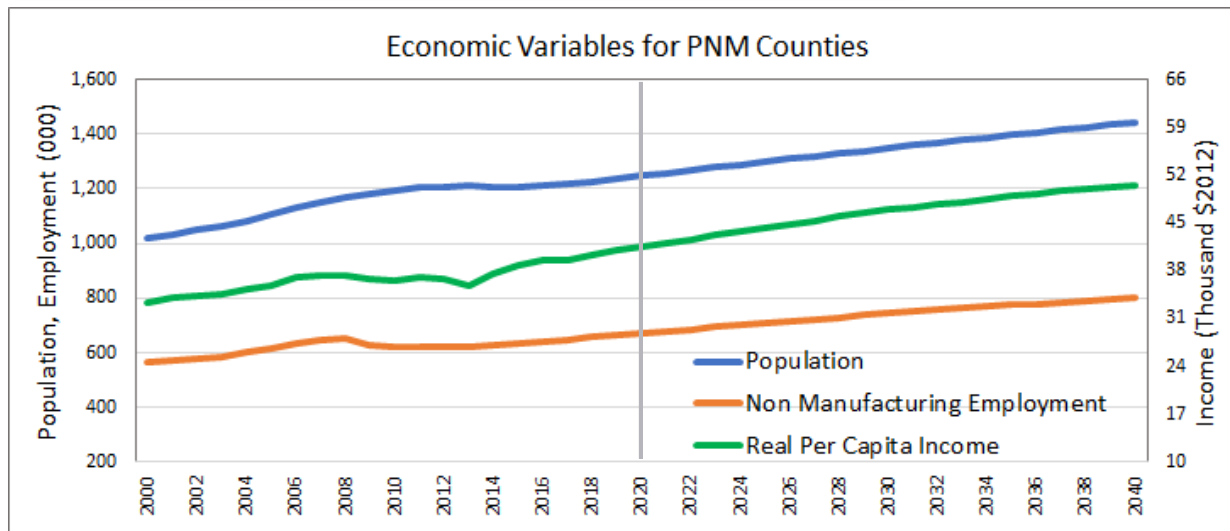
Economic Data and Forecast

- » Forecast provided by Woods and Poole
- » Annual history from 1950
- » Annual forecast to 2050
- » State and County level data
- » Used data for PNM counties:
 - North: Bernalillo, San Miguel, Sandoval
Santa Fe, Union, Valencia
 - South: Grant, Hidalgo, Luna, Otero
- » Annual data converted to monthly using centered moving averages
- » Forecast from 2019 has not been adjusted for COVID impacts



Summary of Key Economic Variables

Year	Levels			Year Range	Growth Rates		
	Population	Non Mfg Employment	Real Income Per Capita		Population	Non Mfg Employment	Real Income Per Capita
2000	1,022	566.6	33,396				
2010	1,196	621.2	36,514	00 to 10	1.58%	0.92%	0.90%
2020	1,248	671.4	41,507	10 to 20	0.43%	0.78%	1.29%
2030	1,349	743.4	46,889	20 to 30	0.78%	1.02%	1.23%
2040	1,444	800.7	50,605	30 to 40	0.68%	0.74%	0.77%



Economic Scenarios

» Population Annual Gains

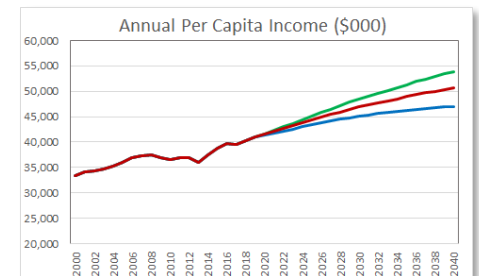
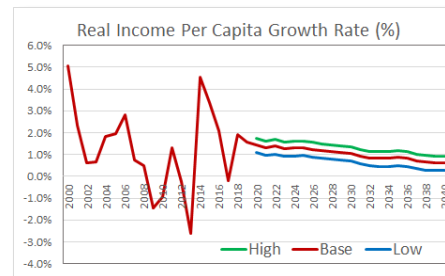
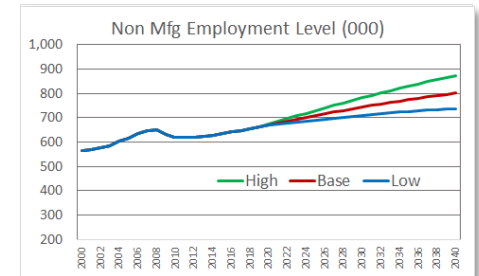
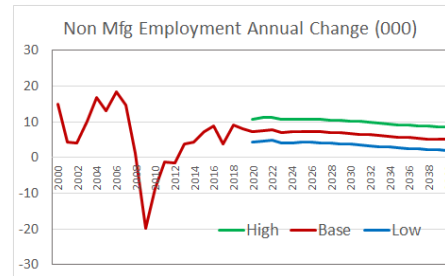
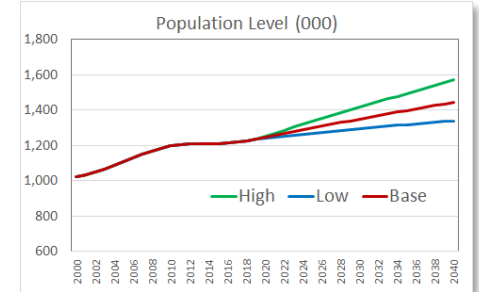
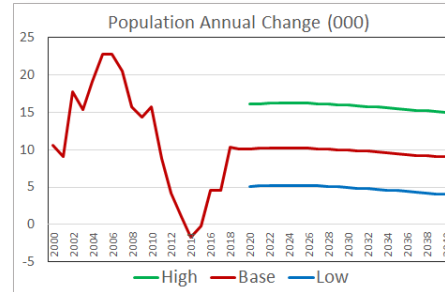
- High Case: 15,800
- Base Case: 9,800
- Low Case: 4,800

» Non Mfg. Employment Annual Gains

- High Case: 10,000
- Base Case: 6,500
- Low Case: 3,500

» Real Per Capita Income Growth

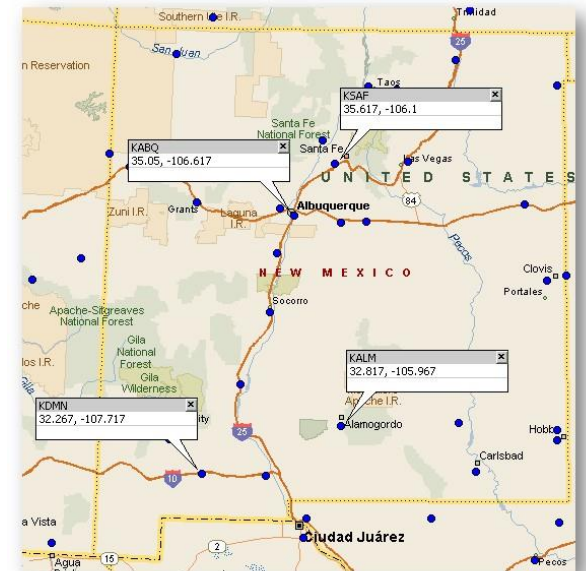
- High Case: 1.3%
- Base Case: 1.0%
- Low Case: 0.6%



Weather Data and Normal Weather

Weather Data and Normal Scenario

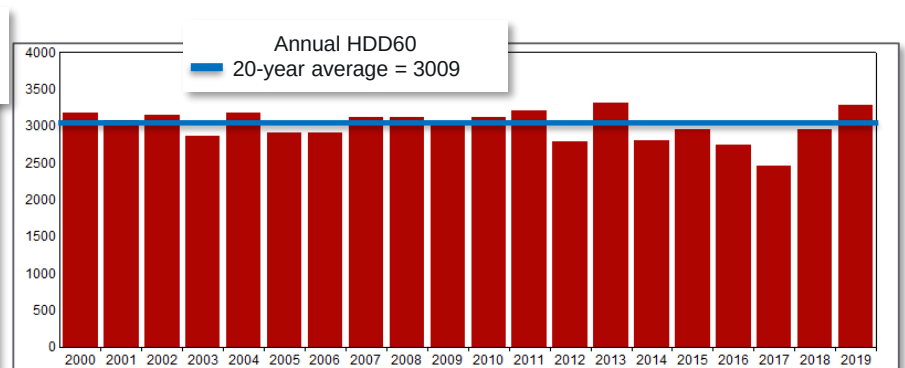
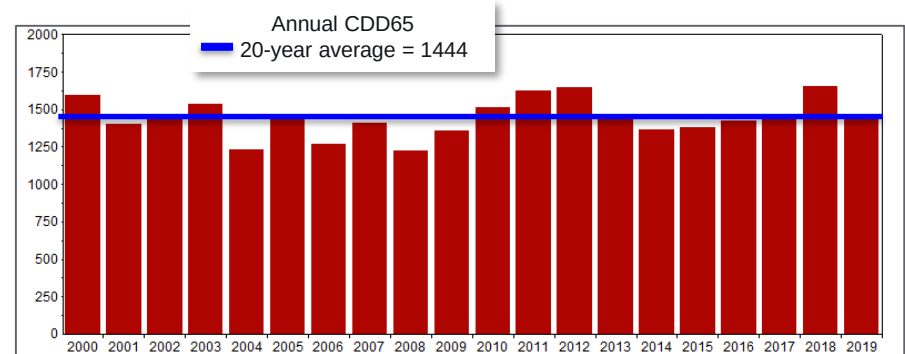
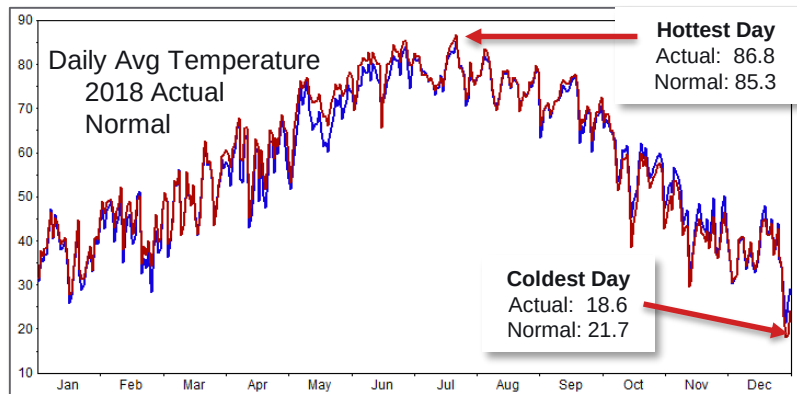
- » Hourly weather data from AccuWeather
 - Temperature – Used to compute Degree Days
 - Global horizontal irradiation (GHI) – Used for solar generation
- » 4 Stations
 - North: Albuquerque (KABQ), Santa Fe (KSAF)
 - South: Deming (KDMN), Alamogordo (KALM)
- » Station weights for weather variables
 - Based on billed sales 2015 to 2018
 - Heating Degree weights based on winter sales
 - Cooling Degree weights based on summer sales
 - Solar GHI weights based on annual sales



Station	Heating Degrees	Cooling Degrees	Solar GHI
KABQ	75.0%	77.8%	76.3%
KALM	3.0%	3.2%	3.1%
KDMN	9.0%	8.4%	8.9%
KSAF	13.0%	10.5%	11.7%

Normal Weather Calculation

- » Normal Weather: 20-year basis
 - Compute daily average temperature
 - Compute daily CD (base 55, 60, 65, 70, 75)
 - Compute daily HD (base 60, 55, 40, 45)
 - Average by Date for energy forecast
 - Rank and Average for load shape forecast
 - Monthly HDD, CDD computed from daily



Weather Response Analysis

- » Load Research data provide hourly and daily use estimates for a statistical sample
- » Daily use shows the response to daily weather
- » Response of load to weather is non linear
- » Load research data used to calculate HD and CD weights
 - Daily regression models
 - Y is daily sales per customer
 - X variables are daily CD and HD values
 - Calculate weights for low, medium, and high-powered degrees

Residential Weights

Spline	Wgt
HD60	0.285
HD55	0.422
HD45	0.293
CD60	0.188
CD65	0.286
CD70	0.526

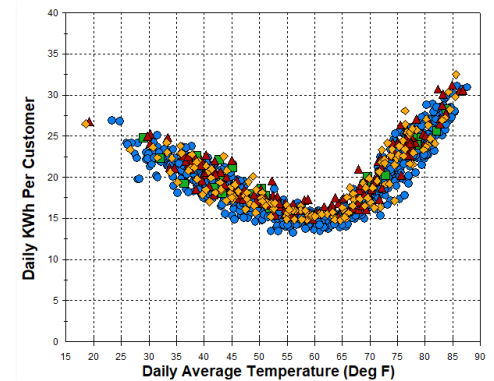
Small Power Weights

Spline	Wgt
HD55	0.572
HD45	0.428
CD55	0.237
CD65	0.629
CD75	0.134

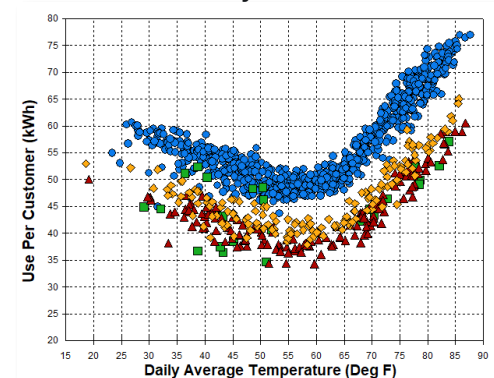
General Power Weights

Spline	Wgt
HD55	0.307
HD45	0.693
CD55	0.448
CD65	0.552

Residential Daily Sales Per Customer



Small Power Daily Sales Per Customer



Behind the Meter PV Data and Forecasts

BTM Solar Capacity and Generation Data

» Solar Capacity Data

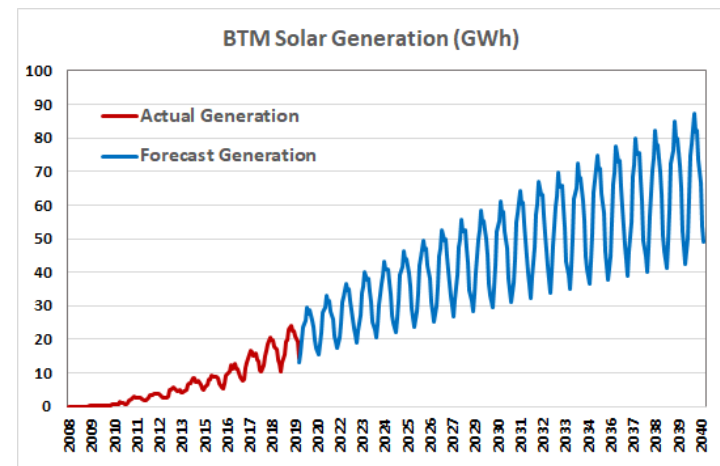
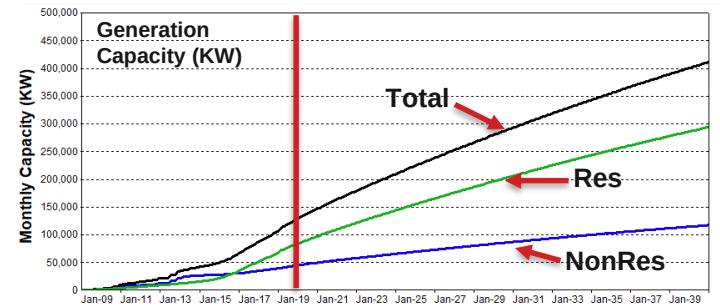
- Generation capacity data for new system
- Aggregated to monthly (Res & NonRes)
- Forecasted through 2040

» Solar Generation Data

- All solar customers have generation output meters
- Data are gathered monthly on a billing-cycle basis
- Totals are calculated by billing month and rate class

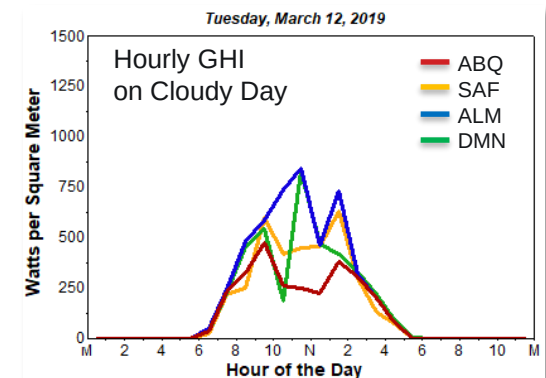
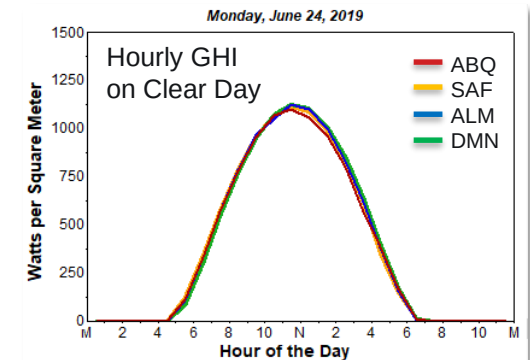
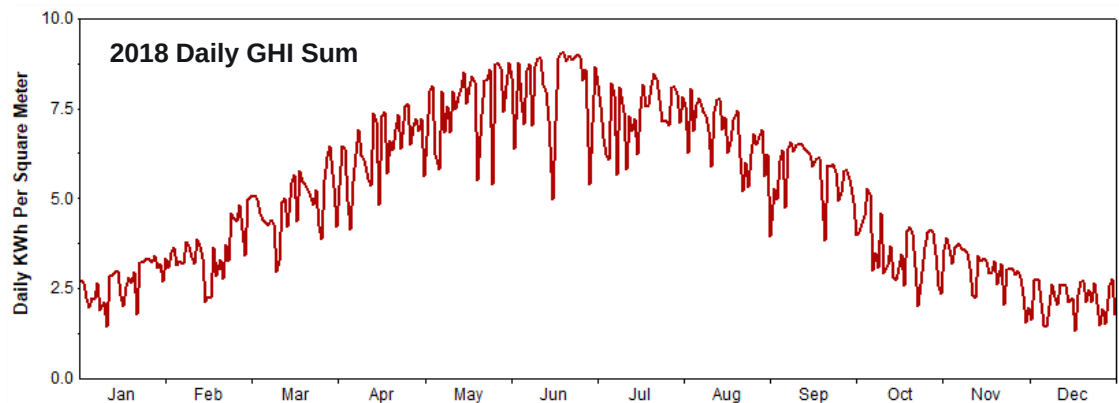
» Solar Model

- Y = Daily average KWh output per KW capacity
- X = Daily average GHI Sum
- Daily forecast allocated to hours based on hourly GHI
- Forecasts of MWh generated
 - $\text{GWh} = \text{Capacity (MW)} * \text{KWhPerKW} / 1000$



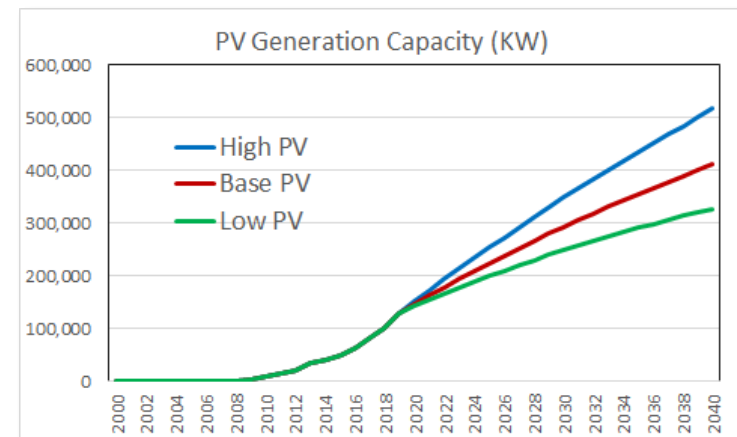
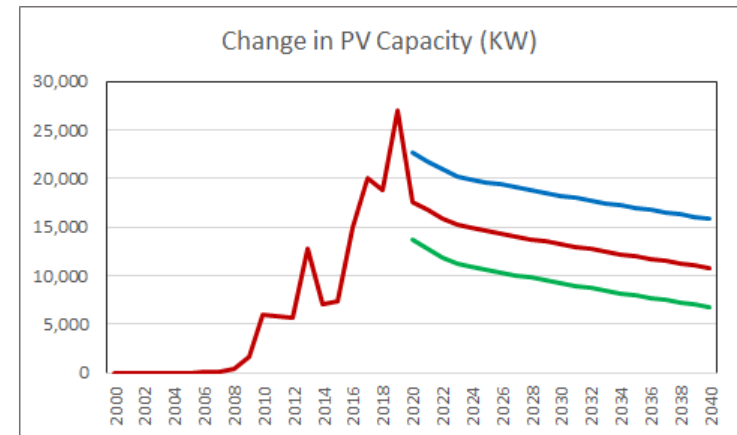
Behind the Meter Solar – GHI Data

- » Global Horizontal Irradiation (GHI) from Accuweather
 - Hourly GHI data for four weather stations
 - Daily sums and monthly sums used in modeling
- » 2018 pattern used for monthly & hourly forecasting
 - 2018 Annual GHI within .3% of 20-year average
 - Rotated to days based on daily temperature pattern



PV Scenarios

- » Base Forecast provided by PNM Customer Operations Department
- » Annual PV Capacity Additions 2021 to 2040
 - High PV: 18.3 MW
 - Base PV: 13.3 MW
 - Low PV: 9.3 MW
- » 2019 Generation Capacity: 128 MW
- » 2040 Generation Capacity (MW)
 - High PV: 516 MW
 - Base PV: 411 MW
 - Low PV: 327 MW



Electric Vehicle Forecast

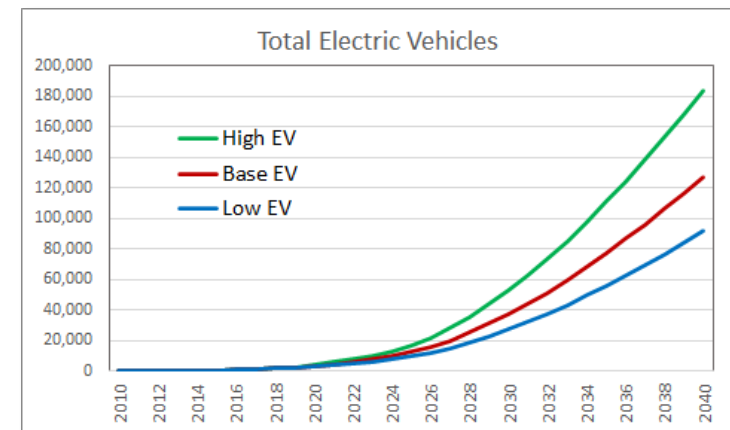
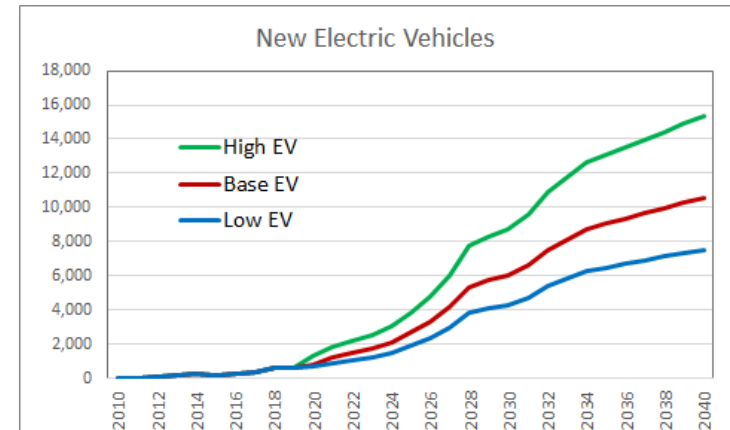
ELECTRIC VEHICLE FORECAST

- » Estimated EV count in PNM area for 2020 is about 3,400
- » Forecasts based on fractions of new car sales
 - Total New Mexico annual car sales are about 87,000
 - US EV adoption ramps up from 2.3% to 20% by 2030, 35% by 2040
 - NM adoption is about 41% of US adoption
 - 75% of NM adoptions are in PNM territory
 - EV annual energy use is about 4 MWh
 - About 80% of charging is residential

Year	EV Share of New Vehicles (US)	EV Share of New Vehicles (NM)	Total Vehicles PNM Area	Annual MWh
2015	0.66%	0.30%	765	3,060
2020	3.04%	1.26%	3,443	13,772
2025	8.82%	4.07%	12,671	50,684
2030	20.00%	9.24%	37,207	148,828
2035	30.00%	13.86%	77,319	309,276
2040	35.00%	16.17%	127,083	508,332

EV SCENARIOS

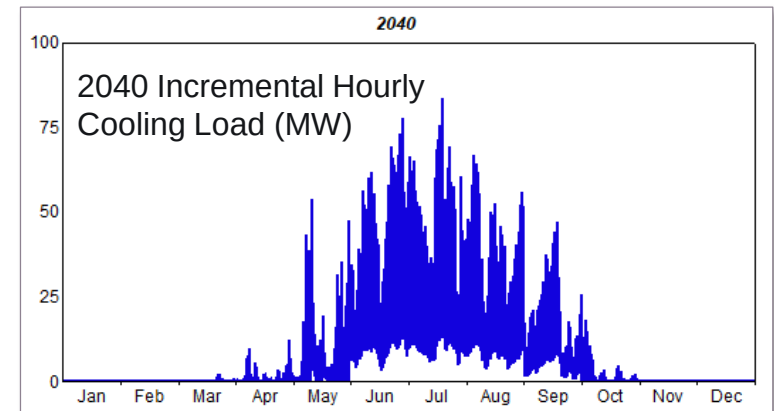
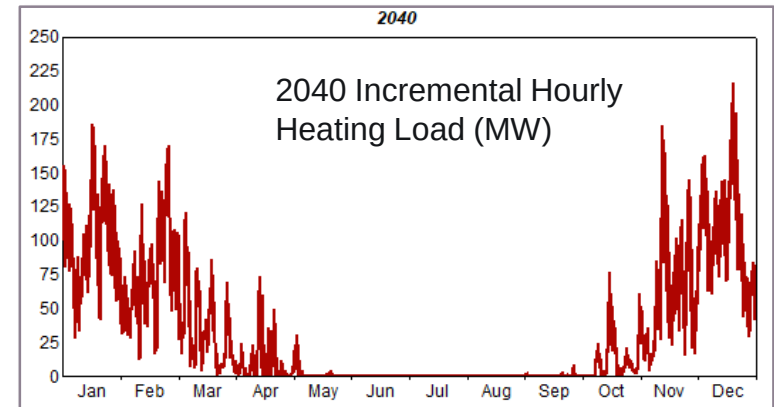
- » Base Forecast developed by PNM Customer Operations Department
- » Annual EV Additions 2021 to 2040
 - High EV: Grows to 15,300 by 2040
 - Base PV: Grows to 10,600 by 2040
 - Low PV: Grows to 7,500 by 2040
- » 2040 Electric Vehicle Count
 - High PV: 183,000
 - Base PV: 127,000
 - Low PV: 92,000



Other Scenario Inputs

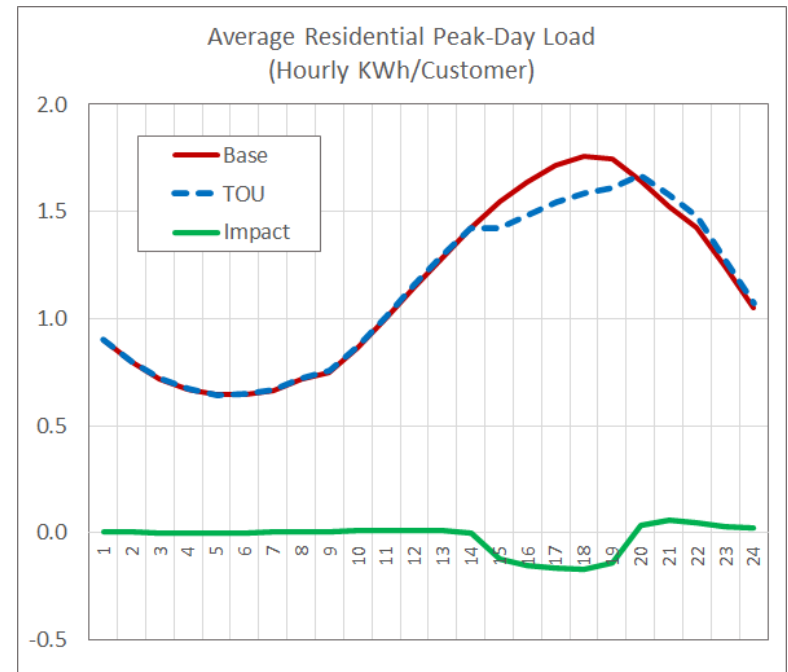
Building Electrification

- » New homes starting in 2023
 - Natural Gas and Propane not allowed
 - Electric heat share goes from 15% to 90%
 - Mostly heat pumps 80% of the increase
 - Less evaporative cooling, more central air
- » Existing homes converted to heat pumps
 - About 2% per year (7,000 homes)
 - Evaporative cooling displaced in 40% of the 2%
 - Incremental cooling UEC is 1700 KWh
- » Heat pump heating UEC averages 2400 KWh
- » Overall electric heating share increases:
 - 15.5% in 2020 to 45% in 2040
- » Heating/Cooling shapes from load research



Residential Time of Use Rates

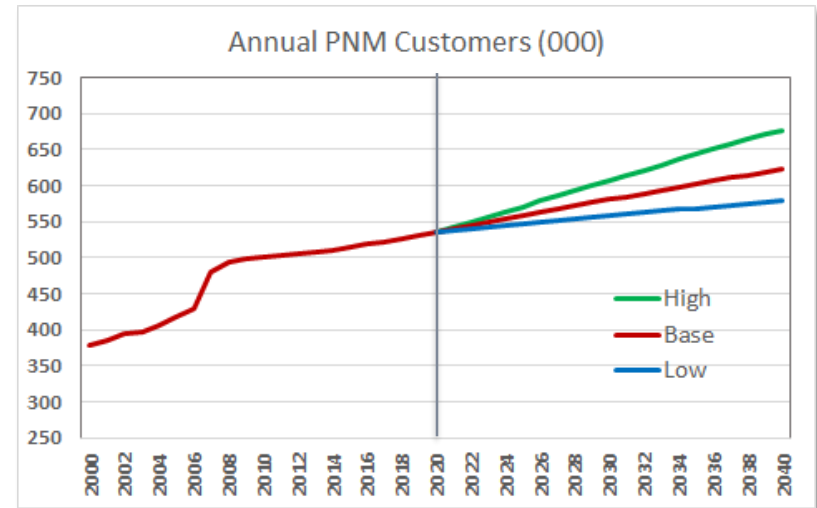
- » Introduce Residential TOU in 2024
 - 80% on TOU rate
 - 20% on Dynamic (Event-Day) Rate
 - Events on Summer Weekdays > 79 degrees
- » Impact hourly profile from pilot studies
- » Peak and energy impact levels from summary report by ACEEE of 50 pricing pilots
 - Dynamic rate peak reduction: 21%
 - TOU peak reduction: 7%
 - Average peak reduction: 9.8%
 - Average energy reduction: 1.8%



Energy Modeling and Forecasts

PNM Customer Forecast

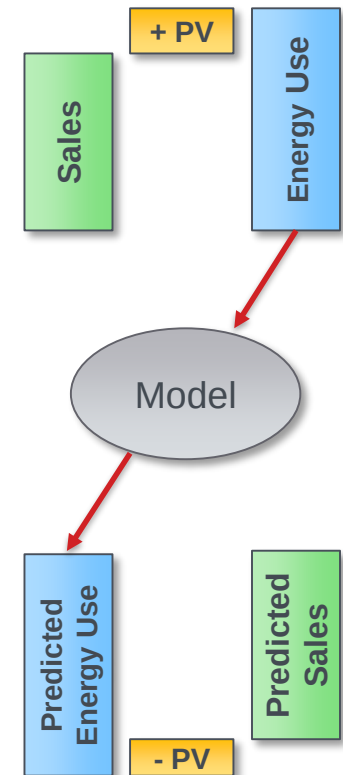
- » Elasticity model for Residential
 - Population
- » Elasticity model for Small Power (SP)
 - Population and Non-Manufacturing Employment
- » Regression model for General Power (GP)
 - Population and Non-Manufacturing Employment
- » Elasticity model for Large Power (LP4)
 - Non-Manufacturing Employment
- » Manual Adjustment for Industrial Loads
 - Expected customer gains in LP35
 - Customer loss from LP5 for San Juan Coal Plant
- » Scenarios reflect High/Low Economics



	Average Annual Customer Gain			
	Res	SP	GP	Total
2010-2020	2,908	356	6.4	3,276
2020-2030	3,868	417	10.0	4,295
2030-2040	3,605	357	9.2	3,971
	Average Annual Growth Rate			
	Res	SP	GP	Total
2010-2020	0.63%	0.69%	0.15%	0.63%
2020-2030	0.78%	0.75%	0.23%	0.78%
2030-2040	0.68%	0.60%	0.21%	0.67%

Energy Use and Energy Sales

- » Monthly sales and monthly energy use:
 - Sales = net delivery of energy through the customer meter
 - Energy use = consumption of appliances and equipment
 - Energy use is bigger than sales because of PV generation
 - Models explain energy use
- » Monthly Use Models
 - Regression models
 - Y is energy use per customer (UPC)
 - X variables are end-use drivers and weighted CD and HD variables
- » PNM Sales and Load
 - Sales computed as Energy Use – PV Generation

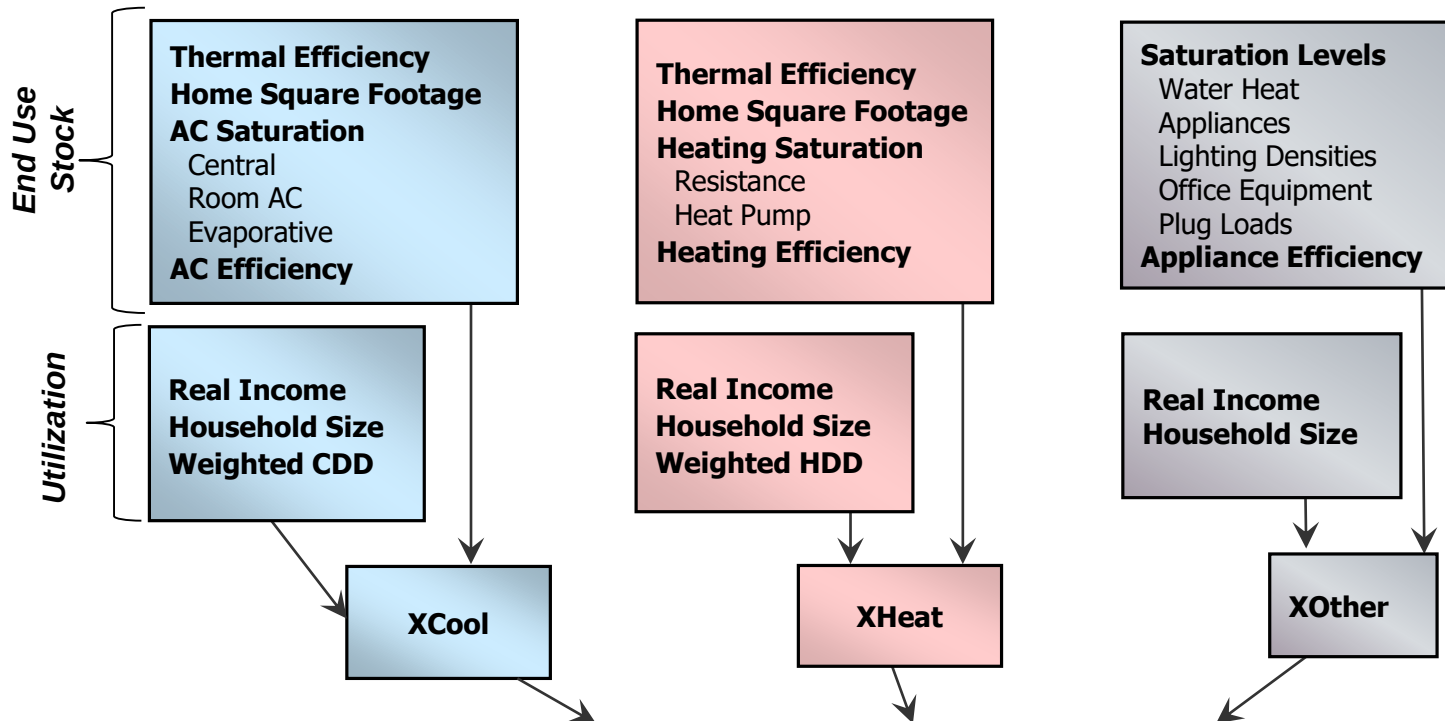


Statistically Adjusted End-Use Framework

- » Residential and commercial models use Statistically Adjusted End-Use (SAE) Model
- » SAE models account for:
 - Appliance and equipment efficiency
 - Thermal efficiency of buildings
 - Appliance saturation and equipment density
- » Efficiency and saturation data initialized using 2018 EIA data for Mountain region
- » Saturation and intensity values are modified to agree with PNM data
 - 2016 base-year intensities and saturations from PNM Efficiency Potential Study
 - Efficiency gains are accelerated in 2021 to 2025 to be consistent with PNM efficiency goals and potential study estimates
- » Residential framework is shown on the next slide
- » Commercial framework is similar (applied to SP, GP, LP)

Residential SAE Modeling Framework

SAE = Statistically Adjusted End-Use



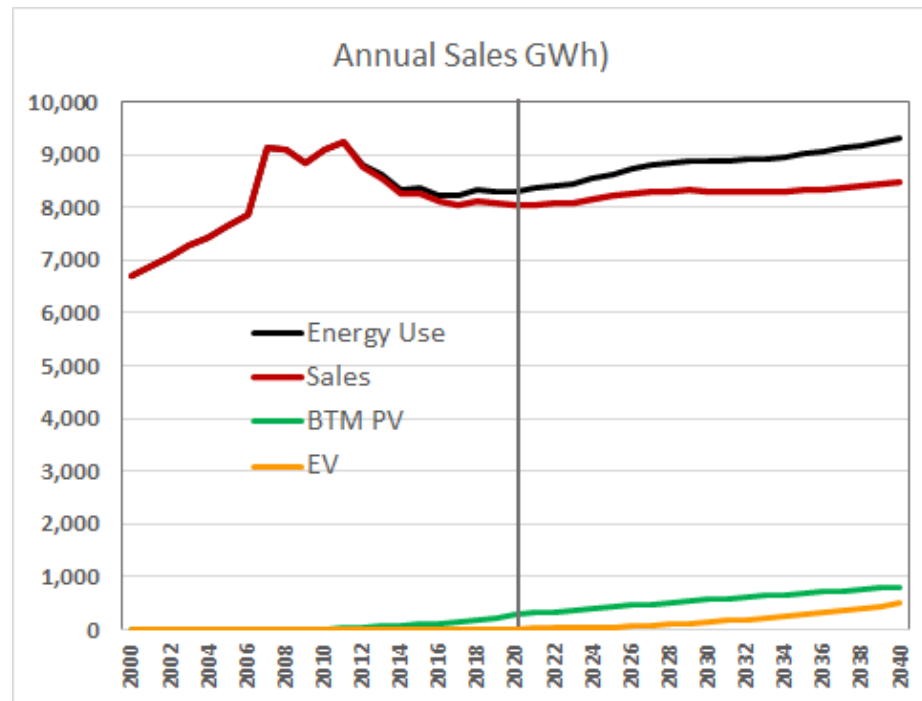
$$\text{Sales}_m + \text{PVGen}_m = a + b_c \times \text{XCool}_m + b_h \times \text{XHeat}_m + b_o \times \text{XOther}_m + e_m$$

Energy Forecast Summary

Year	Customers	Sales (GWh)	EV Sales (GWh)	PV Output (GWh)
2010	501,523	9,088.9	0.0	8.7
2015	514,776	8,267.8	2.7	90.7
2020	534,634	8,035.5	12.3	270.3
2025	557,688	8,207.8	45.9	426.5
2030	580,481	8,298.7	137.5	563.7
2035	602,377	8,319.6	292.5	687.7
2040	623,102	8,490.7	490.2	801.8

Year Range	Customers AGR	Sales AGR	Year	EV % of Sales	PV % of Sales
			2010	0.00%	0.10%
2010 to 2015	0.52%	-1.88%	2015	0.03%	1.10%
2015 to 2020	0.76%	-0.57%	2020	0.15%	3.36%
2020 to 2025	0.85%	0.43%	2025	0.56%	5.20%
2025 to 2030	0.80%	0.22%	2030	1.66%	6.79%
2030 to 2035	0.74%	0.05%	2035	3.52%	8.27%
2035 to 2040	0.68%	0.41%	2040	5.77%	9.44%

Excludes existing data centers and economic development loads



Energy Sales Forecast by Customer Class

Energy Sales in GWh					
Year	Residential	Commercial	Industrial	Other	Total
2010	3,367	2,887.1	2,202.2	632.9	9,088.9
2015	3,211	2,860.3	1,936.9	259.6	8,267.8
2020	3,176	2,855.1	1,773.3	231.1	8,035.5
2025	3,184	2,842.8	1,962.2	219.3	8,207.8
2030	3,258	2,815.9	2,010.1	215.2	8,298.7
2035	3,343	2,776.3	1,989.5	210.7	8,319.6
2040	3,513	2,783.4	1,987.5	206.9	8,490.7

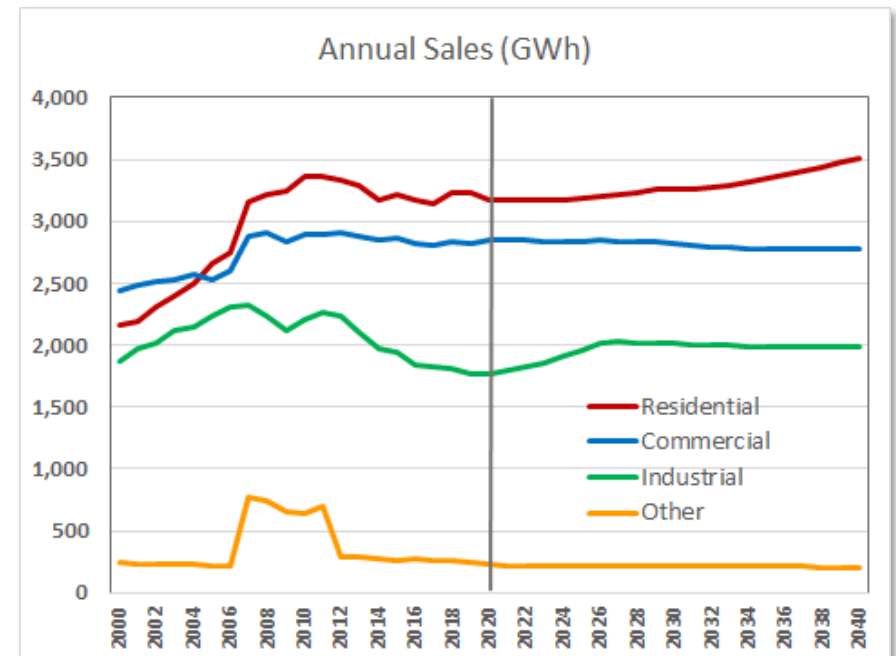
Annual Growth Rate for Energy Sales					
Year Range	Residential	Commercial	Industrial	Other	Total
2010 to 2015	-0.94%	-0.19%	-2.53%	-16.32%	-1.88%
2015 to 2020	-0.22%	-0.04%	-1.75%	-2.30%	-0.57%
2020 to 2025	0.05%	-0.09%	2.04%	-1.04%	0.43%
2025 to 2030	0.46%	-0.19%	0.48%	-0.38%	0.22%
2030 to 2035	0.52%	-0.28%	-0.21%	-0.42%	0.05%
2035 to 2040	1.00%	0.05%	-0.02%	-0.36%	0.41%

Commercial is Small Power + General Power

Industrial is Large Power + Transmission

Other is Irrigation, Water, and Lighting

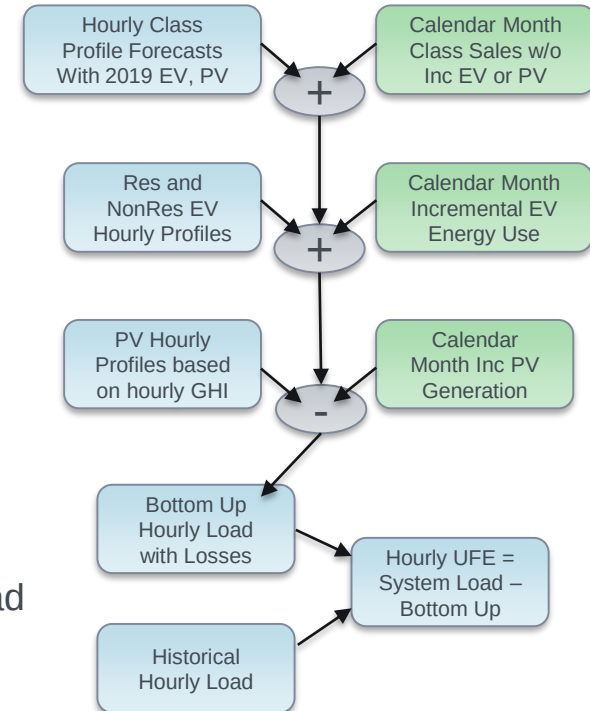
Industrial excludes existing data centers and economic development loads



Hourly Load and Peak Demand Forecast

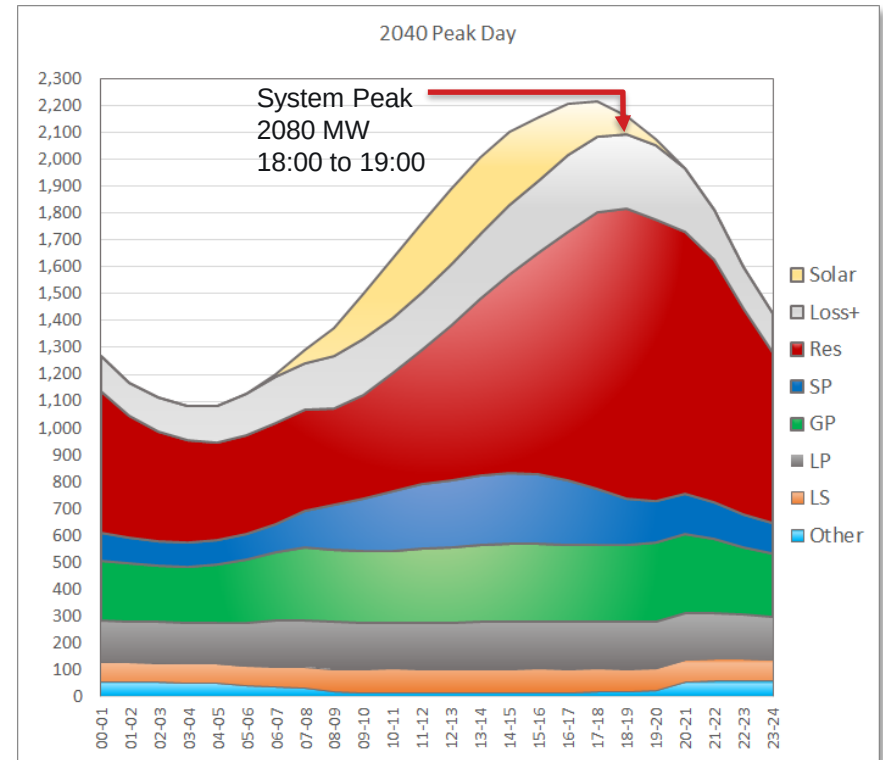
Hourly Load and Peak Load Forecasts

- » Hourly load models for each class
 - Estimated with hourly load research data for 2015 to 2019
 - Forecasted using normal daily weather pattern
- » Hourly shapes for EV and PV
 - EV shapes: Idaho National Labs, EV Charging Reports
 - PV shapes based on hourly GHI data (rotated from 2018)
- » Bottom up logic
 - Calendar month sales forecast without incremental EV or PV
 - Calibrate class hourly profile to calendar month energy value
 - Scale EV profile to incremental EV energy, add to class load
 - Scale PV profile to incremental PV energy, subtract from class load
 - Multiply by annual loss factor based on voltage level
 - Add across classes
- » Compute and apply UFE adjustment factors by month and hour



Hourly Load on Peak Day

- » Bottom up process depiction
 - Class loads are at the meter
 - Class loads exclude existing data centers
 - Loss estimate includes
 - Loss factors by delivery voltage
 - Company use
 - 3rd party transmission
 - FERC Wholesale deliveries
 - Unaccounted for energy
- » Solar is total BTM generation at the customer meter and does not include avoided T&D losses



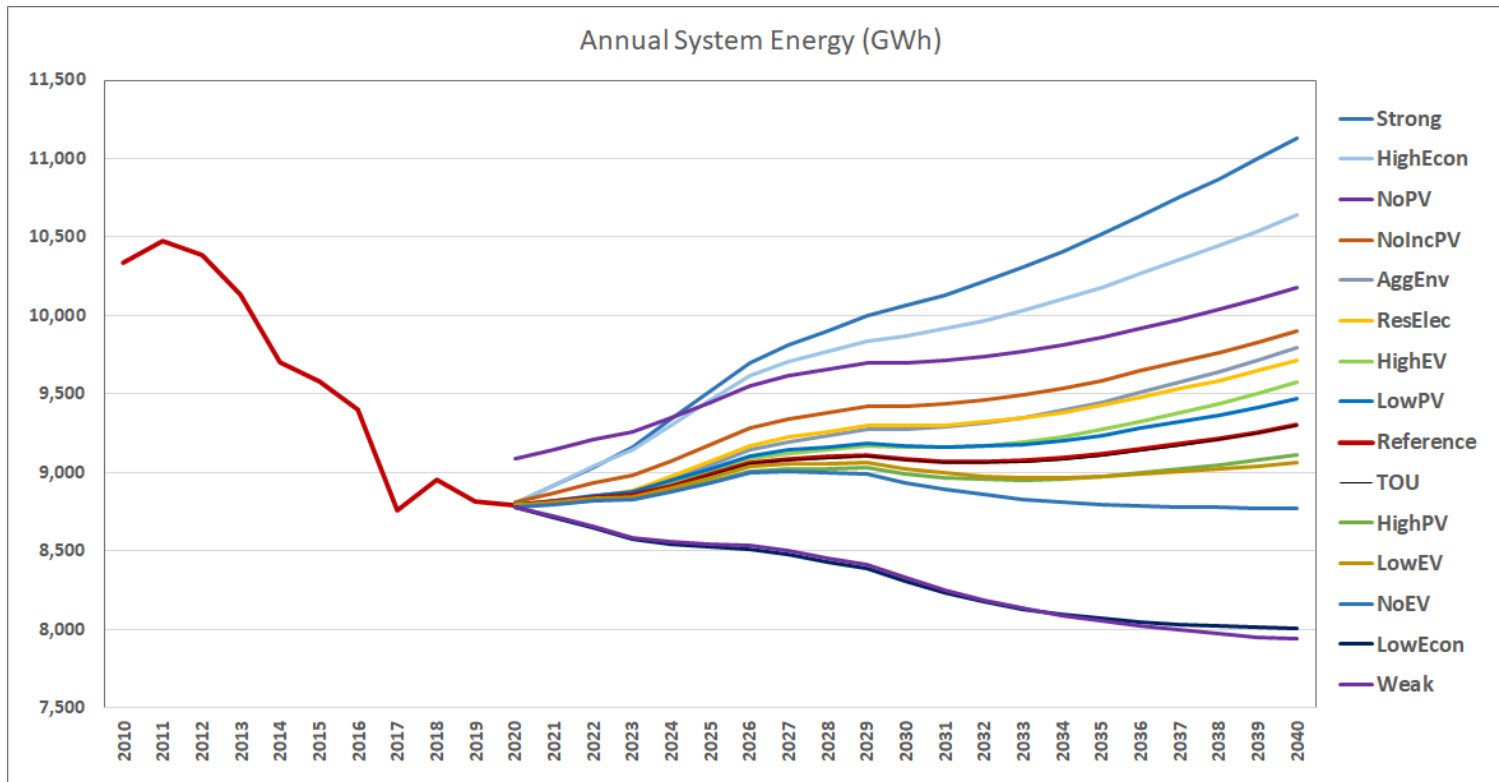
Excludes existing data centers and economic development loads

Forecast Scenarios

Scenario Definitions

	Scenario	Economic Forecast	BTM PV	EV Adoption	Building Electrification	TOU	Description
A	Reference Forecast	Mid	Mid	Mid	No	No	Base Forecast
B	High Economics	High	Mid	Mid	No	No	Strong Econ, Strong Misc. End Use Growth
C	Low Economics	Low	Mid	Mid	No	No	Weak Econ, Weak Misc. End Use Growth
D	Strong Energy Growth	High	High	High	Yes	No	Strong Econ, Strong Misc. End Use Growth, Strong PV, Strong EV, Res Electrification
E	Weak Energy Growth	Low	Low	Low	No	No	Weak Econ, Weak Misc. End Use Growth, Weak PV, Weak EV
F	High BTM PV	Mid	High	Mid	No	No	Strong PV
G	Low BTM PV	Mid	Low	Mid	No	No	Weak PV
H	Zero Incremental PV	Mid	Zero Inc	Mid	No	No	Zero Incremental PV
I	Zero PV	Mid	Zero	Mid	No	No	No PV Ever
J	High EV Adoption	Mid	Mid	High	No	No	Strong EV
K	Low EV Adoption	Mid	Mid	Low	No	No	Weak EV
L	Aggressive Environmental Regulation	Mid	High	High	Yes	No	Strong PV, Strong EV, Res Electrification
M	Residential Electrification	Mid	Mid	Mid	Yes	No	Res Electrification
N	TOU Pricing	Mid	Mid	Mid	No	Yes	TOU Impacts

Annual System Energy Scenarios



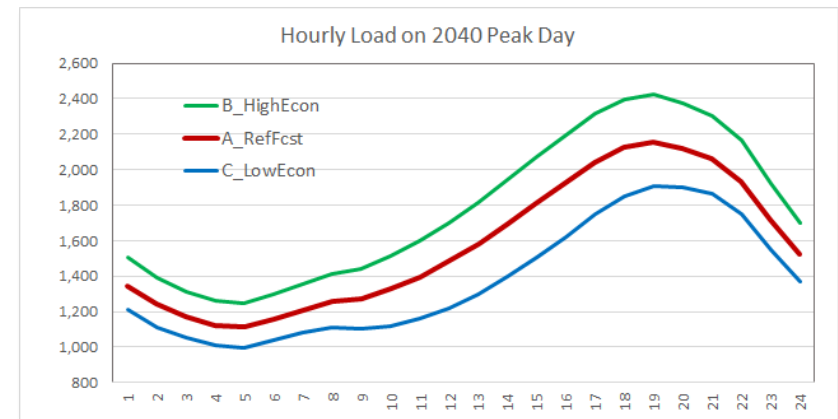
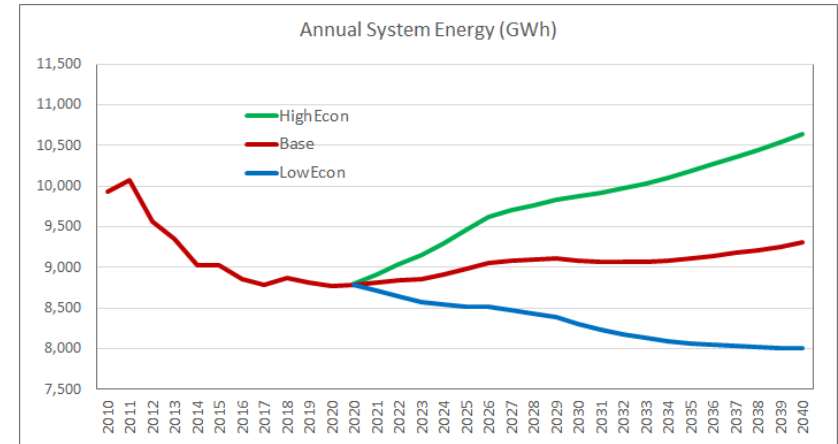
Excludes existing data centers and economic development loads

Growth Scenarios

- » Reference Case
- » High Economic Growth
 - High Population, Employment, Income
 - High Miscellaneous end-use growth
- » Low Economic Growth
 - Low Population, Employment, Income
 - Low Miscellaneous end-use growth

Year	Annual Sales (GWh)			Annual Peak (MW)		
	Base	High Econ	Low Econ	Base	High Econ	Low Econ
2020	8,791	8,800	8,782	1,862	1,862	1,861
2025	8,985	9,460	8,524	1,881	1,970	1,795
2030	9,086	9,871	8,309	1,921	2,074	1,773
2035	9,113	10,182	8,067	1,982	2,192	1,788
2040	9,304	10,639	8,007	2,080	2,348	1,835

Excludes existing data centers and economic development loads

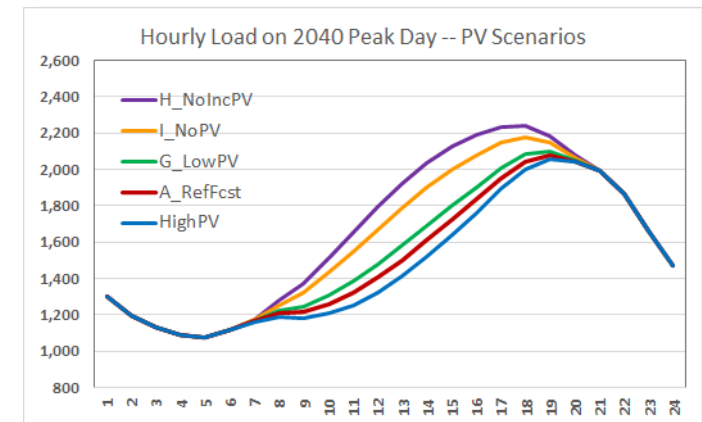
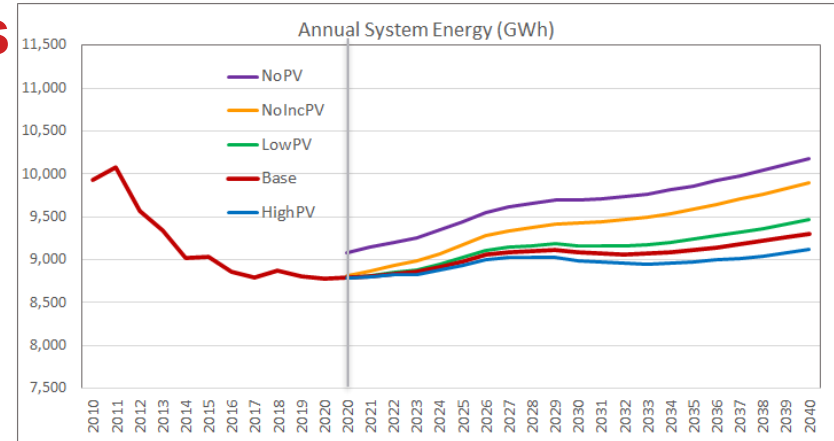


Behind the Meter PV Scenarios

- » PV Capacity in 2040
 - Base – 411 MW in 2040
 - High – 516 MW in 2040
 - Low – 327 MW in 2040
 - No Incremental – 128 MW in 2040
- » Peak Hour
 - » Without PV, hour ending 17 or 18 (4 pm to 6 pm)
 - » With PV, hour ending 19 (6 pm to 7 pm)

Year	Annual Sales (GWh)					Annual Peak (MW)				
	Base	High PV	Low PV	NoIncPV	No PV	Base	High PV	Low PV	NoIncPV	No PV
2020	8,791	8,791	8,791	8,813	9,085	1,862	1,862	1,862	1,870	1,958
2025	8,985	8,941	9,024	9,175	9,449	1,881	1,872	1,890	1,937	2,026
2030	9,086	8,994	9,168	9,425	9,700	1,921	1,902	1,939	2,000	2,088
2035	9,113	8,973	9,238	9,588	9,862	1,982	1,965	1,997	2,074	2,150
2040	9,304	9,115	9,472	9,902	10,177	2,080	2,058	2,100	2,177	2,238

Excludes existing data centers and economic development loads

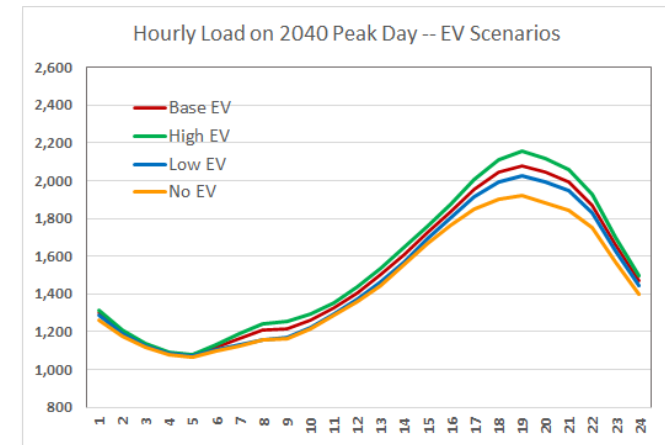
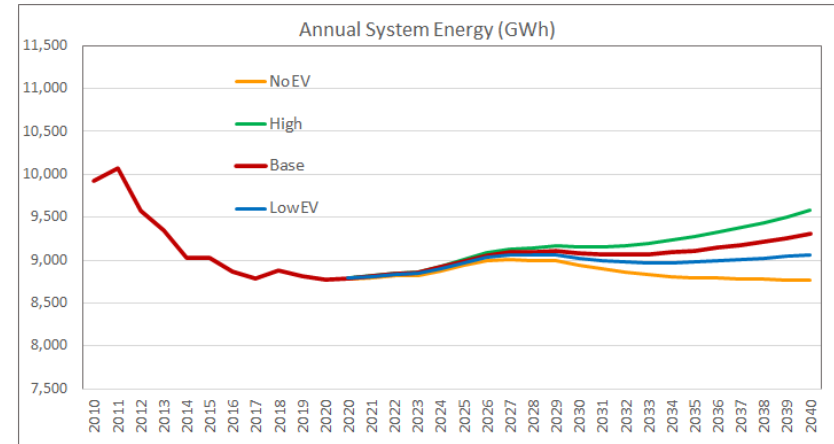


Electric Vehicle Scenarios

- » The Reference forecast includes base levels of EV adoption. In the three scenarios, the number of vehicles in 2040 are as follows:
 - High PV: 183,000
 - Base PV: 127,000
 - Low PV: 92,000
- » Annual sales and peak results are summarized below

Year	Annual Sales (GWh)				Annual Peak (MW)			
	Base	High EV	Low EV	No EV	Base	High EV	Low EV	No EV
2020	8,791	8,793	8,791	8,778	1,862	1,862	1,861	1,859
2025	8,985	9,005	8,968	8,935	1,881	1,886	1,878	1,868
2030	9,086	9,159	9,023	8,936	1,921	1,939	1,907	1,881
2035	9,113	9,274	8,974	8,795	1,982	2,026	1,949	1,885
2040	9,304	9,576	9,067	8,772	2,080	2,155	2,025	1,919

Excludes existing data centers and economic development loads



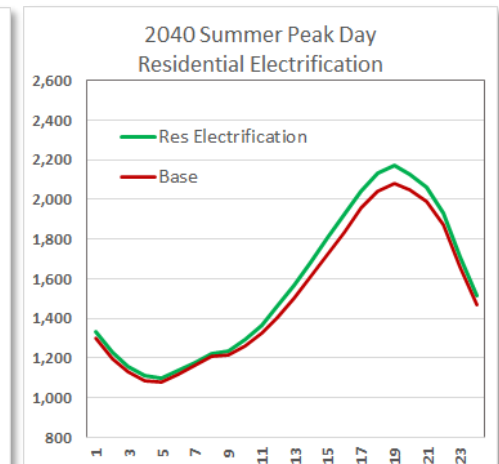
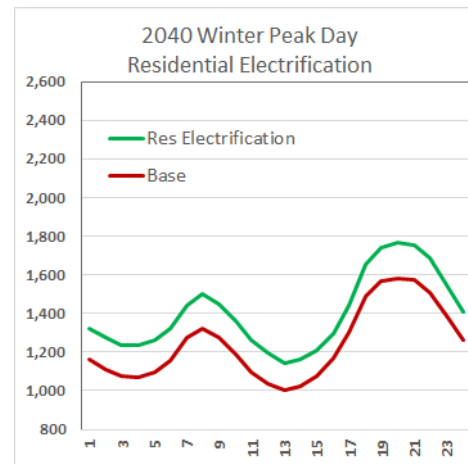
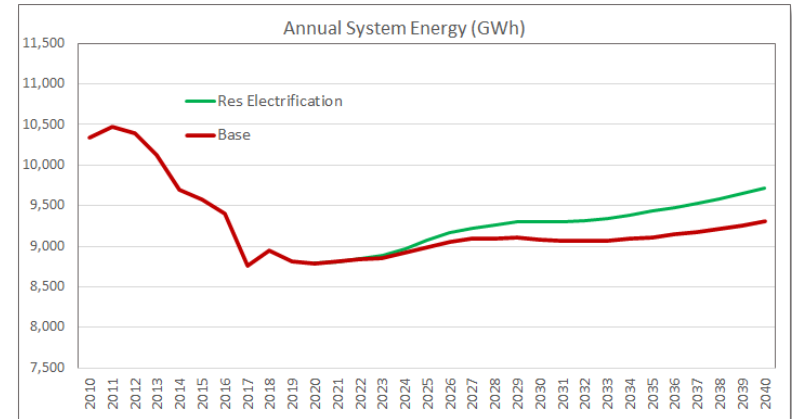
Residential Electrification

» Residential Electrification Scenario

- Gas/Propane not allowed in new homes
- Conversion incentives for existing homes
- Electric heat share rises from 15% to 45%
- Increased cooling loads as heat pumps replace evaporative cooling

Year	Annual Sales (GWh)		Annual Peak (MW)	
	Base	Building Electrification	Base	Building Electrification
2020	8,791	8,791	1,862	1,862
2025	8,985	9,069	1,881	1,899
2030	9,086	9,296	1,921	1,965
2035	9,113	9,429	1,982	2,050
2040	9,304	9,713	2,080	2,170

Excludes existing data centers and economic development loads

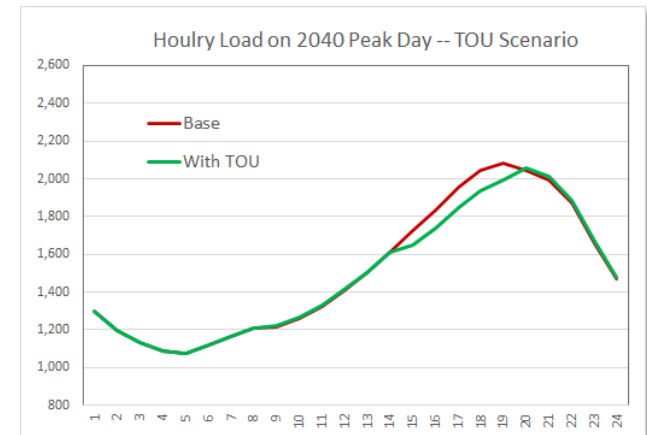
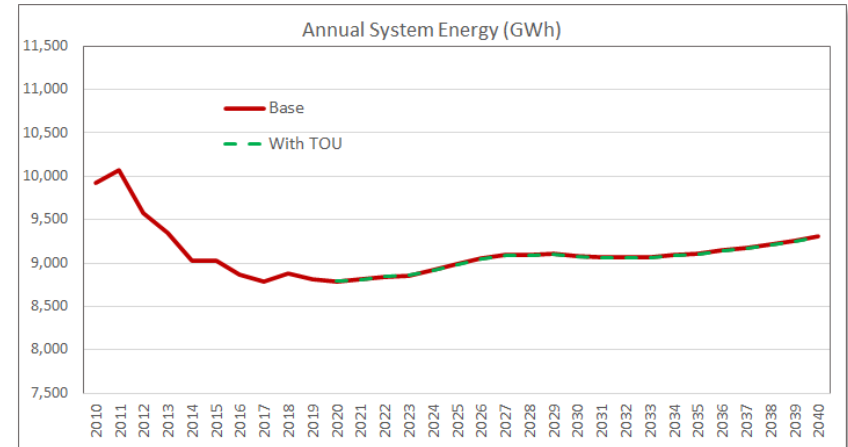


TOU Scenario

- » The TOU scenario introduces residential TOU rates in 2024
 - 80% on simple TOU rate
 - 20% on Dynamic (Event-Day) Rate
 - Events on Summer Weekdays > 79 degrees
- » TOU peak and energy impacts and the hourly profile of the impacts are taken from pilot studies

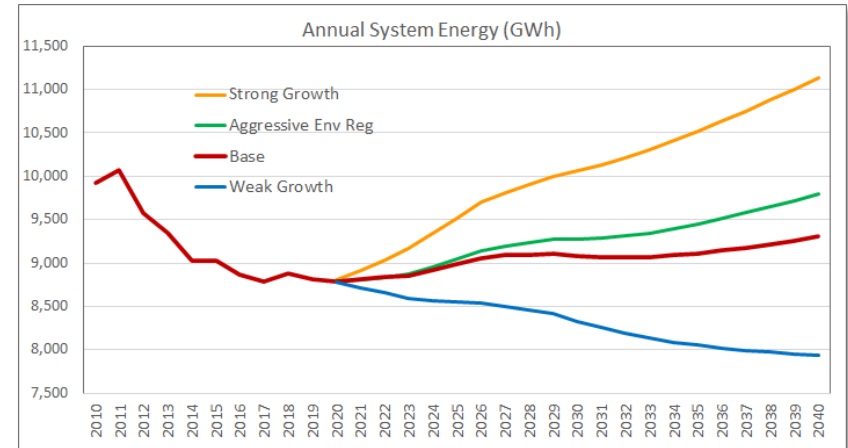
Year	Annual Sales (GWh)		Annual Peak (MW)	
	Base	TOU	Base	TOU
2020	8,791	8,791	1,862	1,862
2025	8,985	8,978	1,881	1,797
2030	9,086	9,078	1,921	1,869
2035	9,113	9,106	1,982	1,949
2040	9,304	9,297	2,080	2,057

Excludes existing data centers and economic development loads



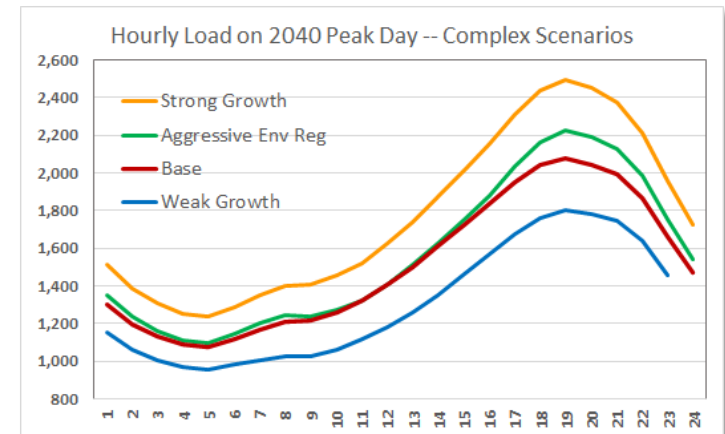
Complex Scenarios

- » Strong Growth Scenario
 - High Econ Growth, High PV, High EV, Residential Electrification
- » Weak Growth
 - Low Econ Growth, Low PV, Low EV
- » Aggressive Environmental Regulation
 - High PV, High EV, Residential Electrification



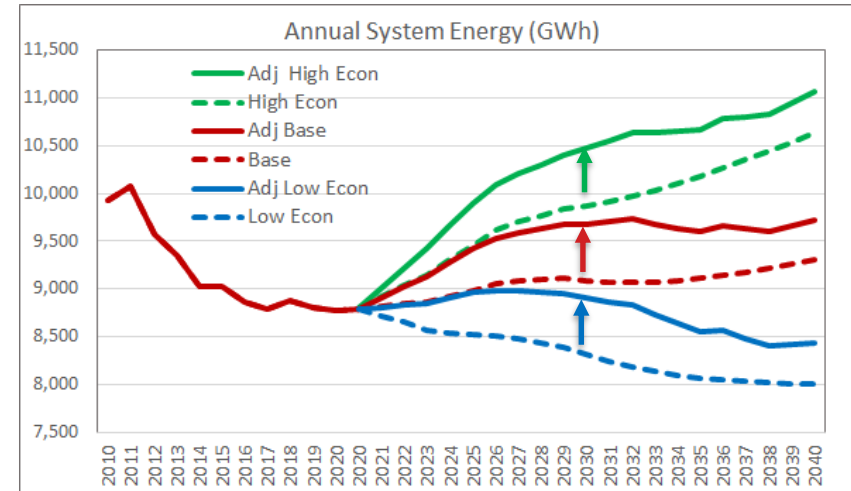
Year	Annual Sales (GWh)				Annual Peak (MW)			
	Base	Strong Growth	Weak Growth	Aggressive Env Reg	Base	Strong Growth	Weak Growth	Aggressive Env Reg
2020	8,791	8,802	8,781	8,793	1,862	1,863	1,860	1,862
2025	8,985	9,521	8,546	9,046	1,881	1,983	1,800	1,894
2030	9,086	10,062	8,328	9,276	1,921	2,115	1,773	1,966
2035	9,113	10,517	8,052	9,449	1,982	2,288	1,771	2,078
2040	9,304	11,131	7,937	9,797	2,080	2,491	1,800	2,223

Excludes existing data centers and economic development loads



Putting EE on the Supply Side

- » The forecast scenarios all include the same aggressive assumptions about Energy Efficiency.
- » EIA efficiency forecasts for the region were accelerated to reflect aggressive levels of PNM program activity.
- » To put EE on an equal footing with supply-side options, the scenario forecasts are adjusted upward to remove the impacts of incremental program activity, including:
 - The Program bundle for 2021 to 2025
 - Bundles A to E for 2026 and beyond
- » To compute the adjustments, load shape impacts by EE bundle are accumulated across years based on average measure life of each bundle. The cumulative impacts are then added to the hourly scenario forecast. The resulting adjusted hourly load shapes are the basis for the IRP process treating EE programs as a supply-side resource. The chart depicts the impact of this adjustment process for annual system energy in the three economic growth scenarios.



THANK YOU

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Appendix D. Description of Balancing Area Reliability Requirements

This appendix provides a detailed explanation of the three primary standards for PNM's BA discussed in the Planning Considerations Section under Operating Reserves.

BAL-002-1

BAL-002-1 is the Disturbance Control Performance Standard which sets requirements to restore supply and demand balance in the event of a system disturbance. It defines the allowable recovery period and the requirement to establish new reserves following a disturbance. To ensure compliance, PNM must maintain contingency reserves, which are resources under PNM's control that can be activated to respond to Disturbance Control Standard (DCS) events within the required time periods. An example of a typical DCS event would be the loss of a BA's single largest hazard. If PNM does not comply with these standards, not only can monetary penalties be assessed, but PNM is also exposed to a load-shed directive from WECC's Regional Coordinator (RC), who monitors system reliability across WECC. System recovery is required to occur within 15 minutes and reserves must be restored within 60 minutes.

Within the 15-minute DCS recovery period, the first five minutes is when the BA conducts the following activities:

- Call and activate non-spinning reserves, which must be available within 10 minutes.
- Verify that PNM is receiving assistance from its reserve sharing group
- Activate any hazard share agreements

The remaining 10 minutes of the DCS reserve recovery period allow for spinning and non-spinning units to ramp up to their 10-minute delivery capability. At the end of the 15-minute recovery period, PNM's area control error must return to zero or to the precontingency value or bring supply into balance with the load.

BAL-002-WECC-2

As PNM adds more variable energy supplies to the system, PNM must consider the need to provide the requisite regulating reserves (i.e., ancillary services and flexibility) to maintain reliability as generation from the new resources ramps up and down. Increased intermittent generation on PNM's system has increased the fluctuations of generation output on the system. This also increases the need for quick-response solutions.

Contingency reserves include spinning and non-spinning reserves. Spinning reserves are the portion of reserves that the utility can call upon to immediately respond to a system disturbance. Spinning reserves include the following:

- PNM-controlled generation or storage resources that are online and synchronized to the BA's system so they can be accessed immediately to provide power to the system
- Market-based products (spin capacity) that are available to be called upon within the required recovery period (e.g., a generator located in another electric utility's system)

Market-based products for spin capacity are agreements with other entities for capacity and/or energy that can be called upon to assist PNM in responding to, and recovering from, a DCS event, re-establishing contingency reserves, and replacing lost generation to meet PNM's load service obligations. Market solutions mitigate, to the extent that they are available, the need for PNM to invest in new generation to comply with NERC and WECC standards. Use of these products requires PNM to maintain sufficient transmission capacity to utilize the agreements within the timeframes needed. Two market solutions for management of and recovery from DCS events include the following:

- **Southwest Reserve Sharing Group (SRSB) participation:** PNM is a participant in SRSB and benefits from sharing contingent reserves, thereby reducing NERC and WECC compliance costs
- **Hazard share agreement:** PNM currently has a 100 MW hazard share agreement with Tri-State that improves PNM's ability to meet DCS recovery and contingency reserve restoration requirements at little or no cost. This agreement terminates when SJGS Unit 4 retires. A hazard share agreement is between two generator owners that agree to share the risks of a generator loss by providing immediate assistance to each other in the event of the loss of the named resource.

SRSB includes 15 southwestern utilities and is registered under NERC. SRSB administers NERC compliance requirements for certain reliability standards including BAL-002, the DCS for utilities in the WECC region. This standard establishes the criteria and reporting requirements to ensure that an area BA, such as PNM, restores the electricity supply and demand balance within prescribed time limits following a reportable system disturbance. SRSB participants share contingency reserves to maximize generator dispatch efficiency, reduce the costs of compliance with the DCS, and enhance electric reliability. The SRSB geographical area covers Arizona, New Mexico, southern Nevada, parts of southern California including the Imperial Valley, and El Paso, Texas.

Load and generation can vary quickly throughout the day, so PNM maintains a margin over the minimum standard to ensure continuous compliance. The minimum margin that PNM should carry is affected by the frequency and magnitude of sudden changes in the supply and demand balance. PNM has studied the relationship between the cost to carry regulating reserves and the probability of not having enough regulating reserves to respond to events that cause load or generation to suddenly change. Findings of this study follow:

- The need for flexible capacity is driven by short duration fluctuations in the supply demand balance (e.g., if a cloud floats over a PV solar generator, the change in generation is instant, but the associated change in demand from reduced household cooling needs will take longer to occur)
- Because loss of generation events typically are of short notice and duration, spinning reserves are more valuable as a supply of regulating reserves than non-spinning reserves

Non-spinning reserves are resources that are not online and synchronized to the balance authority's system, but that are available to respond to system disturbances within a 10-minute period. There are many types of non-spinning reserves, including the following:

- Offline generation capable of ramping up and synchronizing to the grid within 10 minutes. PNM's 10-minute available generating units include the two Lordsburg LM6000 units, the La Luz LM6000 unit, and the Rio Bravo Frame-7 unit on fuel oil.
- Shared contingency reserves, which PNM can access as a participant in the SRSG. Participants in SRSG share contingency reserves to maximize generator dispatch efficiency. SRSG assistance is provided for 60 minutes after the system disturbance. Shared reserves decrease the costs of compliance with the DCS standards and contribute to electric reliability in the Western Interconnection.
- Interruptible (Non-Firm) Interchange Transactions under which PNM's sales to a counterparty can be recalled within 10 minutes to provide contingency reserves.
- Hazard sharing agreements with one or more external balancing authorities or with other generators within another balancing authority's area.
- Demand response management actions to remove load from the system within the disturbance recovery period.
- Generator-based PPA or market purchases that can be delivered within the DCS recovery period.

PNM can use spinning reserves that exceed the spinning reserve requirement to meet the non-spinning contingency reserve requirement.

Standard energy purchases do not directly provide ancillary services such as spin, non-spin and frequency response. If available, market purchases can provide PNM the ability to ramp down its generation or take it offline to create contingency reserves. But, given the future uncertainty of availability, market purchases are not a reliable means of meeting the contingency reserves requirement.

Under the BAL-002-WECC-2 standard, once reserves are activated to recover from a DCS event, those reserves must be restored within 60 minutes. Noncompliance with the standard can result in a directive by the Peak RC to shed load. Restoring reserves allows PNM to accomplish a timely recovery from another DCS event should one occur.

BAL-003-1

NERC Standard BAL-003-1 is the Frequency Response Requirement. PNM, in its role as a BA, is required to have sufficient frequency response capability to maintain interconnection frequency within predefined boundaries by arresting frequency deviations and supporting frequency until the system's frequency is restored to its scheduled value.

Appendix E. Transmission Facilities

This appendix provides a detailed list of PNM's owned transmission facilities, including:

- Existing transmission switching stations in Table E-1;
- Existing transmission lines in Table E-2; and
- Existing jointly-owned transmission lines in Table E-3.

Table E-1. Existing Transmission Switching Stations

Name	Voltage Levels	Operator if Jointly Owned
Artesia	345	EPE
Alamogordo	115	PNM
Algodones	115	
Ambrosia	230, 115	
Amrad	345, 115	EPE
BA	345, 115	
Belen	115	
Bisti	230	
Blackwater	345	
Britton	115	
Cabazon	345	
Corrales Bluffs	115	
College	115	
Clines Corners	345	
Diamond Tail	345	
El Cerro	115	
Embudo	115	
Four Corners	500, 345, 230	APS
Gallegos	230, 115	
Greenlee	345	TEP
Guadalupe	345	
Hidalgo	345, 115	EPE (345), PNM (115)
Huning Ranch	115	
Irving	115	
Jicarilla	345	
Kirtland	115	
Kyrene	500	SRP
Los Morros	115	
Lordsburg	115	
Luna	345, 115	EPE (345), PNM (115)
McKinley	345	TEP
MD1	115	

Name	Voltage Levels	Operator if Jointly Owned
Mimbres	115	
Mission	115	
North	115	
Norton	345, 115	
Ojo	345, 115	
Picacho	115	EPE
Pachmann	115	
Palo Verde	500	SRP
Person	115	
Pillar	230	
Prager	115	
Red Mesa	115	
Reeves	115	
Richmond	115	
Rio Puerco	345, 115	
San Juan	345, 230	
Sandia	345, 115	
Scenic	115	
Shiprock	345	WAPA
Snow Vista	115	
Springerville	345	TEP
Taiban Mesa	345	
Tome	115	
Turquoise	115	
Valencia	115	
Veranda	115	
West Mesa	345, 230, 115	
West Wing	500	SRP
Yah-Ta-Hey	115	
Zia	115	

Table E-2. Existing Transmission Lines

Line Code	Voltage	From-To Switching Station Names or Substation Name if Tap Line
AA	115	Arriba Tap (VS Line)
AB	115	Reeves-BA (East Circuit)
AC	115	Alamogordo - Carrizo (TSGT)
AF	230	Pillar-Four Corners
AH	115	Alamogordo - Holloman (EPE)
AJ	345	West Mesa-Rio Puerco
AL	115	Pachmann - Algodones
ANZ	115	Norton-Zia
ANZ	115	Algodones to 3-way switch
AR	115	Alamogordo - Amrad
AT	115	Person-El Cerro
AV	115	Avila Tap (RB Line)
AW	115	Algodones - Britton
AY	115	Ambrosia -Yah-Ta-Hey
BA-DMND1	345	BA-Diamond Tail
BA-DMND2	345	BA-Diamond Tail
BA	115	Bel Air Tap (HW Line)
BB	345	BA - Guadalupe
BI	230	Ambrosia -Bisti
BJ	345	Rio Puerco - West Mesa
BP	230	Bisti - Pillar
BW	115	Bluewater (TSGT) - West Mesa
CB	115	BA - Pachmann
CE	115	Pachmann - Scenic
CG	115	Sandia-Richmond
CJ	345	Rio Puerco-BA
CK	115	Tome-College
CLCR-DNMD1	345	Clines Corners-Diamond Tail
CLCR-DNMD2	345	Clines Corners-Diamond Tail
CM	115	Church Rock Tap (AY Line)
CN	115	Cornell Tap
CP	345	Clines Corners-Guadalupe
CQ	115	Coal Tap
CS	115	Corrales Bluffs - Sara 1 & 2
CT	115	Corrales Bluffs - Sara 3 & 4 Substation
CY	115	Pachman - Corrales Bluff

Line Code	Voltage	From-To Switching Station Names or Substation Name if Tap Line
CZ	345	Cabazon-Rio Puerco
DL	115	Mimbres - Picacho
DM	115	Mimbres - Deming 1 and 2 (TSGT Line)
DMND-NRTN1	345	Diamond Tail-Norton
EB	115	Embudo - Sandia
EG	115	East Gallup Tap (AY Line)
EJ	115	Embudo - Juan Tabo Sub
ER	115	Embudo -Reeves
ES	115	El Dorado Tap (SL Line)
ET	115	Eastridge Tap (SE Line)
FC	345	San Juan - Four Corners
FW	345	Four Corners - Rio Puerco
GC	230	Gallegos - Pillar
HG	115	Hollywood - Gavilan
HM	115	Huning Ranch-Los Morros
HO	115	Hernandez (TSGT) - Ojo
HR	115	Hidalgo - Turquoise
HU	115	Huning Ranch-West Mesa
HW	115	EB-SP Line (Albuquerque Tie)
IC	115	Irving - Corrales Bluffs
IR	115	Irving - Reeves
JA	115	Jarrales Tap
KA	115	Kirtland - USAF
KB	115	Kirtland - Sandia Lab (KAFB)
KC	115	Marquez Tap (KM Line)
KD	115	Kirtland - Sandia Labs Area 5 (SNL)
KM	115	West Mesa - Red Mesa
KS	115	Kirtland - Sandia
LB	115	Lordsburg - Hidalgo
LK	115	Luna - MD1
LL	345	Luna Station - Luna Energy Facility
LO	115	Lost Horizon Tap
LS	115	San Lucas Tap (KM Line)
LT	115	Leyendecker Tap (TL Line)
LU	115	Lenkurt Tap (EB Line)
LW	115	Lawrence Tap (SE Line)
MA	115	Red Mesa - Ambrosia

Line Code	Voltage	From-To Switching Station Names or Substation Name if Tap Line
MB	115	Ambrosia -Bluewater (TSGT)
MH	115	MD1 - Ivanhoe Sub (Phelps Dodge)
MI	115	Miguel Lujan Tap (NS Line)
ML	115	Mimbres - Luna
MN	115	North-Mission
MP	115	Montano Tap (NP Line)
MR	115	MD1 - Turquoise
MT	115	Manual Tap (EB Line)
MW	115	Mimbres - Hermanas - Hondale
NH	115	Norton - Hernandez (TSGT)
NL	115	Norton - ETA (DOE)
NO	115	Noe Tap (Gallup) (EG Line)
NR	115	Reeves - Mission
NS	115	Norton - Zia
NW	115	West Mesa - Reeves
OC	345	San Juan-Jicarilla
OJ	345	Ojo-Jicarilla
PA	115	Studio Tap (PS Line)
PL	115	Lomas Tap (PN Line)
PM	115	Person - West Mesa
PN	115	North - Richmond
PR	115	Pachmann - Progress Sub
PS	115	Person - Kirtland
PV	115	Rio Puerco - Veranda
PW	115	Person-Snow Vista
RB	115	Reeves - BA (West Circuit)
RE	115	Reeves - Embudo
RL	115	BA - STA (STA Owned by LANL)
RN	115	Reeves - North
RP	115	Prager-Richmond
RR	115	Veranda - Corrales Bluff
RS	115	BA - Zia
SE	115	Sandia - Embudo
SG	115	Signetics Tap (AB Line)
SK	115	West Mesa-Scenic
SL	115	Zia - Valencia
SP	115	Sandia - Person

Line Code	Voltage	From-To Switching Station Names or Substation Name if Tap Line
SR	345	San Juan - Shiprock
ST	115	San Pedro - I-40 (Albuquerque Tie)
TB	345	Taiban Mesa - Blackwater
TC	115	College-El Cerro
TG	345	Taiban Mesa - Guadalupe
TJ	115	Tome - Belen
TL	115	North - Lyendecker
TR	115	Truman Tap (SP Line)
TV	115	Tome - Valencia Energy Facility
TW	115	Britton-Willard (TSGT)
TY	115	Turquoise - Tyrone Sub (Phelps Dodge)
UT	115	University Tap (HW Line)
VS	115	Valencia - Storrie Lake (TSGT)
WA	230	West Mesa - Ambrosia
WB	115	Belen-Los Morros
WC	115	Wesmeco Tap (SP Line)
WD	115	West Mesa-Huning Ranch
WG	115	West Gallup Tap (AY Line)
WJ	115	West Mesa-Snow Vista
WL	115	Willard (TSGT) - Belen
WN	345	Rio Puerco - BA
WP	115	West Mesa - Prager
WR	115	West Mesa - Irving
WS	345	West Mesa - Sandia
WV	115	West Mesa - Volcano
WW	345	San Juan - Cabezon
YN	115	Yah-Ta-Hey - Coalmine (NTUA)
YP	115	Yah-Ta-Hey - Pittsburg Midway Sub
ZF	115	Zia - South Pacheco
ZN	115	Mejia Tap (NZ Line)

Table E-3: Existing Joint-Owned Transmission Lines

Line Code	Voltage	From-To Switching Station Name	Operator
	345	Amrad - Artesia	EPE
SJ-MC 1	345	San Juan - McKinley Line 1	TEP
SJ-MC 2	345	San Juan - McKinley Line 2	TEP
	345	McKinley - Springerville Line 1	TEP
	345	McKinley - Springerville Line 2	TEP
	345	Springerville - Greenlee	TEP
GH	345	Greenlee - Hidalgo	EPE
HL	345	Hidalgo - Luna	EPE
	500	Palo Verde - Westwing Line 1	SRP
	500	Palo Verde - Westwing Line 2	SRP
	500	Hassayampa - Jojoba - Kyrene	SRP

Appendix F. Rules and Regulations

Transmission System

Over the last 18 years, U.S. electric transmission service has undergone major regulatory changes in the way transmission services are offered and provided and how transmission system planning is conducted.

FERC Order No. 888

The largest change stems from the 1996 implementation of the FERC Order No. 888. This order requires that a jurisdictional transmission provider, such as PNM, provide open access for transmission capacity to all eligible customers via an Open Access Transmission Tariff (OATT or Tariff). Eligible customers (e.g., Tri-State Generation and Transmission on behalf of its cooperative members, and Los Alamos County) under the Tariff can contract for Network Integration Transmission Service (NITS) to integrate their designated network resources and designated network loads on the PNM transmission system in a manner comparable to how PNM serves its own retail and wholesale customers.

The order obligates PNM to plan its transmission system to meet not only its own retail customer needs, but also its delivery obligations to NITS and long-term, firm point-to-point transmission service customers. Tariff customers can also choose to contract for firm point-to-point transmission service on a long-term basis with rollover rights that are essentially perpetual.

Energy Policy Act of 2005

The Energy Policy Act of 2005 (EPACT) legislated the implementation on a nationwide basis of mandatory transmission grid reliability rules for all owners, operators, and users of the systems. Under the EPACT, FERC was given authority to develop, monitor, and enforce all aspects of transmission grid reliability. FERC delegated to the North American Electric Reliability Corporation (NERC) the role of the national Electric Reliability Organization (ERO). The Western Electric Coordinating Council (WECC) has been delegated the role of the Regional Entity within North American Electric Reliability Corporation (NERC) that will monitor and enforce the mandatory reliability standards in the Western United States. Failing to comply with the ERO standards subjects a utility to sanctions and civil penalties of up to \$1 million per day for each incident for the most substantive failures to follow FERC's grid reliability rules.

FERC Order No. 890

Issued in February 2007, after broader powers were delegated to FERC and NERC under the EPACT, this order clarified and strengthened these obligations initially established by Order No. 888 and required regional coordination by transmission companies of transmission system planning.

FERC Order No. 1000

FERC Order 1000, issued July, 21, 2011, expands the responsibilities for regional coordination in transmission system planning. Public utility transmission providers participate

in a regional transmission planning process that evaluates transmission alternatives at the regional level in order to resolve the region's needs more efficiently and cost-effectively than alternatives identified by individual public utility transmission providers in their local transmission planning processes. These processes must incorporate transmission needs driven by public policy requirements and result in a regional transmission plan. PNM participation in Order 1000 is through its participation in WestConnect, which started in 2015.

WECC and NERC Criteria

As a member of Western Electricity Coordinating Council (WECC) and North American Electric Reliability Council (NERC), PNM complies with reliability criteria to ensure that its electric systems are safely and reliably operated.

PNM must comply with NERC operating standards, which, in part, might dictate the use of certain resources to meet the requirements. These include Control Performance Standards² (CPS), which measure a control area operator's ability to control system frequency and balance its load and generation at all times. They also include Disturbance Control Standards³, which measure the control area's ability to respond to generator or load loss.

PNM must also comply with NERC standards that relate to transmission planning and operations. These include Transmission Planning Standards⁴ (TPL), which measure the sufficiency of the transmission system to meet present and future needs. TPL standards state that, "The interconnected power system shall be operated at all times so that general system instability, uncontrolled separation, cascading outages or voltage collapse will not occur as a result of any single contingency or multiple contingencies of sufficiently high likelihood."

Power Supply Assessment (PSA)

NERC requires WECC to annually evaluate future resource adequacy of the western region based upon annual resource plans submitted by member utilities. The PSA is a regional and subregional determination of resource adequacy, rather than an individual utility evaluation of resource adequacy. The purpose, is to project whether enough physical resources exist, at any price, to meet load and possible reserves while considering the transmission transfer capabilities of major paths⁵. PNM, balancing area coordinator (BAC) in New Mexico, participates in the PSA study process and collects historical and future load and resource information from load-serving entities (LSEs) within New Mexico. This assessment is important because, if the PSA were to identify a resource adequacy issue in the region or subregion where PNM operates, PNM would be obligated to participate in finding a solution to the resource deficiency.

² See <https://www.nerc.com/pa/Stand/Pages/default.aspx> (BAL-001-0_1a)

³ See <https://www.nerc.com/pa/Stand/Pages/default.aspx> (BAL-002-1 and BAL-002-WECC-1)

⁴ See <https://www.nerc.com/pa/Stand/Pages/default.aspx> (TPL-001-0.1 through TPL-004-0)

⁵ See <https://www.nerc.com/pa/RAPA/ra/Pages/default.aspx> (Reliability Assessment Guidebook)

Reserve Sharing Agreements

In addition to meeting planning criteria, PNM also ensures that its resource portfolio meets operating conditions. From time to time, the operation of PNM's system may warrant additional generation or the use of certain types of reserves to maintain adequate stability.

PNM recognizes the economic and reliability benefits of participating in the Southwest Reserve Sharing Group (SRSG) for operating reserves. The operating reserve margin is measured in real time to maintain proper system frequency and balancing of loads to resources in the southwestern United States.

Southwestern U.S. utilities specify their load requirements and their resource availability on an hourly basis to SRSG. The SRSG administration examines the risk or the likelihood of a system disturbance to determine the collective reserves it needs to hold. SRSG then notifies each utility of the operational reserves they should hold, in addition to the resources each utility uses to serve its customers. Total SRSG operating reserves can be split between spinning reserves (coming from units that are operating at less than their full output) and non-spinning reserves (resources that are not operating, but can be brought online within 10 minutes). PNM's participation in SRSG is critical to minimizing the expense of PNM's reliability obligations. If PNM had to provide all of the necessary reserves itself, the requirement would equal its single largest operating unit, which is the utility's largest risk.

PNM's SRSG allocation is partly determined by the size of the units that are included in PNM's operating portfolio. Currently, PNM's single largest potential risk is SJGS Unit 4 (392 megawatts), if it is operating, or Afton (230 megawatts), if Afton is operating and SJGS Unit 4 is not. Looking forward, and for purposes of this IRP, PNM must determine how new resource additions might change the level of reserves required for SRSG purposes or otherwise result in additional costs to meet reliability standards. Generally, PNM's planning criterion is to limit the size of new generation to that of the current largest unit.

Other System Reliability Standards

Although states have played the primary role in setting reserve margin requirements, federal agencies (Federal Energy Regulatory Commission [FERC] and NERC) have taken on increased responsibility. Numerous states (including Maryland, New Jersey, Pennsylvania, Ohio, Indiana, Wyoming, Delaware, and the District of Columbia, in addition to portions of Michigan, Wisconsin, Illinois, Kentucky, Tennessee, and Virginia) have received approval from FERC to utilize one-day-in-10-years resource planning criteria. Implementation of this criterion would result in planning for sufficient resources so that no more than 48 load hours would be lost in a 20-year planning period. This is a more stringent criterion than PNM's existing reserve planning criteria, but could be a consideration for future planning.

New Mexico IRP Rule (NMAC 17.7.3.9)

This section shows the IRP rule and where in the IRP to find content associated with its various requirements.

B. Contents of IRP for electric utilities. The IRP submitted by an electric utility shall contain the utility's New Mexico jurisdictional:

(1) description of existing electric supply-side and demand-side resources;	Section 6.2, Appendix L
(2) current load forecast as described in this rule;	Section 6.1, Appendix C
(3) load and resources table;	Section 6.4, Appendix K
(4) identification of resource options;	Section 6.4, Appendix I
(5) description of the resource and fuel diversity;	Section 6.2
(6) identification of critical facilities susceptible to supply-source or other failures;	Section 5.2
(7) determination of the most cost effective resource portfolio and alternative portfolios;	Section 9.1
(8) description of public advisory process;	Section 1.3
(9) action plan; and	Section 9.2
(10) other information that the utility finds may aid the commission in reviewing the utility's planning processes.	Section 3.1

C. Description of existing resources. The utility's description of its existing resources used to serve its jurisdictional retail load at the time the IRP is filed shall include:

(1) name(s) and location(s) of utility-owned generation facilities;	Section 6.2.2, Appendix H
(2) rated capacity of utility-owned generation facilities;	Section 6.2.2, Appendix H
(3) fuel type, heat rates, annual capacity factors and availability factors projected for utility-owned generation facilities over the planning period;	Appendix H
(4) cost information, including capital costs, fixed and variable operating and maintenance costs, fuel costs, and purchased power costs;	Appendix G, Appendix H
(5) existing generation facilities' expected retirement dates;	Section 6.2.2, Appendix H
(6) amount of capacity obtained or to be obtained through existing purchased power contracts or agreements relied upon by the utility, including the fuel type, if known, and contract duration;	Section 6.2.2, Appendix H
(7) estimated in-service dates for utility-owned generation facilities for which a certificate of public convenience and necessity (CCN) has been granted but which are not in-service;	Section 6.2.2, Appendix H
(8) amount of capacity and, if applicable, energy, provided annually to the utility pursuant to wheeling agreements and the duration of such wheeling agreements;	Section 7.1
(9) description of existing demand-side resources, including	Section 6.2.1, Appendix L
(a) demand-side resources deployed at the time the IRP is filed; and	Section 6.2.1, Appendix L
(b) demand-side resources approved by the commission, but not yet deployed at the time the IRP is filed; information provided concerning existing demand-side resources shall include, at a minimum, the expected remaining useful life of each demand-side resource and the energy savings and reductions in peak demand, as appropriate, made by the demand-side resource.	Section 6.2.1, Appendix L

(10) description of each existing and approved energy storage resources, to include, at a minimum, the expected remaining useful life of the resource, its maximum capacity and dispatch characteristics, and operating costs;	Section 3.2, Section 6.2.2, Appendix H
(11) reserve margin and reserve reliability requirements (e.g. FERC, power pool, etc.) with which the utility must comply and the methodology used to calculate its reserve margin;	Section 4.1, Appendix M
(12) existing transmission capabilities:	Section 7.1
(a) the utility shall report its existing, and under-construction, transmission facilities of 115 kV and above, including associated switching stations and terminal facilities; the utility shall specifically identify the location and extent of transfer capability limitations on its transmission network that may affect the future siting of supply-side resources;	Section 7.1, Appendix D, Appendix E
(b) the utility shall describe all transmission planning or coordination groups to which it is a party, including state and regional transmission groups, transmission companies, and coordinating councils with which the utility may be associated.	Section 7.1, Appendix D, Appendix E
(13) environmental impacts of existing supply-side resources:	Section 4.3
(a) the utility shall provide the percentage of kilowatt-hours generated by each fuel used by the utility on its existing system, for the latest year for which such information is available;	Section 4.3.1
(b) to the extent feasible, for each existing supply-side resource on its system, the utility shall present emission rates (expressed in pounds emitted per kilowatt-hour generated) of criteria pollutants as well as carbon dioxide and mercury;	Section 4.3.1, Section 4.3.2, Appendix H
(c) to the extent feasible, for each existing supply-side resource on its system, the utility shall present the water consumption rate.	Section 4.3.3, Appendix H
(14) a summary of back-up fuel capabilities and options.	Section 4.3.3, Appendix H

D. Current Load Forecast.

(1) The utility shall provide a load forecast for each year of the planning period; the load forecast shall incorporate the following information and projections:	Section 6.1, Appendix C
(a) annual sales of energy and coincident peak demand on a system-wide basis, by customer class, and disaggregated among commission jurisdictional sales, FERC jurisdictional sales, and sales subject to the jurisdiction of other states;	Appendix C
(b) annual coincident peak system losses and the allocation of such losses to the transmission and distribution components of the system;	Appendix C
(c) weather normalization adjustments;	Appendix C
(d) assumptions for economic and demographic factors relied on in load forecasting;	Appendix C
(e) expected capacity and energy impacts of existing and proposed demand-side resources; and	Section 6.2.1, Section 6.4.1
(f) typical historic day or week load patterns on a system-wide basis for each major customer class.	Appendix C

(2) The utility shall develop base-case, high-growth and low-growth forecasts, or an alternative forecast that provides an assessment of uncertainty (e.g., probabilistic techniques).	Section 6.1, Appendix C
(3) Required detail.	
(a) The utility shall explain how the demand-side savings attributable to actions other than the utility-sponsored demand-side resources for each major customer class are accounted for in the utility's load forecast and the effect, as appropriate, on its load forecast of the utility-sponsored demand-side resources on each major customer class.	Section 2.4, Section 6.1, Appendix C
(b) The utility shall compare the annual forecast of coincident peak demand and energy sales made by the utility to the actual coincident peak demand and energy sales experienced by the utility for the four years preceding the year in which the plan under consideration is filed. In addition, the utility shall compare the annual forecast in its most recently filed resource plan to the annual forecast in the current resource plan. In its initial IRP filing, the utility shall provide information demonstrating how well its forecasts during the preceding four years predicted demand.	Section 6.1.2
(c) The utility shall explain and document the assumptions, methodologies, and any other inputs upon which it relied to develop its load forecast.	Appendix C

E. Load and resources table. The utility shall provide a load and resources table of its existing loads and resources at the time of its IRP filing. The load and resources table, to the extent practical, shall contain the appropriate components from the load forecast. Resources shall include:

(1) utility-owned generation;	Section 6.2.2
(2) energy storage resources;	Section 6.2.2
(3) existing and future contracted-for purchased power including qualifying facility purchases;	Section 6.2.2
(4) purchases through net metering programs, as appropriate;	Section 6.1.3, Section 6.2, Appendix C
(5) demand-side resources, as appropriate; and	Section 6.2.1, Appendix K
(6) other resources relied upon by the utility, such as pooling, wheeling, or coordination agreements effective at the time the plan is filed.	Section 6.2.2, Section 4.1

F. Identification of resource options.

(1) In identifying additional resource options, the utility shall consider all feasible supply-side, energy storage, and demand-side resources. The utility shall describe in its plan those resources it evaluated for selection to its portfolio and the assumptions and methodologies used in evaluating its resource options, including, as applicable: life expectancy of the resources, the recognition of whether the resource is replacing/adding capacity or energy, dispatchability, lead-time requirements, flexibility and efficiency of the resource.	Section 6.4, Appendix I
(2) For supply-side resource options, the utility shall identify the assumptions actually used for capital costs, fixed and variable operating and maintenance costs, fuel costs forecast by year, and purchased power demand and energy charges forecast by year, fuel type, heat rates, annual capacity factors,	Section 6.4, Appendix I

availability factors and, to the extent feasible, emission rates (expressed in pounds emitted per kilowatt-hour generated) of criteria pollutants as well as carbon dioxide and mercury.

(3) The utility shall describe its existing rates and tariffs that incorporate load management or load shifting concepts. The utility shall also describe how changes in rate design might assist in meeting, delaying or avoiding the need for new capacity.

Section 2.4
Section 6.1.3

G. Determination of the most cost effective resource portfolio and alternative portfolios.

(1) To identify the most cost-effective resource portfolio, utilities shall evaluate all feasible supply, energy storage, and demand-side resource options on a consistent and comparable basis, and take into consideration risk and uncertainty (including but not limited to financial, competitive, reliability, operational, fuel supply, price volatility and anticipated environmental regulation). The utility shall evaluate the cost of each resource through its projected life with a life-cycle or similar analysis. The utility shall also consider and describe ways to mitigate ratepayer risk.

Section 8. Section 9.1

(2) Each electric utility shall provide a summary of how the following factors were considered in, or affected, the development of resource portfolios:

Section 8

(a) load management and energy efficiency requirements;

Section 8

(b) renewable energy portfolio requirements;

Section 8

(c) existing and anticipated environmental laws and regulations, and, if determined by the commission, the standardized cost of carbon emissions;

Section 8

(d) fuel diversity;

Section 8

(e) susceptibility to fuel interdependencies;

Section 8

(f) transmission constraints; and

Section 8

(g) system reliability and planning reserve margin requirements.

Section 8

(3) Alternative portfolios. In addition to the detailed description of what the utility determines to be the most cost-effective resource portfolio, the utility shall develop a reasonable number of alternative portfolios by altering risk assumptions and other parameters developed by the utility and the public advisory process.

Section 8

H. Public advisory process. Public input is critical to the development and implementation of integrated resource planning in New Mexico. A utility shall incorporate a public advisory process in the development of its IRP. At least one year prior to the filing date of its IRP, a utility shall initiate a public advisory process to develop its IRP. The purpose of this process shall be to receive public input, solicit public commentary concerning resource planning and related resource acquisition issues. This process shall be administered as follows.

(1) The utility shall initiate the process by providing notice at least 30 days prior to the first scheduled meeting to the commission, interveners in its most recent general rate case, and participants in its most recent renewable energy, energy efficiency and IRP proceedings; the utility shall at the same time, also publish this notice in a newspaper of general circulation in every county which it serves and in the utility's billing inserts; this notice shall consist of:

Section 1.3

(a) a brief description of the IRP process;	Section 1.3
(b) time, date and location of the first meeting;	Section 1.3
(c) a statement that interested individuals should notify the utility of their interest in participating in the process; and	Section 1.3
(d) utility contact information.	Section 1.3
(2) Upon receipt of the initial notice, the commission may designate a facilitator to assist the participants with dispute resolution.	Section 1.3
(3) The utility or its designee shall chair the public participation process, schedule meetings, and develop agendas for these meetings. With adequate notice to the utility, participants shall be allowed to place items on the agenda of public participation process meetings.	Section 1.3
(4) Meetings held as part of the public participation process shall be noticed and scheduled on a regular basis and shall be open to members of the public who shall be heard and their input considered as part of the public participation process. Upon request, the utility shall provide an executive summary containing a non-technical description of its most recent IRP.	Section 1.3
(5) The purposes of the public participation process are for the utility to provide information to, and receive and consider input from, the public regarding the development of its IRP. Topics to be discussed as part of the public participation process include, but are not limited to, the utility's load forecast; evaluation of existing supply- and demand-side resources; the assessment of need for additional resources; identification of resource options; modeling and risk assumptions and the cost and general attributes of potential additional resources; and development of the most cost-effective portfolio of resources for the utility's IRP.	Section 1.3
(6) In its initial IRP advisory process, the utility and participants shall explore a procedure to coordinate the IRP process with renewable energy procurement plans and energy efficiency and load management program proposals. Any proposed procedure shall be designed to conserve commission, participant and utility resources and shall indicate what, if any, variances may be needed to effectuate the proposed procedure.	Section 1.3

I. Action Plan.

(1) The utility's action plan shall detail the specific actions the utility will take to implement the integrated resource plan spanning a four-year period following the filing of the utility's IRP. The action plan will include a status report of the specific actions contained in the previous action plan.	Executive Summary, Section 9.2
(2) An action plan does not replace or supplant any requirements for applications for approval of resource additions set forth in New Mexico law or commission regulations.	Executive Summary, Section 9.2

Other IRP Requirements Established by the Commission

Our 2020 IRP also fulfills a number of additional requirements established in the Recommended Decision in Case No. 17-00174-UT.

First:

PNM shall include a separate section on the status of the prior IRP's Action Plan, and a separate section addressing whether PNM has critical facilities susceptible to supply-source or other failures in the filing of any future IRP.

-Case No 17-00174-UT Recommended Decision

In **Section 1.4**, we review the Action Plan established in our 2017 IRP and provide status updates on each of the items that was included in that plan.

Second:

PNM is required to provide a status report of the actions it has taken [regarding 1) compliance with RPS and EE requirements, 2) pursuit of SJGS abandonment, 3) evaluation of joining the California Energy Imbalance Market, 4) retaining PVNGS leased capacity, and 5) developing new transmission to add eastern New Mexico wind resources to PNM's resource mix] in its 2020 IRP.

-Case No 17-00174-UT Recommended Decision

Most of these topics are discussed in **Section 1.5 (Updates Since 2017 IRP)**. Many of these items were included in our Action Plan and have since been acted upon.

Finally:

PNM has agreed [in Case No. 16-00276-UT] to perform [analysis] in its next IRP to consider closure of FCPP in 2024 and 2028.

-Case No 17-00174-UT Recommended Decision

On January 8, 2020, PNM filed with the Commission for abandonment of our share of FCPP at the end of 2024 through a transfer to NTEC in Case No. 21-00017-UT. While this hearing is pending before the Commission, we believe the analysis presented therein demonstrates that our early exit from the plant under the terms of our agreement with NTEC provides benefits to our customers and reduces the emissions intensity of our portfolio.

Appendix G. Details of Gas, CO₂ and Wholesale Electricity Price Forecasts

The commodity price forecasts for natural gas, carbon, and wholesale electricity markets used in the IRP were developed by PACE Global. These forecasts were presented to stakeholders through PNM's public advisory process on August 25, 2020. Forecasts for carbon, gas, and wholesale electricity prices are summarized in the tables below. The technical details of these forecasts are summarized in the attached report.

Table G-1. Carbon price forecasts (nominal \$/ton)

Year	Low*	Mid	High	\$8/ton*	\$20/ton*	\$40/ton*
2020	-	-	-	\$9.29	\$23.22	\$46.45
2021	-	-	-	\$9.53	\$23.80	\$47.61
2022	-	-	-	\$9.76	\$24.40	\$48.81
2023	-	-	-	\$10.01	\$25.01	\$50.02
2024	-	-	-	\$10.25	\$25.64	\$51.27
2025	-	\$3.96	\$6.86	\$10.51	\$26.28	\$52.55
2026	-	\$4.60	\$7.77	\$10.78	\$26.93	\$53.87
2027	-	\$5.83	\$9.00	\$11.04	\$27.61	\$55.21
2028	-	\$7.10	\$11.19	\$11.32	\$28.30	\$56.60
2029	-	\$7.81	\$12.33	\$11.60	\$29.00	\$58.01
2030	-	\$8.54	\$13.20	\$11.89	\$29.73	\$59.46
2031	-	\$9.29	\$14.07	\$12.19	\$30.47	\$60.94
2032	-	\$10.05	\$14.88	\$12.49	\$31.23	\$62.47
2033	-	\$11.48	\$17.05	\$12.81	\$32.01	\$64.03
2034	-	\$12.95	\$19.12	\$13.13	\$32.81	\$65.63
2035	-	\$14.45	\$20.91	\$13.45	\$33.64	\$67.28
2036	-	\$16.67	\$23.24	\$13.79	\$34.48	\$68.96
2037	-	\$19.63	\$25.69	\$14.13	\$35.34	\$70.68
2038	-	\$23.36	\$31.41	\$14.49	\$36.22	\$72.45
2039	-	\$27.20	\$36.15	\$14.85	\$37.13	\$74.26
2040	-	\$31.14	\$41.08	\$15.22	\$38.06	\$76.11

* Carbon pricing scenarios required by IRP Rule

Table G-2. Natural gas commodity price forecasts (nominal \$/MMBtu)

Year	San Juan Basin			Permian Basin		
	Mid	High	Low	Mid	High	Low
2020	\$1.81	\$1.83	\$1.79	\$1.41	\$1.42	\$1.39
2021	\$2.36	\$2.54	\$2.20	\$2.23	\$2.40	\$2.06
2022	\$2.19	\$2.53	\$1.92	\$1.99	\$2.33	\$1.72
2023	\$2.15	\$2.72	\$1.70	\$1.93	\$2.51	\$1.49
2024	\$2.20	\$2.96	\$1.60	\$1.99	\$2.75	\$1.39
2025	\$2.57	\$3.58	\$1.76	\$2.36	\$3.38	\$1.56
2026	\$3.08	\$4.81	\$2.03	\$2.78	\$4.51	\$1.74
2027	\$3.57	\$5.30	\$2.36	\$3.13	\$4.86	\$1.92
2028	\$3.69	\$5.57	\$2.50	\$3.20	\$5.08	\$2.01
2029	\$3.86	\$5.99	\$2.60	\$3.32	\$5.44	\$2.06
2030	\$4.07	\$6.12	\$2.70	\$3.45	\$5.50	\$2.08
2031	\$4.30	\$6.53	\$2.61	\$3.63	\$5.86	\$1.94
2032	\$4.35	\$6.44	\$2.64	\$3.63	\$5.73	\$1.93
2033	\$4.51	\$6.70	\$2.79	\$3.80	\$5.99	\$2.08
2034	\$4.57	\$7.28	\$2.82	\$3.86	\$6.58	\$2.12
2035	\$4.68	\$7.27	\$2.90	\$3.94	\$6.54	\$2.17
2036	\$4.75	\$7.43	\$2.81	\$3.99	\$6.67	\$2.05
2037	\$4.92	\$8.06	\$3.20	\$4.11	\$7.24	\$2.38
2038	\$5.03	\$7.73	\$3.14	\$4.19	\$6.90	\$2.30
2039	\$5.15	\$8.19	\$3.20	\$4.28	\$7.32	\$2.33
2040	\$5.15	\$8.16	\$3.19	\$4.28	\$7.29	\$2.32

Table G-3. Average annual wholesale electricity market price forecasts (nominal \$/MMBtu)

Year	Four Corners			Palo Verde		
	Mid	High	Low	Mid	High	Low
2020	\$17.52	\$16.72	\$17.31	\$18.07	\$17.33	\$17.84
2021	\$21.81	\$21.78	\$20.68	\$23.38	\$22.97	\$21.99
2022	\$24.92	\$25.82	\$23.17	\$26.76	\$27.65	\$25.04
2023	\$23.79	\$25.73	\$20.92	\$25.18	\$27.07	\$22.13
2024	\$22.98	\$26.23	\$19.52	\$24.01	\$27.39	\$20.63
2025	\$26.09	\$31.89	\$19.33	\$28.12	\$34.08	\$21.69
2026	\$28.61	\$38.92	\$19.72	\$31.38	\$42.59	\$22.29
2027	\$30.76	\$40.99	\$21.04	\$34.07	\$45.00	\$23.86
2028	\$31.18	\$42.44	\$21.53	\$34.63	\$46.75	\$24.49
2029	\$31.15	\$43.99	\$21.33	\$35.05	\$49.25	\$24.52
2030	\$30.82	\$42.44	\$20.58	\$34.46	\$47.83	\$23.91
2031	\$32.18	\$44.24	\$19.71	\$36.68	\$50.57	\$23.37
2032	\$33.01	\$46.38	\$19.36	\$37.17	\$50.90	\$23.17
2033	\$33.36	\$47.12	\$19.82	\$38.49	\$53.19	\$24.36
2034	\$33.05	\$50.35	\$19.88	\$39.36	\$58.05	\$25.40
2035	\$33.91	\$49.89	\$19.89	\$41.16	\$58.78	\$26.08
2036	\$33.64	\$50.01	\$18.80	\$42.04	\$60.39	\$25.81
2037	\$34.14	\$51.78	\$20.18	\$44.31	\$65.01	\$28.33
2038	\$35.09	\$51.42	\$19.35	\$46.12	\$65.00	\$28.01
2039	\$35.20	\$53.19	\$18.86	\$46.26	\$67.73	\$27.40
2040	\$35.24	\$53.19	\$18.49	\$46.93	\$68.56	\$26.92

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Power Market Forecasts

Public Service Company of New Mexico
August 25, 2020

Background



Mr. Despard has 30+ years of power industry experience. He is a Consulting Director and Principal at Siemens Power Technologies International ("PTI"), which is Siemens Industry's economic and technical consulting division. In this role, Mr. Despard and his staff provide electric power clients with the following services:

- ✓ Integrated Planning - Optimization of generation, transmission and distribution
- ✓ Integrated Resource Planning ("IRP") - Meeting energy and capacity requirements
- ✓ Price Forecasting - Power (energy and capacity), fuels, REC's and carbon (CO2)
- ✓ Asset Valuations - Storage and fossil-generating assets
- ✓ Transmission Congestion Analysis
- ✓ Portfolio Optimization and Risk Assessments
- ✓ Commodity Risk Management
- ✓ Commercial strategies



Career Highlights

Mr. Krall is a Consulting Manager at Siemens PTI, Energy Business Advisory unit. In this role Mr. Krall is primarily involved in the development of Siemens PTI's National Forecast Model and Energy Markets Modeling.

Mr. Krall's is an expert in U.S. wholesale electricity markets, and the analysis of those markets using advanced quantitative methods. Mr. Krall has substantial experience with short- and long-term electricity market forecasts. He has expertise in developing electricity market models using production cost tools, linear optimization, mixed-integer optimization, and other analytic methods. Mr. Krall is proficient in AURORA_{xmp}, Python, SQL, GAMS, Fortran, PROMOD, among other programming languages and modeling tools.



- Introduction
- Tools and Methodology
- Base Case Scenario Assumptions and Forecasts
- High and Low Case Scenario Assumptions and Forecasts

Introduction

- Siemens Energy Business Advisory developed commodity price forecasts for PNM's analysis and planning needs.
- Siemens used its comprehensive power market modeling tools to generate these forecasts under Baseline, High, and Low scenarios to reflect uncertainty of market conditions over the long-term planning horizon (2020-2040).

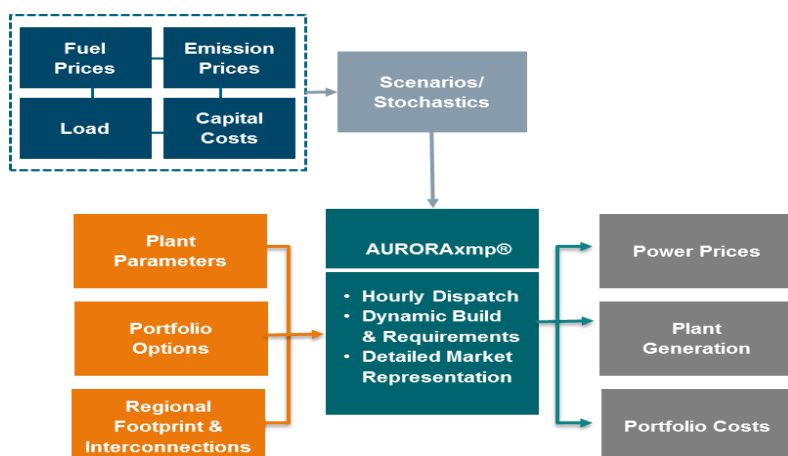
Scenario	High Level Description
Baseline	Reference view based on market forwards early and longer term by fundamentals accounting for expected policy
High	High expected energy pricing based on high natural gas and carbon pricing throughout the forecast period
Low	Low expected energy pricing based on low natural gas and carbon pricing throughout the forecast period

- This presentation summarizes the methodology, assumptions, and forecasts.

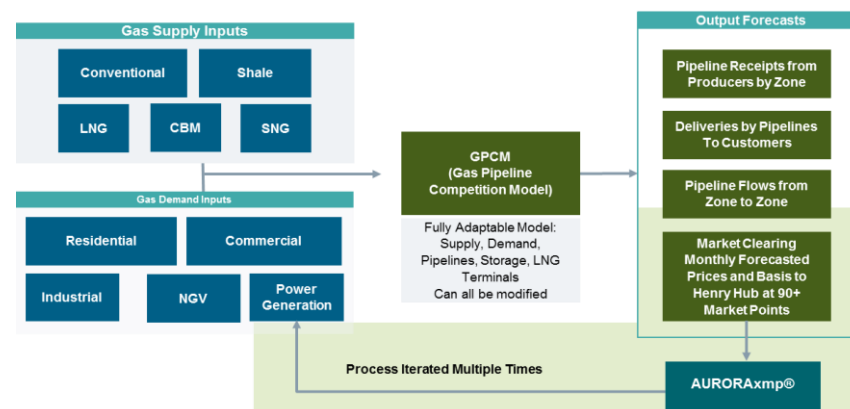
Tools and Methodology

Gas and Power Integrated Modeling Approach

AURORAxmp® as a Modeling Framework



GPCM Modeling Framework



- Power modeling used AURORAxmp®, an hourly dispatch model, to simulate the economic dispatch of power plants within WECC power markets for the forecast horizon. AURORAxmp® assesses the economics of existing and future generation technologies for future builds and retirements in order to maintain minimum reserve margins and meet RPS and carbon free generation targets.
- Natural gas price inputs are produced using GPCM, a dynamic model that incorporates natural gas supply, demand, and infrastructure inputs to solve for expected prices and flows throughout North America.
- Iterations are performed between the two models to ensure gas prices and power sector natural gas demand is in balance.

Base Case

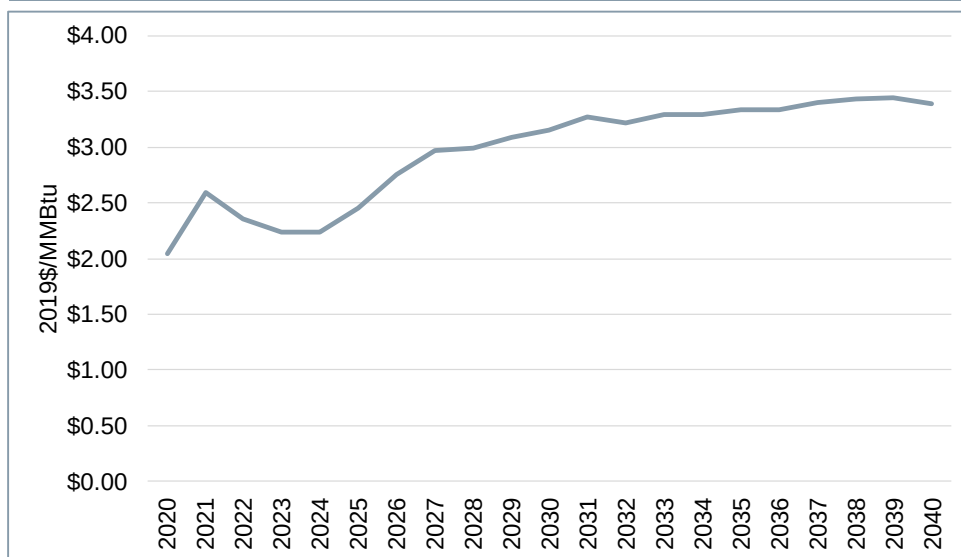
The Baseline Scenario

Key assumptions driving the Baseline scenario are:

- In the short-term, the Baseline assumes a business-as-usual perspective for all market drivers, consistent with market forwards and trends;
- Near-term power prices are projected to be low, driven by low natural gas prices and COVID-19 effects on demand;
- Natural gas prices increase somewhat from current low levels as demand rises faster than production in Winter 2020-21; and
- To reflect uncertainty around a future national carbon policy, Siemens assumes a U.S.-wide price on carbon starting in 2025 increasing through 2040.

Baseline Natural Gas Prices – Henry Hub

Baseline Henry Hub Natural Gas Price Forecast



*Base case prices were developed using OTC Global Holdings futures for Henry Hub as of May 2020

Near-Term – Reflects recent futures with an average price of ~\$2.30/MMBtu through 2022. Markets will yo-yo to adapt to simultaneous supply and demand shocks.

Mid-Term (2025-30) – Gulf Coast prices are expected to rise as new demand (LNG exports, Mexico exports) continues to turn the region into a premium market.

Long-Term – Annual average prices (in real terms) expected to remain below \$3.50/MMBtu, the price ceiling at which most conventional basins become economic.

US Gas Market Drivers:

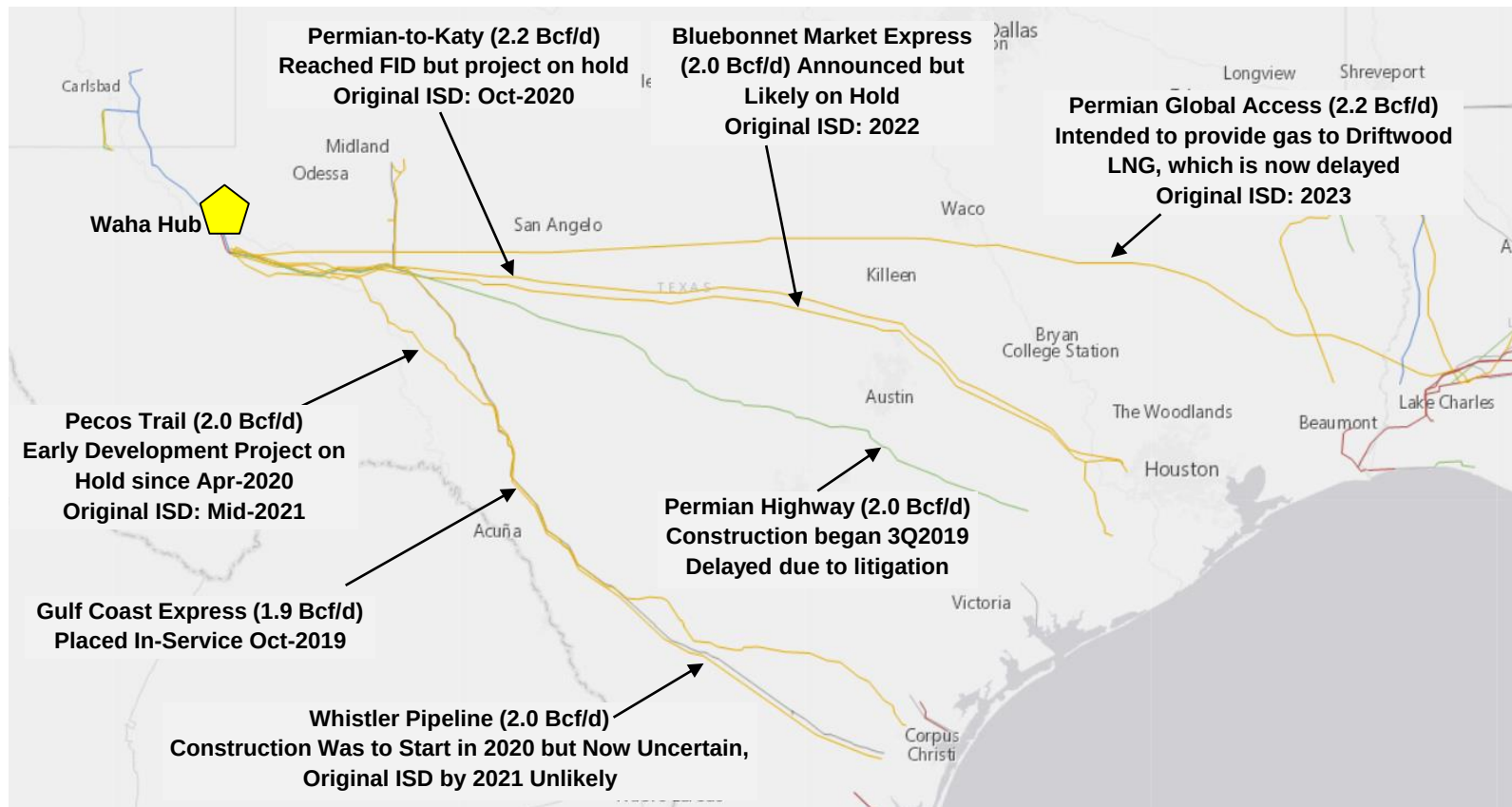
Overall, the US gas market in 2020 continues to adjust to several ongoing shocks and drivers:

- COVID-19, which is depressing demand, putting downward pressure on gas prices, and creating uncertainty in the future;
- Oil price crash, which has curtailed a significant level of associated gas production in the Permian Basin;
- Weak global LNG markets, which is further depressing demand and prices in the Gulf Coast and at the Henry Hub; and
- Expectations, which show in the Aug 2020 futures an increase in Winter 20/21 gas prices as demand rises faster than production can rise.

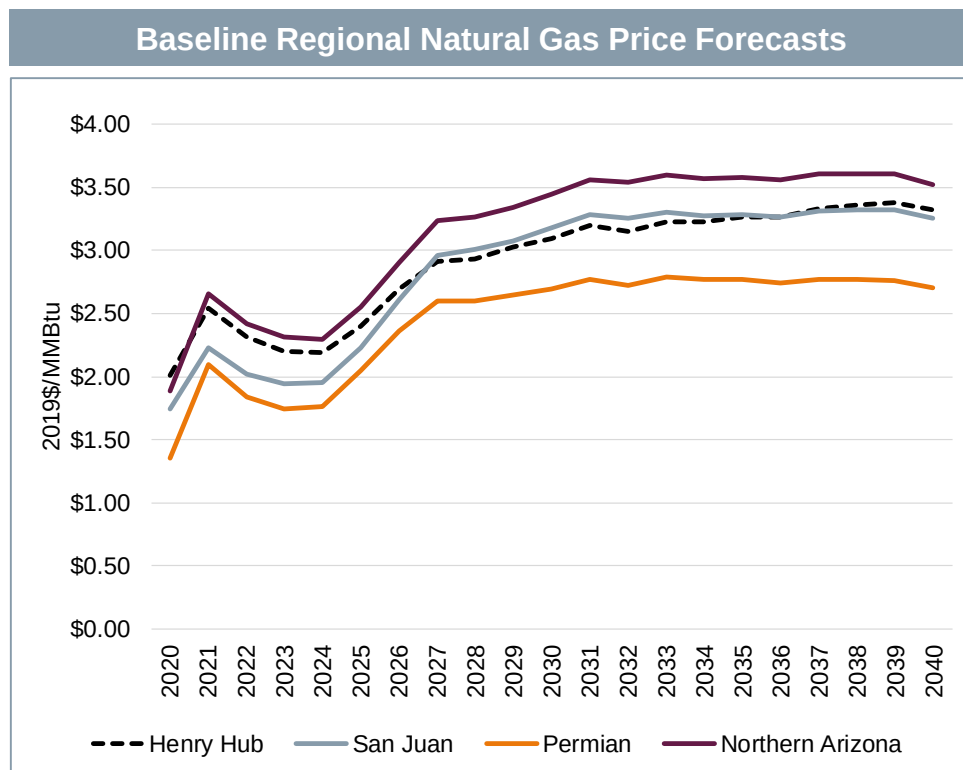
Permian Basin Drivers:

- 10 Bcf/d of pipeline takeaway projects are on hold until pricing fundamentals improve or they are delayed due to litigation;
- US associated gas production in 2020 is down 4 Bcf/d from last year's outlook and could decline another 4 Bcf/d by the end of this year;
- Total Permian Basin production is down 10% in Aug 2020 from the peak in Mar 20, just as the price of oil fell to \$0 and below; and
- To the north, Rockies gas production is on a managed decline, boxed in by cheap production to the north (Canada), east (Marcellus), and south (Permian), but also declining as long-term anchor shipper contracts expire.

Waha Hub to Market - New Pipeline Projects: Development Status as of August 2020



Baseline Natural Gas Prices – Key Southwest Hubs



Permian

Permian production has declined with the drop in oil prices, which curtailed associated gas production. But overall Permian production economics remain competitive even with low Henry Hub prices. Export capacity out of this region is now sufficient, with many pipeline projects on hold as developers await an improvement in economics. Permian (Waha Hub) pricing is expected to maintain a strongly negative basis to the Henry Hub over the planning horizon.

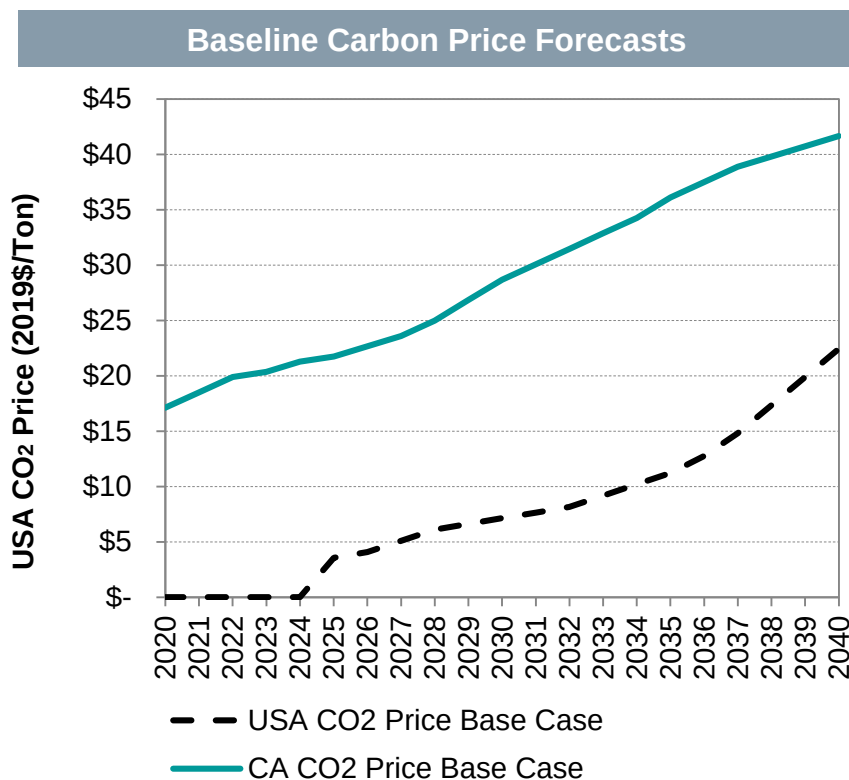
San Juan

This is a longstanding conventional production region in northwest New Mexico overlapping southern CO, but production has fallen significantly in recent years due to displacement from the Permian Basin. It is expected to remain a secondary source of gas for the Southwest, but a higher-cost source than the Permian.

Northern Arizona

This region shows an early negative basis to Henry Hub in 2020, but the longer term price outlook begins to exceed the Henry Hub due to strong demand in Arizona, Southern California, and increasingly from exports to Mexico.

Baseline Carbon Prices – California and U.S.



Note: California carbon allowance pricing is presented here in terms of short tons for comparison purposes, but is traded as units of metric tonnes.

U.S.

- **Near Term** – No national carbon price
- **Mid-Term** – national price on carbon starting in 2025 representing expectation of additional measures
- **Long-Term** – CO2 pricing increases reflecting expectation of eventual restrictions

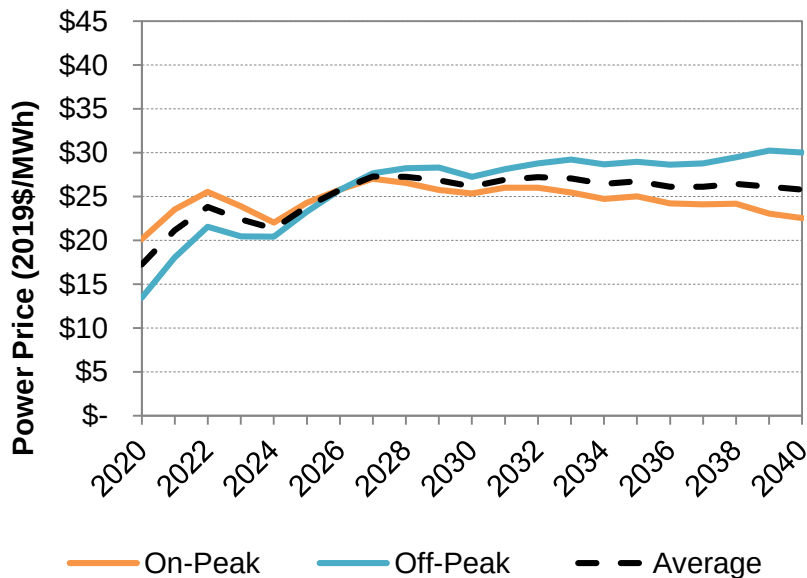
California

- **Near-to-Mid Term** – Prices are expected to increase due to emission reduction targets
- **Long-Term** – Assumes that the program is extended beyond 2030 to meet long-term emission reduction goals

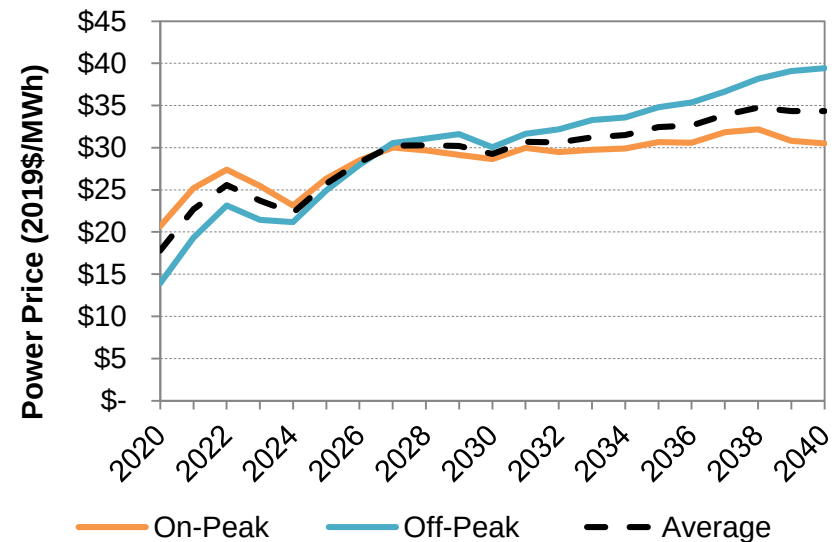
Baseline Zonal Power Prices – Annual

- **Near Term** – Low power prices reflecting low natural gas prices and COVID-19 effects on electricity demand.
- **Mid-Term** – On-peak energy prices decline driven by increase in solar capacity, reducing prices in many hours of the peak period.
- **Long-Term** – On-peak prices fall below average prices, driven by increased solar.

Four Corners Annual Pricing



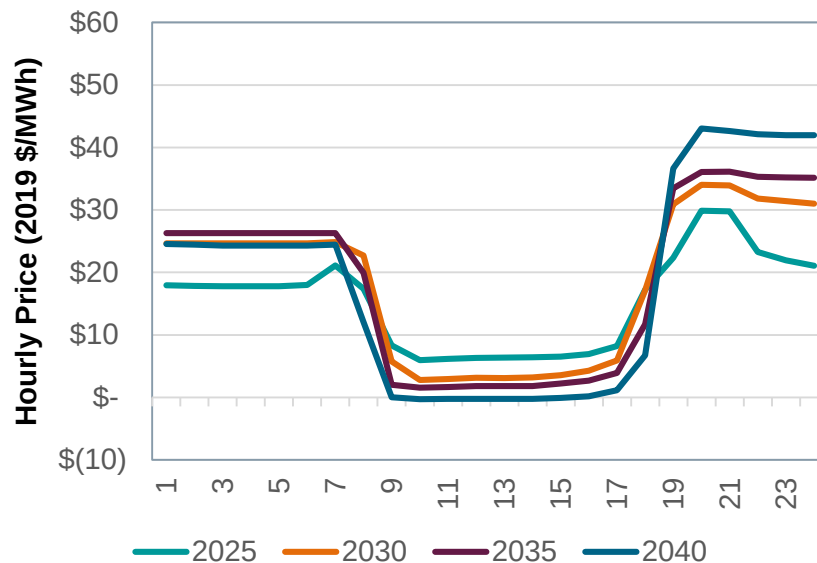
Palo Verde Annual Pricing



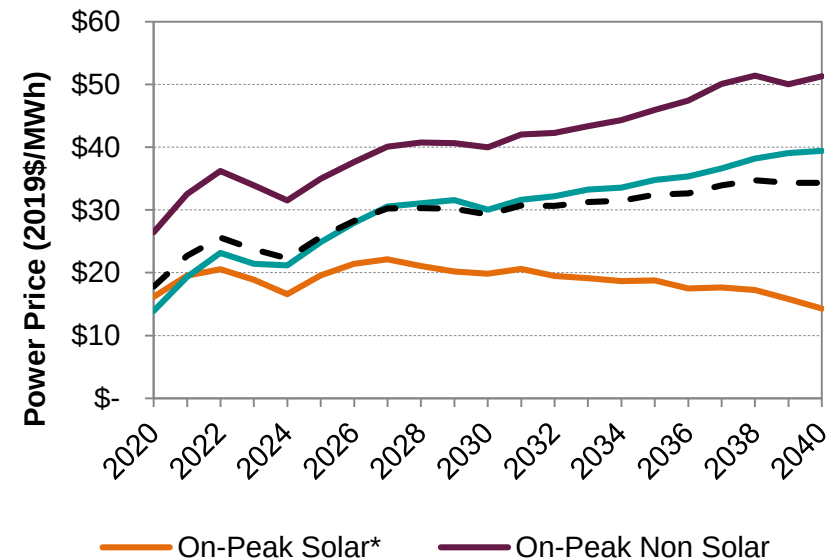
Increased Solar Penetration and the “Duck Curve”

- With growth in solar generation expected to exceed electricity demand growth, duck curve effects are projected to increase.
- Peak solar hours, from 8 A.M. to 5 P.M., will experience price drop while the balance of peak power hours are expected to see higher prices.
- This trend is projected to increase over the forecast horizon, creating incentives for storage resources that can arbitrage price differences.

Palo Verde Average Hourly Pricing (April)



Palo Verde Annual Pricing w/ On-Peak Solar

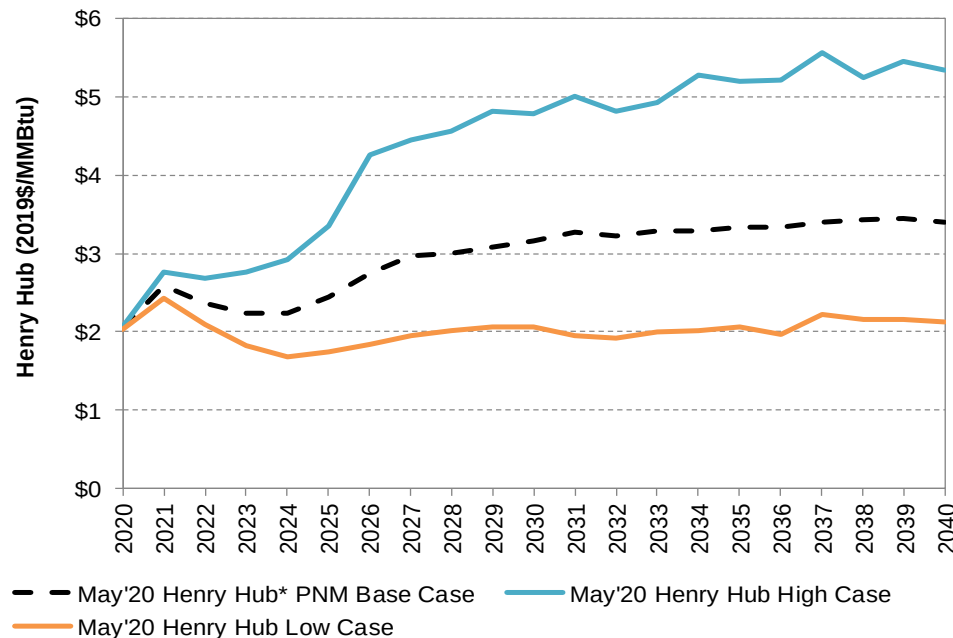


- Under the Base Case, new builds in the region are largely solar, wind, fast ramping gas units and battery storage. Battery storage capacity additions help to manage increasing amounts of non-dispatchable renewable resources in the region;
- Palo Verde is priced at a premium to Four Corners throughout the forecast horizon; and
- On-peak prices are driven lower by renewables additions, particularly solar, and fall below average prices by the late 2020s.

High and Low Cases

Natural Gas Price Scenarios – Henry Hub

HH Natural Gas Price Forecast Scenarios



Henry Hub Low and High Cases

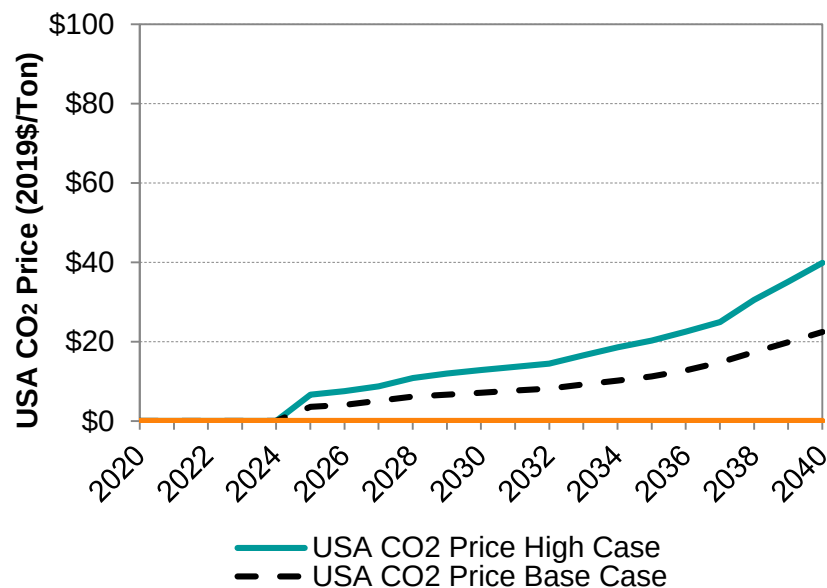
Low Case – The Low Case reflects a sensitivity case with increased amounts of low-cost gas resources and relatively lower demand.

High Case – The High Case reflects a sensitivity case with restricted production, and higher demand.

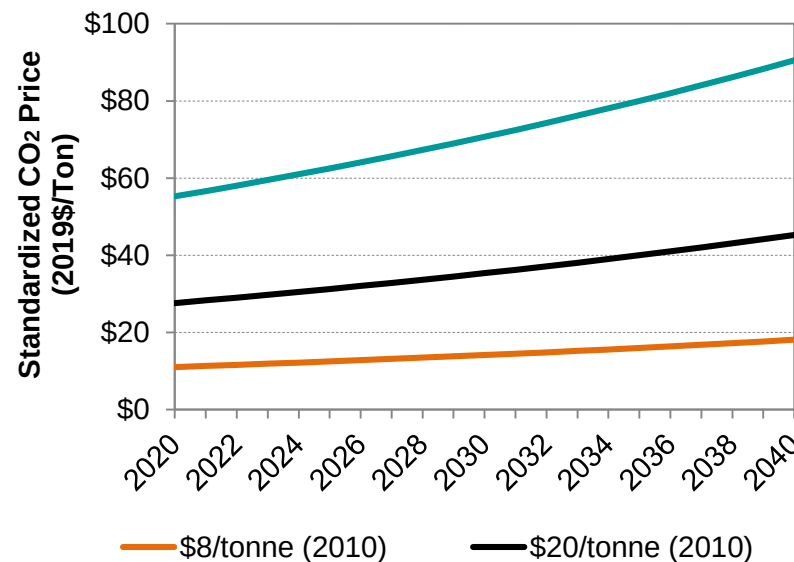
Carbon Price Scenarios

- Range of carbon prices reflects uncertain outlook for carbon policy and resulting pricing in western states. The High Case nears \$40/ton by the end of the forecast horizon while the Low Case remains at \$0 in all years.

U.S. Carbon Price Scenarios



IRP Rule Standardized CO₂ Prices

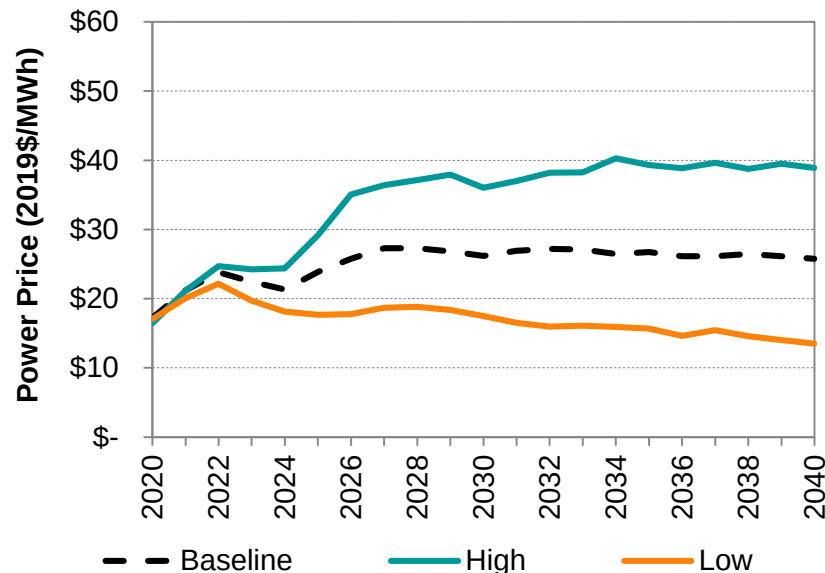


Notes: Standardized prices assumed to escalate at 2.5% per year beginning from 2010. In this figure, standardized prices are converted to \$/short ton for comparison purposes.

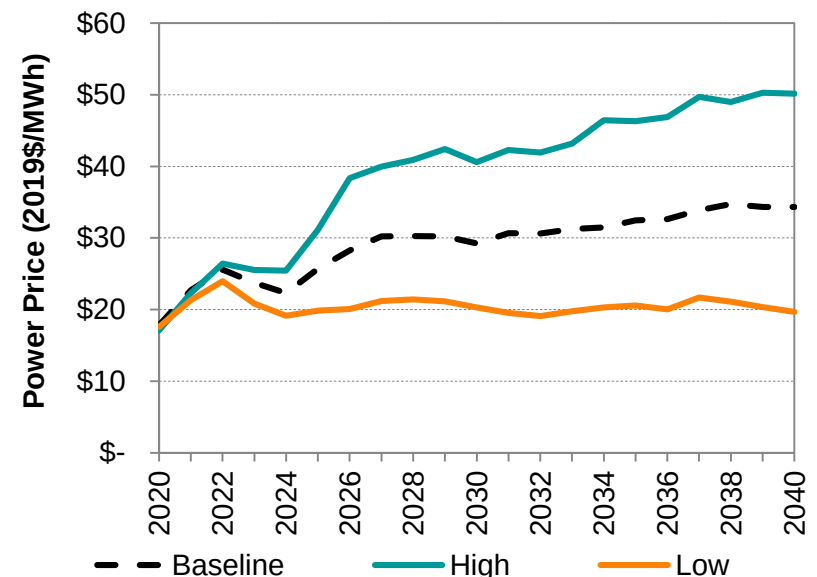
Zonal Power Price Scenarios – Four Corners and Palo Verde

- Higher energy pricing in the High Case is driven by higher natural gas prices throughout the forecast, and higher CO2 prices later in the horizon.
- Lower energy pricing in the Low Case is driven largely by lower natural gas prices in that scenario, as well as the absence of a long-term CO2 price.

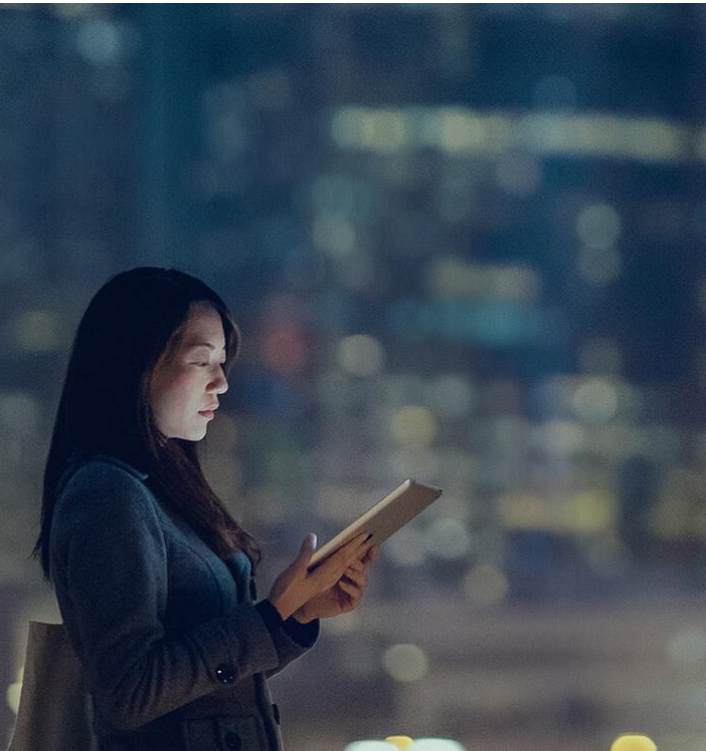
Four Corners



Palo Verde



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Appendix H. Cost and Performance Data for PNM's Existing Generating Resources

In accordance with the IRP Rule, this appendix provides detailed characteristics of our existing generation resources, including:

- Names and locations of utility-owned generation facilities;
- Rated capacity of utility-owned generation facilities;
- Fuel type, heat rate, capacity factors, and availability factors as applicable;
- Cost information, including capital, operating, and fuel costs;
- Expected retirement dates;
- Details on PNM's power purchase agreements with existing resources; and
- Estimated in-service dates for utility-owned generation and PPA resources.

Table H-1. Resource Data – Existing Nuclear and Coal Resources

	Palo Verde Generating Station			San Juan Generating Station		Four Corners Power Plant	
	Unit 1	Unit 2	Unit 3	Unit 1	Unit 4	Unit 4	Unit 5
Fuel Type	Nuclear	Nuclear	Nuclear	Coal	Coal	Coal	Coal
Ownership	Owned/Leased	Owned/Leased	Owned	Owned	Owned	Owned	Owned
Location (County)	Maricopa	Maricopa	Maricopa	San Juan	San Juan	San Juan	San Juan
Summer Net Dependable Unit Capacity (MW)	134*	134**	134	170	327	100	100
Peak Contribution (% of Max)	98.0%	98.0%	98.0%	82.0%	82.0%	80.0%	80.0%
Estimated Heat Rate @ Max Output (Btu/kWh)	10,300	10,300	10,300	10,285	10,350	10,114	10,114
Storage Roundtrip Efficiency (%)							
Duty Cycle	Baseload	Baseload	Baseload	Baseload	Baseload	Baseload	Baseload
Forced Outage Rate (%)	2.0%	2.0%	2.0%	12.7%***	18%****	20.0%	20.0%
Expected Retirement Date	Dec-2041	Dec-2041	Dec-2047	May-2022	May-2022	Dec-2024	Dec-2024
Fixed O&M (thousand 2019\$)	see following tables for owned resource costs						
PPA Cost (\$/MWh)							
Emission Rates							
CO ₂ Rate (lbs/MWh)				2,560	2,560	2,004	2,004
SO ₂ Rate (lbs/MWh)				0.618	0.618	1.2	1.2
NO _x Rate (lbs/MWh)				2.755	2.755	4.72	4.72
Hg Rate (lbs/GWh)				0.0009	0.0009	0.0053	0.0053
Coal Ash Rate (lbs/MWh)				246	246	253	253
Water Usage (gal/MWh)	21.1	21.1	21.1	628	628	577.5	577.5

* Drops to 30 in 2023 when leases are returned

** Drops to 124 in 2024 when leases are returned

*** FOR is 15% in 2021 and 18% in 2022

**** FOR is 12.9% in 2021 and 15% in 2022

Table H-2. Estimated fuel costs for existing nuclear & coal plants (\$000s)

	Palo Verde	San Juan	Four Corners
2021	24,011	38,596	35,164
2022	25,412	15,198	35,815
2023	18,507	-	35,893
2024	16,385	-	35,591
2025	15,471	-	-
2026	15,774	-	-
2027	15,468	-	-
2028	16,174	-	-
2029	16,492	-	-
2030	16,177	-	-
2031	16,915	-	-
2032	17,212	-	-
2033	16,875	-	-
2034	17,627	-	-
2035	18,127	-	-
2036	17,635	-	-
2037	18,439	-	-
2038	18,822	-	-
2039	18,434	-	-
2040	18,739	-	-

Table H-3. Resource Data - Existing Gas Resources

	Afton Generating Station	La Luz Gas Turbine	Lordsburg Generating Station		Luna Energy Facility	Reeves Generating Station			Rio Bravo (Delta) GT	Valencia Energy Facility
			Unit 1	Unit 2		Unit 1	Unit 2	Unit 3		
Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Ownership	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	PPA
Location (County)	Dona Ana	Valencia	Hidalgo	Hidalgo	Luna	Bernalillo	Bernalillo	Bernalillo	Bernalillo	Valencia
Summer Net Dependable Unit Capacity (MW)	235	41	42.7	42.7	190	41	42	63	141	149
Peak Contribution (% of Max)	96.0%	96.7%	96.7%	96.7%	96.0%	96.7%	96.7%	96.7%	96.7%	96.7%
Estimated Heat Rate @ Max Output (Btu/kWh)	7,491	9,405	9,596	9,576	7,416	10,749	11,076	10,999	10,284	9,422
Storage Roundtrip Efficiency (%)										
Duty Cycle	Intermediate	Peaking	Peaking	Peaking	Intermediate	Peaking	Peaking	Peaking	Peaking	Peaking
Forced Outage Rate (%)	4.0%	3.3%	3.3%	3.3%	4.0%	3.3%	3.3%	3.3%	3.3%	3.3%
Expected Retirement Date	Dec-2039	Dec-2045	Dec-2045	Dec-2045	Dec-2039	Dec-2030	Dec-2030	Dec-2030	Dec-2039	May-2028
Fixed O&M (thousand 2019\$)	see following tables for owned resource costs									
PPA Cost (thousand 2019\$/MWh)										
Emission Rates										
CO ₂ Rate (lbs/MWh)	964	1,236	1,312	1,312	844	1,535	1,535	1,535	1,394	1,331
SO ₂ Rate (lbs/MWh)	0.005	0.006	0.007	0.007	0.004	0.008	0.008	0.008	0.007	0.01
NO _x Rate (lbs/MWh)	0.196	0.123	1.095	1.095	0.077	3.072	3.072	3.072	0.384	0.4
Hg Rate (lbs/GWh)										
Coal Ash Rate (lbs/MWh)										
Water Usage (gal/MWh)	70.6	58.3	183.5	183.5	205.9	791.6	791.6	791.6	4.8	23.2

Table H-4. Resource Data – Existing PNM-owned Solar Resources

	Alamogordo Solar	Albuquerque Solar Energy Center (Reeves)	Cibola Solar	Deming Solar	Las Vegas Solar	Los Lunas Solar	Manzano Solar	Meadow lake Solar	Otero Solar	Prosperity Solar
Fuel Type	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar
Ownership	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned
Location (County)	Otero	Bernalillo	Cibola	Luna	San Miguel	Valencia	Valencia	Valencia	Otero	Bernalillo
Summer Net Dependable Unit Capacity (MW)	5	2	8	9	5	7	8.4	8.94	8	0.5
Storage Roundtrip Efficiency (%)	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]
Estimated Heat Rate @ Max Output (Btu/kWh)										
Storage Roundtrip Efficiency (%)										
Duty Cycle	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent
Forced Outage Rate (%)										
Expected Retirement Date	Dec-2041	Dec-2041	Dec-2035	Dec-2041	Dec-2041	Dec-2041	Dec-2043	Dec-2045	Dec-2043	Dec-2041
Fixed O&M (thousand 2019\$)	see following tables for owned resource costs									
PPA Cost (thousand 2019\$/MWh)										

	Rio Communities Solar	Rio Del Oro Solar	Rio Rancho Solar	San Miguel 1 Solar	San Miguel 2 Solar	Sandoval Solar	Santa Fe Solar	Santolina Solar	South Valley Solar	Vista Solar
Fuel Type	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar
Ownership	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned	Owned
Location (County)	Valencia	Valencia	Bernalillo	San Miguel	San Miguel	Sandoval	Santa Fe	Bernalillo	Bernalillo	Valencia
Capacity (MW)	10	10	10	10	10	6.1	9.45	10.5	10	10
Storage Roundtrip Efficiency (%)	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]
Estimated Heat Rate @ Max Output (Btu/kWh)										
Storage Roundtrip Efficiency (%)										
Duty Cycle	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent
Forced Outage Rate (%)										
Expected Retirement Date	Dec-2045	Dec-2049	Dec-2049	Dec-2049	Dec-2049	Dec-2044	Dec-2045	Dec-2045	Dec-2045	Dec-2049
Fixed O&M (thousand 2019\$)	see following tables for owned resource costs									
PPA Cost (thousand 2019\$/MWh)										

[†] See Appendix M for detailed ELCC results

Table H-5. Resource Data - Existing Wind PPA Resources

	Dale Burgett	Casa Mesa Wind	NM Wind Energy Center	La Joya		Red Mesa Wind
				1	2	
Fuel Type	Geothermal	Wind	Wind	Wind	Wind	Wind
Ownership	PPA	PPA	PPA	PPA	PPA	PPA
Location (County)	Hidalgo	Quay	Quay	Torrance	Torrance	Sandoval
Summer Net Dependable Unit Capacity (MW)	11	50	200	166	140	102
Peak Contribution (% of Max)	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]	ELCC [†]
Estimated Heat Rate @ Max Output (Btu/kWh)						
Storage Roundtrip Efficiency (%)						
Duty Cycle	Baseload	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent
Forced Outage Rate (%)						
Expected Retirement Date	Dec-2041	Dec-2041	Dec-2041	Dec-2041	Dec-2040**	Dec-2034
Fixed O&M (thousand 2019\$)						
PPA Cost (thousand 2019\$/MWh)	89.00	*	27.25	*	18.13	27.92

* Special service contract resource

** Estimated based on original planned in-service date

† See Appendix M for detailed ELCC results

Table H-6. Resource Performance Data - Existing Solar and Storage PPA Resources

	Arroyo Solar**	Britton Solar	Encino Solar	Facebook Solar 1-3	Jicarilla 1 Solar**	Jicarilla 2 Solar**	Rockmont Solar**	Route 66 Solar	San Juan Solar**	Arroyo Storage**	Jicarilla 1 Storage**	Rockmont Storage**	San Juan Storage**
Fuel Type	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Solar	Storage	Storage	Storage	Storage
Ownership	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA
Location (County)	McKinley	Torrance	Sandoval	Valencia, Bernalillo	Rio Arriba	Rio Arriba	San Juan	Cibola	San Juan	McKinley	Rio Arriba	San Juan	San Juan
Summer Net Dependable Unit Capacity (MW)	300	50	50	30	50	50	200	50	100	150	20	100	30
Peak Contribution (% of Max)	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†
Estimated Heat Rate @ Max Output (Btu/kWh)													
Storage Roundtrip Efficiency (%)										88%	90%	79%	85%
Duty Cycle	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Intermittent	Storage	Storage	Storage	Storage
Forced Outage Rate (%)													
Expected Retirement Date	Jun-2042	Dec-2044	Dec-2044	Dec-2041	Apr-2042	Dec-2045	Jun-2042	Dec-2041	Jun-2042	Jun-2042	Apr-2042	Jun-2042	Jun-2042
Fixed O&M (thousand 2019\$)										14,334	2,557	3,136	9,240***
PPA Cost (thousand 2019\$/MWh)	18.65	*	*	*	19.73	*	27.35	*	26.31				

* Special service contract resource

** Indicates resources with a CCN approved by the Commission as replacement resources for SJGS

*** FOM drops to 3,939 in 2027

† See Appendix M for detailed ELCC results

Table H-7. Existing & planned solar PV resources

Resource	Ownership	County	In-Service Year	Retirement/ Contract Expiration	Summer Net Dependable Unit Capacity (MW)	Colocated Storage Capacity (MW)
Alamogordo Solar	Utility	Otero	2011	2041	5	
Albuquerque Solar Energy Center	Utility	Bernalillo	2011	2041	2	
Arroyo Solar*	PPA/ESA	McKinley	2022	2042	300	150
Britton Solar	PPA	Torrance	2019	2044	50	
Cibola Solar	Utility	Cibola	2015	2035	8	
Deming Solar	Utility	Luna	2011	2041	9	
Encino Solar	PPA	Sandoval	2020	2035	50	
Facebook 1 Solar	PPA	Valencia	2017	2042	10	
Facebook 2 Solar	PPA	Bernalillo	2018	2043	10	
Facebook 3 Solar	PPA	Bernalillo	2018	2043	10	
Jicarilla 1 Solar*	PPA/ESA	Rio Arriba	2021	2042	50	20
Jicarilla Solar 2	PPA	Rio Arriba	2021	2036	50	
Las Vegas Solar	Utility	San Miguel	2011	2041	5	
Los Lunas Solar	Utility	Valencia	2011	2041	7	
Manzano Solar	Utility	Valencia	2013	2043	8	
Meadow Lake Solar	Utility	Valencia	2015	2045	8.9	
Otero Solar	Utility	Otero	2013	2043	7.5	
Prosperity Solar	Utility	Bernalillo	2011	2041	0.5	0.5
Rio Communities Solar	Utility	Valencia	2015	2045	9.9	
Rio Del Oro Solar	Utility	Valencia	2019	2049	9.8	
Rio Rancho Solar	Utility	Bernalillo	2019	2049	9.7	
Rockmont Solar*	PPA/ESA	San Juan	2022	2042	100	30
Route 66 Solar	PPA	Cibola	2021	2046	49.5	
San Juan Solar*	PPA/ESA	San Juan	2022	2042	200	100
San Miguel 1 Solar	Utility	San Miguel	2019	2049	10	
San Miguel 2 Solar	Utility	San Miguel	2019	2049	10	
Sandoval Solar	Utility	Sandoval	2014	2044	6	
Santa Fe Solar	Utility	Santa Fe	2015	2045	9.2	
Santolina Solar	Utility	Bernalillo	2015	2045	10.5	
South Valley Solar	Utility	Bernalillo	2015	2045	10	
Vista Solar	Utility	Valencia	2019	2049	9.9	
Total					1,035.1	300.5

Table H-8. Fixed O&M Cost (\$000)*

	Palo Verde			San Juan		Four Corners	Afton	La Luz	Lordsburg Fixed	Luna Fixed	Reeves		Rio Bravo	Valencia	Combined PNM- owned Solar
	Unit 1	Unit 2	Unit 3	Unit 1	Unit 4						Unit 1,2	Unit 3			
2020	45,815	26,433	20,265	18,362	35,320	10,872	9,661	1,033	1,600	6,950	1,993	2,990	227	23,446	3,072
2021	42,100	25,862	24,190	17,409	33,486	11,136	10,094	2,075	1,597	7,179	1,983	2,974	1,145	23,798	3,146
2022	45,992	23,306	25,283	8,929	17,174	10,206	14,364	1,171	1,554	7,566	1,318	1,977	242	24,155	3,193
2023	5,465	27,195	22,668			10,376	9,815	2,432	1,565	7,595	1,400	2,099	1,503	24,517	3,241
2024	4,868	22,945	26,579			12,135	9,872	1,159	1,651	8,536	2,217	3,325	230	24,885	3,289
2025	5,266	22,372	24,679				10,998	1,623	1,617	7,691	1,812	2,719	679	25,258	3,339
2026	5,339	22,685	25,005				11,189	1,647	1,641	7,809	1,841	2,761	690	25,637	3,389
2027	5,414	23,002	25,336				11,385	1,672	1,666	7,930	1,870	2,805	700	26,022	3,440
2028	5,489	23,324	25,672				11,587	1,697	1,691	8,053	1,899	2,849	710		3,491
2029	5,566	23,651	26,013				11,795	1,722	1,717	8,178	1,930	2,894	721		3,544
2030	5,644	23,983	26,359				12,008	1,748	1,742	8,305	1,960	2,940	732		3,597
2031	5,723	24,320	26,710				12,227	1,774	1,768	8,434			743		3,651
2032	5,803	24,662	27,066				12,445	1,801	1,795	8,565			754		3,705
2033	5,885	25,009	27,428				12,574	1,828	1,822	8,685			765		3,761
2034	5,968	25,361	27,795				12,805	1,856	1,849	8,821			777		3,817
2035	6,052	25,719	28,168				13,043	1,883	1,877	8,959			788		3,875
2036	6,137	26,082	28,546				13,289	1,912	1,905	9,099			800		3,933
2037	6,223	26,450	28,930				13,543	1,940	1,934	9,237			812		3,992
2038	6,311	26,824	29,320				13,805	1,969	1,963	9,381			825		4,052
2039	6,400	27,203	29,715				14,076	1,999	1,993	9,528			837		4,112
2040	6,491	27,589	30,117					6,190	6,190						4,174

* These values represent the total cost to operate, including variable O&M

Table H-9. Taxes and Depreciation (\$000)

	Palo Verde	San Juan	San Juan Investment Recovery	Four Corners	Four Corners Investment Recovery	Afton	La Luz	Lordsburg	Luna	Reeves	Rio Bravo
2020	21,361	22,641		4,791		9,660	2,140	1,834	2,437	4,137	2,380
2021	22,068	22,325		5,160		9,636	2,116	1,839	2,505	4,325	2,420
2022	22,141	11,832		5,690		10,459	2,655	2,108	2,934	5,036	2,635
2023	22,179		17,303	6,165		11,354	3,182	2,438	3,319	5,648	2,869
2024	22,871		17,457	6,724		11,320	3,126	2,486	3,333	5,614	2,927
2025	23,489		17,615		12,468	11,289	3,070	2,491	3,378	5,656	2,927
2026	24,157		17,777		13,137	11,296	3,016	2,517	3,405	5,741	2,950
2027	27,141		17,944		13,405	12,084	3,087	2,859	3,779	7,727	3,333
2028	27,866		18,116		13,674	12,102	3,032	2,890	3,801	7,699	3,364
2029	28,594		18,293		13,942	12,120	2,976	2,919	3,820	7,505	3,393
2030	29,332		18,476		14,210	12,136	2,919	2,949	3,840	7,287	3,422
2031	30,078		18,665		14,479	12,153	2,863	2,978	3,859		3,451
2032	34,564		18,860		14,747	13,560	2,841	3,508	4,423		4,067
2033	35,370		19,061		15,016	13,576	2,784	3,537	4,441		4,065
2034	36,175		19,270		15,284	13,575	2,727	3,564	4,457		4,090
2035	36,989		19,486		15,553	13,572	2,671	3,591	4,473		4,117
2036	37,813		19,710		15,821	13,436	2,618	3,617	4,440		4,092
2037	45,104		19,941		16,090	17,404	2,647	5,152	5,961		5,714
2038	46,024		20,180		16,358	16,992	2,593	5,179	5,833		5,582
2039	46,943		20,428		16,627	16,556	2,538	5,199	5,699		5,443
2040	48,405		20,685		16,895						

Appendix I. Cost and Performance Data for New Resource Options

This appendix summarizes assumptions used to characterize new resource options considered in the IRP. Contents include:

- Operational characteristics for new resources (Table I-1);
- Fixed O&M costs for new resources by year (Table I-2);
- Capital cost assumptions for new resource options by year (Table I-3); and
- Characteristics of the energy efficiency bundles considered in the IRP (Table I-4).

This appendix also includes a presentation by AEG summarizing the development of assumptions to characterize energy efficiency bundles.

Table I 1. New Resource Options Data

	Generic LM6000	Generic Wind	Generic Solar	Hybrid 4-hr Li- ion Battery	4-hr Li- ion Battery	8-hr Li- ion Battery	10-hr Flow Battery	Pumped Storage
Fuel Type	Natural Gas / Hydrogen	Wind	Solar	Storage	Storage	Storage	Storage	Storage
Capacity per Unit (MW)	40	400	10	10	10	10	10	300
Peak Contribution (% of Max)	96.7	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†	ELCC†
Estimated Heat Rate @ Max Output (Btu/kWh)	8212							
Storage Roundtrip Efficiency (%)				87%	87%	87%	65%	80%
Duty Cycle	Peaking	Intermittent	Intermittent	Storage	Storage	Storage	Storage	Storage
Forced Outage Rate (%)	3.3%							1.0%
Facility Lifetime (years)	40	30	30	20	20	20	20	50
Emission Rates								
CO ₂ Rate (lbs/MWh)	961*							
SO ₂ Rate (lbs/MWh)								
NO _x Rate (lbs/MWh)	0.246							
Hg Rate (lbs/GWh)								
Coal Ash Rate (lbs/MWh)								
Water Usage (gal/MWh)	58.3							

* Decreases to 0 when burning 100% hydrogen

† See Appendix M for detailed ELCC results

Table I-2. New Resource Option Fixed O&M (\$/kW-yr)

	Generic LM6000	Generic Wind	Generic Solar	Li-Ion Battery	Flow Battery	Pumped Storage
2020						
2021						
2022	20.06	35.14	15.25	31.86	2.93	
2023	20.06	34.84	14.64	29.61	2.72	
2024	20.06	34.55	14.04	27.35	2.51	
2025	20.06	34.25	13.43	25.10	2.30	
2026	20.06	33.96	12.83	24.17	2.22	
2027	20.06	33.66	12.22	23.23	2.13	
2028	20.06	33.37	11.62	22.30	2.05	
2029	20.06	33.07	11.01	21.37	1.96	
2030	20.06	32.77	10.40	20.43	1.88	36.74
2031	20.06	32.48	9.80	20.18	1.85	36.74
2032	20.06	32.24	9.71	19.92	1.83	36.74
2033	20.06	31.99	9.62	19.66	1.81	36.74
2034	20.06	31.75	9.54	19.41	1.78	36.74
2035	20.06	31.50	9.45	19.15	1.76	36.74
2036	20.06	31.26	9.36	18.90	1.74	36.74
2037	20.06	31.02	9.28	18.64	1.71	36.74
2038	20.06	30.77	9.19	18.39	1.69	36.74
2039	20.06	30.53	9.10	18.13	1.66	36.74
2040	154.74*	30.29	9.01	17.88	1.64	36.74

* 2040 value is cost to convert to 100% hydrogen compatability

Table I 3. New Resource Option CapEx (\$000 per unit)

	Generic LM6000	Generic Wind	Generic Solar	Hybrid 4-hr Li-Ion Battery	4-hr Li-Ion Battery	8-hr Li-Ion Battery	10-hr Flow Battery	Pumped Storage
2020								
2021								
2022	41,313	700,576	14,155	15,690	15,690	23,733	35,632	
2023	40,924	691,600	13,699	14,178	14,178	22,055	35,632	
2024	40,322	682,365	13,098	13,847	13,847	20,377	35,632	
2025	39,925	672,870	12,513	12,782	12,782	18,699	35,632	
2026	39,685	663,114	11,738	12,271	12,271	18,003	35,632	
2027	39,427	653,100	11,281	11,571	11,571	17,307	35,632	
2028	39,258	642,825	10,824	11,189	11,189	16,611	35,632	
2029	39,144	632,291	10,368	10,807	10,807	15,915	35,632	
2030	38,986	621,496	9,911	10,425	10,425	15,220	30,943	841,200
2031	38,851	610,442	9,454	10,320	10,320	15,029	25,167	841,200
2032	38,706	606,266	9,389	10,216	10,216	14,839	19,990	841,200
2033	38,540	602,075	9,323	10,111	10,111	14,649	17,517	841,200
2034	38,421	597,868	9,257	10,007	10,007	14,459	17,030	841,200
2035	38,335	593,644	9,192	9,902	9,902	14,268	16,509	841,200
2036	38,218	589,406	9,126	9,798	9,798	14,078	15,945	841,200
2037	38,147	585,151	9,061	9,693	9,693	13,888	15,344	841,200
2038	38,063	580,881	8,995	9,589	9,589	13,698	14,704	841,200
2039	37,956	576,594	8,929	9,484	9,484	13,507	14,023	841,200
2040	37,843	572,292	8,864	9,380	9,380	13,317	13,301	841,200

Table I-4. Energy Efficiency Bundle Characteristics*

		Vintage Year																			
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Program	Annual GWh	91.37	90.00	91.02	87.38	76.62															
	Peak MW	19.73	19.61	20.35	21.37	21.43															
	Levelized \$/MWh	35.15	34.46	33.82	35.34	39.39															
Up to \$50	Annual GWh	12.41	12.03	11.90	12.56	13.38															
	Peak MW	2.33	2.28	2.30	2.43	2.59															
	Levelized \$/MWh	40.55	43.44	44.33	44.37	44.53															
Up to \$5	Annual GWh						3.74	3.36	2.99	2.61	0.82	0.84	0.87	0.94	0.96	0.97	0.99	1.01	1.05	1.08	1.09
	Peak MW						0.59	0.55	0.51	0.47	0.21	0.21	0.22	0.23	0.23	0.23	0.24	0.24	0.25	0.25	0.26
	Levelized \$/MWh						2.74	2.82	2.93	3.08	4.19	4.27	4.35	4.50	4.57	4.63	4.70	4.78	4.79	4.86	4.94
\$5 to \$15	Annual GWh						5.08	5.10	5.09	4.99	4.97	4.98	5.12	5.33	5.53	5.72	5.92	5.97	6.12	6.29	6.31
	Peak MW						1.30	1.31	1.31	1.30	1.31	1.31	1.34	1.39	1.44	1.48	1.52	1.54	1.58	1.63	1.63
	Levelized \$/MWh						10.51	10.61	10.70	10.69	10.86	11.01	11.16	11.33	11.48	11.65	11.85	11.91	12.07	12.23	12.41
\$15 to \$25	Annual GWh						3.61	3.66	3.73	3.86	3.86	3.77	3.77	3.71	3.73	3.73	3.70	3.87	3.93	4.05	4.13
	Peak MW						0.90	0.92	0.94	0.97	0.98	0.97	0.97	0.96	0.99	0.99	0.99	1.03	1.05	1.08	1.10
	Levelized \$/MWh						22.93	23.27	23.66	23.93	24.38	24.71	25.17	25.58	25.93	26.46	26.83	27.17	27.60	27.92	28.32
\$25 to \$35	Annual GWh						3.81	3.85	3.89	4.10	4.34	4.47	4.54	4.67	5.11	5.26	5.54	5.72	5.79	6.27	5.69
	Peak MW						0.77	0.78	0.78	0.82	0.87	0.89	0.90	0.93	1.02	1.05	1.10	1.14	1.15	1.22	1.12
	Levelized \$/MWh						34.71	35.08	35.53	36.20	36.92	37.37	37.91	38.39	39.24	39.83	40.23	40.72	41.22	41.61	42.28
\$35 to \$50	Annual GWh						16.81	16.12	15.81	15.26	17.02	16.55	17.03	17.62	17.82	18.27	17.23	17.61	18.24	19.39	19.11
	Peak MW						3.24	3.11	3.12	3.10	3.34	3.31	3.41	3.54	3.62	3.70	3.51	3.61	3.71	3.99	3.89
	Levelized \$/MWh						49.76	50.33	50.96	51.71	52.49	53.19	53.87	54.57	55.60	56.23	56.74	57.54	58.33	59.17	60.08
\$50 and Up	Annual GWh	19.66	22.46	25.20	27.87	31.21	15.49	15.98	16.55	17.12	17.57	18.02	18.58	19.14	19.49	19.91	20.48	21.10	21.73	22.44	21.74
	Peak MW	7.72	8.63	9.35	10.43	11.96	9.24	9.58	9.96	10.35	10.61	10.95	11.39	11.82	12.18	12.61	13.02	13.52	14.03	14.52	14.15
	Levelized \$/MWh	982.34	857.09	775.97	757.69	741.95	570.40	575.64	579.69	584.88	592.46	601.54	608.08	615.17	628.64	640.12	647.09	653.80	660.27	661.22	685.27

* Impact at system level shown (grossed up from impact at load by transmission and distribution losses)

Appendix J. Summary Results for Each Portfolio

This appendix provides detailed summaries of the results of each scenario modeled in a standardized and consistent format.

Table J-1. Index of detailed scenario results

Page	Scenario	Future	Sensitivity
J-3	Technology Neutral	Current Trends & Policy	None
J-4	Technology Neutral	Aggressive Environmental Regulation	None
J-5	Technology Neutral	High Economic Growth	None
J-6	Technology Neutral	Low Economic Growth	None
J-7	No New Combustion	Current Trends & Policy	None
J-8	No New Combustion	Aggressive Environmental Regulation	None
J-9	No New Combustion	High Economic Growth	None
J-10	No New Combustion	Low Economic Growth	None
J-11	Technology Neutral	Current Trends & Policy	Likely Econ Dev Loads
J-12	Technology Neutral	Current Trends & Policy	High Econ Dev Loads
J-13	Technology Neutral	Current Trends & Policy	Low Growth
J-14	Technology Neutral	Current Trends & Policy	High Growth
J-15	Technology Neutral	Current Trends & Policy	Low BTM PV
J-16	Technology Neutral	Current Trends & Policy	High BTM PV
J-17	Technology Neutral	Current Trends & Policy	No Incremental BTM PV
J-18	Technology Neutral	Current Trends & Policy	High Electric Vehicles
J-19	Technology Neutral	Current Trends & Policy	Low Electric Vehicles
J-20	Technology Neutral	Current Trends & Policy	High Building Electrification
J-21	Technology Neutral	Current Trends & Policy	TOD Pricing
J-22	Technology Neutral	Current Trends & Policy	Low Gas Prices
J-23	Technology Neutral	Current Trends & Policy	High Gas Prices
J-24	Technology Neutral	Current Trends & Policy	Low Carbon Prices
J-25	Technology Neutral	Current Trends & Policy	High Carbon Prices
J-26	Technology Neutral	Current Trends & Policy	\$8/ton Carbon Price
J-27	Technology Neutral	Current Trends & Policy	\$20/ton Carbon Price
J-28	Technology Neutral	Current Trends & Policy	\$40/ton Carbon Price
J-29	Technology Neutral	Current Trends & Policy	Low Technology Costs
J-30	Technology Neutral	Current Trends & Policy	High Technology Costs
J-31	Technology Neutral	Current Trends & Policy	Tax Credit Extension
J-32	Technology Neutral	Aggressive Environmental Regulation	Likely Econ Dev Loads
J-33	Technology Neutral	Aggressive Environmental Regulation	High Econ Dev Loads
J-34	Technology Neutral	Aggressive Environmental Regulation	Low Technology Costs
J-35	Technology Neutral	Aggressive Environmental Regulation	High Technology Costs
J-36	Technology Neutral	High Economic Growth	Likely Econ Dev Loads
J-37	Technology Neutral	High Economic Growth	High Econ Dev Loads
J-38	Technology Neutral	High Economic Growth	Low Technology Costs
J-39	Technology Neutral	High Economic Growth	High Technology Costs
J-40	Technology Neutral	Low Economic Growth	Likely Econ Dev Loads
J-41	Technology Neutral	Low Economic Growth	High Econ Dev Loads
J-42	Technology Neutral	Low Economic Growth	Low Technology Costs

Page	Scenario	Future	Sensitivity
J-43	Technology Neutral	Low Economic Growth	High Technology Costs
J-44	No New Combustion	Current Trends & Policy	Likely Econ Dev Loads
J-45	No New Combustion	Current Trends & Policy	High Econ Dev Loads
J-46	No New Combustion	Current Trends & Policy	Low Growth
J-47	No New Combustion	Current Trends & Policy	High Growth
J-48	No New Combustion	Current Trends & Policy	Low BTM PV
J-49	No New Combustion	Current Trends & Policy	High BTM PV
J-50	No New Combustion	Current Trends & Policy	No Incremental BTM PV
J-51	No New Combustion	Current Trends & Policy	High Electric Vehicles
J-52	No New Combustion	Current Trends & Policy	Low Electric Vehicles
J-53	No New Combustion	Current Trends & Policy	High Building Electrification
J-54	No New Combustion	Current Trends & Policy	TOD Pricing
J-55	No New Combustion	Current Trends & Policy	Low Gas Prices
J-56	No New Combustion	Current Trends & Policy	High Gas Prices
J-57	No New Combustion	Current Trends & Policy	Low Carbon Prices
J-58	No New Combustion	Current Trends & Policy	High Carbon Prices
J-59	No New Combustion	Current Trends & Policy	\$8/ton Carbon Price
J-60	No New Combustion	Current Trends & Policy	\$20/ton Carbon Price
J-61	No New Combustion	Current Trends & Policy	\$40/ton Carbon Price
J-62	No New Combustion	Current Trends & Policy	Low Technology Costs
J-63	No New Combustion	Current Trends & Policy	High Technology Costs
J-64	No New Combustion	Current Trends & Policy	Tax Credit Extension
J-65	No New Combustion	Aggressive Environmental Regulation	Likely Econ Dev Loads
J-66	No New Combustion	Aggressive Environmental Regulation	High Econ Dev Loads
J-67	No New Combustion	Aggressive Environmental Regulation	Low Technology Costs
J-68	No New Combustion	Aggressive Environmental Regulation	High Technology Costs
J-69	No New Combustion	High Economic Growth	Likely Econ Dev Loads
J-70	No New Combustion	High Economic Growth	High Econ Dev Loads
J-71	No New Combustion	High Economic Growth	Low Technology Costs
J-72	No New Combustion	High Economic Growth	High Technology Costs
J-73	No New Combustion	Low Economic Growth	Likely Econ Dev Loads
J-74	No New Combustion	Low Economic Growth	High Econ Dev Loads
J-75	No New Combustion	Low Economic Growth	Low Technology Costs
J-76	No New Combustion	Low Economic Growth	High Technology Costs
J-77	Carbon Free 2030	Current Trends & Policy	None

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$6,841 million**
20-Year Carbon Emissions: **31.01 million tons**
20-Year Water Consumption: **11.79 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	413	240	245	244	242	239	232	231	181	184	183	194	194	200	199	157	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,153	1,147	1,138	1,198	2,456
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	523	527	563	569	569	738	738	738	748	781	798	825	855	878	1,535
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,184	4,189	4,187	4,208	4,607	4,586	4,575	4,485	4,518	4,521	4,525	4,611	5,962

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,366	2,294	2,364	2,365	2,294	2,358	2,358	2,279	2,340	2,411	2,286	2,336	2,354	2,272	2,236
Coal	GWh	3,927	2,132	1,155	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,187	2,739	2,916	2,920	2,954	2,925	2,824	2,854	2,252	2,268	2,263	2,387	2,394	2,485	2,470	1,956	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,114	3,244	3,260	3,231	3,185	3,163	3,141	3,144	2,991	2,940	2,922	2,920	2,974	2,943	2,972	3,243	5,613
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-116	-116	-117	-126	-127	-125	-157	-159	-154	-159	-163	-170	-188	-212	-243	-792
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,018	11,428	11,103	11,275	10,992	11,201	11,168	11,216	11,214	11,037	11,160	11,953	11,807	11,759	11,672	11,648	11,658	11,608	11,256	11,152
Net Purchases	GWh	-1,233	-1,295	-792	-690	-151	59	251	249	290	473	365	-393	-308	-300	-246	-150	-202	-173	238	408
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$6,939 million**
20-Year Carbon Emissions: **24.30 million tons**
20-Year Water Consumption: **10.24 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	418	387	211	206	204	180	178	174	88	94	94	92	96	98	105	99	96	0

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	280	280	280	280	280	360	360	360	360	360	360	360	360	360	486
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,258	1,327	1,346	1,509	1,519	1,518	1,510	1,532	1,524	1,516	1,507	1,499	1,510	1,529	1,571	1,833
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,458	1,458	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356
Battery	MW	-	300	419	519	519	601	628	799	818	825	825	856	892	923	973	1,001	1,044	1,093	1,155	1,797
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,938	4,188	4,124	4,282	4,334	4,526	4,561	4,574	5,307	5,367	5,382	5,392	5,319	5,346	5,383	5,435	5,540	5,881

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,294	2,356	2,362	2,284	2,303	2,307	2,225	2,215	2,227	2,151	2,202	2,253	2,147	2,172	2,194	2,119	2,336
Coal	GWh	3,880	2,184	1,158	1,118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	2,099	1,939	2,453	2,488	2,486	2,234	2,228	2,171	1,117	1,197	1,199	1,182	1,224	1,255	1,343	1,272	1,243	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	2,819	3,209	3,358	3,758	3,843	4,508	4,556	4,531	3,744	3,801	3,846	3,915	4,059	4,106	4,163	4,287	4,446	4,489
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,203	2,223	2,207	5,242	5,221	5,253	5,244	5,049	5,072	5,057	5,059	5,053	5,086
Battery	GWh	-	-44	-106	-118	-113	-132	-138	-177	-180	-182	-186	-193	-230	-269	-322	-351	-381	-414	-445	-717
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,905	11,316	10,973	11,127	10,820	11,251	11,316	11,706	11,798	11,647	12,858	13,013	12,917	12,916	12,845	12,847	12,901	12,887	12,912	12,123
Net Purchases	GWh	-1,120	-1,191	-646	-504	82	94	214	-105	-129	53	-1,115	-1,207	-1,143	-1,152	-1,084	-983	-1,049	-1,025	-960	-71
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [High Economic Growth](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$7,673 million**
20-Year Carbon Emissions: **28.43 million tons**
20-Year Water Consumption: **11.22 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,047	661	443	413	252	252	250	249	244	241	222	79	77	111	88	90	102	103	96	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	320	360	360	520	520	560	600	600	600	600	600	600	600	600	600	726
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,249	1,253	1,244	1,263	1,254	1,395	1,396	1,465	1,465	1,556	1,633	1,655	1,657	1,759	3,408
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	493	593	593	663	707	725	752	752	902	902	968	1,016	1,090	1,146	1,196	1,251	1,308	2,165
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,988	4,238	4,213	4,345	4,400	4,428	4,480	4,518	4,709	5,117	5,240	5,276	5,326	5,465	5,520	5,561	5,721	7,665

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,295	2,359	2,367	2,295	2,366	2,366	2,295	2,342	2,322	2,216	2,281	2,308	2,172	2,204	2,242	2,142	2,175
Coal	GWh	3,950	2,154	1,156	1,112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,863	2,490	2,380	3,007	3,154	3,166	3,243	3,203	3,180	2,971	1,079	1,040	1,538	1,216	1,253	1,435	1,462	1,369	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	2,748	3,188	3,290	3,422	3,465	3,431	3,550	3,531	4,209	4,041	4,314	4,388	4,788	5,077	5,207	5,324	5,709	8,092
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,774	3,752	3,531	3,539	3,527	3,531	3,527	3,546
Battery	GWh	-	-44	-123	-135	-131	-144	-153	-158	-164	-161	-198	-200	-213	-257	-281	-301	-357	-420	-503	-1,251
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,083	11,544	11,275	11,526	11,292	11,574	11,613	11,719	11,842	11,748	12,285	11,754	11,830	12,343	12,147	12,358	12,563	12,629	12,739	13,108
Net Purchases	GWh	-1,196	-1,220	-655	-518	86	329	532	553	551	738	302	954	903	435	683	628	465	462	495	279
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Low Economic Growth](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$6,142 million**
20-Year Carbon Emissions: **24.30 million tons**
20-Year Water Consumption: **10.24 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	22%	18%	18%	18%	18%	18%	19%	18%	18%	19%	18%	18%	19%	19%	18%	19%	18%
Carbon Intensity	lbs/MWh	1,021	649	450	430	238	231	228	214	210	202	182	57	52	162	56	54	107	154	54	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	406
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,291	1,376	1,420	1,412	1,427	1,484	1,476	1,467	1,481	1,686
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	359	459	486	550	554	708	708	708	821	821	836	836	860	883	883	883	916	1,396
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,854	4,104	3,986	4,044	4,046	4,050	4,048	4,046	4,125	4,217	4,262	4,241	4,166	4,254	4,229	4,203	4,251	4,854

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,441	2,287	2,351	2,364	2,292	2,364	2,364	2,292	2,340	2,311	2,206	2,251	2,302	2,144	2,170	2,194	2,111	2,336
Coal	GWh	3,780	2,040	1,149	1,106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,766	2,295	2,191	2,557	2,583	2,563	2,460	2,414	2,298	2,088	667	599	1,816	639	620	1,198	1,683	610	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	109
Geothermal	GWh	71	70	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,631	2,976	3,131	3,176	3,131	3,166	3,132	3,115	3,522	3,812	3,932	3,924	3,989	4,143	4,088	4,058	4,124	3,603
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,997	1,998	1,998	3,546
Battery	GWh	-	-44	-94	-106	-109	-122	-123	-157	-154	-153	-181	-183	-184	-187	-191	-196	-196	-199	-234	-518
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,832	11,305	10,985	11,139	10,697	10,776	10,702	10,671	10,644	10,455	10,730	9,579	9,493	10,663	9,323	9,335	9,805	10,225	9,104	9,584
Net Purchases	GWh	-1,140	-1,354	-942	-909	-295	-40	131	153	164	298	-23	1,102	1,067	-204	1,042	1,041	468	-33	1,085	608
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$7,029** million
20-Year Carbon Emissions: **25.03** million tons
20-Year Water Consumption: **10.71** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,052	659	429	397	218	221	217	208	206	198	164	64	48	145	95	60	74	148	82	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,295	1,282	1,274	1,265	1,265	1,257	1,460	1,587	1,657	1,649	1,685	1,757	1,749	1,740	1,831	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	807	888	907	1,062	1,070	1,070	1,282	1,286	1,310	1,330	1,383	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,169	4,244	4,261	4,265	4,280	4,278	4,554	4,692	4,773	4,773	4,747	4,843	4,843	4,846	4,971	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,356	2,367	2,295	2,365	2,366	2,296	2,326	2,295	2,194	2,249	2,298	2,156	2,188	2,212	2,112	2,147
Coal	GWh	3,952	2,151	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	665	1,729	2,211	2,039	2,473	2,605	2,577	2,542	2,525	2,413	2,049	815	623	1,802	1,195	760	939	1,835	1,026	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,867	2,764	3,207	3,595	3,611	3,588	3,576	3,595	3,574	4,584	5,089	5,287	5,288	5,486	5,699	5,699	5,741	6,006	7,220
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,004	1,998	1,999	1,996	3,463
Battery	GWh	-	-45	-140	-156	-172	-186	-191	-221	-221	-217	-272	-281	-287	-301	-318	-339	-366	-402	-444	-1,036
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,018	11,399	10,997	11,185	11,018	11,172	11,108	11,100	11,152	10,968	11,647	10,891	10,756	11,896	11,244	10,899	11,005	11,874	11,191	12,304
Net Purchases	GWh	-1,232	-1,266	-686	-600	-177	88	311	366	353	542	-122	669	743	-437	182	599	450	-439	303	-744
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$7,081** million
20-Year Carbon Emissions: **21.43** million tons
20-Year Water Consumption: **9.65** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	393	365	171	165	160	143	144	140	89	97	63	62	64	65	69	66	64	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,207	1,376	1,496	1,609	1,637	1,752	1,744	1,735	1,727	1,719	1,710	1,702	1,693	1,685	1,677	1,668	1,660	2,927
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356
Battery	MW	-	300	585	685	814	940	977	1,177	1,190	1,195	1,316	1,342	1,342	1,364	1,414	1,442	1,479	1,520	1,567	2,310
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,054	4,304	4,377	4,623	4,694	4,867	4,878	4,881	5,256	5,280	5,658	5,660	5,586	5,613	5,625	5,641	5,682	7,002

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,440	2,283	2,333	2,335	2,251	2,278	2,284	2,200	2,227	2,241	2,134	2,169	2,219	2,119	2,132	2,173	2,116	2,085
Coal	GWh	3,880	2,184	1,155	1,105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	1,825	1,697	1,962	1,969	1,921	1,749	1,777	1,726	1,137	1,239	794	788	817	831	882	841	822	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	3,329	3,704	4,424	4,949	5,055	5,468	5,451	5,416	5,092	5,120	4,608	4,662	4,832	4,908	4,923	5,001	5,072	6,460
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,237	2,202	2,220	2,205	3,764	3,748	5,273	5,248	5,054	5,074	5,059	5,066	5,066	5,042
Battery	GWh	-	-44	-141	-155	-177	-206	-216	-260	-260	-263	-292	-313	-310	-338	-392	-430	-458	-503	-552	-1,112
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,904	11,316	11,169	11,319	11,308	11,822	11,851	12,071	12,136	11,979	12,654	12,795	13,197	13,171	13,114	13,121	13,086	13,068	13,019	12,985
Net Purchases	GWh	-1,120	-1,191	-842	-696	-405	-477	-322	-469	-468	-278	-911	-989	-1,423	-1,407	-1,353	-1,257	-1,233	-1,205	-1,066	-933
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [High Economic Growth](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$8,053** million
20-Year Carbon Emissions: **26.90** million tons
20-Year Water Consumption: **11.15** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	20%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,047	661	432	402	236	230	223	214	207	184	155	73	61	140	87	105	92	107	110	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,287	1,329	1,358	1,350	1,391	1,520	1,742	1,993	2,105	2,097	2,193	2,307	2,328	2,349	2,511	4,970
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	671	771	932	1,055	1,106	1,284	1,308	1,328	1,560	1,595	1,642	1,688	1,749	1,852	1,852	1,896	1,958	3,297
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,031	4,280	4,286	4,457	4,545	4,571	4,644	4,800	5,114	5,406	5,554	5,579	5,621	5,846	5,849	5,898	6,123	9,633

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,295	2,360	2,367	2,295	2,366	2,366	2,287	2,298	2,245	2,158	2,210	2,262	2,138	2,156	2,171	2,088	2,000
Coal	GWh	3,950	2,154	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,864	2,372	2,257	2,789	2,842	2,784	2,762	2,703	2,397	2,079	980	812	1,889	1,185	1,433	1,281	1,497	1,525	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	2,889	3,351	3,602	3,884	4,062	4,053	4,289	4,916	5,860	6,478	6,643	6,778	7,132	7,578	7,573	7,696	8,025	9,961
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,210	2,235	2,214	1,995	2,002	1,996	1,995	1,992	3,513
Battery	GWh	-	-44	-154	-170	-195	-220	-234	-267	-273	-283	-339	-352	-359	-418	-490	-631	-622	-658	-744	-1,307
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,083	11,544	11,269	11,533	11,322	11,648	11,747	11,753	11,971	12,219	12,858	12,320	12,187	13,315	12,668	13,137	12,931	13,190	13,380	14,677
Net Purchases	GWh	-1,196	-1,220	-649	-525	55	255	398	519	422	267	-270	389	546	-537	162	-151	97	-99	-146	-1,290
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Low Economic Growth](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$6,278 million**
20-Year Carbon Emissions: **23.81 million tons**
20-Year Water Consumption: **10.24 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	22%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,021	649	441	418	228	225	221	205	201	193	165	63	39	149	65	38	141	134	59	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,316	1,308	1,352	1,344	1,352	1,399	1,390	1,382	1,416	2,518
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	529	629	703	774	779	921	921	921	1,064	1,064	1,064	1,065	1,092	1,092	1,099	1,111	1,124	1,983
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,864	4,113	4,003	4,068	4,071	4,063	4,061	4,059	4,192	4,190	4,222	4,203	4,123	4,177	4,159	4,145	4,194	5,866

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,292	2,357	2,365	2,294	2,366	2,367	2,295	2,347	2,361	2,266	2,322	2,386	2,241	2,273	2,302	2,206	2,067
Coal	GWh	3,780	2,040	1,153	1,113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,765	2,210	2,080	2,459	2,521	2,472	2,357	2,314	2,201	1,907	734	451	1,685	726	433	1,551	1,473	646	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,707	3,082	3,230	3,255	3,220	3,230	3,202	3,184	3,743	3,742	3,891	3,854	3,920	4,097	4,038	4,043	4,152	5,299
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,242	2,217	2,000	2,006	2,000	2,000	2,000	3,527
Battery	GWh	-	-44	-128	-142	-152	-163	-168	-194	-193	-191	-228	-229	-231	-230	-251	-253	-256	-273	-293	-791
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,832	11,304	10,945	11,111	10,661	10,753	10,658	10,597	10,577	10,392	10,730	9,581	9,317	10,489	9,365	9,142	10,153	10,035	9,205	10,612
Net Purchases	GWh	-1,140	-1,353	-902	-881	-258	-17	175	227	230	360	-23	1,101	1,243	-30	1,000	1,234	120	157	984	-419
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,528 million**
20-Year Carbon Emissions: **30.52 million tons**
20-Year Water Consumption: **11.68 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,047	2,113	2,183	2,247	2,328	2,390	2,420	2,431	2,428	2,438	2,454	2,459	2,458	2,452	2,468	2,470	2,479	2,512	2,527
PRM	%	12%	9%	18%	19%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,049	660	443	414	256	252	253	255	252	248	219	175	82	153	100	104	89	185	116	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	320	360	360	520	520	520	520	520	520	520	520	520	520	520	520	646
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,267	1,273	1,265	1,263	1,255	1,432	1,423	1,415	1,407	1,463	1,517	1,516	1,508	1,575	3,175
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	483	583	607	658	736	755	762	762	948	948	948	954	969	978	1,001	1,034	1,068	1,938
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,978	4,227	4,227	4,359	4,449	4,478	4,490	4,488	4,712	5,110	5,089	5,074	5,031	5,101	5,107	5,114	5,218	7,124

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,296	2,360	2,367	2,296	2,366	2,367	2,296	2,347	2,336	2,252	2,309	2,356	2,211	2,249	2,283	2,181	2,198
Coal	GWh	3,927	2,134	1,156	1,112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,823	2,486	2,449	3,107	3,204	3,315	3,456	3,442	3,378	3,018	2,431	1,126	2,135	1,387	1,445	1,233	2,562	1,605	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,871	2,749	3,209	3,312	3,524	3,591	3,566	3,582	3,561	4,454	4,267	4,216	4,191	4,449	4,668	4,665	4,701	4,974	7,420
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,545	3,534	3,534	3,533	3,546
Battery	GWh	-	-44	-121	-132	-132	-142	-156	-161	-162	-159	-204	-207	-205	-208	-231	-247	-272	-297	-349	-996
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,481	11,274	11,620	11,413	11,728	11,886	12,065	12,115	11,979	12,575	13,339	11,863	12,820	12,080	12,242	11,956	13,274	12,440	12,702
Net Purchases	GWh	-1,233	-1,263	-657	-471	167	367	680	756	816	957	377	-348	1,062	65	773	687	926	-413	480	288
Total Supply	GWh	9,787	10,219	10,617	11,148	11,580	12,095	12,566	12,820	12,931	12,937	12,952	12,990	12,925	12,885	12,853	12,928	12,882	12,861	12,920	12,990

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,664 million**
20-Year Carbon Emissions: **31.45 million tons**
20-Year Water Consumption: **11.96 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,059	2,149	2,276	2,423	2,602	2,711	2,774	2,796	2,793	2,798	2,809	2,809	2,808	2,801	2,815	2,815	2,825	2,859	2,873
PRM	%	12%	9%	18%	27%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	19%	19%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,049	660	263	378	246	247	242	230	229	229	216	93	90	150	95	94	95	131	100	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,066	1,684	1,658	1,778	1,905	2,037	2,054	2,043	2,104	2,467	2,573	2,562	2,631	2,687	2,675	2,664	2,738	4,383
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	535	802	802	932	1,092	1,236	1,265	1,265	1,405	1,405	1,406	1,406	1,429	1,464	1,476	1,483	1,530	2,784
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	155	142	130	117	124	107	90	92	95
Total Capacity	MW	3,187	3,672	4,022	4,889	4,807	5,144	5,437	5,691	5,744	5,739	5,802	6,556	6,651	6,627	6,604	6,702	6,686	6,665	6,788	9,124

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,279	2,356	2,364	2,288	2,339	2,342	2,271	2,325	2,235	2,144	2,192	2,246	2,122	2,141	2,150	2,074	2,189
Coal	GWh	3,928	2,145	1,146	1,099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,857	620	2,295	3,314	3,668	3,784	3,794	3,825	3,806	3,617	1,618	1,552	2,552	1,643	1,614	1,648	2,249	1,719	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,875	2,876	4,358	4,530	5,249	5,951	6,604	6,718	6,671	7,031	7,578	7,632	7,617	7,795	7,942	7,937	7,936	8,127	10,724
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,713	3,707	3,691	3,459	3,467	3,460	3,468	3,461	3,546
Battery	GWh	-	-44	-129	-187	-179	-211	-244	-277	-282	-279	-388	-449	-447	-446	-480	-525	-543	-548	-614	-1,371
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	684	623	566	509	544	473	415	420	435
Total Generation	GWh	11,019	11,529	9,517	12,530	12,787	13,845	14,619	15,297	15,491	15,372	15,546	15,451	15,282	16,242	15,242	15,235	15,186	15,741	15,257	15,643
Net Purchases	GWh	-1,232	-1,219	1,380	-636	262	518	632	513	535	659	501	642	738	-263	705	796	790	215	757	451
Total Supply	GWh	9,788	10,310	10,897	11,894	13,049	14,363	15,252	15,810	16,026	16,031	16,046	16,093	16,020	15,980	15,947	16,031	15,976	15,956	16,015	16,093

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Growth](#)

20-Year NPV Revenue Requirement **\$6,320 million**
20-Year Carbon Emissions: **24.86 million tons**
20-Year Water Consumption: **10.42 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,957	1,997	2,010	2,026	2,048	2,103	2,112	2,109	2,108	2,100	2,104	2,111	2,107	2,100	2,090	2,101	2,094	2,090	2,109	2,118
PRM	%	13%	12%	18%	23%	18%	18%	18%	18%	18%	19%	18%	18%	19%	18%	18%	19%	19%	18%	19%	19%
Carbon Intensity	lbs/MWh	1,051	661	444	416	231	233	231	222	220	209	193	57	52	182	61	55	86	196	61	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	326
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,302	1,398	1,440	1,432	1,455	1,511	1,503	1,494	1,524	2,159
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	352	452	479	543	547	700	700	700	825	831	860	860	891	927	927	927	967	1,573
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,847	4,096	3,979	4,037	4,039	4,042	4,040	4,038	4,139	4,248	4,307	4,286	4,225	4,324	4,299	4,274	4,346	5,424

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,252	3,256	2,442	2,291	2,355	2,366	2,292	2,362	2,365	2,292	2,334	2,307	2,201	2,250	2,296	2,155	2,183	2,192	2,117	2,228
Coal	GWh	3,903	2,114	1,153	1,109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	660	1,692	2,228	2,056	2,520	2,630	2,609	2,559	2,532	2,386	2,221	669	604	2,051	704	625	965	2,156	684	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	784	1,855	2,647	3,013	3,189	3,232	3,198	3,181	3,151	3,123	3,620	3,955	4,070	4,037	4,158	4,319	4,246	4,208	4,333	4,826
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,240	2,217	1,999	2,003	1,996	1,997	1,995	3,546
Battery	GWh	-	-44	-92	-104	-106	-120	-121	-153	-153	-150	-181	-185	-189	-193	-198	-205	-205	-208	-257	-752
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,961	11,313	10,939	11,050	10,723	10,883	10,818	10,788	10,782	10,554	10,955	9,719	9,625	11,004	9,543	9,517	9,734	10,835	9,367	10,358
Net Purchases	GWh	-1,272	-1,371	-910	-838	-343	-172	-11	12	3	179	-263	953	932	-539	837	884	574	-598	880	-95
Total Supply	GWh	9,690	9,943	10,029	10,212	10,380	10,711	10,807	10,799	10,785	10,733	10,692	10,672	10,557	10,464	10,380	10,400	10,308	10,237	10,246	10,262

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Growth](#)

20-Year NPV Revenue Requirement **\$7,460 million**
20-Year Carbon Emissions: **29.16 million tons**
20-Year Water Consumption: **11.40 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,995	2,073	2,121	2,170	2,223	2,311	2,344	2,366	2,388	2,405	2,428	2,455	2,471	2,482	2,494	2,527	2,541	2,559	2,601	2,631
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,047	661	443	412	251	251	248	248	246	242	224	179	77	117	95	97	85	150	106	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	320	320	480	520	520	560	560	560	560	560	560	560	560	560	646
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,245	1,236	1,228	1,219	1,211	1,335	1,327	1,347	1,339	1,424	1,492	1,512	1,504	1,598	3,094
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	494	594	620	684	723	733	733	733	873	873	897	927	982	1,016	1,054	1,098	1,142	1,921
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,988	4,238	4,200	4,323	4,360	4,379	4,417	4,416	4,580	4,978	5,011	5,020	5,045	5,155	5,196	5,215	5,354	7,027

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,443	2,295	2,360	2,367	2,296	2,366	2,367	2,296	2,352	2,341	2,252	2,318	2,354	2,206	2,242	2,284	2,178	2,221
Coal	GWh	3,950	2,156	1,156	1,113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	728	1,870	2,480	2,353	2,971	3,115	3,123	3,191	3,199	3,146	2,956	2,391	1,017	1,594	1,291	1,318	1,152	2,054	1,451	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,874	2,750	3,192	3,299	3,406	3,384	3,353	3,332	3,312	3,936	3,763	3,846	3,862	4,243	4,543	4,639	4,696	5,068	7,366
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,545	3,533	3,534	3,533	3,546
Battery	GWh	-	-44	-123	-135	-135	-148	-155	-159	-158	-156	-187	-189	-194	-220	-239	-269	-312	-344	-415	-1,130
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,081	11,553	11,267	11,503	11,261	11,514	11,488	11,589	11,627	11,501	12,019	12,818	11,396	11,947	11,767	11,963	11,801	12,714	12,310	12,540
Net Purchases	GWh	-1,193	-1,221	-663	-533	55	304	547	547	602	794	352	-355	1,062	526	728	657	830	-50	465	354
Total Supply	GWh	9,888	10,332	10,605	10,970	11,316	11,818	12,035	12,136	12,229	12,296	12,370	12,463	12,458	12,473	12,495	12,621	12,631	12,664	12,776	12,895

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low BTM PV](#)

20-Year NPV Revenue Requirement **\$6,893 million**
20-Year Carbon Emissions: **30.68 million tons**
20-Year Water Consumption: **11.74 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,977	2,039	2,073	2,108	2,146	2,217	2,240	2,252	2,264	2,270	2,282	2,299	2,304	2,304	2,302	2,321	2,325	2,332	2,363	2,382
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	661	442	412	240	246	244	242	239	232	232	181	184	182	190	189	126	197	157	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,163	1,178	1,170	1,170	1,161	1,235	2,554
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	432	532	532	532	543	581	590	591	766	766	766	776	800	815	842	873	895	1,559
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,927	4,177	4,112	4,186	4,195	4,202	4,210	4,209	4,237	4,635	4,614	4,613	4,537	4,552	4,561	4,566	4,664	6,085

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,358	2,367	2,295	2,365	2,366	2,295	2,359	2,361	2,283	2,346	2,410	2,286	2,338	2,358	2,270	2,233
Coal	GWh	3,928	2,137	1,155	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,782	2,349	2,191	2,750	2,936	2,938	2,969	2,948	2,847	2,891	2,277	2,281	2,274	2,371	2,369	1,591	2,475	1,980	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,868	2,715	3,128	3,254	3,266	3,241	3,200	3,181	3,161	3,163	3,026	2,979	2,979	3,076	3,090	3,087	3,116	3,453	5,878
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-110	-122	-117	-118	-120	-129	-131	-129	-161	-162	-158	-164	-167	-182	-202	-225	-258	-824
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,021	11,440	11,114	11,293	11,011	11,226	11,195	11,243	11,252	11,078	11,212	12,015	11,858	11,828	11,808	11,728	10,896	11,748	11,474	11,376
Net Purchases	GWh	-1,230	-1,294	-780	-678	-130	81	280	287	326	514	404	-355	-252	-253	-257	-97	701	-163	179	352
Total Supply	GWh	9,790	10,146	10,334	10,615	10,880	11,307	11,475	11,530	11,578	11,592	11,616	11,659	11,606	11,575	11,551	11,632	11,597	11,586	11,653	11,728

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High BTM PV](#)

20-Year NPV Revenue Requirement **\$6,793 million**
20-Year Carbon Emissions: **30.69 million tons**
20-Year Water Consumption: **11.73 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,974	2,030	2,058	2,088	2,125	2,194	2,214	2,221	2,229	2,232	2,242	2,260	2,265	2,268	2,267	2,287	2,289	2,294	2,323	2,340
PRM	%	12%	10%	18%	22%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	414	239	244	242	240	236	230	229	179	182	180	191	192	198	198	159	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	440	440	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,136	1,128	1,119	1,138	2,414
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	413	513	535	535	551	584	588	588	756	756	756	772	803	820	845	874	903	1,548
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,908	4,157	4,075	4,149	4,163	4,165	4,167	4,166	4,186	4,585	4,564	4,559	4,467	4,483	4,482	4,486	4,536	5,893

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,293	2,357	2,366	2,294	2,364	2,365	2,294	2,358	2,355	2,276	2,335	2,403	2,284	2,337	2,356	2,281	2,232
Coal	GWh	3,924	2,132	1,155	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	693	1,770	2,336	2,179	2,712	2,885	2,878	2,911	2,877	2,780	2,810	2,204	2,214	2,202	2,329	2,348	2,424	2,416	1,948	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	784	1,864	2,700	3,098	3,241	3,256	3,228	3,181	3,155	3,130	3,135	2,973	2,918	2,902	2,897	2,907	2,864	2,888	2,974	5,485
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-106	-118	-118	-119	-122	-131	-131	-129	-162	-163	-159	-165	-168	-187	-206	-229	-257	-807
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,017	11,419	11,088	11,253	10,958	11,163	11,119	11,163	11,154	10,978	11,102	11,881	11,723	11,667	11,579	11,516	11,501	11,455	10,976	11,000
Net Purchases	GWh	-1,237	-1,301	-801	-702	-161	43	236	229	269	441	321	-433	-345	-339	-294	-169	-205	-189	339	370
Total Supply	GWh	9,780	10,118	10,287	10,550	10,797	11,206	11,356	11,392	11,422	11,418	11,424	11,448	11,378	11,328	11,286	11,348	11,296	11,266	11,315	11,371

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [No Incremental BTM PV](#)

20-Year NPV Revenue Requirement **\$7,089 million**
20-Year Carbon Emissions: **29.67 million tons**
20-Year Water Consumption: **11.50 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,995	2,065	2,107	2,149	2,195	2,273	2,300	2,314	2,329	2,337	2,351	2,369	2,375	2,379	2,380	2,403	2,407	2,413	2,444	2,464
PRM	%	11%	8%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,047	659	440	409	243	247	245	244	240	234	226	178	180	178	167	93	73	180	103	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	1,147	1,147	1,267	1,347	1,347	1,358	1,358	1,358	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	686
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,246	1,237	1,229	1,237	1,255	1,330	1,342	1,334	1,420	2,793
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	475	575	582	591	620	621	634	637	757	757	757	773	802	815	840	870	900	1,623
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,970	4,220	4,162	4,245	4,273	4,282	4,294	4,295	4,375	4,773	4,752	4,764	4,696	4,792	4,812	4,816	4,935	6,467

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,254	3,258	2,442	2,296	2,359	2,367	2,296	2,366	2,367	2,296	2,359	2,361	2,282	2,341	2,403	2,263	2,301	2,334	2,225	2,220
Coal	GWh	3,941	2,148	1,156	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	711	1,804	2,384	2,228	2,823	2,999	3,000	3,061	3,035	2,943	2,881	2,282	2,298	2,276	2,158	1,207	935	2,339	1,342	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,875	2,747	3,184	3,290	3,293	3,271	3,237	3,220	3,201	3,494	3,348	3,304	3,363	3,478	3,827	3,878	3,914	4,284	6,491
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-118	-131	-127	-128	-132	-135	-136	-135	-159	-161	-157	-164	-168	-192	-221	-237	-287	-854
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,055	11,482	11,173	11,376	11,112	11,307	11,275	11,367	11,373	11,209	11,535	12,343	12,202	12,209	11,989	11,270	10,974	12,375	11,593	11,935
Net Purchases	GWh	-1,212	-1,256	-735	-633	-80	174	396	380	443	641	357	-387	-282	-302	-89	729	1,006	-391	474	223
Total Supply	GWh	9,843	10,226	10,438	10,743	11,031	11,481	11,671	11,747	11,815	11,850	11,893	11,956	11,921	11,907	11,900	11,999	11,980	11,984	12,067	12,157

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Electric Vehicles](#)

20-Year NPV Revenue Requirement **\$6,928 million**
20-Year Carbon Emissions: **30.27 million tons**
20-Year Water Consumption: **11.62 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,036	2,068	2,101	2,140	2,213	2,237	2,249	2,263	2,270	2,284	2,303	2,314	2,322	2,329	2,355	2,364	2,377	2,413	2,438
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	442	413	240	246	244	243	239	232	234	184	188	185	192	153	119	196	112	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	560	560	560	560	560	560	560	560	560	686
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,174	1,199	1,204	1,215	1,206	1,280	2,604
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	426	526	526	526	539	578	588	591	722	722	726	753	787	811	841	879	913	1,623
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,921	4,170	4,106	4,180	4,191	4,199	4,208	4,209	4,233	4,631	4,614	4,641	4,585	4,621	4,645	4,658	4,767	6,239

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,367	2,295	2,364	2,366	2,295	2,358	2,359	2,281	2,338	2,399	2,278	2,323	2,347	2,255	2,230
Coal	GWh	3,928	2,133	1,155	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,782	2,346	2,195	2,745	2,929	2,927	2,974	2,947	2,849	2,909	2,316	2,338	2,310	2,399	1,932	1,514	2,469	1,424	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,711	3,117	3,247	3,261	3,235	3,193	3,173	3,153	3,145	2,992	2,945	3,006	3,145	3,211	3,262	3,301	3,636	6,004
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-109	-121	-116	-117	-119	-129	-131	-129	-154	-155	-152	-160	-168	-183	-210	-240	-290	-862
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,021	11,433	11,107	11,287	11,000	11,215	11,178	11,240	11,242	11,070	11,219	12,025	11,886	11,887	11,893	11,402	10,970	11,901	11,055	11,461
Net Purchases	GWh	-1,231	-1,293	-784	-687	-138	72	277	273	322	513	394	-361	-266	-288	-306	278	688	-241	687	371
Total Supply	GWh	9,790	10,140	10,322	10,600	10,862	11,287	11,455	11,512	11,564	11,583	11,613	11,664	11,620	11,599	11,587	11,680	11,658	11,660	11,742	11,832

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Electric Vehicles](#)

20-Year NPV Revenue Requirement **\$6,782 million**
20-Year Carbon Emissions: **30.80 million tons**
20-Year Water Consumption: **11.76 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,034	2,065	2,096	2,131	2,201	2,221	2,228	2,237	2,239	2,246	2,258	2,257	2,254	2,252	2,269	2,268	2,269	2,293	2,308
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	19%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	442	413	239	244	242	240	237	229	229	177	180	179	190	190	197	196	186	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	440	440	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,140	1,135	1,127	1,119	2,364
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	422	522	543	543	561	593	597	597	762	762	762	762	782	796	817	841	870	1,508
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,916	4,166	4,083	4,157	4,173	4,175	4,177	4,175	4,192	4,591	4,569	4,549	4,445	4,463	4,462	4,461	4,483	5,803

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,293	2,358	2,366	2,295	2,365	2,365	2,294	2,358	2,356	2,279	2,338	2,408	2,282	2,336	2,354	2,285	2,239
Coal	GWh	3,926	2,135	1,155	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	690	1,772	2,339	2,181	2,721	2,893	2,888	2,918	2,890	2,777	2,809	2,194	2,201	2,194	2,311	2,325	2,406	2,391	2,264	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,707	3,112	3,250	3,263	3,237	3,192	3,169	3,146	3,146	2,993	2,940	2,916	2,904	2,916	2,873	2,895	2,882	5,371
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-120	-121	-123	-133	-132	-131	-162	-163	-159	-162	-164	-170	-183	-202	-226	-758
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	11,017	11,425	11,097	11,268	10,975	11,177	11,136	11,180	11,179	10,990	11,113	11,893	11,735	11,678	11,577	11,518	11,514	11,462	11,235	10,945
Net Purchases	GWh	-1,234	-1,297	-794	-696	-151	60	252	245	275	458	338	-423	-341	-342	-290	-178	-235	-223	43	377
Total Supply	GWh	9,783	10,128	10,303	10,572	10,824	11,237	11,389	11,425	11,454	11,448	11,450	11,470	11,394	11,337	11,287	11,340	11,279	11,239	11,278	11,322

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 reflects roundtrip losses

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Building Electrification](#)

20-Year NPV Revenue Requirement **\$7,021 million**
20-Year Carbon Emissions: **29.44 million tons**
20-Year Water Consumption: **11.44 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,072	2,110	2,152	2,229	2,256	2,271	2,287	2,296	2,312	2,331	2,339	2,346	2,352	2,378	2,385	2,396	2,429	2,452
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	442	412	242	246	246	245	242	237	235	185	187	185	125	89	80	181	109	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	520	520	520	520	520	520	520	520	520	646
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,187	1,179	1,170	1,187	1,208	1,270	1,266	1,258	1,339	2,708
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	431	531	531	536	564	564	577	582	760	760	760	784	821	834	865	900	933	1,743
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,925	4,175	4,111	4,190	4,216	4,225	4,237	4,240	4,279	4,677	4,656	4,685	4,628	4,710	4,721	4,730	4,847	6,463

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,366	2,294	2,365	2,366	2,295	2,359	2,359	2,281	2,338	2,400	2,259	2,307	2,335	2,234	2,212
Coal	GWh	3,927	2,132	1,154	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,778	2,356	2,207	2,777	2,957	2,970	3,035	3,018	2,935	2,960	2,357	2,356	2,338	1,600	1,142	1,033	2,313	1,396	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,712	3,122	3,250	3,265	3,243	3,191	3,172	3,152	3,176	3,035	2,986	3,074	3,195	3,490	3,487	3,520	3,877	6,244
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-110	-122	-117	-119	-124	-126	-128	-127	-160	-162	-158	-168	-173	-200	-233	-254	-306	-868
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,428	11,117	11,303	11,033	11,245	11,223	11,303	11,315	11,159	11,296	12,102	11,939	11,976	11,140	10,856	10,677	11,938	11,229	11,670
Net Purchases	GWh	-1,233	-1,295	-776	-661	-107	126	333	325	377	561	461	-288	-165	-221	602	977	1,132	-132	654	299
Total Supply	GWh	9,786	10,133	10,341	10,642	10,926	11,371	11,556	11,628	11,692	11,720	11,758	11,814	11,774	11,754	11,742	11,833	11,809	11,807	11,883	11,969

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [TOD Pricing](#)

20-Year NPV Revenue Requirement **\$6,761** million
20-Year Carbon Emissions: **30.97** million tons
20-Year Water Consumption: **11.84** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,010	2,047	2,125	2,152	2,167	2,184	2,195	2,212	2,232	2,240	2,245	2,248	2,271	2,276	2,285	2,316	2,336
PRM	%	12%	10%	18%	27%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	413	240	245	242	241	238	231	231	182	185	183	193	193	199	198	160	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	160	240	240	400	400	400	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,156	1,151	1,142	1,192	2,456
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	529	556	557	572	579	714	714	715	741	777	796	825	858	885	1,543
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	3,983	4,063	4,088	4,098	4,111	4,117	4,144	4,542	4,523	4,528	4,441	4,478	4,485	4,493	4,572	5,930

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,357	2,366	2,295	2,365	2,366	2,295	2,359	2,357	2,281	2,339	2,409	2,283	2,335	2,357	2,274	2,236
Coal	GWh	3,927	2,132	1,155	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,180	2,715	2,890	2,872	2,935	2,906	2,803	2,849	2,262	2,271	2,260	2,382	2,380	2,461	2,452	1,992	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,115	3,245	3,261	3,237	3,183	3,164	3,144	3,137	2,978	2,926	2,919	2,919	2,985	2,962	2,990	3,227	5,624
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-116	-118	-123	-125	-127	-127	-153	-154	-151	-158	-164	-170	-190	-216	-249	-802
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,428	11,103	11,271	10,967	11,174	11,121	11,196	11,195	11,017	11,152	11,955	11,801	11,754	11,664	11,642	11,649	11,607	11,272	11,150
Net Purchases	GWh	-1,233	-1,295	-792	-694	-133	80	292	263	303	485	366	-402	-308	-302	-245	-151	-200	-179	215	403
Total Supply	GWh	9,786	10,133	10,312	10,577	10,835	11,254	11,413	11,459	11,498	11,502	11,519	11,554	11,493	11,452	11,419	11,491	11,449	11,428	11,487	11,553

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Gas Prices](#)

20-Year NPV Revenue Requirement **\$6,656 million**
20-Year Carbon Emissions: **28.30 million tons**
20-Year Water Consumption: **11.14 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,020	648	450	429	248	244	242	233	230	225	220	163	161	162	166	81	91	153	88	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	520	520	520	520	520	520	520	520	520	646
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,153	1,163	1,154	1,220	1,983
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	523	527	527	528	528	692	692	692	703	735	753	779	809	834	1,490
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,189	4,187	4,186	4,203	4,601	4,580	4,569	4,479	4,512	4,531	4,536	4,628	5,485

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,254	2,442	2,292	2,355	2,366	2,293	2,365	2,364	2,294	2,357	2,354	2,275	2,334	2,405	2,280	2,323	2,347	2,249	2,348
Coal	GWh	3,805	2,053	1,152	1,112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	684	1,848	2,413	2,334	2,777	2,853	2,871	2,838	2,809	2,731	2,709	2,023	1,980	1,993	2,041	1,013	1,132	1,893	1,090	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	217
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	783	1,861	2,686	3,065	3,194	3,206	3,172	3,146	3,117	3,104	3,115	2,927	2,898	2,874	2,876	2,932	2,946	2,991	3,257	4,548
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-109	-121	-117	-117	-118	-120	-118	-118	-152	-154	-152	-152	-159	-166	-170	-199	-215	-639
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,889	11,411	11,147	11,368	10,976	11,083	11,058	11,067	11,058	10,913	10,990	11,662	11,475	11,442	11,281	10,224	10,314	11,057	10,410	10,529
Net Purchases	GWh	-1,103	-1,278	-835	-783	-135	177	361	398	446	598	536	-102	24	16	145	1,274	1,142	378	1,083	1,031
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Gas Prices](#)

20-Year NPV Revenue Requirement **\$7,120 million**
20-Year Carbon Emissions: **30.46 million tons**
20-Year Water Consumption: **11.55 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	420	388	223	230	230	227	227	224	215	175	183	188	191	197	202	206	207	0

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	400	400	400	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,242	1,230	1,239	1,231	1,222	1,214	1,260	1,252	1,243	1,243	1,259	1,250	1,252	1,251	1,261	2,041
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	546	547	564	645	653	653	768	768	768	776	804	822	847	875	909	1,570
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,095	4,171	4,204	4,214	4,220	4,218	4,280	4,678	4,657	4,653	4,582	4,599	4,608	4,619	4,664	5,543

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,296	2,357	2,366	2,294	2,363	2,364	2,293	2,350	2,334	2,260	2,313	2,368	2,257	2,299	2,327	2,257	2,351
Coal	GWh	3,881	2,184	1,159	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	628	1,621	2,109	1,942	2,566	2,755	2,767	2,789	2,806	2,752	2,681	2,197	2,265	2,327	2,361	2,430	2,500	2,543	2,557	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	584
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,860	2,739	3,140	3,297	3,290	3,342	3,300	3,283	3,259	3,480	3,311	3,263	3,273	3,357	3,378	3,382	3,439	3,526	4,947
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-107	-119	-118	-119	-123	-140	-139	-139	-163	-167	-160	-164	-170	-189	-211	-236	-268	-664
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,903	11,319	10,904	11,062	10,868	11,066	11,120	11,151	11,203	11,068	11,308	12,189	12,103	12,142	12,034	12,040	12,052	12,098	12,102	11,272
Net Purchases	GWh	-1,117	-1,186	-592	-477	-27	193	299	314	302	443	217	-629	-604	-684	-608	-542	-596	-663	-608	287
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Carbon Prices](#)

20-Year NPV Revenue Requirement **\$6,739 million**
20-Year Carbon Emissions: **32.91 million tons**
20-Year Water Consumption: **12.17 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	412	262	262	265	265	267	260	262	208	216	218	231	198	191	238	157	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,152	1,145	1,137	1,198	2,456
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	523	527	563	569	569	738	738	738	748	781	799	825	855	878	1,535
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,184	4,189	4,187	4,208	4,607	4,586	4,575	4,485	4,517	4,520	4,524	4,611	5,962

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,367	2,294	2,364	2,365	2,294	2,358	2,358	2,280	2,342	2,409	2,287	2,339	2,354	2,269	2,235
Coal	GWh	3,927	2,132	1,155	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,186	2,931	3,091	3,148	3,223	3,246	3,153	3,211	2,567	2,637	2,664	2,822	2,437	2,373	2,900	1,955	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Geothermal	GWh	71	70	71	71	71	71	71	71	71	70	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,114	3,244	3,259	3,230	3,186	3,163	3,140	3,145	2,990	2,940	2,920	2,921	2,967	2,935	2,967	3,246	5,613
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-116	-117	-116	-126	-127	-124	-157	-159	-153	-159	-162	-169	-188	-212	-243	-792
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,018	11,428	11,103	11,274	11,184	11,375	11,396	11,485	11,534	11,367	11,517	12,268	12,177	12,161	12,108	11,687	11,540	12,034	11,257	11,151
Net Purchases	GWh	-1,233	-1,295	-792	-690	-343	-115	23	-20	-29	143	8	-708	-678	-702	-681	-189	-85	-599	237	409
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Carbon Prices](#)

20-Year NPV Revenue Requirement **\$6,909 million**
20-Year Carbon Emissions: **28.94 million tons**
20-Year Water Consumption: **11.36 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	412	227	233	232	224	219	211	210	158	156	153	157	159	165	156	146	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,172	1,181	1,179	1,171	1,222	2,456
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	523	527	563	569	569	738	738	738	748	776	793	819	849	874	1,535
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,184	4,189	4,187	4,208	4,607	4,586	4,575	4,507	4,540	4,548	4,553	4,631	5,962

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,366	2,295	2,365	2,365	2,294	2,358	2,357	2,278	2,338	2,404	2,280	2,326	2,347	2,263	2,236
Coal	GWh	3,927	2,132	1,155	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,186	2,610	2,776	2,776	2,748	2,692	2,584	2,607	1,983	1,939	1,903	1,950	1,976	2,058	1,944	1,813	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,114	3,245	3,260	3,230	3,186	3,163	3,141	3,145	2,991	2,941	2,924	3,011	3,082	3,074	3,105	3,340	5,613
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-116	-116	-116	-125	-126	-124	-156	-159	-155	-160	-165	-171	-185	-211	-244	-792
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	11,018	11,428	11,103	11,274	10,863	11,061	11,024	11,011	10,982	10,797	10,914	11,684	11,477	11,399	11,318	11,332	11,355	11,209	11,201	11,152
Net Purchases	GWh	-1,233	-1,295	-792	-690	-21	199	395	454	523	713	611	-124	21	60	108	166	100	226	293	408
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$8/ton Carbon Price](#)

20-Year NPV Revenue Requirement **\$6,983** million
20-Year Carbon Emissions: **28.31** million tons
20-Year Water Consumption: **10.79** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	824	551	397	365	215	223	225	228	227	222	223	173	180	183	197	198	199	218	157	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	480	480	480	480	480	480	480	480	480	480	480	480	606
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,153	1,146	1,138	1,198	2,456
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	547	549	569	569	569	569	738	738	738	748	781	798	825	855	878	1,535
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,087	4,163	4,181	4,190	4,189	4,187	4,208	4,607	4,586	4,575	4,485	4,518	4,521	4,525	4,611	5,962

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,367	2,295	2,364	2,366	2,294	2,359	2,358	2,281	2,340	2,410	2,286	2,337	2,356	2,271	2,235
Coal	GWh	3,020	1,788	1,151	1,110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	840	1,563	1,888	1,724	2,471	2,665	2,706	2,789	2,792	2,706	2,756	2,155	2,220	2,257	2,419	2,437	2,472	2,689	1,957	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,115	3,252	3,265	3,241	3,187	3,163	3,141	3,144	2,991	2,938	2,922	2,920	2,972	2,941	2,970	3,246	5,613
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-107	-119	-121	-120	-125	-126	-127	-125	-156	-159	-155	-159	-164	-169	-188	-213	-243	-792
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,261	10,870	10,645	10,809	10,727	10,952	10,956	11,053	11,081	10,920	11,064	11,857	11,758	11,754	11,703	11,691	11,644	11,826	11,260	11,152
Net Purchases	GWh	-475	-738	-334	-224	114	308	463	412	424	591	462	-297	-260	-295	-277	-193	-188	-391	234	408
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$20/ton Carbon Price](#)

20-Year NPV Revenue Requirement **\$7,271 million**
20-Year Carbon Emissions: **22.20 million tons**
20-Year Water Consumption: **9.25 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	714	490	332	298	151	165	172	172	174	172	161	112	117	121	131	139	154	162	163	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	440	440	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,219	1,210	1,202	1,202	1,209	1,201	1,192	1,184	1,179	2,502
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	547	549	569	605	612	612	776	776	776	784	813	831	857	887	922	1,570
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,087	4,163	4,181	4,186	4,192	4,190	4,247	4,645	4,624	4,620	4,541	4,558	4,559	4,564	4,595	6,004

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,359	2,367	2,295	2,365	2,366	2,295	2,357	2,352	2,272	2,330	2,396	2,277	2,329	2,351	2,282	2,234
Coal	GWh	2,652	1,713	1,146	1,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	685	1,129	1,206	1,098	1,751	1,986	2,085	2,126	2,159	2,130	2,024	1,423	1,467	1,515	1,640	1,732	1,921	2,012	2,025	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,115	3,252	3,265	3,241	3,198	3,177	3,155	3,323	3,156	3,106	3,121	3,187	3,202	3,165	3,192	3,201	5,741
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-43	-109	-119	-120	-120	-126	-132	-131	-132	-162	-169	-167	-171	-182	-200	-220	-243	-274	-836
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	9,737	10,361	9,956	10,134	10,007	10,272	10,335	10,395	10,458	10,351	10,502	11,274	11,152	11,189	11,159	11,175	11,276	11,336	11,263	11,224
Net Purchases	GWh	48	-228	355	451	834	988	1,084	1,070	1,047	1,159	1,023	286	347	270	267	323	179	99	231	336
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$40/ton Carbon Price](#)

20-Year NPV Revenue Requirement **\$7,620 million**
20-Year Carbon Emissions: **17.26 million tons**
20-Year Water Consumption: **7.95 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	20%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	669	443	289	260	114	123	131	129	127	130	116	70	74	78	83	88	95	96	101	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	280	280	400	400	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,278	1,277	1,268	1,263	1,254	1,269	1,261	1,252	1,251	1,268	1,260	1,252	1,251	1,280	2,502
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	581	600	638	645	645	767	767	767	775	804	821	847	876	908	1,570
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,213	4,237	4,244	4,252	4,290	4,288	4,687	4,666	4,660	4,591	4,608	4,608	4,619	4,683	6,004

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,293	2,358	2,365	2,293	2,361	2,363	2,292	2,351	2,332	2,256	2,310	2,370	2,256	2,302	2,327	2,246	2,232
Coal	GWh	2,551	1,706	1,145	1,023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	462	651	727	749	1,351	1,502	1,610	1,615	1,589	1,618	1,459	869	913	968	1,033	1,097	1,186	1,202	1,255	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,116	3,245	3,528	3,534	3,484	3,474	3,446	3,548	3,352	3,296	3,307	3,403	3,426	3,395	3,449	3,607	5,741
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-109	-120	-116	-129	-134	-142	-142	-143	-165	-170	-169	-172	-177	-200	-223	-250	-289	-836
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	9,414	9,876	9,476	9,747	9,603	10,040	10,142	10,157	10,172	10,117	10,153	10,895	10,771	10,806	10,748	10,744	10,743	10,752	10,848	11,223
Net Purchases	GWh	371	257	836	838	1,238	1,219	1,277	1,308	1,332	1,393	1,372	665	728	652	678	754	713	683	646	337
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,748 million**
20-Year Carbon Emissions: **30.41 million tons**
20-Year Water Consumption: **11.70 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,049	660	443	413	240	245	243	237	235	227	216	167	171	170	179	180	186	184	181	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	360	360	360	400	400	400	400	400	400	400	400	400	526
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,260	1,252	1,243	1,235	1,227	1,218	1,210	1,201	1,209	2,676
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	547	549	569	696	704	704	819	819	819	828	857	875	901	931	964	1,635
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,087	4,163	4,181	4,198	4,203	4,202	4,291	4,689	4,668	4,656	4,562	4,579	4,581	4,585	4,627	6,203

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,358	2,367	2,295	2,365	2,366	2,295	2,355	2,344	2,263	2,323	2,398	2,279	2,332	2,353	2,280	2,205
Coal	GWh	3,927	2,132	1,155	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,189	2,731	2,904	2,903	2,896	2,880	2,771	2,677	2,087	2,105	2,104	2,212	2,222	2,305	2,282	2,243	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,114	3,252	3,265	3,240	3,222	3,203	3,180	3,524	3,342	3,291	3,268	3,292	3,305	3,266	3,295	3,359	6,095
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-121	-122	-125	-153	-153	-151	-176	-179	-174	-177	-205	-225	-245	-269	-303	-915
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,018	11,428	11,103	11,279	10,986	11,188	11,153	11,168	11,183	10,999	11,341	12,106	11,960	11,911	11,816	11,746	11,741	11,685	11,608	11,455
Net Purchases	GWh	-1,233	-1,295	-792	-694	-145	71	266	297	322	512	185	-546	-461	-453	-390	-248	-285	-250	-115	105
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,001** million
20-Year Carbon Emissions: **28.63** million tons
20-Year Water Consumption: **11.20** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,049	660	442	412	240	245	244	243	240	233	236	190	194	194	84	65	67	204	71	0

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	640	640	640	640	640	640	640	640	640	726
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,153	1,213	1,219	1,211	1,279	2,323
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	423	523	523	523	527	527	528	528	559	559	559	568	596	616	630	657	682	1,407
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,189	4,187	4,186	4,189	4,588	4,567	4,555	4,468	4,555	4,559	4,560	4,656	5,822

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,366	2,294	2,364	2,365	2,294	2,356	2,348	2,269	2,328	2,399	2,256	2,290	2,322	2,213	2,240
Coal	GWh	3,927	2,133	1,155	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,775	2,344	2,183	2,739	2,916	2,920	2,970	2,940	2,840	2,914	2,358	2,381	2,390	1,042	810	829	2,524	870	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,114	3,244	3,260	3,231	3,174	3,149	3,125	3,087	2,893	2,840	2,819	2,857	3,127	3,121	3,140	3,423	5,266
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,546
Battery	GWh	-	-44	-108	-120	-116	-116	-117	-119	-118	-117	-123	-125	-122	-124	-155	-168	-171	-187	-236	-709
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,427	11,103	11,271	10,992	11,201	11,168	11,228	11,223	11,045	11,195	11,987	11,843	11,806	10,261	10,190	10,151	11,825	10,299	10,936
Net Purchases	GWh	-1,233	-1,294	-791	-687	-151	59	251	237	282	466	331	-427	-344	-348	1,166	1,308	1,305	-390	1,195	624
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Tax Credit Extension](#)

20-Year NPV Revenue Requirement **\$6,666 million**
20-Year Carbon Emissions: **29.17 million tons**
20-Year Water Consumption: **11.37 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	443	413	240	242	238	226	223	216	156	159	159	157	162	164	171	169	163	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	320	320	400	400	400	400	400	400	400	400	400	400	400	400	526
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,242	1,251	1,298	1,295	1,287	1,380	1,383	1,395	1,402	1,393	1,385	1,376	1,368	1,400	2,142
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	1,058	956	956	956	956	956	1,356
Battery	MW	-	300	423	523	523	545	562	636	642	642	754	764	785	806	845	863	888	918	964	1,573
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,918	4,168	4,103	4,180	4,213	4,272	4,282	4,280	4,746	4,766	4,786	4,802	4,717	4,734	4,734	4,738	4,818	6,007

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,358	2,366	2,293	2,357	2,360	2,287	2,281	2,285	2,195	2,244	2,317	2,209	2,251	2,289	2,202	2,186
Coal	GWh	3,927	2,132	1,155	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,777	2,344	2,187	2,739	2,869	2,839	2,759	2,726	2,627	1,938	1,981	1,956	1,938	1,996	2,033	2,119	2,099	2,020	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,709	3,115	3,244	3,344	3,401	3,615	3,616	3,582	3,756	3,746	3,780	3,813	3,903	3,918	3,890	3,916	4,061	4,761
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	3,768	3,752	3,773	3,749	3,534	3,546	3,534	3,534	3,534	5,085
Battery	GWh	-	-44	-108	-120	-116	-121	-124	-143	-143	-141	-168	-170	-173	-179	-222	-243	-266	-297	-320	-740
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,428	11,103	11,277	10,992	11,234	11,249	11,427	11,445	11,257	12,301	12,353	12,229	12,206	12,112	12,081	12,077	12,032	11,993	11,808
Net Purchases	GWh	-1,233	-1,295	-792	-692	-151	26	170	38	59	253	-776	-793	-730	-747	-686	-583	-621	-597	-499	-248
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,609 million**
20-Year Carbon Emissions: **24.14 million tons**
20-Year Water Consumption: **10.19 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,044	2,113	2,187	2,253	2,338	2,405	2,439	2,460	2,469	2,486	2,509	2,526	2,538	2,545	2,573	2,584	2,603	2,646	2,670
PRM	%	12%	9%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	656	412	382	218	212	170	146	147	143	91	98	98	97	69	71	75	72	72	0

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	486
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,140	1,308	1,300	1,376	1,399	1,619	1,637	1,633	1,769	1,761	1,753	1,744	1,736	1,727	1,719	1,711	1,702	2,012
Wind	MW	658	658	658	658	658	658	1,058	1,058	1,058	1,058	1,458	1,458	1,458	1,458	1,756	1,756	1,756	1,756	1,756	1,756
Battery	MW	-	300	475	575	575	664	696	924	951	955	1,116	1,137	1,174	1,204	1,206	1,232	1,267	1,312	1,363	1,968
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,036	4,286	4,302	4,474	4,934	5,240	5,293	5,300	5,858	5,877	5,893	5,903	6,180	6,205	6,215	6,235	6,280	6,631

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,295	2,358	2,362	2,273	2,285	2,287	2,206	2,215	2,228	2,153	2,200	2,201	2,099	2,107	2,140	2,075	2,239
Coal	GWh	3,880	2,186	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,659	2,156	2,104	2,705	2,744	2,291	2,034	2,072	2,010	1,279	1,389	1,379	1,374	969	993	1,060	1,008	1,013	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	367
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,864	3,046	3,475	3,617	4,060	4,039	4,914	5,003	4,964	4,932	4,970	5,027	5,103	4,655	4,740	4,770	4,866	4,951	4,832
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	3,773	3,742	3,754	3,738	5,272	5,266	5,286	5,268	6,545	6,581	6,560	6,579	6,586	6,619
Battery	GWh	-	-44	-119	-131	-125	-144	-153	-205	-208	-211	-249	-275	-313	-351	-352	-388	-417	-470	-525	-734
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,905	11,364	11,245	11,543	11,320	11,797	12,826	13,404	13,572	13,402	14,175	14,336	14,230	14,236	14,602	14,645	14,628	14,614	14,595	13,833
Net Purchases	GWh	-1,120	-1,153	-613	-356	320	383	-149	-447	-476	-276	-1,005	-1,100	-1,029	-1,046	-1,414	-1,350	-1,350	-1,325	-1,216	-350
Total Supply	GWh	9,785	10,211	10,632	11,187	11,641	12,180	12,676	12,957	13,095	13,127	13,169	13,236	13,200	13,190	13,188	13,294	13,279	13,289	13,379	13,483

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,502 million**
20-Year Carbon Emissions: **26.17 million tons**
20-Year Water Consumption: **10.76 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,055	2,149	2,279	2,430	2,612	2,725	2,793	2,819	2,820	2,834	2,858	2,873	2,885	2,891	2,918	2,929	2,949	2,993	3,016
PRM	%	12%	9%	18%	26%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	656	383	354	216	221	143	114	117	114	84	91	91	89	91	94	100	95	75	1

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	640	640	640	640	640	640	640	640	640	766
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,104	1,722	1,697	1,829	1,871	1,889	1,913	1,902	1,891	1,891	1,931	1,963	1,952	1,941	1,930	1,918	1,907	1,996
Wind	MW	658	658	658	658	658	658	1,458	1,858	1,858	1,858	2,258	2,258	2,258	2,258	2,156	2,156	2,156	2,156	2,556	2,556
Battery	MW	-	300	532	799	800	943	996	1,025	1,061	1,061	1,061	1,073	1,123	1,167	1,213	1,239	1,274	1,321	1,329	1,955
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,057	4,923	4,844	5,206	6,107	6,572	6,639	6,635	7,004	7,023	7,100	7,165	7,084	7,106	7,113	7,132	7,531	7,682

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,276	2,354	2,359	2,251	2,278	2,281	2,203	2,219	2,234	2,150	2,189	2,239	2,132	2,149	2,190	2,012	2,172
Coal	GWh	3,880	2,194	1,156	1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	632	1,704	1,983	2,024	2,968	3,362	2,334	1,952	2,023	1,981	1,461	1,589	1,562	1,530	1,582	1,631	1,740	1,664	1,281	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	572
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	70	70	71
Solar	GWh	781	1,869	3,078	4,508	4,733	5,498	5,383	5,220	5,369	5,312	4,870	4,871	4,975	5,095	5,226	5,279	5,305	5,380	4,869	4,650
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	5,304	6,801	6,807	6,791	8,300	8,294	8,293	8,261	8,082	8,118	8,101	8,113	9,496	9,692
Battery	GWh	-	-45	-129	-186	-180	-210	-224	-232	-238	-240	-242	-245	-252	-266	-314	-345	-378	-428	-409	-526
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,906	11,421	11,091	12,407	12,640	13,784	15,650	16,653	16,906	16,741	17,335	17,502	17,426	17,451	17,399	17,435	17,464	17,409	17,743	17,070
Net Purchases	GWh	-1,119	-1,119	-179	-475	470	664	-288	-707	-716	-520	-1,071	-1,163	-1,131	-1,166	-1,116	-1,037	-1,091	-1,026	-1,270	-484
Total Supply	GWh	9,786	10,303	10,912	11,932	13,111	14,449	15,362	15,947	16,190	16,221	16,264	16,339	16,295	16,285	16,283	16,397	16,373	16,383	16,473	16,586

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,939 million**
20-Year Carbon Emissions: **24.30 million tons**
20-Year Water Consumption: **10.24 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	418	387	211	206	204	180	178	174	88	94	94	92	96	98	105	99	96	0

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	280	280	280	280	280	360	360	360	360	360	360	360	360	360	486
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,258	1,327	1,346	1,509	1,519	1,518	1,510	1,532	1,524	1,516	1,507	1,499	1,510	1,529	1,571	1,833
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,458	1,458	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356
Battery	MW	-	300	419	519	519	601	628	799	818	825	825	856	892	923	973	1,001	1,044	1,093	1,155	1,797
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,938	4,188	4,124	4,282	4,334	4,526	4,561	4,574	5,307	5,367	5,382	5,392	5,319	5,346	5,383	5,435	5,540	5,881

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,294	2,356	2,362	2,284	2,303	2,307	2,225	2,215	2,227	2,151	2,202	2,253	2,147	2,172	2,194	2,119	2,336
Coal	GWh	3,880	2,184	1,158	1,118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	2,099	1,939	2,453	2,488	2,486	2,234	2,228	2,171	1,117	1,197	1,199	1,182	1,224	1,255	1,343	1,272	1,243	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	2,819	3,209	3,358	3,758	3,843	4,508	4,556	4,531	3,744	3,801	3,846	3,915	4,059	4,106	4,163	4,287	4,446	4,489
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,203	2,223	2,207	5,242	5,221	5,253	5,244	5,049	5,072	5,057	5,059	5,053	5,086
Battery	GWh	-	-44	-106	-118	-113	-132	-138	-177	-180	-182	-186	-193	-230	-269	-322	-351	-381	-414	-445	-717
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,905	11,316	10,973	11,127	10,820	11,251	11,316	11,706	11,798	11,647	12,858	13,013	12,917	12,916	12,845	12,847	12,901	12,887	12,912	12,123
Net Purchases	GWh	-1,120	-1,191	-646	-504	82	94	214	-105	-129	53	-1,115	-1,207	-1,143	-1,152	-1,084	-983	-1,049	-1,025	-960	-71
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,306** million
20-Year Carbon Emissions: **26.87** million tons
20-Year Water Consumption: **10.75** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	414	386	209	216	214	215	211	208	113	125	128	128	133	135	143	138	138	1

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	280	360	360	520	520	520	600	640	640	640	640	640	640	640	640	766
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,122	1,290	1,282	1,273	1,290	1,282	1,286	1,283	1,274	1,266	1,258	1,249	1,241	1,254	1,260	1,252	1,288	1,735
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,458	1,458	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356
Battery	MW	-	300	417	517	517	521	546	546	559	564	564	564	581	613	664	690	726	768	817	1,516
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,961	4,210	4,146	4,228	4,276	4,286	4,310	4,318	5,050	5,089	5,085	5,096	5,023	5,070	5,096	5,112	5,200	5,782

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,292	2,355	2,364	2,290	2,354	2,355	2,283	2,241	2,259	2,183	2,245	2,316	2,197	2,225	2,277	2,190	2,344
Coal	GWh	3,880	2,184	1,157	1,111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	2,053	1,925	2,419	2,608	2,613	2,674	2,651	2,603	1,448	1,600	1,636	1,641	1,701	1,732	1,839	1,776	1,775	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	589
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	2,913	3,294	3,461	3,487	3,565	3,489	3,529	3,507	2,978	2,946	2,928	2,959	3,034	3,117	3,151	3,194	3,358	4,137
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	5,276	5,257	5,284	5,268	5,065	5,082	5,066	5,068	5,067	5,086
Battery	GWh	-	-44	-107	-118	-113	-115	-120	-120	-122	-123	-127	-126	-139	-172	-218	-232	-253	-298	-317	-595
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,904	11,316	11,020	11,188	10,889	11,119	11,188	11,235	11,300	11,172	12,542	12,695	12,588	12,583	12,482	12,515	12,574	12,507	12,569	12,070
Net Purchases	GWh	-1,120	-1,191	-693	-565	14	225	341	367	369	529	-799	-889	-814	-819	-721	-651	-722	-645	-616	-18
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [High Economic Growth](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,400 million**
20-Year Carbon Emissions: **29.24 million tons**
20-Year Water Consumption: **11.42 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,081	2,168	2,259	2,342	2,443	2,522	2,567	2,601	2,622	2,652	2,687	2,713	2,737	2,755	2,795	2,817	2,848	2,903	2,939
PRM	%	11%	7%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,046	661	377	286	259	242	243	247	240	240	219	88	91	98	95	102	106	104	102	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	360	360	360	520	520	560	600	600	600	600	600	600	600	600	600	726
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,291	1,392	1,425	1,417	1,456	1,447	1,603	1,759	1,838	1,834	1,931	2,001	2,032	2,033	2,141	3,949
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	553	653	686	808	909	947	994	994	1,159	1,159	1,206	1,250	1,297	1,335	1,384	1,443	1,506	2,382
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,073	4,323	4,403	4,634	4,775	4,822	4,915	4,953	5,174	5,736	5,850	5,878	5,907	6,023	6,085	6,128	6,301	8,423

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,296	2,359	2,366	2,293	2,363	2,364	2,294	2,332	2,262	2,166	2,224	2,263	2,140	2,163	2,185	2,109	2,169
Coal	GWh	3,950	2,156	1,152	1,050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	727	1,911	1,927	1,291	3,266	3,235	3,353	3,545	3,493	3,496	3,250	1,339	1,376	1,501	1,449	1,569	1,644	1,618	1,602	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,876	2,875	3,355	3,604	4,194	4,409	4,387	4,613	4,593	5,328	5,612	5,822	5,929	6,285	6,512	6,671	6,843	7,161	9,491
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,746	3,759	3,743	3,521	3,529	3,520	3,524	3,520	3,546
Battery	GWh	-	-44	-135	-144	-149	-174	-195	-203	-213	-209	-251	-257	-266	-324	-382	-436	-492	-566	-653	-1,424
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	514	548	477	419	424	439
Total Generation	GWh	11,080	11,597	10,823	10,534	11,846	12,396	12,700	12,930	13,143	13,077	13,620	13,462	13,554	13,715	13,720	13,933	14,054	14,094	14,234	14,381
Net Purchases	GWh	-1,192	-1,187	103	1,038	270	342	592	697	676	835	394	677	605	490	537	484	401	423	427	436
Total Supply	GWh	9,888	10,410	10,925	11,572	12,116	12,738	13,293	13,627	13,820	13,912	14,014	14,139	14,159	14,204	14,257	14,417	14,455	14,518	14,661	14,817

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [High Economic Growth](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$9,625 million**
20-Year Carbon Emissions: **33.57 million tons**
20-Year Water Consumption: **12.46 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,093	2,204	2,351	2,519	2,717	2,842	2,922	2,960	2,974	3,000	3,036	3,063	3,083	3,101	3,140	3,162	3,194	3,250	3,284
PRM	%	11%	7%	18%	25%	18%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	19%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,046	661	272	371	248	253	241	251	246	246	237	99	95	145	98	98	101	103	101	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	320	360	360	520	520	520	520	520	520	520	520	520	520	520	520	646
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,130	1,749	1,725	1,819	2,018	2,007	2,052	2,056	2,104	2,938	3,030	3,019	3,123	3,248	3,236	3,225	3,356	5,314
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	607	874	876	1,081	1,291	1,371	1,428	1,443	1,614	1,614	1,685	1,685	1,753	1,799	1,836	1,883	1,957	3,309
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,159	5,025	4,988	5,333	5,749	5,836	5,945	5,971	6,050	7,291	7,441	7,418	7,475	7,653	7,661	7,681	7,888	10,634

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,259	2,441	2,272	2,354	2,365	2,284	2,354	2,356	2,284	2,349	2,228	2,140	2,192	2,241	2,119	2,137	2,147	2,071	2,137
Coal	GWh	3,950	2,163	1,145	1,089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	729	1,956	819	2,370	3,468	3,913	3,922	4,333	4,336	4,320	4,233	1,862	1,770	2,696	1,856	1,867	1,932	1,972	1,944	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,879	3,212	4,680	4,888	5,501	6,561	6,563	6,826	6,869	7,194	8,638	8,913	8,920	9,273	9,535	9,635	9,788	10,125	12,965
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,647	3,668	3,652	3,439	3,433	3,436	3,456	3,452	3,546
Battery	GWh	-	-44	-146	-202	-196	-239	-285	-298	-309	-309	-431	-555	-646	-645	-741	-811	-857	-920	-1,026	-1,787
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,081	11,652	10,032	12,894	13,280	14,315	15,322	15,789	16,096	16,066	16,305	16,579	16,543	17,456	16,653	16,762	16,829	16,932	17,060	17,551
Net Purchases	GWh	-1,193	-1,150	1,173	-577	306	691	656	828	818	941	803	663	711	-157	699	758	720	680	695	369
Total Supply	GWh	9,889	10,502	11,205	12,317	13,586	15,007	15,978	16,617	16,914	17,007	17,109	17,242	17,254	17,299	17,351	17,520	17,549	17,612	17,755	17,920

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [High Economic Growth](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,511** million
20-Year Carbon Emissions: **30.30** million tons
20-Year Water Consumption: **11.67** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,047	661	443	414	252	255	255	255	248	247	218	164	137	152	104	104	113	127	118	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	320	360	360	520	520	560	560	560	560	560	560	560	560	560	560	686
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,230	1,221	1,213	1,230	1,222	1,408	1,399	1,459	1,463	1,532	1,613	1,639	1,641	1,745	3,485
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	493	593	593	666	713	731	759	759	963	963	1,031	1,081	1,130	1,167	1,217	1,272	1,328	2,224
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,988	4,238	4,213	4,330	4,374	4,402	4,454	4,492	4,743	5,142	5,257	5,298	5,301	5,426	5,485	5,526	5,688	7,760

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,295	2,359	2,367	2,296	2,366	2,367	2,296	2,342	2,324	2,225	2,289	2,334	2,193	2,228	2,264	2,163	2,171
Coal	GWh	3,950	2,154	1,156	1,112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,863	2,490	2,382	3,007	3,193	3,238	3,315	3,267	3,253	2,923	2,235	1,877	2,097	1,448	1,459	1,595	1,802	1,672	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	2,748	3,188	3,290	3,326	3,304	3,276	3,389	3,370	4,287	4,095	4,337	4,418	4,766	5,108	5,242	5,359	5,764	8,266
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,544	3,533	3,534	3,532	3,546
Battery	GWh	-	-44	-123	-135	-131	-144	-152	-158	-164	-160	-208	-212	-224	-264	-323	-376	-424	-481	-567	-1,308
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,083	11,544	11,275	11,528	11,292	11,517	11,525	11,637	11,746	11,661	12,305	12,955	12,688	12,933	12,342	12,546	12,722	12,968	13,060	13,211
Net Purchases	GWh	-1,196	-1,220	-655	-520	86	386	620	636	647	825	283	-247	45	-155	488	440	306	123	174	176
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [High Economic Growth](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,942 million**
20-Year Carbon Emissions: **27.67 million tons**
20-Year Water Consumption: **11.05 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,047	661	443	414	252	248	249	248	243	241	237	70	74	75	77	79	86	80	80	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen	MW	-	-	160	160	320	360	360	520	520	560	640	640	640	640	640	640	640	640	640	766
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,267	1,258	1,250	1,269	1,261	1,301	1,410	1,489	1,481	1,582	1,671	1,688	1,690	1,805	3,069
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	493	593	593	659	706	724	752	752	831	831	866	912	959	996	1,046	1,101	1,159	1,878
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,988	4,238	4,213	4,360	4,404	4,432	4,486	4,524	4,584	5,100	5,201	5,227	5,260	5,393	5,443	5,484	5,658	7,078

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,296	2,359	2,367	2,295	2,365	2,365	2,295	2,356	2,312	2,208	2,275	2,306	2,167	2,200	2,233	2,134	2,244
Coal	GWh	3,950	2,154	1,156	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,863	2,490	2,383	3,007	3,111	3,152	3,232	3,188	3,171	3,171	950	1,002	1,023	1,066	1,093	1,202	1,120	1,130	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	2,748	3,188	3,290	3,511	3,494	3,459	3,580	3,561	3,773	4,066	4,362	4,421	4,855	5,176	5,291	5,419	5,815	7,404
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,772	3,751	3,532	3,541	3,530	3,533	3,530	3,546
Battery	GWh	-	-44	-123	-135	-131	-144	-153	-158	-164	-161	-195	-217	-262	-320	-381	-432	-489	-558	-638	-1,201
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,083	11,544	11,275	11,531	11,291	11,620	11,628	11,735	11,857	11,769	12,066	11,624	11,781	11,792	11,962	12,164	12,281	12,237	12,467	12,626
Net Purchases	GWh	-1,196	-1,220	-655	-523	86	283	517	537	536	717	522	1,085	952	986	869	823	747	854	767	761
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Low Economic Growth](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$6,799 million**
20-Year Carbon Emissions: **26.27 million tons**
20-Year Water Consumption: **10.68 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,013	2,063	2,117	2,165	2,231	2,281	2,297	2,297	2,282	2,277	2,279	2,271	2,256	2,238	2,244	2,232	2,227	2,245	2,248
PRM	%	13%	11%	18%	20%	19%	18%	18%	18%	18%	19%	18%	19%	19%	19%	19%	19%	19%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,021	648	442	351	255	250	252	242	237	233	215	109	53	154	60	58	56	102	62	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	320	360	360	440	440	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,276	1,267	1,277	1,269	1,310	1,345	1,337	1,328	1,376	2,021
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	419	519	519	538	594	689	689	689	787	787	787	787	787	787	787	787	800	1,441
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	155	142	130	117	124	107	90	92	95
Total Capacity	MW	3,187	3,672	3,914	4,163	4,139	4,192	4,247	4,270	4,269	4,267	4,315	4,698	4,695	4,675	4,600	4,643	4,618	4,593	4,655	5,379

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,293	2,357	2,366	2,296	2,367	2,367	2,296	2,356	2,349	2,266	2,317	2,364	2,218	2,248	2,273	2,160	2,335
Coal	GWh	3,780	2,044	1,152	1,086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,804	2,359	1,687	2,926	3,000	3,124	3,120	3,079	2,986	2,776	1,428	668	1,964	758	730	704	1,275	762	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	202
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,858	2,689	3,098	3,225	3,235	3,237	3,244	3,218	3,201	3,618	3,429	3,449	3,421	3,571	3,705	3,638	3,620	3,747	4,594
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,545	3,533	3,534	3,528	3,546
Battery	GWh	-	-44	-108	-117	-116	-120	-130	-151	-149	-149	-173	-173	-171	-173	-175	-176	-175	-176	-178	-613
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	684	623	566	509	544	473	415	420	435
Total Generation	GWh	10,831	11,354	11,095	10,732	11,158	11,256	11,367	11,418	11,401	11,237	11,539	11,541	10,682	11,919	10,632	10,637	10,491	11,010	10,510	10,569
Net Purchases	GWh	-1,138	-1,318	-747	62	-18	315	613	761	833	941	595	571	1,304	-34	1,159	1,169	1,208	607	1,105	1,054
Total Supply	GWh	9,693	10,036	10,348	10,794	11,140	11,571	11,980	12,179	12,234	12,179	12,134	12,112	11,986	11,885	11,792	11,806	11,699	11,618	11,615	11,623

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Low Economic Growth](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,703 million**
20-Year Carbon Emissions: **30.61 million tons**
20-Year Water Consumption: **11.74 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,025	2,099	2,210	2,342	2,505	2,601	2,652	2,662	2,646	2,639	2,636	2,623	2,606	2,585	2,589	2,577	2,573	2,592	2,593
PRM	%	13%	10%	18%	28%	18%	18%	18%	18%	18%	19%	18%	20%	20%	20%	20%	20%	20%	19%	19%	18%
Carbon Intensity	lbs/MWh	1,022	648	279	398	250	264	269	247	244	242	217	87	86	112	90	93	116	125	93	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	360	360	440	440	440	440	440	440	440	440	440	440	440	440	566
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,023	1,641	1,615	1,604	1,647	1,758	1,754	1,743	1,882	2,206	2,254	2,243	2,275	2,350	2,339	2,328	2,360	3,027
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	474	741	741	816	933	1,102	1,110	1,110	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,278	1,922
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	155	142	130	117	124	107	90	92	95
Total Capacity	MW	3,187	3,672	3,919	4,785	4,663	4,854	5,020	5,238	5,249	5,244	5,393	6,110	6,145	6,121	6,039	6,121	6,093	6,065	6,118	6,866

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,253	2,442	2,271	2,351	2,366	2,296	2,364	2,364	2,295	2,342	2,199	2,122	2,172	2,209	2,074	2,097	2,117	2,033	2,306
Coal	GWh	3,782	2,048	1,146	1,098	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	652	1,845	728	2,358	3,199	3,705	4,005	3,898	3,894	3,814	3,443	1,420	1,391	1,791	1,447	1,483	1,830	1,959	1,466	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	426
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,864	2,655	4,095	4,269	4,345	4,602	5,234	5,253	5,227	5,880	6,546	6,587	6,577	6,613	6,680	6,635	6,602	6,652	7,419
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,684	3,673	3,650	3,425	3,390	3,376	3,378	3,357	3,545
Battery	GWh	-	-45	-118	-174	-168	-184	-203	-245	-243	-241	-283	-287	-283	-288	-285	-284	-286	-288	-308	-933
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	684	623	566	509	544	473	415	420	435
Total Generation	GWh	10,832	11,406	9,415	12,333	12,417	13,008	13,539	14,090	14,155	13,998	14,343	14,317	14,183	14,538	13,988	13,957	14,194	14,255	13,691	13,269
Net Purchases	GWh	-1,138	-1,277	1,213	-794	193	831	1,127	1,079	1,173	1,276	885	898	897	442	898	952	599	458	1,019	1,457
Total Supply	GWh	9,694	10,128	10,628	11,539	12,610	13,840	14,666	15,169	15,328	15,273	15,228	15,215	15,080	14,980	14,886	14,909	14,794	14,712	14,710	14,726

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Low Economic Growth](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,084 million**
20-Year Carbon Emissions: **24.33 million tons**
20-Year Water Consumption: **10.25 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	22%	18%	18%	18%	18%	18%	19%	18%	18%	19%	18%	18%	19%	19%	18%	19%	19%
Carbon Intensity	lbs/MWh	1,021	649	450	430	238	231	228	214	210	202	181	60	52	162	58	53	107	153	57	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	366
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,291	1,377	1,422	1,413	1,429	1,481	1,473	1,465	1,485	1,819
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	359	459	486	550	554	708	708	708	821	821	834	834	854	872	872	872	900	1,457
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,854	4,104	3,986	4,044	4,046	4,050	4,048	4,046	4,125	4,217	4,262	4,242	4,163	4,240	4,214	4,189	4,240	5,008

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,287	2,351	2,364	2,292	2,364	2,364	2,292	2,340	2,311	2,204	2,250	2,301	2,154	2,177	2,194	2,115	2,302
Coal	GWh	3,780	2,040	1,149	1,108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,766	2,294	2,185	2,557	2,583	2,563	2,460	2,414	2,298	2,088	701	602	1,817	660	610	1,187	1,679	640	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73
Geothermal	GWh	71	70	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,631	2,976	3,131	3,176	3,131	3,166	3,132	3,115	3,522	3,816	3,936	3,927	4,003	4,156	4,102	4,081	4,143	3,895
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,998	1,998	1,998	3,546
Battery	GWh	-	-44	-94	-106	-109	-122	-123	-157	-154	-153	-181	-183	-184	-187	-203	-225	-223	-226	-261	-585
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,832	11,305	10,983	11,135	10,697	10,776	10,702	10,671	10,644	10,455	10,729	9,618	9,497	10,666	9,344	9,318	9,789	10,217	9,129	9,740
Net Purchases	GWh	-1,140	-1,354	-940	-905	-295	-40	131	153	164	298	-22	1,064	1,063	-207	1,021	1,057	484	-25	1,060	453
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Technology Neutral](#)
Future: [Low Economic Growth](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,262 million**
20-Year Carbon Emissions: **27.53 million tons**
20-Year Water Consumption: **10.89 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	22%	18%	19%	19%	18%	18%	19%	18%	19%	19%	19%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,021	649	450	430	240	235	233	223	220	215	215	158	156	155	161	159	157	150	140	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	160	160	240	320	320	440	440	440	560	560	560	560	560	560	560	560	560	686
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,136	1,128	1,119	1,111	1,427
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	359	459	459	459	459	459	459	459	459	459	459	459	459	459	461	469	484	1,044
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	96	120	124	127	134	137	141	146	134	121	109	96	104	90	76	80	87
Total Capacity	MW	3,187	3,672	3,854	4,101	3,997	4,068	4,063	4,032	4,027	4,022	3,993	4,373	4,352	4,331	4,208	4,207	4,186	4,172	4,183	4,498

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,287	2,350	2,362	2,289	2,359	2,358	2,288	2,346	2,311	2,232	2,282	2,344	2,222	2,246	2,277	2,195	2,349
Coal	GWh	3,780	2,040	1,149	1,106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,766	2,294	2,196	2,576	2,631	2,625	2,569	2,528	2,440	2,457	1,823	1,762	1,746	1,797	1,764	1,734	1,647	1,534	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	241
Geothermal	GWh	71	70	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,631	2,977	3,120	3,137	3,089	3,057	3,017	2,990	2,918	2,620	2,578	2,566	2,543	2,523	2,459	2,437	2,392	2,962
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,752	3,773	3,749	3,533	3,544	3,532	3,532	3,532	3,546
Battery	GWh	-	-44	-94	-106	-103	-103	-103	-105	-104	-104	-104	-107	-105	-104	-104	-105	-105	-107	-110	-433
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	365	454	470	486	519	533	547	569	580	520	463	406	440	386	344	362	392
Total Generation	GWh	10,832	11,305	10,983	11,133	10,696	10,772	10,694	10,673	10,626	10,439	10,491	11,049	10,830	10,771	10,589	10,458	10,322	10,202	9,975	9,127
Net Purchases	GWh	-1,140	-1,354	-940	-903	-294	-36	139	151	181	313	216	-368	-271	-312	-224	-83	-49	-11	214	1,066
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,842 million**
20-Year Carbon Emissions: **27.33 million tons**
20-Year Water Consumption: **11.24 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,047	2,113	2,183	2,247	2,328	2,390	2,420	2,431	2,428	2,438	2,454	2,459	2,458	2,452	2,468	2,470	2,479	2,512	2,527
PRM	%	12%	9%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	21%
Carbon Intensity	lbs/MWh	1,049	659	432	403	239	221	209	203	189	183	155	80	69	147	94	67	151	151	102	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,299	1,402	1,492	1,484	1,588	1,580	1,830	2,010	2,086	2,077	2,113	2,203	2,195	2,186	2,282	4,209
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	659	759	944	1,071	1,170	1,349	1,349	1,349	1,509	1,517	1,538	1,552	1,580	1,590	1,614	1,646	1,683	2,720
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,019	4,269	4,310	4,546	4,742	4,771	4,882	4,880	5,151	5,346	5,430	5,423	5,372	5,480	5,478	5,485	5,619	8,294

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,296	2,360	2,366	2,291	2,363	2,359	2,287	2,280	2,244	2,157	2,203	2,259	2,131	2,152	2,166	2,085	2,042
Coal	GWh	3,927	2,135	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,821	2,374	2,332	2,866	2,778	2,702	2,729	2,560	2,455	2,117	1,101	924	1,982	1,266	916	2,028	2,023	1,383	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	70	71	71	71	71	71	71
Solar	GWh	785	1,871	2,888	3,368	3,675	4,271	4,767	4,767	5,280	5,252	6,238	6,615	6,691	6,683	6,872	6,977	6,999	7,091	7,272	9,125
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,211	2,235	2,215	1,996	2,000	1,996	1,996	1,993	3,533
Battery	GWh	-	-44	-151	-167	-195	-224	-250	-285	-289	-286	-330	-336	-336	-344	-384	-398	-428	-470	-519	-1,213
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,480	11,273	11,629	11,472	11,966	12,350	12,413	12,796	12,611	13,266	12,594	12,370	13,380	12,593	12,244	13,295	13,297	12,708	13,997
Net Purchases	GWh	-1,233	-1,261	-656	-480	108	129	217	408	135	326	-314	396	555	-495	260	684	-413	-435	212	-1,007
Total Supply	GWh	9,787	10,219	10,617	11,148	11,580	12,095	12,566	12,820	12,931	12,937	12,952	12,990	12,925	12,885	12,853	12,928	12,882	12,861	12,920	12,990

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 reflects roundtrip losses

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,974 million**
20-Year Carbon Emissions: **29.71 million tons**
20-Year Water Consumption: **11.94 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,059	2,149	2,276	2,423	2,602	2,711	2,774	2,796	2,793	2,798	2,809	2,809	2,808	2,801	2,815	2,815	2,825	2,859	2,873
PRM	%	12%	9%	18%	27%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%	19%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	415	358	224	210	210	166	161	154	134	126	80	133	109	113	115	117	120	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,153	1,771	1,745	1,958	2,051	2,040	2,112	2,121	2,457	2,471	2,567	2,556	2,598	2,670	2,659	2,648	2,763	6,234
Wind	MW	658	658	658	658	658	658	658	1,058	1,058	1,058	1,058	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	710	977	1,091	1,370	1,519	1,696	1,712	1,712	1,839	1,844	1,859	1,873	1,891	1,948	1,948	1,956	1,995	3,964
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,125	4,991	4,903	5,401	5,650	6,074	6,169	6,184	6,508	6,534	6,632	6,623	6,568	6,704	6,676	6,657	6,813	11,563

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,440	2,268	2,355	2,359	2,285	2,343	2,335	2,257	2,247	2,243	2,154	2,208	2,256	2,133	2,154	2,166	2,085	2,007
Coal	GWh	3,928	2,145	1,154	1,089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,858	2,314	2,065	2,969	3,043	3,163	2,717	2,670	2,539	2,230	2,127	1,344	2,200	1,813	1,873	1,910	1,942	1,969	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,875	3,330	4,777	5,014	6,196	6,741	6,637	6,974	6,998	7,963	7,973	8,094	8,105	8,259	8,509	8,449	8,462	8,678	12,854
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	3,744	3,758	3,743	3,755	3,734	3,740	3,729	3,504	3,510	3,506	3,503	3,486	3,519
Battery	GWh	-	-44	-166	-224	-241	-304	-335	-373	-375	-373	-413	-414	-430	-454	-471	-552	-546	-557	-616	-1,508
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	514	548	477	419	424	439
Total Generation	GWh	11,019	11,530	11,633	12,661	12,863	14,069	14,693	15,703	16,026	15,859	16,509	16,423	15,599	16,430	15,945	16,093	16,021	16,006	16,096	17,382
Net Purchases	GWh	-1,232	-1,220	-736	-767	186	295	559	107	-0	172	-463	-329	420	-450	2	-62	-45	-50	-81	-1,288
Total Supply	GWh	9,788	10,310	10,897	11,894	13,049	14,363	15,252	15,810	16,026	16,031	16,046	16,093	16,020	15,980	15,947	16,031	15,976	15,956	16,015	16,093

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Growth](#)

20-Year NPV Revenue Requirement **\$6,408 million**
20-Year Carbon Emissions: **25.62 million tons**
20-Year Water Consumption: **10.76 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,957	1,997	2,010	2,026	2,048	2,103	2,112	2,109	2,108	2,100	2,104	2,111	2,107	2,100	2,090	2,101	2,094	2,090	2,109	2,118
PRM	%	13%	12%	18%	23%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,051	660	434	402	224	228	224	212	211	199	174	177	47	169	113	50	171	172	90	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,336	1,330	1,359	1,350	1,364	1,417	1,408	1,400	1,447	2,551
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	521	621	696	766	770	914	914	914	1,072	1,075	1,088	1,095	1,128	1,129	1,142	1,159	1,178	2,072
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,856	4,105	3,996	4,060	4,063	4,056	4,054	4,052	4,221	4,224	4,253	4,240	4,171	4,232	4,220	4,211	4,280	5,988

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,252	3,256	2,442	2,293	2,358	2,366	2,294	2,365	2,366	2,294	2,343	2,353	2,263	2,323	2,379	2,237	2,277	2,301	2,201	2,147
Coal	GWh	3,903	2,113	1,157	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	660	1,691	2,130	1,931	2,434	2,556	2,504	2,429	2,419	2,266	2,005	2,029	536	1,906	1,279	561	1,897	1,893	998	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	784	1,855	2,721	3,119	3,264	3,283	3,254	3,236	3,212	3,188	3,868	3,857	3,945	3,908	4,012	4,217	4,162	4,165	4,344	5,693
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,242	2,217	2,000	2,006	2,000	2,000	1,999	3,533
Battery	GWh	-	-44	-126	-140	-149	-163	-164	-193	-193	-190	-228	-231	-236	-236	-255	-266	-278	-297	-320	-883
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,961	11,311	10,884	11,004	10,673	10,817	10,728	10,675	10,692	10,461	10,949	10,981	9,448	10,759	9,999	9,374	10,605	10,551	9,718	11,000
Net Purchases	GWh	-1,272	-1,368	-855	-793	-293	-106	79	124	93	272	-257	-309	1,109	-295	381	1,027	-298	-314	528	-738
Total Supply	GWh	9,690	9,943	10,029	10,212	10,380	10,711	10,807	10,799	10,785	10,733	10,692	10,672	10,557	10,464	10,380	10,400	10,308	10,237	10,246	10,262

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Growth](#)

20-Year NPV Revenue Requirement **\$7,760 million**
20-Year Carbon Emissions: **26.49 million tons**
20-Year Water Consumption: **11.05 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,995	2,073	2,121	2,170	2,223	2,311	2,344	2,366	2,388	2,405	2,428	2,455	2,471	2,482	2,494	2,527	2,541	2,559	2,601	2,631
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,047	661	432	400	236	234	225	217	211	187	157	73	61	144	87	83	93	103	89	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,287	1,298	1,331	1,322	1,347	1,465	1,695	1,879	1,977	1,968	2,044	2,143	2,149	2,144	2,278	4,120
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	671	771	916	1,024	1,069	1,239	1,257	1,263	1,491	1,522	1,554	1,584	1,634	1,663	1,703	1,746	1,793	2,715
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,031	4,281	4,270	4,396	4,480	4,499	4,549	4,679	4,998	5,220	5,337	5,346	5,357	5,493	5,521	5,542	5,725	8,201

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,295	2,360	2,367	2,295	2,367	2,367	2,291	2,308	2,264	2,161	2,214	2,262	2,134	2,157	2,174	2,092	2,049
Coal	GWh	3,950	2,156	1,158	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	728	1,869	2,365	2,228	2,771	2,867	2,784	2,771	2,722	2,409	2,070	977	796	1,890	1,154	1,105	1,250	1,392	1,200	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,874	2,890	3,354	3,601	3,720	3,916	3,904	4,055	4,661	5,663	6,212	6,395	6,433	6,654	6,851	6,957	7,093	7,356	8,908
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,212	2,238	2,216	1,997	2,000	1,995	1,996	1,994	3,536
Battery	GWh	-	-44	-154	-170	-192	-211	-224	-256	-259	-266	-323	-335	-340	-352	-359	-400	-446	-503	-566	-1,158
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	514	548	477	419	424	439
Total Generation	GWh	11,081	11,553	11,263	11,508	11,306	11,518	11,610	11,624	11,772	11,998	12,678	12,089	11,948	13,042	12,291	12,310	12,460	12,643	12,570	13,844
Net Purchases	GWh	-1,193	-1,221	-659	-538	10	299	425	512	457	298	-308	373	510	-569	204	311	171	21	205	-950
Total Supply	GWh	9,888	10,332	10,605	10,970	11,316	11,818	12,035	12,136	12,229	12,296	12,370	12,463	12,458	12,473	12,495	12,621	12,631	12,664	12,776	12,895

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low BTM PV](#)

20-Year NPV Revenue Requirement **\$7,081** million
20-Year Carbon Emissions: **25.63** million tons
20-Year Water Consumption: **10.81** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,977	2,039	2,073	2,108	2,146	2,217	2,240	2,252	2,264	2,270	2,282	2,299	2,304	2,304	2,302	2,321	2,325	2,332	2,363	2,382
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	661	433	402	219	224	221	211	211	201	168	73	57	149	93	83	71	142	101	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,317	1,305	1,296	1,288	1,279	1,271	1,481	1,610	1,679	1,671	1,715	1,782	1,778	1,769	1,869	3,238
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	609	709	819	900	921	1,078	1,086	1,086	1,305	1,313	1,341	1,358	1,406	1,418	1,445	1,475	1,508	2,300
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,944	4,193	4,203	4,278	4,297	4,304	4,310	4,309	4,599	4,742	4,826	4,822	4,801	4,887	4,892	4,897	5,031	6,903

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,296	2,357	2,366	2,295	2,366	2,366	2,296	2,345	2,314	2,203	2,261	2,305	2,163	2,198	2,234	2,125	2,114
Coal	GWh	3,928	2,138	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	693	1,781	2,263	2,105	2,494	2,643	2,619	2,573	2,587	2,464	2,103	923	694	1,850	1,160	1,031	882	1,765	1,252	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,868	2,768	3,213	3,705	3,729	3,707	3,695	3,674	3,654	4,673	5,191	5,401	5,406	5,622	5,831	5,839	5,873	6,171	7,306
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,536
Battery	GWh	-	-44	-142	-157	-175	-190	-195	-225	-226	-222	-278	-286	-292	-311	-323	-343	-372	-410	-453	-993
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,022	11,439	11,051	11,257	11,147	11,323	11,266	11,246	11,288	11,095	11,803	11,114	10,945	12,064	11,349	11,305	11,093	11,952	11,588	12,472
Net Purchases	GWh	-1,231	-1,293	-717	-641	-266	-16	209	284	290	497	-188	545	661	-489	202	326	504	-366	65	-744
Total Supply	GWh	9,790	10,146	10,334	10,615	10,880	11,307	11,475	11,530	11,578	11,592	11,616	11,659	11,606	11,575	11,551	11,632	11,597	11,586	11,653	11,728

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High BTM PV](#)

20-Year NPV Revenue Requirement **\$6,970 million**
20-Year Carbon Emissions: **25.41 million tons**
20-Year Water Consumption: **10.74 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,974	2,030	2,058	2,088	2,125	2,194	2,214	2,221	2,229	2,232	2,242	2,260	2,265	2,268	2,267	2,287	2,289	2,294	2,323	2,340
PRM	%	12%	10%	18%	22%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	435	403	223	226	223	213	211	202	170	70	52	153	94	65	89	156	81	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,291	1,284	1,275	1,267	1,263	1,254	1,455	1,566	1,628	1,619	1,653	1,724	1,716	1,707	1,795	3,104
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	588	688	794	873	889	1,042	1,046	1,046	1,255	1,266	1,296	1,315	1,365	1,378	1,402	1,430	1,460	2,348
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,923	4,172	4,151	4,231	4,245	4,247	4,254	4,252	4,523	4,651	4,730	4,728	4,697	4,788	4,787	4,790	4,910	6,818

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,357	2,366	2,294	2,365	2,367	2,294	2,338	2,312	2,204	2,260	2,309	2,162	2,199	2,228	2,123	2,124
Coal	GWh	3,924	2,133	1,158	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,769	2,255	2,086	2,511	2,640	2,611	2,560	2,552	2,432	2,088	862	627	1,856	1,147	790	1,082	1,876	982	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	784	1,864	2,757	3,190	3,561	3,612	3,588	3,573	3,573	3,552	4,505	4,937	5,119	5,119	5,307	5,514	5,498	5,526	5,777	7,042
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,531
Battery	GWh	-	-44	-139	-154	-170	-185	-189	-219	-220	-217	-269	-277	-284	-305	-324	-343	-368	-404	-443	-1,079
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,017	11,418	11,035	11,217	11,026	11,208	11,144	11,116	11,158	10,964	11,624	10,807	10,606	11,789	11,022	10,747	10,957	11,715	10,931	12,128
Net Purchases	GWh	-1,237	-1,300	-748	-666	-228	-2	212	276	264	454	-200	642	772	-461	263	601	338	-449	383	-757
Total Supply	GWh	9,780	10,118	10,287	10,550	10,797	11,206	11,356	11,392	11,422	11,418	11,424	11,448	11,378	11,328	11,286	11,348	11,296	11,266	11,315	11,371

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [No Incremental BTM PV](#)

20-Year NPV Revenue Requirement **\$7,326 million**
20-Year Carbon Emissions: **25.62 million tons**
20-Year Water Consumption: **10.82 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,995	2,065	2,107	2,149	2,195	2,273	2,300	2,314	2,329	2,337	2,351	2,369	2,375	2,379	2,380	2,403	2,407	2,413	2,444	2,464
PRM	%	11%	8%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,047	659	427	396	223	227	224	216	213	199	164	68	49	140	78	78	66	130	95	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,307	1,294	1,286	1,277	1,284	1,308	1,522	1,718	1,791	1,783	1,833	1,920	1,924	1,915	2,020	3,418
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	651	751	880	969	995	1,156	1,171	1,171	1,394	1,399	1,432	1,452	1,499	1,516	1,542	1,571	1,605	2,303
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,011	4,261	4,254	4,337	4,361	4,372	4,400	4,430	4,728	4,937	5,030	5,029	5,012	5,122	5,135	5,139	5,279	7,086

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,254	3,258	2,442	2,295	2,359	2,367	2,296	2,367	2,367	2,296	2,347	2,305	2,198	2,249	2,299	2,157	2,187	2,220	2,118	2,105
Coal	GWh	3,941	2,149	1,158	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	710	1,804	2,249	2,098	2,578	2,730	2,710	2,691	2,668	2,491	2,103	874	615	1,785	1,003	989	843	1,677	1,224	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,875	2,887	3,345	3,691	3,695	3,672	3,660	3,716	3,868	4,939	5,701	5,916	5,948	6,203	6,456	6,498	6,549	6,839	7,667
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,536
Battery	GWh	-	-44	-148	-165	-183	-198	-204	-232	-233	-232	-293	-304	-313	-335	-369	-396	-425	-460	-505	-895
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,055	11,483	11,149	11,375	11,211	11,369	11,313	11,324	11,405	11,326	12,056	11,549	11,354	12,504	11,719	11,831	11,651	12,476	12,169	12,923
Net Purchases	GWh	-1,211	-1,257	-711	-632	-180	112	357	424	411	524	-163	407	566	-597	181	167	329	-492	-102	-765
Total Supply	GWh	9,843	10,226	10,438	10,743	11,031	11,481	11,671	11,747	11,815	11,850	11,893	11,956	11,921	11,907	11,900	11,999	11,980	11,984	12,067	12,157

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Electric Vehicles](#)

20-Year NPV Revenue Requirement **\$7,127 million**
20-Year Carbon Emissions: **25.64 million tons**
20-Year Water Consumption: **10.80 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,036	2,068	2,101	2,140	2,213	2,237	2,249	2,263	2,270	2,284	2,303	2,314	2,322	2,329	2,355	2,364	2,377	2,413	2,438
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	434	402	221	226	222	213	213	203	170	73	58	150	84	79	68	150	99	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,306	1,293	1,285	1,276	1,268	1,261	1,475	1,619	1,693	1,685	1,733	1,812	1,810	1,802	1,911	3,384
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	602	702	812	896	917	1,076	1,085	1,087	1,309	1,320	1,359	1,386	1,438	1,459	1,492	1,529	1,569	2,364
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,937	4,186	4,185	4,262	4,282	4,290	4,298	4,300	4,596	4,758	4,859	4,865	4,850	4,958	4,971	4,983	5,135	7,113

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,357	2,366	2,295	2,365	2,367	2,296	2,345	2,308	2,197	2,254	2,300	2,160	2,194	2,225	2,122	2,095
Coal	GWh	3,928	2,133	1,159	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,782	2,262	2,101	2,504	2,663	2,629	2,595	2,606	2,479	2,116	917	708	1,858	1,052	977	849	1,860	1,232	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,764	3,206	3,645	3,668	3,645	3,632	3,610	3,602	4,636	5,205	5,430	5,430	5,683	5,926	5,957	6,019	6,335	7,520
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,539
Battery	GWh	-	-44	-141	-156	-174	-189	-194	-225	-225	-222	-279	-288	-297	-305	-340	-373	-409	-454	-507	-1,019
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,021	11,434	11,047	11,246	11,099	11,283	11,214	11,206	11,245	11,057	11,778	11,115	10,977	12,095	11,279	11,315	11,137	12,139	11,675	12,645
Net Purchases	GWh	-1,231	-1,294	-725	-646	-237	4	241	306	319	526	-165	549	643	-496	308	365	521	-479	67	-813
Total Supply	GWh	9,790	10,140	10,322	10,600	10,862	11,287	11,455	11,512	11,564	11,583	11,613	11,664	11,620	11,599	11,587	11,680	11,658	11,660	11,742	11,832

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Electric Vehicles](#)

20-Year NPV Revenue Requirement **\$6,953** million
20-Year Carbon Emissions: **25.93** million tons
20-Year Water Consumption: **10.87** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,034	2,065	2,096	2,131	2,201	2,221	2,228	2,237	2,239	2,246	2,258	2,257	2,254	2,252	2,269	2,268	2,269	2,293	2,308
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	434	402	223	228	224	213	211	202	170	69	51	153	126	57	145	157	86	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,288	1,276	1,267	1,271	1,267	1,258	1,453	1,558	1,622	1,614	1,644	1,702	1,694	1,685	1,764	2,987
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	597	697	803	882	899	1,055	1,059	1,059	1,263	1,263	1,280	1,293	1,339	1,353	1,374	1,396	1,424	2,291
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,932	4,181	4,158	4,232	4,247	4,264	4,271	4,269	4,528	4,640	4,708	4,701	4,663	4,741	4,736	4,734	4,843	6,644

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,296	2,357	2,367	2,296	2,366	2,367	2,295	2,343	2,319	2,208	2,264	2,313	2,172	2,206	2,234	2,127	2,142
Coal	GWh	3,926	2,136	1,158	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,770	2,255	2,085	2,524	2,678	2,639	2,570	2,560	2,435	2,096	858	615	1,859	1,535	696	1,744	1,883	1,039	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,761	3,200	3,558	3,574	3,549	3,600	3,600	3,578	4,512	4,934	5,119	5,111	5,284	5,455	5,428	5,445	5,673	6,846
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,529
Battery	GWh	-	-44	-140	-155	-171	-186	-190	-221	-221	-218	-269	-275	-280	-296	-310	-318	-342	-370	-397	-1,028
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,017	11,424	11,038	11,227	11,035	11,208	11,134	11,153	11,192	10,994	11,643	10,809	10,600	11,796	11,406	10,628	11,583	11,681	10,936	12,000
Net Purchases	GWh	-1,234	-1,296	-735	-655	-211	29	255	272	262	454	-193	661	793	-459	-119	711	-304	-442	342	-678
Total Supply	GWh	9,783	10,128	10,303	10,572	10,824	11,237	11,389	11,425	11,454	11,448	11,450	11,470	11,394	11,337	11,287	11,340	11,279	11,239	11,278	11,322

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 reflects roundtrip losses

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Building Electrification](#)

20-Year NPV Revenue Requirement **\$7,263** million
20-Year Carbon Emissions: **25.52** million tons
20-Year Water Consumption: **10.76** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,072	2,110	2,152	2,229	2,256	2,271	2,287	2,296	2,312	2,331	2,339	2,346	2,352	2,378	2,385	2,396	2,429	2,452
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	21%
Carbon Intensity	lbs/MWh	1,049	660	434	402	218	224	221	212	211	202	168	71	55	147	79	70	72	146	86	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,326	1,313	1,305	1,296	1,289	1,286	1,502	1,682	1,763	1,755	1,811	1,898	1,890	1,882	1,999	3,946
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	607	707	826	914	940	1,102	1,114	1,120	1,345	1,354	1,387	1,413	1,465	1,485	1,516	1,550	1,587	2,587
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,942	4,192	4,219	4,301	4,325	4,336	4,347	4,357	4,659	4,855	4,957	4,961	4,955	5,070	5,076	5,085	5,240	7,899

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,296	2,355	2,367	2,295	2,366	2,366	2,295	2,340	2,290	2,184	2,233	2,280	2,146	2,171	2,196	2,105	2,030
Coal	GWh	3,927	2,133	1,158	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,775	2,271	2,116	2,488	2,661	2,640	2,600	2,606	2,491	2,117	905	690	1,841	999	877	909	1,833	1,088	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,765	3,208	3,743	3,770	3,749	3,737	3,724	3,733	4,766	5,425	5,635	5,643	5,876	6,071	6,120	6,187	6,441	8,195
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,240	2,217	1,998	2,003	1,998	1,999	1,996	3,518
Battery	GWh	-	-44	-142	-157	-177	-194	-199	-232	-231	-230	-287	-297	-303	-313	-333	-364	-397	-443	-491	-1,150
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,427	11,056	11,264	11,175	11,379	11,324	11,309	11,351	11,192	11,898	11,296	11,144	12,262	11,403	11,353	11,349	12,262	11,634	13,103
Net Purchases	GWh	-1,233	-1,294	-716	-622	-249	-8	232	319	340	528	-140	519	630	-508	338	480	460	-455	249	-1,134
Total Supply	GWh	9,786	10,133	10,341	10,642	10,926	11,371	11,556	11,628	11,692	11,720	11,758	11,814	11,774	11,754	11,742	11,833	11,809	11,807	11,883	11,969

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 reflects roundtrip losses

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [TOD Pricing](#)

20-Year NPV Revenue Requirement **\$6,908 million**
20-Year Carbon Emissions: **25.70 million tons**
20-Year Water Consumption: **10.82 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,010	2,047	2,125	2,152	2,167	2,184	2,195	2,212	2,232	2,240	2,245	2,248	2,271	2,276	2,285	2,316	2,336
PRM	%	12%	10%	18%	27%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	434	402	235	230	224	215	213	202	169	68	54	153	82	56	120	154	85	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,274	1,279	1,271	1,263	1,262	1,480	1,597	1,669	1,660	1,692	1,770	1,762	1,753	1,846	3,171
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	699	787	813	975	989	998	1,224	1,240	1,274	1,296	1,341	1,357	1,385	1,417	1,450	2,303
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	3,999	4,135	4,173	4,184	4,196	4,211	4,516	4,657	4,749	4,751	4,712	4,813	4,816	4,822	4,951	6,839

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,359	2,366	2,294	2,365	2,366	2,295	2,335	2,303	2,192	2,246	2,297	2,156	2,188	2,225	2,122	2,120
Coal	GWh	3,927	2,133	1,158	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,775	2,255	2,091	2,646	2,688	2,629	2,590	2,582	2,445	2,084	845	657	1,867	1,007	689	1,470	1,879	1,036	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,202	3,295	3,554	3,599	3,587	3,572	3,591	4,615	5,062	5,268	5,265	5,466	5,686	5,690	5,730	5,992	7,148
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,537
Battery	GWh	-	-44	-140	-156	-150	-170	-175	-208	-209	-208	-264	-272	-279	-286	-324	-348	-378	-421	-465	-1,013
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	514	548	477	419	424	439
Total Generation	GWh	11,019	11,427	11,039	11,234	10,917	11,214	11,187	11,172	11,198	11,027	11,731	10,910	10,777	11,949	11,029	10,807	11,517	11,903	11,179	12,301
Net Purchases	GWh	-1,233	-1,294	-727	-657	-82	40	226	287	300	476	-213	643	715	-497	390	684	-68	-474	308	-748
Total Supply	GWh	9,786	10,133	10,312	10,577	10,835	11,254	11,413	11,459	11,498	11,502	11,519	11,554	11,493	11,452	11,419	11,491	11,449	11,428	11,487	11,553

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Gas Prices](#)

20-Year NPV Revenue Requirement **\$6,914 million**
20-Year Carbon Emissions: **24.63 million tons**
20-Year Water Consumption: **10.49 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,020	648	441	420	231	230	225	212	210	203	166	55	44	137	75	48	65	123	58	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,273	1,260	1,251	1,243	1,234	1,226	1,425	1,586	1,658	1,650	1,686	1,756	1,748	1,739	1,829	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	808	890	910	1,066	1,072	1,072	1,279	1,280	1,306	1,325	1,377	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,147	4,224	4,242	4,246	4,251	4,250	4,516	4,685	4,770	4,769	4,743	4,841	4,842	4,845	4,969	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,254	2,442	2,294	2,356	2,366	2,295	2,366	2,367	2,296	2,349	2,303	2,193	2,250	2,293	2,137	2,177	2,218	2,101	2,044
Coal	GWh	3,805	2,052	1,153	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	683	1,848	2,336	2,256	2,590	2,686	2,651	2,570	2,548	2,456	2,048	675	535	1,675	911	591	802	1,507	704	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	783	1,861	2,752	3,161	3,452	3,473	3,447	3,452	3,425	3,409	4,363	4,969	5,182	5,213	5,388	5,579	5,590	5,638	5,884	6,867
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,999	3,530
Battery	GWh	-	-44	-141	-156	-171	-187	-192	-223	-220	-219	-273	-282	-286	-307	-328	-336	-366	-402	-446	-962
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,889	11,410	11,102	11,354	10,994	11,113	11,042	11,004	11,007	10,846	11,447	10,638	10,563	11,689	10,847	10,596	10,750	11,451	10,737	11,988
Net Purchases	GWh	-1,103	-1,278	-791	-769	-153	147	377	461	498	664	78	923	936	-230	579	902	706	-16	757	-428
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Gas Prices](#)

20-Year NPV Revenue Requirement **\$7,229 million**
20-Year Carbon Emissions: **25.06 million tons**
20-Year Water Consumption: **10.59 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	407	375	194	191	186	178	179	172	146	157	57	154	115	116	120	122	121	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,364	1,427	1,446	1,437	1,437	1,428	1,609	1,601	1,651	1,642	1,634	1,626	1,617	1,609	1,601	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	956	956	956	956	956	956
Battery	MW	-	300	594	694	802	905	932	1,087	1,095	1,095	1,302	1,312	1,329	1,349	1,349	1,351	1,377	1,406	1,440	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,954	4,203	4,233	4,406	4,458	4,462	4,476	4,475	4,724	4,732	4,786	4,785	5,062	5,063	5,063	5,067	5,095	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,442	2,295	2,352	2,358	2,280	2,351	2,352	2,279	2,283	2,305	2,205	2,263	2,273	2,162	2,194	2,235	2,176	2,123
Coal	GWh	3,881	2,184	1,162	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	628	1,621	1,967	1,803	2,207	2,252	2,204	2,161	2,192	2,091	1,804	1,945	696	1,898	1,421	1,424	1,486	1,502	1,490	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,860	2,888	3,308	3,929	4,310	4,394	4,377	4,394	4,358	5,128	5,124	5,284	5,290	4,989	4,978	4,966	4,999	5,040	7,190
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	3,529	3,541	3,532	3,533	3,533	3,537
Battery	GWh	-	-44	-140	-155	-171	-195	-203	-233	-232	-233	-284	-290	-303	-327	-329	-332	-361	-392	-429	-1,003
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,902	11,319	10,881	11,055	11,084	11,500	11,515	11,494	11,593	11,397	11,892	12,057	10,821	11,981	12,467	12,392	12,364	12,367	12,306	12,356
Net Purchases	GWh	-1,117	-1,186	-569	-470	-243	-240	-96	-29	-88	113	-367	-497	678	-523	-1,041	-895	-908	-932	-812	-796
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Carbon Prices](#)

20-Year NPV Revenue Requirement **\$6,966 million**
20-Year Carbon Emissions: **26.59 million tons**
20-Year Water Consumption: **11.03 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	433	402	240	246	244	235	235	226	190	71	52	174	101	65	70	176	89	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,293	1,280	1,272	1,263	1,263	1,254	1,458	1,587	1,657	1,649	1,685	1,757	1,748	1,740	1,832	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	807	888	907	1,062	1,070	1,070	1,282	1,286	1,310	1,330	1,383	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,167	4,242	4,259	4,263	4,278	4,276	4,552	4,692	4,773	4,773	4,747	4,842	4,842	4,846	4,971	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,358	2,367	2,295	2,366	2,367	2,296	2,344	2,314	2,205	2,254	2,310	2,161	2,196	2,230	2,128	2,120
Coal	GWh	3,927	2,132	1,158	1,116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,778	2,254	2,093	2,694	2,861	2,851	2,828	2,834	2,712	2,339	890	630	2,116	1,248	800	862	2,111	1,089	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,203	3,580	3,599	3,576	3,562	3,582	3,561	4,548	5,059	5,263	5,251	5,461	5,678	5,672	5,705	5,970	7,133
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,999	3,537
Battery	GWh	-	-44	-140	-156	-172	-189	-194	-224	-227	-224	-278	-280	-286	-293	-317	-337	-365	-404	-442	-1,002
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,018	11,428	11,038	11,236	11,226	11,413	11,368	11,370	11,443	11,248	11,915	10,956	10,751	12,186	11,286	10,926	10,911	12,131	11,239	12,298
Net Purchases	GWh	-1,233	-1,295	-726	-652	-385	-153	51	95	62	263	-389	605	748	-728	140	572	544	-696	255	-738
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Carbon Prices](#)

20-Year NPV Revenue Requirement **\$7,065 million**
20-Year Carbon Emissions: **24.60 million tons**
20-Year Water Consumption: **10.55 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	434	403	203	209	205	194	189	179	148	72	56	130	104	66	96	125	89	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,329	1,316	1,307	1,299	1,299	1,290	1,494	1,586	1,657	1,648	1,685	1,757	1,749	1,740	1,831	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	804	886	905	1,060	1,068	1,068	1,280	1,287	1,311	1,331	1,384	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,200	4,275	4,292	4,296	4,311	4,309	4,587	4,693	4,774	4,774	4,748	4,843	4,843	4,846	4,971	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,356	2,366	2,294	2,365	2,365	2,295	2,338	2,316	2,203	2,257	2,307	2,161	2,197	2,227	2,126	2,117
Coal	GWh	3,927	2,133	1,158	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,775	2,255	2,092	2,311	2,460	2,427	2,361	2,306	2,184	1,840	900	680	1,601	1,283	803	1,190	1,543	1,092	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,203	3,744	3,779	3,755	3,742	3,766	3,743	4,693	5,057	5,267	5,250	5,462	5,681	5,674	5,712	5,973	7,138
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,536
Battery	GWh	-	-44	-140	-156	-172	-187	-192	-222	-222	-218	-274	-281	-287	-290	-316	-337	-364	-402	-444	-1,000
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,427	11,039	11,238	11,005	11,193	11,125	11,084	11,102	10,906	11,559	10,964	10,802	11,675	11,319	10,932	11,244	11,569	11,240	12,301
Net Purchases	GWh	-1,233	-1,294	-727	-653	-164	67	294	381	403	605	-34	596	697	-217	107	566	212	-134	254	-741
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$8/ton Carbon Price](#)

20-Year NPV Revenue Requirement **\$7,163** million
20-Year Carbon Emissions: **22.68** million tons
20-Year Water Consumption: **9.71** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	824	551	387	354	191	199	200	196	196	189	158	71	54	152	103	65	74	165	89	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,329	1,316	1,307	1,299	1,296	1,288	1,492	1,587	1,657	1,649	1,685	1,757	1,749	1,740	1,831	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	804	886	905	1,060	1,067	1,067	1,279	1,286	1,310	1,330	1,383	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,200	4,275	4,292	4,296	4,308	4,306	4,583	4,692	4,774	4,773	4,747	4,842	4,843	4,846	4,971	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,356	2,366	2,294	2,365	2,366	2,295	2,336	2,314	2,204	2,255	2,307	2,159	2,198	2,227	2,126	2,118
Coal	GWh	3,020	1,788	1,152	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	840	1,562	1,785	1,599	2,188	2,352	2,380	2,389	2,392	2,295	1,965	889	654	1,858	1,273	800	916	1,993	1,087	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,204	3,744	3,779	3,755	3,742	3,752	3,731	4,685	5,060	5,265	5,252	5,462	5,682	5,673	5,706	5,970	7,134
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,999	3,535
Battery	GWh	-	-44	-140	-155	-171	-185	-193	-222	-223	-220	-273	-280	-287	-291	-316	-337	-364	-403	-442	-999
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,261	10,870	10,564	10,742	10,882	11,086	11,077	11,113	11,175	11,004	11,675	10,955	10,776	11,932	11,310	10,929	10,969	12,013	11,235	12,298
Net Purchases	GWh	-475	-737	-252	-158	-41	174	342	353	330	507	-149	605	723	-473	116	569	487	-578	259	-738
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$20/ton Carbon Price](#)

20-Year NPV Revenue Requirement **\$7,381** million
20-Year Carbon Emissions: **18.27** million tons
20-Year Water Consumption: **8.48** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	714	490	320	286	121	129	136	131	130	128	102	73	61	108	93	65	92	132	97	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,098	1,267	1,364	1,362	1,367	1,359	1,359	1,350	1,556	1,583	1,655	1,647	1,683	1,756	1,748	1,740	1,831	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	594	694	802	886	909	1,064	1,072	1,072	1,286	1,299	1,323	1,343	1,385	1,399	1,425	1,453	1,485	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,954	4,203	4,233	4,322	4,357	4,361	4,376	4,374	4,654	4,701	4,784	4,783	4,747	4,842	4,842	4,846	4,971	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,294	2,353	2,363	2,290	2,361	2,364	2,292	2,318	2,314	2,205	2,257	2,309	2,161	2,201	2,231	2,127	2,117
Coal	GWh	2,652	1,713	1,146	1,057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	685	1,130	1,069	959	1,405	1,542	1,633	1,618	1,608	1,578	1,274	917	747	1,340	1,145	796	1,131	1,625	1,194	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,856	3,283	3,900	4,005	4,045	4,035	4,051	4,029	4,934	5,058	5,269	5,263	5,469	5,696	5,685	5,721	5,991	7,138
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,998	3,538
Battery	GWh	-	-43	-144	-156	-173	-191	-197	-224	-225	-224	-277	-283	-289	-293	-328	-351	-375	-413	-455	-1,004
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	9,737	10,362	9,930	10,123	10,250	10,494	10,611	10,628	10,685	10,578	11,210	10,979	10,871	11,426	11,177	10,927	11,188	11,653	11,350	12,299
Net Purchases	GWh	48	-229	381	461	592	765	808	837	820	932	315	581	628	33	249	571	267	-218	144	-739
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [\\$40/ton Carbon Price](#)

20-Year NPV Revenue Requirement [\\$7,732](#) million
20-Year Carbon Emissions: [13.78](#) million tons
20-Year Water Consumption: [7.11](#) million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	669	443	276	247	81	82	88	76	72	73	66	56	46	47	51	53	58	59	62	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,150	1,318	1,418	1,520	1,539	1,584	1,584	1,576	1,592	1,584	1,576	1,567	1,559	1,550	1,542	1,534	1,568	3,165
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	590	690	798	913	940	1,111	1,119	1,119	1,277	1,287	1,287	1,287	1,312	1,329	1,355	1,384	1,416	2,307
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,001	4,251	4,282	4,507	4,559	4,634	4,648	4,647	4,682	4,690	5,069	5,049	4,950	4,966	4,966	4,970	5,039	6,837

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,440	2,290	2,344	2,346	2,267	2,315	2,319	2,245	2,301	2,314	2,189	2,241	2,305	2,194	2,236	2,275	2,187	2,118
Coal	GWh	2,551	1,706	1,143	1,017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	462	650	578	591	944	984	1,061	930	887	899	819	689	550	576	614	647	717	724	764	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	3,087	3,483	4,119	4,667	4,759	4,980	4,975	4,926	5,064	5,054	4,707	4,682	4,748	4,768	4,742	4,769	4,935	7,136
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	3,773	3,750	3,533	3,545	3,534	3,534	3,533	3,538
Battery	GWh	-	-44	-146	-156	-176	-202	-208	-246	-246	-246	-280	-281	-282	-284	-311	-333	-358	-393	-434	-1,002
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	514	548	477	419	424	439
Total Generation	GWh	9,414	9,876	9,664	9,910	9,997	10,570	10,719	10,817	10,822	10,728	10,865	10,748	11,635	11,606	11,473	11,440	11,418	11,398	11,480	12,299
Net Purchases	GWh	371	257	648	675	844	689	700	648	683	783	660	812	-136	-147	-47	58	38	37	14	-739
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,913** million
20-Year Carbon Emissions: **26.09** million tons
20-Year Water Consumption: **10.93** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	433	402	227	221	214	205	203	194	163	97	69	150	109	90	114	152	117	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,273	1,312	1,330	1,322	1,321	1,313	1,518	1,580	1,652	1,643	1,683	1,757	1,749	1,740	1,834	3,295
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	808	905	931	1,086	1,094	1,094	1,307	1,314	1,329	1,349	1,385	1,399	1,425	1,453	1,485	2,152
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,934	4,183	4,147	4,290	4,342	4,346	4,360	4,359	4,637	4,713	4,787	4,786	4,747	4,843	4,843	4,846	4,974	6,812

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,359	2,366	2,293	2,363	2,365	2,294	2,333	2,320	2,207	2,264	2,317	2,168	2,207	2,240	2,132	2,114
Coal	GWh	3,927	2,132	1,158	1,115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,778	2,254	2,094	2,570	2,603	2,528	2,487	2,479	2,357	2,014	1,224	850	1,847	1,348	1,105	1,407	1,854	1,438	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,204	3,484	3,763	3,872	3,860	3,882	3,861	4,798	5,056	5,282	5,291	5,509	5,748	5,737	5,768	6,054	7,363
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,006	1,999	1,999	1,999	3,540
Battery	GWh	-	-44	-140	-156	-170	-192	-200	-230	-231	-228	-281	-284	-304	-329	-370	-393	-421	-458	-502	-1,203
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,428	11,038	11,238	11,010	11,316	11,334	11,319	11,382	11,187	11,824	11,288	10,975	11,931	11,388	11,253	11,476	11,894	11,615	12,324
Net Purchases	GWh	-1,233	-1,295	-726	-653	-169	-56	85	147	122	323	-299	272	524	-473	38	245	-20	-459	-121	-764
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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
"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,480 million**
20-Year Carbon Emissions: **24.94 million tons**
20-Year Water Consumption: **10.62 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	23%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	434	403	222	222	220	210	208	199	182	52	43	151	64	43	90	153	66	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,299	1,311	1,302	1,294	1,293	1,285	1,368	1,602	1,695	1,686	1,725	1,813	1,804	1,796	1,892	3,272
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	599	699	776	859	877	1,032	1,040	1,040	1,185	1,185	1,194	1,215	1,251	1,266	1,291	1,320	1,352	2,173
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	131	155	162	168	175	182	188	195	202	189	177	164	172	154	138	140	143
Total Capacity	MW	3,187	3,672	3,934	4,216	4,175	4,275	4,292	4,297	4,311	4,309	4,397	4,638	4,728	4,727	4,688	4,797	4,798	4,801	4,931	6,843

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,442	2,295	2,358	2,366	2,293	2,364	2,366	2,295	2,357	2,319	2,200	2,260	2,309	2,160	2,192	2,224	2,124	2,110
Coal	GWh	3,927	2,133	1,158	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	692	1,775	2,255	2,094	2,512	2,610	2,587	2,541	2,534	2,410	2,249	640	525	1,849	782	532	1,110	1,864	816	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,763	3,203	3,602	3,748	3,725	3,712	3,733	3,712	4,172	5,152	5,419	5,430	5,648	5,891	5,895	5,930	6,179	7,326
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,241	2,217	1,999	2,005	1,999	1,999	1,999	3,541
Battery	GWh	-	-44	-140	-156	-166	-184	-188	-219	-219	-217	-339	-408	-427	-438	-497	-525	-540	-579	-630	-1,169
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	379	468	502	534	566	596	627	658	690	630	573	516	550	479	422	427	441
Total Generation	GWh	11,019	11,427	11,039	11,241	11,074	11,317	11,260	11,239	11,303	11,105	11,402	10,677	10,659	11,961	10,828	10,685	11,206	11,930	10,985	12,320
Net Purchases	GWh	-1,233	-1,294	-727	-656	-233	-57	159	227	202	405	124	883	840	-502	598	813	250	-495	508	-760
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Current Trends & Policy](#)
Sensitivity: [Tax Credit Extension](#)

20-Year NPV Revenue Requirement **\$6,860 million**
20-Year Carbon Emissions: **25.15 million tons**
20-Year Water Consumption: **10.63 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,049	660	412	388	197	200	198	172	172	165	148	152	150	148	128	64	88	105	105	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,197	1,365	1,465	1,458	1,449	1,585	1,585	1,576	1,715	1,707	1,699	1,690	1,686	1,756	1,747	1,739	1,731	3,110
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	956	956	956
Battery	MW	-	300	586	686	794	876	895	1,093	1,102	1,102	1,296	1,307	1,326	1,346	1,385	1,399	1,425	1,425	1,443	2,372
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,045	4,294	4,326	4,407	4,424	4,616	4,631	4,629	4,824	4,832	4,831	4,831	4,750	4,841	4,841	5,216	5,228	6,847

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,438	2,282	2,333	2,357	2,282	2,317	2,320	2,243	2,261	2,270	2,189	2,239	2,312	2,166	2,205	2,185	2,117	2,126
Coal	GWh	3,927	2,132	1,150	1,102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,778	2,026	1,916	2,219	2,345	2,337	2,080	2,087	1,994	1,819	1,877	1,827	1,819	1,578	787	1,084	1,300	1,289	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	3,272	3,649	4,291	4,413	4,397	4,965	4,961	4,914	5,447	5,412	5,387	5,389	5,486	5,707	5,695	5,297	5,316	7,041
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,234	2,213	2,241	2,217	1,999	2,005	1,999	3,530	3,529	3,534
Battery	GWh	-	-44	-143	-156	-174	-192	-196	-241	-243	-240	-284	-288	-289	-296	-339	-365	-389	-393	-417	-922
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	94	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,019	11,428	11,305	11,480	11,436	11,698	11,660	11,961	12,012	11,814	12,203	12,243	12,052	12,008	11,620	10,919	11,141	12,409	12,329	12,288
Net Purchases	GWh	-1,233	-1,295	-993	-896	-594	-438	-241	-495	-507	-304	-677	-683	-553	-550	-194	579	314	-974	-835	-729
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,859 million**
20-Year Carbon Emissions: **21.34 million tons**
20-Year Water Consumption: **9.62 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,044	2,113	2,187	2,253	2,338	2,405	2,439	2,460	2,469	2,486	2,509	2,526	2,538	2,545	2,573	2,584	2,603	2,646	2,670
PRM	%	12%	9%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	656	374	352	160	155	117	113	116	113	71	78	76	75	77	77	57	56	56	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,372	1,541	1,747	1,880	1,872	1,863	1,855	1,847	1,838	1,830	1,821	1,813	1,805	1,796	1,788	1,779	1,771	3,089
Wind	MW	658	658	658	658	658	658	1,058	1,058	1,058	1,058	1,458	1,458	1,458	1,458	1,356	1,356	1,756	1,756	1,756	1,756
Battery	MW	-	300	639	739	981	1,127	1,157	1,342	1,360	1,363	1,479	1,499	1,537	1,567	1,613	1,639	1,639	1,674	1,725	2,467
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,273	4,523	4,794	5,081	5,509	5,543	5,560	5,561	5,929	5,948	5,964	5,974	5,897	5,922	6,296	6,306	6,350	7,721

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,426	2,254	2,311	2,325	2,239	2,273	2,281	2,196	2,218	2,233	2,159	2,202	2,256	2,155	2,076	2,110	2,053	2,041
Coal	GWh	3,880	2,186	1,130	1,070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,660	1,736	1,752	1,950	1,960	1,545	1,545	1,606	1,557	1,001	1,092	1,066	1,056	1,091	1,087	795	765	775	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,864	3,925	4,348	5,371	5,904	5,611	5,853	5,870	5,831	5,475	5,480	5,535	5,597	5,736	5,786	5,204	5,242	5,310	6,461
Wind	GWh	2,199	2,181	2,212	2,237	2,228	2,202	3,760	3,740	3,751	3,737	5,294	5,284	5,301	5,279	5,066	5,082	6,530	6,555	6,557	6,578
Battery	GWh	-	-44	-155	-168	-216	-248	-258	-294	-298	-298	-327	-333	-371	-407	-456	-486	-462	-489	-532	-1,016
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,905	11,365	11,624	11,940	12,180	12,713	13,499	13,750	13,874	13,718	14,387	14,514	14,387	14,368	14,278	14,243	14,691	14,673	14,658	14,573
Net Purchases	GWh	-1,119	-1,154	-991	-753	-539	-533	-822	-794	-779	-591	-1,218	-1,277	-1,186	-1,178	-1,089	-948	-1,412	-1,385	-1,279	-1,091
Total Supply	GWh	9,785	10,211	10,632	11,187	11,641	12,180	12,676	12,957	13,095	13,127	13,169	13,236	13,200	13,190	13,188	13,294	13,279	13,289	13,379	13,483

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#) 20-Year NPV Revenue Requirement **\$8,845 million**
Future: [Aggressive Environmental Regulation](#) 20-Year Carbon Emissions: **22.18 million tons**
Sensitivity: [High Econ Dev Loads](#) 20-Year Water Consumption: **9.97 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,055	2,149	2,279	2,430	2,612	2,725	2,793	2,819	2,820	2,834	2,858	2,873	2,885	2,891	2,918	2,929	2,949	2,993	3,016
PRM	%	12%	9%	18%	26%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	656	375	328	171	135	109	82	83	83	61	64	65	64	65	67	69	68	65	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,300	1,919	2,068	2,181	2,170	2,159	2,148	2,136	2,125	2,114	2,103	2,092	2,080	2,069	2,058	2,047	2,110	3,824
Wind	MW	658	658	658	658	658	1,058	1,458	1,858	1,858	1,858	2,258	2,258	2,258	2,258	2,156	2,156	2,156	2,156	2,156	2,156
Battery	MW	-	300	701	967	1,143	1,355	1,442	1,624	1,649	1,649	1,756	1,778	1,813	1,843	1,889	1,915	1,950	1,997	2,047	2,789
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,263	5,129	5,278	6,010	6,492	6,921	6,941	6,937	7,293	7,311	7,322	7,329	7,248	7,271	7,277	7,296	7,411	9,178

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,435	2,245	2,314	2,326	2,242	2,269	2,281	2,201	2,149	2,169	2,093	2,130	2,187	2,095	2,103	2,155	2,068	2,031
Coal	GWh	3,880	2,194	1,143	1,053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	632	1,702	1,871	1,725	2,294	2,023	1,735	1,376	1,425	1,412	1,017	1,067	1,084	1,062	1,095	1,126	1,186	1,142	1,103	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	70	71	70	70	70	71	71	70	70	71
Solar	GWh	781	1,869	3,914	5,194	6,207	6,647	6,547	6,411	6,465	6,403	5,976	5,995	5,971	6,019	6,116	6,172	6,162	6,193	6,426	8,163
Wind	GWh	2,199	2,181	2,212	2,235	2,227	3,732	5,292	6,799	6,808	6,798	8,224	8,216	8,263	8,227	8,057	8,099	8,063	8,085	8,081	8,132
Battery	GWh	-	-44	-167	-225	-256	-304	-325	-364	-370	-370	-390	-397	-417	-446	-472	-499	-529	-558	-623	-1,172
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,906	11,421	11,757	12,676	13,323	14,993	16,094	17,125	17,273	17,140	17,702	17,807	17,692	17,632	17,568	17,612	17,532	17,506	17,550	17,664
Net Purchases	GWh	-1,119	-1,118	-845	-744	-212	-544	-732	-1,178	-1,083	-918	-1,439	-1,468	-1,397	-1,347	-1,285	-1,215	-1,159	-1,123	-1,077	-1,078
Total Supply	GWh	9,786	10,303	10,912	11,932	13,111	14,449	15,362	15,947	16,190	16,221	16,264	16,339	16,295	16,285	16,283	16,397	16,373	16,383	16,473	16,586

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
"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,081** million
20-Year Carbon Emissions: **21.43** million tons
20-Year Water Consumption: **9.65** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	393	365	171	165	160	143	144	140	89	97	63	62	64	65	69	66	64	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,207	1,376	1,496	1,609	1,637	1,752	1,744	1,735	1,727	1,719	1,710	1,702	1,693	1,685	1,677	1,668	1,660	2,927
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,458	1,458	1,356	1,356	1,356	1,356	1,356	1,356
Battery	MW	-	300	585	685	814	940	977	1,177	1,190	1,195	1,316	1,342	1,342	1,364	1,414	1,442	1,479	1,520	1,567	2,310
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,054	4,304	4,377	4,623	4,694	4,867	4,878	4,881	5,256	5,280	5,658	5,660	5,586	5,613	5,625	5,641	5,682	7,002

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,440	2,283	2,333	2,335	2,251	2,278	2,284	2,200	2,227	2,241	2,134	2,169	2,219	2,119	2,132	2,173	2,116	2,085
Coal	GWh	3,880	2,184	1,155	1,105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	1,825	1,697	1,962	1,969	1,921	1,749	1,777	1,726	1,137	1,239	794	788	817	831	882	841	822	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	3,329	3,704	4,424	4,949	5,055	5,468	5,451	5,416	5,092	5,120	4,608	4,662	4,832	4,908	4,923	5,001	5,072	6,460
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,237	2,202	2,220	2,205	3,764	3,748	5,273	5,248	5,054	5,074	5,059	5,066	5,066	5,042
Battery	GWh	-	-44	-141	-155	-177	-206	-216	-260	-260	-263	-292	-313	-310	-338	-392	-430	-458	-503	-552	-1,112
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	571	513	548	477	419	424	439
Total Generation	GWh	10,904	11,316	11,169	11,319	11,308	11,822	11,851	12,071	12,136	11,979	12,654	12,795	13,197	13,171	13,114	13,121	13,086	13,068	13,019	12,985
Net Purchases	GWh	-1,120	-1,191	-842	-696	-405	-477	-322	-469	-468	-278	-911	-989	-1,423	-1,407	-1,353	-1,257	-1,233	-1,205	-1,066	-933
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Aggressive Environmental Regulation](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,638 million**
20-Year Carbon Emissions: **22.35 million tons**
20-Year Water Consumption: **9.90 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,975	2,032	2,066	2,104	2,147	2,224	2,251	2,267	2,283	2,294	2,315	2,342	2,358	2,370	2,380	2,410	2,422	2,438	2,478	2,506
PRM	%	12%	10%	18%	22%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,036	657	385	360	171	167	163	144	144	141	85	93	91	91	93	92	99	96	61	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,277	1,445	1,534	1,633	1,661	1,796	1,807	1,799	1,791	1,782	1,774	1,765	1,757	1,749	1,740	1,732	1,724	2,886
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	1,058	956	956	956	956	1,356	1,356
Battery	MW	-	300	580	680	777	893	929	1,137	1,156	1,161	1,283	1,308	1,344	1,375	1,424	1,452	1,489	1,530	1,532	2,251
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	131	155	162	168	175	182	188	195	202	189	177	164	172	154	138	140	143
Total Capacity	MW	3,187	3,672	4,119	4,401	4,410	4,632	4,704	4,904	4,941	4,944	5,318	5,342	5,356	5,367	5,293	5,319	5,331	5,347	5,742	6,935

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,249	3,260	2,436	2,266	2,325	2,331	2,246	2,273	2,276	2,192	2,225	2,240	2,165	2,215	2,274	2,170	2,207	2,243	2,102	2,085
Coal	GWh	3,880	2,184	1,144	1,083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	631	1,619	1,742	1,644	1,958	1,976	1,942	1,762	1,772	1,722	1,086	1,184	1,159	1,162	1,185	1,181	1,273	1,243	781	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	781	1,858	3,542	3,907	4,502	4,952	5,060	5,483	5,509	5,471	5,335	5,379	5,426	5,491	5,625	5,666	5,677	5,739	5,310	6,294
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,204	2,236	2,200	2,217	2,202	3,760	3,743	3,769	3,747	3,531	3,545	3,534	3,534	5,066	5,054
Battery	GWh	-	-44	-142	-155	-170	-195	-205	-252	-253	-255	-414	-446	-478	-517	-569	-601	-632	-674	-675	-962
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	379	468	502	534	566	596	627	658	691	630	573	516	550	479	422	427	441
Total Generation	GWh	10,905	11,316	11,283	11,433	11,382	11,840	11,883	12,103	12,187	12,028	12,720	12,862	12,742	12,741	12,633	12,582	12,608	12,577	13,081	12,982
Net Purchases	GWh	-1,120	-1,191	-956	-810	-479	-495	-354	-501	-518	-328	-977	-1,056	-968	-977	-871	-718	-755	-715	-1,129	-930
Total Supply	GWh	9,784	10,125	10,327	10,623	10,903	11,345	11,529	11,602	11,669	11,700	11,743	11,806	11,774	11,764	11,762	11,864	11,852	11,862	11,952	12,052

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 reflects roundtrip losses
"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [High Economic Growth](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,786 million**
20-Year Carbon Emissions: **28.49 million tons**
20-Year Water Consumption: **11.58 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,081	2,168	2,259	2,342	2,443	2,522	2,567	2,601	2,622	2,652	2,687	2,713	2,737	2,755	2,795	2,817	2,848	2,903	2,939
PRM	%	11%	7%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,046	661	401	382	226	205	194	187	182	169	126	130	123	123	121	119	121	117	111	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,261	1,429	1,421	1,575	1,695	1,708	1,761	1,862	1,853	1,845	1,938	1,935	2,044	2,115	2,153	2,207	2,333	5,996
Wind	MW	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	721	821	1,054	1,221	1,349	1,549	1,580	1,596	1,729	1,765	1,810	1,855	1,901	1,940	1,988	2,046	2,111	3,859
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,243	4,493	4,542	4,870	5,124	5,195	5,286	5,409	5,794	5,828	5,955	5,984	6,024	6,141	6,210	6,305	6,498	11,221

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,437	2,287	2,358	2,362	2,281	2,353	2,349	2,253	2,281	2,302	2,194	2,255	2,289	2,160	2,184	2,195	2,110	1,973
Coal	GWh	3,950	2,156	1,150	1,101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	727	1,911	2,170	2,227	2,834	2,699	2,624	2,645	2,611	2,404	1,878	1,956	1,835	1,857	1,829	1,790	1,841	1,796	1,697	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,876	3,655	4,090	4,314	5,161	5,773	5,899	6,156	6,531	6,328	6,343	6,639	6,724	7,152	7,415	7,582	7,841	8,210	11,731
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	3,769	3,752	3,774	3,750	3,530	3,539	3,530	3,530	3,524	3,492
Battery	GWh	-	-44	-171	-184	-225	-263	-293	-335	-342	-346	-374	-381	-402	-454	-512	-566	-622	-696	-792	-1,535
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	624	655	688	627	570	513	548	477	419	424	438
Total Generation	GWh	11,080	11,597	11,803	12,207	12,047	12,735	13,225	13,400	13,661	13,745	14,608	14,731	14,738	14,772	14,873	14,957	15,064	15,156	15,244	16,170
Net Purchases	GWh	-1,192	-1,187	-877	-635	69	3	68	227	159	168	-594	-592	-578	-568	-616	-540	-609	-638	-583	-1,353
Total Supply	GWh	9,888	10,410	10,925	11,572	12,116	12,738	13,293	13,627	13,820	13,912	14,014	14,139	14,159	14,204	14,257	14,417	14,455	14,518	14,661	14,817

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [High Economic Growth](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement [\\$10,422](#) million
20-Year Carbon Emissions: [30.03](#) million tons
20-Year Water Consumption: [12.13](#) million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,093	2,204	2,351	2,519	2,717	2,842	2,922	2,960	2,974	3,000	3,036	3,063	3,083	3,101	3,140	3,162	3,194	3,250	3,284
PRM	%	11%	7%	18%	25%	18%	18%	18%	18%	18%	18%	18%	18%	19%	18%	18%	20%	19%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,046	661	411	356	229	207	177	156	152	146	124	125	111	112	115	97	101	101	96	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,192	1,810	1,784	2,073	2,061	2,289	2,384	2,446	2,917	2,906	3,436	3,424	3,452	4,023	4,011	4,000	4,251	8,092
Wind	MW	658	658	658	658	658	658	1,058	1,058	1,058	1,058	1,058	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	775	1,042	1,206	1,533	1,636	1,870	1,908	1,916	2,191	2,228	2,442	2,455	2,503	2,875	2,875	2,902	2,976	5,035
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,229	5,095	5,057	5,679	6,178	6,498	6,636	6,714	7,320	7,352	8,084	8,073	8,034	8,984	8,955	8,954	9,281	14,492

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,259	2,440	2,271	2,355	2,355	2,279	2,310	2,301	2,211	2,241	2,239	2,143	2,195	2,241	2,121	2,134	2,144	2,062	1,944
Coal	GWh	3,950	2,163	1,154	1,088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	729	1,956	2,388	2,186	3,146	3,113	2,849	2,654	2,629	2,515	2,215	2,256	2,003	2,045	2,088	1,791	1,886	1,882	1,798	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,879	3,541	4,997	5,248	6,791	6,727	7,734	8,086	8,240	9,294	9,407	10,132	10,173	10,441	11,489	11,464	11,564	11,963	15,259
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	3,773	3,743	3,755	3,736	3,736	3,725	3,663	3,652	3,444	3,385	3,371	3,383	3,343	3,500
Battery	GWh	-	-44	-180	-238	-265	-339	-360	-416	-424	-426	-578	-624	-739	-752	-814	-1,039	-1,027	-1,056	-1,175	-1,906
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	624	655	688	627	570	513	547	477	418	423	439
Total Generation	GWh	11,081	11,652	11,904	12,989	13,250	14,695	15,870	16,660	17,010	16,970	17,633	17,761	17,898	17,953	17,983	18,364	18,375	18,407	18,486	19,306
Net Purchases	GWh	-1,193	-1,150	-699	-672	336	312	107	-43	-96	37	-525	-520	-644	-655	-632	-844	-826	-795	-731	-1,386
Total Supply	GWh	9,889	10,502	11,205	12,317	13,586	15,007	15,978	16,617	16,914	17,007	17,109	17,242	17,254	17,299	17,351	17,520	17,549	17,612	17,755	17,920

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [High Economic Growth](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$7,871** million
20-Year Carbon Emissions: **27.48** million tons
20-Year Water Consumption: **11.30** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	20%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	20%
Carbon Intensity	lbs/MWh	1,047	661	437	405	233	211	201	193	189	171	160	120	120	120	123	119	122	116	107	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,303	1,441	1,490	1,488	1,519	1,617	1,688	1,680	1,672	1,663	1,668	1,728	1,766	1,813	1,937	5,097
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	676	776	947	1,098	1,156	1,335	1,375	1,390	1,563	1,563	1,611	1,656	1,709	1,747	1,798	1,852	1,910	3,204
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	4,011	4,260	4,318	4,612	4,726	4,761	4,838	4,958	5,063	5,462	5,488	5,514	5,456	5,561	5,633	5,718	5,902	9,666

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,442	2,296	2,359	2,364	2,288	2,360	2,361	2,273	2,319	2,297	2,228	2,293	2,372	2,237	2,265	2,282	2,174	1,996
Coal	GWh	3,950	2,154	1,159	1,118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,864	2,426	2,296	2,757	2,616	2,522	2,500	2,474	2,239	2,140	1,644	1,625	1,656	1,697	1,647	1,697	1,631	1,498	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	2,789	3,264	3,684	4,453	4,715	4,740	4,914	5,328	5,667	5,413	5,450	5,501	5,612	5,910	6,100	6,361	6,840	10,207
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,752	3,776	3,752	3,534	3,546	3,534	3,534	3,533	3,502
Battery	GWh	-	-44	-153	-170	-199	-235	-249	-286	-293	-298	-334	-341	-382	-429	-471	-531	-585	-652	-754	-1,520
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	11,083	11,544	11,226	11,490	11,368	11,973	12,115	12,152	12,342	12,445	12,752	13,524	13,395	13,415	13,329	13,428	13,558	13,645	13,786	14,693
Net Purchases	GWh	-1,196	-1,220	-606	-482	10	-70	30	121	51	41	-165	-816	-662	-637	-499	-441	-530	-554	-552	-1,306
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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 reflects roundtrip losses
"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [High Economic Growth](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$8,572 million**
20-Year Carbon Emissions: **28.46 million tons**
20-Year Water Consumption: **11.58 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,994	2,069	2,121	2,176	2,236	2,328	2,367	2,395	2,424	2,447	2,477	2,517	2,545	2,569	2,590	2,631	2,655	2,683	2,735	2,774
PRM	%	11%	8%	18%	21%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,047	661	409	385	213	219	219	210	210	205	182	138	138	139	137	113	132	127	115	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,212	1,380	1,410	1,397	1,389	1,380	1,372	1,364	1,489	1,480	1,472	1,463	1,547	1,622	1,654	1,694	1,826	5,083
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	662	762	896	1,003	1,043	1,221	1,249	1,270	1,439	1,439	1,487	1,533	1,581	1,618	1,668	1,721	1,778	3,214
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	131	155	162	168	175	182	188	195	202	189	177	164	172	154	138	140	143
Total Capacity	MW	3,187	3,672	4,136	4,418	4,405	4,506	4,545	4,572	4,598	4,618	4,772	5,171	5,197	5,223	5,240	5,359	5,423	5,499	5,691	9,695

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,258	2,439	2,285	2,352	2,364	2,294	2,365	2,366	2,295	2,357	2,360	2,286	2,351	2,411	2,280	2,326	2,337	2,229	1,998
Coal	GWh	3,950	2,154	1,151	1,102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	731	1,864	2,129	2,056	2,515	2,706	2,730	2,704	2,736	2,659	2,437	1,888	1,867	1,909	1,890	1,573	1,831	1,779	1,615	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	786	1,873	3,398	3,798	4,169	4,223	4,205	4,198	4,183	4,175	4,862	4,744	4,731	4,739	5,175	5,557	5,715	5,966	6,545	10,166
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	3,753	3,776	3,752	3,534	3,546	3,534	3,534	3,534	3,511
Battery	GWh	-	-44	-158	-172	-194	-215	-224	-259	-263	-275	-418	-428	-458	-488	-554	-634	-682	-754	-871	-1,492
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	379	468	501	534	566	596	627	657	691	630	573	516	550	479	422	427	441
Total Generation	GWh	11,083	11,544	11,521	11,758	11,609	11,855	11,847	11,849	11,912	11,760	12,200	13,078	12,902	12,906	13,042	12,943	13,273	13,355	13,549	14,694
Net Purchases	GWh	-1,196	-1,220	-901	-750	-232	48	299	424	481	726	388	-369	-169	-128	-212	44	-245	-264	-315	-1,307
Total Supply	GWh	9,887	10,324	10,620	11,008	11,378	11,903	12,145	12,272	12,393	12,486	12,588	12,709	12,733	12,778	12,830	12,987	13,028	13,091	13,234	13,387

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Low Economic Growth](#)
Sensitivity: [Likely Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$7,104 million**
20-Year Carbon Emissions: **25.38 million tons**
20-Year Water Consumption: **10.68 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,013	2,063	2,117	2,165	2,231	2,281	2,297	2,297	2,282	2,277	2,279	2,271	2,256	2,238	2,244	2,232	2,227	2,245	2,248
PRM	%	13%	11%	18%	20%	18%	18%	18%	18%	18%	19%	18%	19%	18%	19%	18%	19%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,021	648	441	422	238	234	235	201	198	191	166	53	48	136	58	51	135	131	55	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,273	1,260	1,265	1,401	1,393	1,384	1,518	1,869	1,932	1,924	1,943	2,015	2,007	1,998	2,034	3,240
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	594	694	846	920	978	1,183	1,183	1,183	1,325	1,325	1,325	1,325	1,325	1,340	1,340	1,340	1,369	2,182
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,929	4,179	4,185	4,254	4,324	4,523	4,521	4,519	4,655	5,013	5,063	5,043	4,947	5,042	5,016	4,991	5,057	6,787

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,295	2,359	2,367	2,296	2,364	2,365	2,294	2,342	2,203	2,122	2,170	2,207	2,075	2,097	2,116	2,035	2,036
Coal	GWh	3,780	2,044	1,154	1,113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,803	2,356	2,367	2,733	2,815	2,876	2,565	2,548	2,425	2,138	685	603	1,710	728	637	1,660	1,608	679	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,858	2,751	3,185	3,487	3,488	3,550	4,288	4,268	4,250	4,834	5,802	5,829	5,813	5,836	5,914	5,869	5,833	5,902	6,964
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,211	2,236	2,215	1,996	1,998	1,992	1,992	1,989	3,541
Battery	GWh	-	-44	-140	-155	-178	-192	-202	-252	-249	-247	-283	-294	-290	-296	-293	-311	-315	-314	-349	-992
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,831	11,353	11,125	11,490	11,166	11,253	11,360	11,803	11,819	11,625	11,991	11,365	11,198	12,253	11,059	10,932	11,850	11,725	10,750	12,059
Net Purchases	GWh	-1,138	-1,316	-776	-696	-26	318	620	376	415	554	142	746	788	-368	733	874	-151	-107	865	-436
Total Supply	GWh	9,693	10,036	10,348	10,794	11,140	11,571	11,980	12,179	12,234	12,179	12,134	12,112	11,986	11,885	11,792	11,806	11,699	11,618	11,615	11,623

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Low Economic Growth](#)
Sensitivity: [High Econ Dev Loads](#)

20-Year NPV Revenue Requirement **\$8,141 million**
20-Year Carbon Emissions: **28.53 million tons**
20-Year Water Consumption: **11.58 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,025	2,099	2,210	2,342	2,505	2,601	2,652	2,662	2,646	2,639	2,636	2,623	2,606	2,585	2,589	2,577	2,573	2,592	2,593
PRM	%	13%	10%	18%	28%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%
Carbon Intensity	lbs/MWh	1,022	648	451	386	234	248	240	183	176	171	138	83	64	129	77	66	129	127	82	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,024	1,642	1,662	1,651	1,773	1,787	1,822	1,813	2,109	2,169	2,231	2,220	2,223	2,278	2,267	2,256	2,301	5,252
Wind	MW	658	658	658	658	658	658	658	1,058	1,058	1,058	1,058	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	654	921	996	1,190	1,340	1,510	1,514	1,514	1,651	1,651	1,651	1,651	1,651	1,651	1,651	1,653	1,673	3,380
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,940	4,806	4,725	4,914	5,194	5,635	5,680	5,678	5,973	6,039	6,089	6,065	5,953	6,015	5,987	5,961	6,028	9,997

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,253	2,443	2,280	2,353	2,367	2,294	2,360	2,361	2,292	2,262	2,257	2,151	2,204	2,248	2,112	2,129	2,157	2,066	1,922
Coal	GWh	3,782	2,048	1,154	1,099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	652	1,849	2,569	2,260	2,988	3,442	3,452	2,855	2,791	2,678	2,199	1,327	1,001	2,005	1,197	1,019	1,977	1,921	1,241	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,864	2,702	4,195	4,542	4,605	5,307	5,377	5,573	5,562	6,715	6,857	6,976	6,960	6,976	7,048	6,998	6,965	7,055	10,924
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	3,744	3,758	3,743	3,769	3,750	3,766	3,746	3,526	3,532	3,523	3,521	3,509	3,534
Battery	GWh	-	-44	-149	-211	-220	-253	-288	-325	-323	-323	-366	-369	-369	-372	-371	-370	-372	-372	-401	-1,267
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	438
Total Generation	GWh	10,832	11,409	11,280	12,309	12,430	12,937	13,604	14,646	14,824	14,646	15,305	14,582	14,223	15,185	14,160	13,960	14,801	14,681	13,965	15,623
Net Purchases	GWh	-1,138	-1,281	-652	-770	180	903	1,061	522	504	627	-77	633	858	-205	726	949	-8	31	745	-897
Total Supply	GWh	9,694	10,128	10,628	11,539	12,610	13,840	14,666	15,169	15,328	15,273	15,228	15,215	15,080	14,980	14,886	14,909	14,794	14,712	14,710	14,726

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Low Economic Growth](#)
Sensitivity: [Low Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,191** million
20-Year Carbon Emissions: **24.21** million tons
20-Year Water Consumption: **10.35** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	22%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%
Carbon Intensity	lbs/MWh	1,021	649	441	418	228	225	221	204	200	191	165	131	45	149	69	42	138	131	64	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,305	1,297	1,336	1,327	1,337	1,381	1,372	1,364	1,400	2,550
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	529	629	703	774	779	983	983	983	1,122	1,122	1,122	1,124	1,146	1,146	1,152	1,164	1,177	1,913
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	122	105	107	110
Total Capacity	MW	3,187	3,672	3,864	4,113	4,003	4,068	4,071	4,125	4,123	4,121	4,240	4,238	4,265	4,245	4,162	4,213	4,194	4,181	4,232	5,828

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,292	2,356	2,365	2,294	2,366	2,365	2,295	2,349	2,364	2,273	2,333	2,396	2,260	2,299	2,318	2,220	2,075
Coal	GWh	3,780	2,040	1,153	1,113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,765	2,211	2,082	2,459	2,521	2,472	2,351	2,305	2,185	1,905	1,517	518	1,680	774	468	1,528	1,451	698	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,707	3,083	3,231	3,255	3,220	3,243	3,216	3,198	3,730	3,727	3,867	3,822	3,903	4,082	4,019	4,030	4,157	5,377
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,242	2,217	2,000	2,006	2,000	2,000	2,000	3,532
Battery	GWh	-	-44	-128	-142	-152	-163	-168	-204	-203	-201	-238	-235	-240	-241	-268	-274	-277	-292	-313	-889
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	377	466	499	531	564	594	625	655	688	627	570	513	548	477	419	424	439
Total Generation	GWh	10,832	11,304	10,946	11,113	10,661	10,753	10,658	10,595	10,571	10,380	10,707	10,345	9,357	10,454	9,388	9,161	10,117	9,996	9,256	10,605
Net Purchases	GWh	-1,140	-1,353	-903	-883	-259	-17	175	229	237	373	-0	336	1,203	5	977	1,215	156	195	933	-412
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [No New Combustion](#)
Future: [Low Economic Growth](#)
Sensitivity: [High Technology Costs](#)

20-Year NPV Revenue Requirement **\$6,593 million**
20-Year Carbon Emissions: **23.47 million tons**
20-Year Water Consumption: **10.15 million gallons**

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,958	2,001	2,016	2,032	2,053	2,109	2,118	2,114	2,113	2,104	2,101	2,102	2,095	2,085	2,073	2,081	2,070	2,062	2,077	2,083
PRM	%	13%	12%	18%	24%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	23%
Carbon Intensity	lbs/MWh	1,021	649	441	417	229	225	221	197	193	186	175	43	35	149	49	37	141	134	49	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,073	1,241	1,233	1,224	1,219	1,264	1,256	1,247	1,260	1,315	1,371	1,362	1,369	1,424	1,416	1,407	1,446	2,555
Wind	MW	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956
Battery	MW	-	300	529	629	672	743	746	883	883	883	991	991	991	991	1,008	1,008	1,015	1,026	1,040	1,886
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	MW	52	87	107	131	155	162	168	175	182	188	195	202	189	177	164	172	154	138	140	143
Total Capacity	MW	3,187	3,672	3,864	4,146	4,005	4,072	4,078	4,118	4,116	4,114	4,095	4,157	4,200	4,180	4,090	4,152	4,132	4,119	4,173	5,839

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,252	2,442	2,292	2,355	2,365	2,293	2,363	2,361	2,291	2,358	2,363	2,267	2,325	2,386	2,242	2,277	2,304	2,199	2,081
Coal	GWh	3,780	2,040	1,153	1,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	653	1,765	2,210	2,074	2,467	2,515	2,471	2,260	2,218	2,113	2,011	506	399	1,678	560	414	1,553	1,476	543	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	782	1,851	2,707	3,082	3,219	3,254	3,225	3,474	3,443	3,425	3,536	3,793	3,984	3,947	4,010	4,203	4,143	4,146	4,269	5,391
Wind	GWh	2,199	2,181	2,212	2,238	2,229	2,205	2,238	2,204	2,223	2,208	2,235	2,213	2,242	2,217	2,000	2,006	2,000	2,000	2,000	3,529
Battery	GWh	-	-44	-128	-142	-146	-158	-161	-191	-188	-187	-293	-314	-327	-314	-351	-356	-351	-369	-395	-918
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSM	GWh	93	188	279	379	468	501	534	566	596	627	658	690	630	573	516	550	479	422	427	441
Total Generation	GWh	10,832	11,304	10,945	11,108	10,664	10,753	10,670	10,746	10,723	10,546	10,575	9,324	9,265	10,496	9,189	9,129	10,171	10,049	9,113	10,595
Net Purchases	GWh	-1,140	-1,353	-902	-878	-262	-17	163	77	84	206	132	1,358	1,295	-37	1,176	1,246	102	142	1,076	-402
Total Supply	GWh	9,692	9,951	10,043	10,230	10,402	10,736	10,833	10,824	10,807	10,752	10,707	10,681	10,560	10,459	10,365	10,376	10,273	10,191	10,189	10,193

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

"Total Supply" matches the annual energy from the corresponding load forecast

Scenario: [Carbon Free 2030](#)
Future: [Current Trends & Policy](#)
Sensitivity: [None](#)

20-Year NPV Revenue Requirement **\$15,618** million
20-Year Carbon Emissions: **16.69** million tons
20-Year Water Consumption: **8.09** million gallons

Key Annual Metrics

Metric	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peak load	MW	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
PRM	%	12%	10%	18%	21%	22%	20%	19%	18%	18%	85%	78%	78%	77%	76%	75%	73%	72%	71%	68%	44%
Carbon Intensity	lbs/MWh	1,049	660	431	404	64	151	155	155	154	-	-	-	-	-	-	-	-	-	-	-

Installed Capacity by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	MW	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
Coal	MW	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	MW	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	-
Hydrogen-Ready	MW	-	-	120	120	120	120	120	240	240	240	240	240	240	240	240	240	240	240	240	366
Geothermal	MW	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Solar	MW	379	1,026	1,132	1,300	1,488	1,475	1,467	1,459	1,456	2,645	2,665	2,657	2,656	2,711	2,854	2,882	2,874	2,905	2,896	2,930
Wind	MW	658	658	658	658	658	1,058	1,058	1,058	1,058	1,058	1,058	1,058	1,058	1,058	956	956	956	956	956	956
Battery	MW	-	300	458	558	755	755	755	757	763	763	763	763	763	763	763	763	763	763	763	763
Pumped Hydro	MW	-	-	-	-	-	-	-	-	-	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
DSM	MW	52	87	107	98	122	129	136	143	149	156	163	170	157	145	132	139	118	102	98	98
Total Capacity	MW	3,187	3,672	3,971	4,221	4,430	4,824	4,822	4,794	4,804	7,500	7,381	7,379	7,366	7,408	7,437	7,472	7,443	7,457	7,445	6,912

Annual Generation by Resource Type

Resource Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Nuclear	GWh	3,253	3,257	2,441	2,289	2,323	2,327	2,250	2,294	2,293	2,100	2,126	2,120	2,035	2,074	2,109	2,010	2,004	2,007	1,942	2,161
Coal	GWh	3,927	2,132	1,152	1,106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	GWh	691	1,778	2,219	2,092	767	1,804	1,869	1,899	1,905	-	-	-	-	-	-	-	-	-	-	-
Hydrogen	GWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	GWh	71	70	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Solar	GWh	785	1,866	2,949	3,334	4,343	4,101	4,111	4,043	4,020	7,912	7,831	7,826	7,845	7,878	8,088	8,182	8,221	8,187	8,306	6,940
Wind	GWh	2,199	2,181	2,212	2,238	2,229	3,733	3,765	3,735	3,747	3,488	3,506	3,484	3,521	3,479	3,283	3,294	3,283	3,291	3,298	3,533
Battery	GWh	-	-44	-116	-128	-166	-169	-168	-168	-171	-83	-74	-78	-76	-67	-65	-68	-75	-76	-70	-107
Pumped Hydro	GWh	-	-	-	-	-	-	-	-	-	-858	-842	-860	-866	-890	-922	-940	-951	-920	-953	-750
DSM	GWh	94	188	279	377	466	499	531	564	594	624	654	686	627	569	512	546	458	400	379	376
Total Generation	GWh	11,019	11,428	11,207	11,379	10,033	12,366	12,430	12,438	12,458	13,255	13,271	13,249	13,157	13,114	13,075	13,095	13,011	12,960	12,973	12,225
Net Purchases	GWh	-1,233	-1,295	-895	-794	808	-1,106	-1,011	-972	-953	-1,745	-1,746	-1,689	-1,658	-1,656	-1,649	-1,597	-1,556	-1,525	-1,479	-665
Total Supply	GWh	9,786	10,133	10,312	10,585	10,841	11,260	11,419	11,465	11,505	11,510	11,525	11,560	11,499	11,459	11,426	11,498	11,456	11,435	11,494	11,560

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

"Total Supply" matches the annual energy from the corresponding load forecast

Appendix K. MCEP Loads and Resources Tables

This appendix presents loads and resources tables for the two portfolios identified as MCEPs in our IRP: the Technology Neutral and the No New Combustion scenarios. For completeness, we report both the installed capacity and the “effective” capacity of each resource in the portfolios; the effective capacity is used to assess whether our portfolio meets our resource adequacy needs.

For the sake of clarity, we also include a version of this table showing existing & approved resources. While not yet authorized by the Commission, this version of the table also includes:

- Energy efficiency needed to meet EUEA goals in 2024 and 2025; and
- The 15 MW DR resource for which PNM is currently seeking Commission approval as part of the SJGS replacement portfolio.

The data in this table correspond to the capacity need shown in Figure 53 and the technology-level information shown in Table 22.

Public Service Company of New Mexico
2020 Integrated Resource Plan
Technology Neutral Scenario

Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	EUEA Energy Efficiency	20	39	60	81	102	102	102	102	102	102	102	102	83	63	43	43	21	-	-	-
(2)	Incremental Energy Efficiency	-	-	-	2	5	12	18	25	32	39	45	52	59	66	74	81	86	90	92	95
(3)	Total Energy Efficiency (MW)	20	39	60	83	107	114	121	128	134	141	148	155	142	130	117	124	107	90	92	95
(4)	Peak Saver	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	Power Saver	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	SJGS Replacement DR	-	15	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-
(7)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(8)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15
(10)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Total Demand Response (MW)	33	48	48	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
(13)	Four Corners	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(14)	San Juan	497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	Total Coal Resources (MW)	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Palo Verde Unit 1	134	134	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(17)	Palo Verde Unit 2	134	134	134	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
(18)	Palo Verde Unit 3	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
(19)	Total Nuclear Resources (MW)	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
(20)	Afton	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	-
(21)	La Luz	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
(22)	Lordsburg	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
(23)	Luna	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	-
(24)	Reeves	146	146	146	146	146	146	146	146	146	146	-	-	-	-	-	-	-	-	-	-
(25)	Rio Bravo	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	-
(26)	Valencia PPA	149	149	149	149	149	149	149	-	-	-	-	-	-	-	-	-	-	-	-	-
(27)	New Hydrogen-Ready CT	-	-	160	160	280	360	360	480	480	480	480	480	480	480	480	480	480	480	480	480
(28)	Total Natural Gas Resources (MW)	987	987	1,147	1,147	1,267	1,347	1,347	1,467	1,318	1,318	1,172	1,172	1,172	1,172	1,172	1,172	1,172	1,172	1,172	606
(29)	Dale Burgett	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(30)	Total Geothermal Resources (MW)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(31)	Casa Mesa Wind	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(32)	La Joya Wind 1	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
(33)	La Joya Wind 2	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
(34)	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
(35)	Red Mesa Wind Energy Center	102	102	102	102	102	102	102	102	102	102	102	102	102	102	-	-	-	-	-	-
(36)	New Wind	-	-	-	-	-	-	-	-	-	-	-	400	400	400	400	400	400	400	400	400
(37)	Total Wind Resources (MW)	658	658	658	658	658	658	658	658	658	658	658	1,058	1,058	1,058	956	956	956	956	956	956

Public Service Company of New Mexico
2020 Integrated Resource Plan
Technology Neutral Scenario

Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(38)	PNM Existing Utility-Owned Solar	153	152	151	150	149	148	147	146	145	144	143	142	141	140	140	139	138	137	136	135
(39)	Arroyo Solar	-	300	300	291	289	287	285	283	281	278	276	274	272	270	268	266	264	262	260	257
(40)	Britton Solar	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42
(41)	Encino Solar	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(42)	Facebook Solar 1-3	29	29	28	28	28	28	28	27	27	27	27	27	26	26	26	26	26	25	25	25
(43)	Jicarilla Solar 1	-	50	50	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43
(44)	Jicarilla Solar 2	49	48	48	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42	42
(45)	Rockmont Solar	-	100	100	97	96	96	95	94	94	93	92	91	91	90	89	89	88	87	87	86
(46)	Route 66 Solar	50	50	49	48	48	47	47	46	46	46	46	45	45	45	44	44	44	43	43	43
(47)	San Juan Solar	-	200	200	194	193	191	190	188	187	186	184	183	181	180	179	177	176	174	173	172
(48)	New Solar PV	-	-	50	240	239	232	231	229	227	226	224	222	221	219	217	233	233	231	298	1,562
(49)	Total Solar Resources (MW)	379	1,026	1,073	1,241	1,233	1,220	1,212	1,203	1,195	1,187	1,178	1,170	1,161	1,153	1,145	1,153	1,147	1,138	1,198	2,456
(50)	Arroyo Storage ESA	-	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
(51)	Jicarilla Storage ESA	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(52)	Rockmont Storage ESA	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(53)	San Juan Storage ESA	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(54)	New Lithium Ion Battery (4hr)	-	-	123	223	223	223	227	263	269	269	438	438	438	448	481	498	500	500	500	800
(55)	New Lithium Ion Battery (8hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(56)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	55	78	435
(57)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Total Storage Resources (MW)	-	300	423	523	523	523	527	563	569	569	738	738	738	748	781	798	825	855	878	1,535
(59)	Total Installed Capacity	3,187	3,672	3,918	4,168	4,103	4,177	4,179	4,184	4,189	4,187	4,208	4,607	4,586	4,575	4,485	4,518	4,521	4,525	4,611	5,962

Notes

1. "Installed capacity" of energy efficiency reflects peak load reductions
2. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
3. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

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Line Loads and Effective Capacity (MW)

No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	Forecast Peak Demand (MW)	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
(2)	EUEA Energy Efficiency	-20	-39	-60	-81	-102	-102	-102	-102	-102	-102	-102	-102	-83	-63	-43	-43	-21	-	-	-
(3)	Incremental Energy Efficiency	-	-	-	-2	-5	-12	-18	-25	-32	-39	-45	-52	-59	-66	-74	-81	-86	-90	-92	-95
(4)	Net System Peak Demand (MW)	1,956	1,996	2,006	2,015	2,027	2,092	2,107	2,110	2,114	2,111	2,115	2,122	2,138	2,153	2,167	2,181	2,201	2,224	2,252	2,267
(5)	Peak Saver	10	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Power Saver	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	SJGS Replacement DR	-	12	12	12	12	12	12	12	12	12	12	-	-	-	-	-	-	-	-	-
(8)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	12	12	12	12	12	12	12	12	12
(11)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	Total Demand Response (MW)	30	42	42	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
(14)	Four Corners	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	San Juan	408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Total Coal Resources (MW)	568	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(17)	Palo Verde Unit 1	131	131	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
(18)	Palo Verde Unit 2	131	131	131	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
(19)	Palo Verde Unit 3	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
(20)	Total Nuclear Resources (MW)	394	394	292	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
(21)	Afton	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	-
(22)	La Luz	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
(23)	Lordsburg	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
(24)	Luna	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	-
(25)	Reeves	141	141	141	141	141	141	141	141	141	141	-	-	-	-	-	-	-	-	-	-
(26)	Rio Bravo	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	-
(27)	Valencia PPA	144	144	144	144	144	144	144	-	-	-	-	-	-	-	-	-	-	-	-	-
(28)	New Hydrogen-Ready CT	-	-	155	155	271	348	348	464	464	464	464	464	464	464	464	464	464	464	464	464
(29)	Total Natural Gas Resources (MW)	952	952	1,107	1,107	1,223	1,300	1,300	1,272	1,272	1,272	1,131	1,131	1,131	1,131	1,131	1,131	1,131	1,131	1,131	586
(49)	Dale Burgett	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(50)	Total Geothermal Resources (MW)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(30)	Casa Mesa Wind	14	14	14	14	14	14	14	14	14	14	14	11	11	11	11	11	11	11	11	11
(31)	La Joya Wind 1	46	46	46	46	46	46	46	46	46	46	46	35	35	35	37	37	37	37	37	37
(32)	La Joya Wind 2	38	38	38	38	38	38	38	38	38	38	38	29	29	29	31	31	31	31	31	31
(33)	New Mexico Wind Energy Center	55	55	55	55	55	55	55	55	55	55	55	42	42	42	45	45	45	45	45	45
(34)	Red Mesa Wind Energy Center	28	28	28	28	28	28	28	28	28	28	28	21	21	21	-	-	-	-	-	-
(35)	New Wind	-	-	-	-	-	-	-	-	-	-	-	84	84	84	89	89	89	89	89	89
(36)	Total Wind Resources (MW)	181	181	181	181	181	181	181	181	181	181	181	223	223	223	213	213	213	213	213	213

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Line Loads and Effective Capacity (MW)

No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(37)	PNM Existing Utility-Owned Solar	26	25	25	25	25	25	25	24	24	24	24	24	24	23	23	23	23	23	23	13
(38)	Arroyo Solar	-	50	49	48	48	48	47	47	46	46	46	45	45	45	44	44	44	43	43	24
(39)	Britton Solar	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	4
(40)	Encino Solar	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	4
(41)	Facebook Solar 1-3	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	2
(42)	Jicarilla Solar 1	-	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	4
(43)	Jicarilla Solar 2	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	4
(44)	Rockmont Solar	-	17	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15	14	14	8
(45)	Route 66 Solar	-	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	4
(46)	San Juan Solar	-	33	32	32	32	32	31	31	31	31	31	30	30	30	30	29	29	29	29	16
(47)	New Solar PV	-	-	8	40	40	39	39	38	38	38	37	37	37	37	36	39	39	39	50	162
(48)	Total Solar Resources (MW)	54	171	175	206	205	202	199	199	198	197	195	194	192	191	189	191	189	188	198	245
(51)	Arroyo Storage ESA	-	143	142	142	142	142	142	142	142	142	138	138	138	138	138	137	137	137	137	124
(52)	Jicarilla Storage ESA	-	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18	17
(53)	Rockmont Storage ESA	-	29	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	25
(54)	San Juan Storage ESA	-	96	95	95	95	95	95	95	95	95	92	92	92	92	92	92	92	92	92	83
(55)	New Lithium Ion Battery (4hr)	-	-	117	212	212	212	216	249	256	256	408	408	408	416	445	460	462	462	462	673
(56)	New Lithium Ion Battery (8hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(57)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	52	75	416
(58)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(59)	Total Storage Resources (MW)	-	287	401	497	497	497	500	533	539	539	684	684	684	693	721	735	760	789	811	1,336
(60)	Total Effective Capacity (MW)	2,184	2,192	2,363	2,450	2,404	2,479	2,482	2,485	2,490	2,488	2,491	2,531	2,530	2,537	2,553	2,569	2,593	2,620	2,652	2,680
(61)	Reserve Margin (MW)	228	196	357	435	377	387	375	375	376	377	376	409	392	383	386	388	392	396	401	413
(62)	Reserve Margin (%)	12%	10%	18%	22%	19%	19%	18%	18%	18%	18%	18%	19%	18%	18%	18%	18%	18%	18%	18%	18%

Notes

1. "Forecast Peak Demand" does not include impacts of energy efficiency, which is shown below as a load adjustment
2. "Net System Peak Demand" includes impacts of all load modifying resources, including energy efficiency
3. Effective capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention
4. Effective capacity for non-firm resources (renewables, storage) reported using "Effective Load Carrying Capability" (ELCC) convention
5. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
6. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

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No New Combustion Scenario

Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	EUEA Energy Efficiency	20	39	60	81	102	102	102	102	102	102	102	102	83	63	43	43	21	-	-	-
(2)	Incremental Energy Efficiency	-	-	-	2	5	12	18	25	32	39	45	52	59	66	74	81	86	90	92	95
(3)	Total Energy Efficiency (MW)	20	39	60	83	107	114	121	128	134	141	148	155	142	130	117	124	107	90	92	95
(4)	Peak Saver	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	Power Saver	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	SJGS Replacement DR	-	15	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-
(7)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(8)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15
(10)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Total Demand Response (MW)	33	48	48	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
(13)	Four Corners	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(14)	San Juan	497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	Total Coal Resources (MW)	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Palo Verde Unit 1	134	134	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(17)	Palo Verde Unit 2	134	134	134	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
(18)	Palo Verde Unit 3	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
(19)	Total Nuclear Resources (MW)	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
(20)	Afton	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	-
(21)	La Luz	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	-
(22)	Lordsburg	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	-
(23)	Luna	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	-
(24)	Reeves	146	146	146	146	146	146	146	146	146	146	-	-	-	-	-	-	-	-	-	-
(25)	Rio Bravo	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	-
(26)	Valencia PPA	149	149	149	149	149	149	149	-	-	-	-	-	-	-	-	-	-	-	-	-
(27)	New Hydrogen-Ready CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(28)	Total Natural Gas Resources (MW)	987	987	987	987	987	987	987	987	838	838	692	692	692	692	692	692	692	692	692	-
(29)	Dale Burgett	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(30)	Total Geothermal Resources (MW)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(31)	Casa Mesa Wind	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(32)	La Joya Wind 1	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
(33)	La Joya Wind 2	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
(34)	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
(35)	Red Mesa Wind Energy Center	102	102	102	102	102	102	102	102	102	102	102	102	102	102	-	-	-	-	-	-
(36)	New Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400
(37)	Total Wind Resources (MW)	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	956

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Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(38)	PNM Existing Utility-Owned Solar	153	152	151	150	149	148	147	146	145	144	143	142	141	140	140	139	138	137	136	135
(39)	Arroyo Solar	-	300	300	291	289	287	285	283	281	278	276	274	272	270	268	266	264	262	260	257
(40)	Britton Solar	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42
(41)	Encino Solar	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(42)	Facebook Solar 1-3	29	29	28	28	28	28	28	27	27	27	27	27	26	26	26	26	26	25	25	25
(43)	Jicarilla Solar 1	-	50	50	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43
(44)	Jicarilla Solar 2	49	48	48	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42	42
(45)	Rockmont Solar	-	100	100	97	96	96	95	94	94	93	92	91	91	90	89	89	88	87	87	86
(46)	Route 66 Solar	50	50	49	48	48	47	47	46	46	46	46	45	45	45	44	44	44	43	43	43
(47)	San Juan Solar	-	200	200	194	193	191	190	188	187	186	184	183	181	180	179	177	176	174	173	172
(48)	New Solar PV	-	-	50	240	301	294	293	291	298	296	506	639	716	715	758	837	835	833	931	2,271
(49)	Total Solar Resources (MW)	379	1,026	1,073	1,241	1,295	1,282	1,274	1,265	1,265	1,257	1,460	1,587	1,657	1,649	1,685	1,757	1,749	1,740	1,831	3,165
(50)	Arroyo Storage ESA	-	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
(51)	Jicarilla Storage ESA	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(52)	Rockmont Storage ESA	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(53)	San Juan Storage ESA	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(54)	New Lithium Ion Battery (4hr)	-	-	299	399	500	500	500	500	508	508	720	724	748	748	793	800	800	800	800	1,025
(55)	New Lithium Ion Battery (8hr)	-	-	-	-	7	88	107	262	262	262	262	262	262	273	273	273	273	273	273	391
(56)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	9	17	26	51	80	112	590
(57)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Total Storage Resources (MW)	-	300	599	699	807	888	907	1,062	1,070	1,070	1,282	1,286	1,310	1,330	1,383	1,399	1,425	1,453	1,485	2,307
(59)	Total Installed Capacity	3,187	3,672	3,934	4,183	4,169	4,244	4,261	4,265	4,280	4,278	4,554	4,692	4,773	4,773	4,747	4,843	4,843	4,846	4,971	6,837

Notes

1. "Installed capacity" of energy efficiency reflects peak load reductions
2. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
3. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

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No New Combustion Scenario

Line Loads and Effective Capacity (MW)

No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	Forecast Peak Demand (MW)	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
(2)	EUEA Energy Efficiency	-20	-39	-60	-81	-102	-102	-102	-102	-102	-102	-102	-102	-83	-63	-43	-43	-21	-	-	-
(3)	Incremental Energy Efficiency	-	-	-	-2	-5	-12	-18	-25	-32	-39	-45	-52	-59	-66	-74	-81	-86	-90	-92	-95
(4)	Net System Peak Demand (MW)	1,956	1,996	2,006	2,015	2,027	2,092	2,107	2,110	2,114	2,111	2,115	2,122	2,138	2,153	2,167	2,181	2,201	2,224	2,252	2,267
(5)	Peak Saver	10	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Power Saver	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	SJGS Replacement DR	-	12	12	12	12	12	12	12	12	12	12	-	-	-	-	-	-	-	-	-
(8)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	12	12	12	12	12	12	12	12	12
(11)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	Total Demand Response (MW)	30	42	42	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
(14)	Four Corners	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	San Juan	408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Total Coal Resources (MW)	568	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(17)	Palo Verde Unit 1	131	131	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
(18)	Palo Verde Unit 2	131	131	131	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
(19)	Palo Verde Unit 3	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
(20)	Total Nuclear Resources (MW)	394	394	292	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
(21)	Afton	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	-
(22)	La Luz	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	-
(23)	Lordsburg	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	-
(24)	Luna	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	-
(25)	Reeves	141	141	141	141	141	141	141	141	141	141	-	-	-	-	-	-	-	-	-	-
(26)	Rio Bravo	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	-
(27)	Valencia PPA	144	144	144	144	144	144	144	-	-	-	-	-	-	-	-	-	-	-	-	-
(28)	New Hydrogen-Ready CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(29)	Total Natural Gas Resources (MW)	952	952	952	952	952	952	952	808	808	808	667	667	667	667	667	667	667	667	667	-
(49)	Dale Burgett	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(50)	Total Geothermal Resources (MW)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(30)	Casa Mesa Wind	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	11
(31)	La Joya Wind 1	46	46	46	46	46	46	46	46	46	46	46	46	46	46	48	48	48	48	48	37
(32)	La Joya Wind 2	38	38	38	38	38	38	38	38	38	38	38	38	38	38	40	40	40	40	40	31
(33)	New Mexico Wind Energy Center	55	55	55	55	55	55	55	55	55	55	55	55	55	55	58	58	58	58	58	45
(34)	Red Mesa Wind Energy Center	28	28	28	28	28	28	28	28	28	28	28	28	28	28	-	-	-	-	-	-
(35)	New Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
(36)	Total Wind Resources (MW)	181	181	181	181	181	181	181	181	181	181	181	181	181	181	161	161	161	161	161	213

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Line Loads and Effective Capacity (MW)

No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(37)	PNM Existing Utility-Owned Solar	26	25	25	25	25	24	24	24	24	24	22	20	19	19	19	18	18	18	17	10
(38)	Arroyo Solar	-	50	49	48	47	47	47	47	46	46	41	38	37	37	36	34	34	34	32	18
(39)	Britton Solar	8	8	8	8	8	8	8	8	8	8	7	6	6	6	6	6	6	6	5	3
(40)	Encino Solar	8	8	8	8	8	8	8	8	8	8	7	6	6	6	6	6	6	6	5	3
(41)	Facebook Solar 1-3	5	5	5	5	5	5	5	5	5	4	4	4	4	4	3	3	3	3	3	2
(42)	Jicarilla Solar 1	-	8	8	8	8	8	8	8	8	8	7	6	6	6	6	6	6	6	5	3
(43)	Jicarilla Solar 2	8	8	8	8	8	8	8	8	8	7	7	6	6	6	6	6	6	6	5	3
(44)	Rockmont Solar	-	17	16	16	16	16	16	16	15	15	14	13	12	12	12	11	11	11	11	6
(45)	Route 66 Solar	-	8	8	8	8	8	8	8	8	8	7	6	6	6	6	6	6	6	5	3
(46)	San Juan Solar	-	33	32	32	32	31	31	31	31	27	26	25	24	24	24	23	23	23	21	12
(47)	New Solar PV	-	-	8	40	50	49	49	49	50	49	80	96	105	105	109	117	117	117	125	183
(48)	Total Solar Resources (MW)	54	171	175	206	213	211	210	210	209	208	222	228	232	231	233	235	235	235	236	246
(51)	Arroyo Storage ESA	-	143	139	139	137	137	137	137	137	137	127	126	126	126	124	124	124	124	124	108
(52)	Jicarilla Storage ESA	-	19	19	19	18	18	18	18	18	18	17	17	17	17	17	17	17	17	17	14
(53)	Rockmont Storage ESA	-	29	28	28	27	27	27	27	27	27	25	25	25	25	25	25	25	25	25	22
(54)	San Juan Storage ESA	-	96	93	93	92	92	92	92	91	91	84	84	84	84	83	83	83	83	83	72
(55)	New Lithium Ion Battery (4hr)	-	-	277	373	462	462	462	462	468	468	619	622	638	638	668	673	673	673	673	759
(56)	New Lithium Ion Battery (8hr)	-	-	-	-	6	84	102	250	250	250	250	250	250	261	261	261	261	261	261	374
(57)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	9	16	25	49	77	107	564
(58)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(59)	Total Storage Resources (MW)	-	287	556	651	743	821	839	987	992	992	1,122	1,125	1,139	1,159	1,193	1,207	1,231	1,259	1,289	1,913
(60)	Total Effective Capacity (MW)	2,184	2,192	2,363	2,450	2,388	2,464	2,482	2,485	2,490	2,488	2,491	2,500	2,518	2,537	2,553	2,569	2,593	2,620	2,652	2,671
(61)	Reserve Margin (MW)	228	196	357	435	361	372	375	375	376	377	376	377	380	383	386	388	392	396	401	403
(62)	Reserve Margin (%)	12%	10%	18%	22%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%

Notes

1. "Forecast Peak Demand" does not include impacts of energy efficiency, which is shown below as a load adjustment
2. "Net System Peak Demand" includes impacts of all load modifying resources, including energy efficiency
3. Effective capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention
4. Effective capacity for non-firm resources (renewables, storage) reported using "Effective Load Carrying Capability" (ELCC) convention
5. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
6. All natural gas capacity remaining in 2040 is converted to operate using carbon-free hydrogen fuel

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Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	EUEA Energy Efficiency	20	39	60	81	102	102	102	102	102	102	102	102	83	63	43	43	21	-	-	-
(2)	Incremental Energy Efficiency	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Energy Efficiency (MW)	20	39	60	81	102	102	102	102	102	102	102	102	83	63	43	43	21	-	-	-
(4)	Peak Saver	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	Power Saver	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	SJGS Replacement DR	-	15	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-
(7)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(8)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Total Demand Response (MW)	33	48	48	15	15	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-
(13)	Four Corners	200	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(14)	San Juan	497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	Total Coal Resources (MW)	697	200	200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Palo Verde Unit 1	134	134	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(17)	Palo Verde Unit 2	134	134	134	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
(18)	Palo Verde Unit 3	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
(19)	Total Nuclear Resources (MW)	402	402	298	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288	288
(20)	Afton	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	-
(21)	La Luz	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
(22)	Lordsburg	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
(23)	Luna	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	-
(24)	Reeves	146	146	146	146	146	146	146	146	146	146	-	-	-	-	-	-	-	-	-	-
(25)	Rio Bravo	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	-
(26)	Valencia PPA	149	149	149	149	149	149	149	-	-	-	-	-	-	-	-	-	-	-	-	-
(27)	New Hydrogen-Ready CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(28)	Total Natural Gas Resources (MW)	987	987	987	987	987	987	987	838	838	838	692	692	692	692	692	692	692	692	692	126
(29)	Dale Burgett	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(30)	Total Geothermal Resources (MW)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
(31)	Casa Mesa Wind	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(32)	La Joya Wind 1	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
(33)	La Joya Wind 2	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
(34)	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
(35)	Red Mesa Wind Energy Center	102	102	102	102	102	102	102	102	102	102	102	102	102	102	-	-	-	-	-	-
(36)	New Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(37)	Total Wind Resources (MW)	658	658	658	658	658	658	658	658	658	658	658	658	658	658	556	556	556	556	556	556

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Line No.	Nameplate Capacity (MW) Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(38)	PNM Existing Utility-Owned Solar	153	152	151	150	149	148	147	146	145	144	143	142	141	140	140	139	138	137	136	135
(39)	Arroyo Solar	-	300	300	291	289	287	285	283	281	278	276	274	272	270	268	266	264	262	260	257
(40)	Britton Solar	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42
(41)	Encino Solar	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
(42)	Facebook Solar 1-3	29	29	28	28	28	28	28	27	27	27	27	27	26	26	26	26	26	25	25	25
(43)	Jicarilla Solar 1	-	50	50	49	48	48	47	47	47	46	46	46	45	45	45	44	44	44	43	43
(44)	Jicarilla Solar 2	49	48	48	47	47	46	46	46	45	45	45	44	44	44	43	43	43	42	42	42
(45)	Rockmont Solar	-	100	100	97	96	96	95	94	94	93	92	91	91	90	89	89	88	87	87	86
(46)	Route 66 Solar	50	50	49	48	48	47	47	46	46	46	46	45	45	45	44	44	44	43	43	43
(47)	San Juan Solar	-	200	200	194	193	191	190	188	187	186	184	183	181	180	179	177	176	174	173	172
(48)	New Solar PV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(49)	Total Solar Resources (MW)	379	1,026	1,023	1,001	995	988	981	974	968	961	954	947	941	934	927	920	914	907	900	894
(50)	Arroyo Storage ESA	-	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
(51)	Jicarilla Storage ESA	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(52)	Rockmont Storage ESA	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
(53)	San Juan Storage ESA	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(54)	New Lithium Ion Battery (4hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(55)	New Lithium Ion Battery (8hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(56)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(57)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Total Storage Resources (MW)	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
(59)	Total Installed Capacity	3,187	3,672	3,585	3,542	3,356	3,350	3,343	3,187	3,180	3,174	3,021	2,999	2,973	2,946	2,817	2,811	2,783	2,754	2,748	2,175

Notes

- * This table also includes EE measures needed to meet EUEA goals through 2025 and the demand response resource for which PNM is currently seeking approval as part of the SJGS replacement portfolio
1. "Installed capacity" of energy efficiency reflects peak load reductions and reflects all measures needed to meet EUEA targets through 2025
 2. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
 3. All natural gas capacity remaining in 2040 is a candidate for conversion to carbon-free fuel or may be retired

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Line Loads and Effective Capacity (MW)

No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(1)	Forecast Peak Demand (MW)	1,976	2,035	2,066	2,098	2,135	2,206	2,228	2,237	2,248	2,252	2,262	2,277	2,280	2,283	2,284	2,305	2,308	2,314	2,344	2,363
(2)	EUEA Energy Efficiency	-20	-39	-60	-81	-102	-102	-102	-102	-102	-102	-102	-102	-83	-63	-43	-43	-21	-	-	-
(3)	Incremental Energy Efficiency	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4)	Net System Peak Demand (MW)	1,956	1,996	2,006	2,017	2,032	2,104	2,125	2,135	2,145	2,150	2,160	2,174	2,197	2,220	2,241	2,262	2,287	2,314	2,344	2,363
(5)	Peak Saver	10	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	Power Saver	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	SJGS Replacement DR	-	12	12	12	12	12	12	12	12	12	12	-	-	-	-	-	-	-	-	-
(8)	Peak Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	Power Saver Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	SJGS Replacement DR Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	Peak Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	Power Saver Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	Total Demand Response (MW)	30	42	42	12	12	12	12	12	12	12	12	-	-	-	-	-	-	-	-	-
(14)	Four Corners	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	San Juan	408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	Total Coal Resources (MW)	568	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(17)	Palo Verde Unit 1	131	131	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
(18)	Palo Verde Unit 2	131	131	131	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
(19)	Palo Verde Unit 3	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
(20)	Total Nuclear Resources (MW)	394	394	292	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
(21)	Afton	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	-
(22)	La Luz	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
(23)	Lordsburg	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
(24)	Luna	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	-
(25)	Reeves	141	141	141	141	141	141	141	141	141	141	-	-	-	-	-	-	-	-	-	-
(26)	Rio Bravo	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	-
(27)	Valencia PPA	144	144	144	144	144	144	144	-	-	-	-	-	-	-	-	-	-	-	-	-
(28)	New Hydrogen-Ready CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(29)	Total Natural Gas/Hydrogen Resources (MW)	952	952	952	952	952	952	952	808	808	808	667	667	667	667	667	667	667	667	667	122
(30)	Dale Burgett	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(31)	Total Geothermal Resources (MW)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
(30)	Casa Mesa Wind	14	14	14	14	14	14	14	14	14	14	14	11	11	11	11	11	11	11	11	11
(32)	La Joya Wind 1	46	46	46	46	46	46	46	46	46	46	46	35	35	35	37	37	37	37	37	37
(33)	La Joya Wind 2	38	38	38	38	38	38	38	38	38	38	38	29	29	29	31	31	31	31	31	31
(34)	New Mexico Wind Energy Center	55	55	55	55	55	55	55	55	55	55	55	42	42	42	45	45	45	45	45	45
(35)	Red Mesa Wind Energy Center	28	28	28	28	28	28	28	28	28	28	28	21	21	21	-	-	-	-	-	-
(36)	New Wind	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(37)	Total Wind Resources (MW)	181	181	181	181	181	181	181	181	181	181	181	138	138	138	124	124	124	124	124	124

**Public Service Company of New Mexico
2020 Integrated Resource Plan
Existing & Approved* Resources Only**

Line No.	Loads and Effective Capacity (MW)																				
	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
(38)	PNM Existing Utility-Owned Solar	26	25	25	25	25	25	25	24	24	24	24	24	24	23	23	23	23	23	23	13
(39)	Arroyo Solar	-	50	49	48	48	48	47	47	46	46	46	45	45	44	44	44	44	43	43	24
(40)	Britton Solar	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	4
(41)	Encino Solar	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	4
(42)	Facebook Solar 1-3	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	2
(43)	Jicarilla Solar 1	-	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	4
(44)	Jicarilla Solar 2	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	4
(45)	Rockmont Solar	-	17	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15	14	14	8
(46)	Route 66 Solar	-	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	4
(47)	San Juan Solar	-	33	32	32	32	32	31	31	31	31	31	30	30	30	30	29	29	29	29	16
(48)	New Solar PV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(49)	Total Solar Resources (MW)	54	171	167	166	165	164	162	161	160	159	158	156	155	154	153	152	151	149	148	83
(50)	Arroyo Storage ESA	-	143	142	142	142	142	142	142	142	142	138	138	138	138	138	137	137	137	137	124
(51)	Jicarilla Storage ESA	-	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18	17
(52)	Rockmont Storage ESA	-	29	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	25
(53)	San Juan Storage ESA	-	96	95	95	95	95	95	95	95	95	92	92	92	92	92	92	92	92	92	83
(54)	New Lithium Ion Battery (4hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(55)	New Lithium Ion Battery (8hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(56)	New Flow Battery (10hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(57)	New Pumped Storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(58)	Total Storage Resources (MW)	-	287	284	284	284	284	284	284	284	284	277	277	277	276	275	275	275	275	275	248
(59)	Total Effective Capacity (MW)	2,184	2,192	2,084	2,042	1,881	1,880	1,879	1,733	1,732	1,731	1,581	1,526	1,524	1,523	1,506	1,504	1,503	1,502	1,501	864
(60)	Reserve Margin (MW)	228	196	77	25	-151	-224	-247	-402	-414	-419	-578	-649	-672	-697	-735	-758	-784	-813	-843	-1,499
(61)	Reserve Margin (%)	12%	10%	4%	1%	-7%	-11%	-12%	-19%	-19%	-19%	-27%	-30%	-31%	-31%	-33%	-34%	-34%	-35%	-36%	-63%

Notes

* This table also includes EE measures needed to meet EUEA goals through 2025 and the demand response resource for which PNM is currently seeking approval as part of the SJGS replacement portfolio

1. "Forecast Peak Demand" does not include impacts of energy efficiency, which is shown below as a load adjustment
2. "Net System Peak Demand" includes impacts of all load modifying resources, including energy efficiency
3. Effective capacity for firm resources (nuclear, coal, and natural gas) reported using "Unforced Capacity" (UCAP) convention
4. Effective capacity for non-firm resources (renewables, storage) reported using "Effective Load Carrying Capability" (ELCC) convention
5. SJGS is abandoned in June 2022 and does not contribute to PNM's firm capacity needs in that year
6. All natural gas capacity remaining in 2040 is a candidate for conversion to carbon-free fuel or may be retired

Appendix L. Description of Existing Demand-Side Management Programs

PNM's demand-side management programs include both energy efficiency and demand response. These programs provide savings for our customers by reducing our loads and needs for new capacity resources. Historical savings provided by PNM's current demand-side programs is shown in Table L-1 below.

Table L-1. PNM's historical DSM programs

Year	Energy Efficiency			Demand Response	
	First-Year Energy Savings (GWh)	First-Year Peak Reduction (MW)	Program Cost (\$ millions)	Peak Reduction (MW)	Program Cost (\$ millions)
2008	35	7	\$4	47	\$4
2009	40	6	\$6	53	\$6
2010	59	10	\$10	67	\$7
2011	58	10	\$10	57	\$8
2012	79	14	\$14	57	\$7
2013	76	12	\$12	62	\$8
2014	75	12	\$12	61	\$8
2015	79	12	\$12	59	\$7
2016	82	13	\$13	57	\$7
2017	74	12	\$12	60	\$6
2018	71	13	\$13	57	\$7
2019	78	14	\$14	44*	\$7

** In 2019, PNM changed its methodology to evaluate peak reductions from demand response programs to better align with actual load impacts*

A brief description of each of PNM's current DSM programs follows.

Commercial Comprehensive Program

The Commercial Comprehensive program is PNM's flagship program for non-residential customers and includes six components which are each described briefly below: Retrofit Rebates, New Construction, Building Tune-Up, Distributor Discount, Multifamily and PNM QuickSaver™ for small business customers. The program provides incentives for the retrofit or installation of both prescriptive and non-prescriptive measures that decrease demand and save energy. The program is designed to be a "one-stop-shop" for commercial customers interested in improving the efficiency of their existing or planned new facilities. Examples of measures include a prescriptive list of lighting upgrades, building controls, compressed air and fan systems, and HVAC and refrigeration upgrades, as well as incentives for custom measures. This program also includes a new construction option that offers incentives for buildings constructed to exceed local building code energy requirements and special incentives for small businesses. In addition, the program offers training programs and on-site audits. One important aspect of the Commercial Comprehensive program is its reliance on the participation of local energy efficiency vendors, suppliers and contractors who install the energy saving equipment. These businesses are critical "trade allies" and the program would not be successful without their enthusiastic support.

The Multifamily component targets a unique and hard-to-reach customer segment. The target audience consists of owners of multifamily (apartment) dwellings, who are eligible to receive

rebates and direct-install measures for energy efficiency upgrades in common areas and residential housing units in properties that include five or more residential housing units. The goal is to offer a program that is streamlined and offers a simple approach to better engage property owners to participate which in turn, will make their buildings more energy efficient and enable tenants to save money on their utility bills.

New Home Construction Program

In 2017, PNM relaunched a hybrid version of the former ENERGY STAR New Homes program that has proven successful in similar utility programs. The target audience consists of custom, semi-custom, and production home builders and includes consumers, realtors, trade allies, raters, developers and architects. The goal is to offer a streamlined program that offers participants incentives for highly efficient new single-family residential construction through either a prescriptive or a whole home performance path.

Residential Lighting Program

The Residential Lighting program provides incentives to PNM customers to replace incandescent light bulbs with primarily LED bulbs through instant, markdown discounts and coupons at participating retailers in the PNM service territory. The residential lighting market has been undergoing transformative change over the last few years and change is expected to continue as LEDs become more affordable and new halogen incandescent bulbs continue to claim market share. Beginning in 2021, PNM intends to incorporate additional retail products such as advanced power strips, evaporative cooling equipment and room air conditioners to the current residential lighting program. Incorporating additional offerings provides customers with a more comprehensive program of discounted products at the point of sale and will also assist in offsetting reduced lighting savings in the future.

Refrigerator Recycling Program

The Refrigerator Recycling program is designed to encourage retirement of old or unnecessary second refrigerators and freezers. A refrigerator manufactured before 1995 can use up to three times more energy than a newer model. By retiring and not replacing an extra working unit, a PNM residential customer can save up to \$175 a year in electricity costs. This program is also available to PNM business customers, although only residential size and type refrigerators and freezers are accepted. The program provides a rebate for each unit that is recycled.

Residential Cooling and Pool Pump Program

The Residential Cooling and Pool Pump program offers PNM residential customers cost and energy savings during the summer months by offering incentives for efficient cooling and pool pump equipment including evaporative, refrigerated air conditioning, and heat pump technologies. A midstream component will also be added in 2021 to incentivize distributors and contractors to stock higher efficiency cooling equipment and smart thermostats that can be readily available for customers.

Home Energy Checkup Program

The Home Energy Checkup program provides PNM residential customers, including low-income customers, the opportunity to participate in a Home Energy Checkup to save money and energy by choosing between two individually priced direct installation packages. The Home Energy Checkup applies a one-stop-shop approach that includes a walk-through assessment and informative discussion between the program participant and energy specialist explaining the assessment results, while also providing additional educational materials including conservation tips, ENERGY STAR cooling equipment and appliance rebate applications and information about other energy efficiency programs available to participants. Low income customers may be eligible for a free refrigerator replacement and free smart thermostat. As an alternative to an in-home assessment, customers may instead fill out an online Home Energy Analyzer survey about equipment in their homes and receive rebate applications for appliances and smart thermostats.

Home Works and Energy Innovation Program

PNM Home Works and Energy Innovation is an energy savings and education program that combines energy efficiency curriculum for teachers, an interactive hands-on presentation with students, and easy-to-install energy efficiency and water-saving measures for students to install at home with an adult. The program has two main goals: energy savings and market transformation through education. This program is offered to 5th grade and high school students.

Easy Savings Kit

The Easy Savings Kit program provides free LED lightbulbs, a showerhead, and educational materials on saving energy to low-income PNM customers. This program currently targets low-income PNM customers through direct mail and through agencies serving low income communities across PNM's service area.

Energy Smart Program (MFA)

The Energy Smart program provides funding to the New Mexico EnergySmart weatherization program implemented by New Mexico Mortgage Finance Authority (MFA). PNM funding is used by MFA to supplement federal and state funding they receive to administer the low-income weatherization program. In recent years, the program has focused on installation of LED bulbs, weatherization, and replacement of older inefficient refrigerators with ENERGY STAR qualified models. In 2017, the program was expanded to include a number of additional items for PNM customers who have electric space heating, electric water heating or HVAC. The new options include: Weatherization, shell measures, programmable thermostats, and water measures.

Power Saver Program

The Power Saver load management program controls refrigerated air conditioning units in participating homes and small businesses during periods of peak demand. PNM typically “dispatches” the Power Saver program during the hottest days of the year. Power Saver participants are paid an annual incentive per unit that is controlled. Most recently, a smart thermostat option has been added to this program which also enables participating customers to receive an incentive. For the 2020 season, the program has approximately 44,000 residential and

6,700 small and medium commercial customers enrolled for a potential capacity of roughly 44 MW. Full subscription of the program would be 60 MW.

Peak Saver Program

The Peak Saver load management program is designed to help medium and large commercial customers with demand greater than 50 kW reduce the amount of energy they require during peak demand periods. Participants have equipment installed that reduces loads when called upon. As with the Power Saver program, PNM typically “dispatches” the Peak Saver program during the hottest days of the year. Peak Saver participants are paid an annual incentive based on the amount of peak demand managed by the program. For the 2020 season, the program has approximately 100 customers and is fully subscribed with a nominated capacity of 25 MW.

Appendix M. Resource Adequacy Study

This IRP uses loss-of-load-expectation 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 Astrape Consulting using the SERVIM model, is summarized in the attached report.

PNM Planning Reserve Margin (PRM) and Effective Load Carrying Capability (ELCC) Analysis

01/2021

PREPARED FOR

PNM Resources

PREPARED BY

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Study Summary

SERVM (Strategic Energy and Risk Valuation Model) was utilized to perform Effective Load Carrying Capability (ELCC) and Planning Reserve Margin (PRM) analysis in support of the PNM 2020 IRP. Conducting these studies in parallel ensures that resource accreditation and determination of the planning reserve margin requirement are synchronized. After category ELCCs and the target PRM were identified, SERVM was utilized to verify the reliability target had been achieved in portfolios determined through PNM's IRP process.

The results of the ELCC component of this analysis are provided below in Table ES.1. The results of the PRM component of this analysis are provided below in Table ES.2. In Summary, for the expected portfolio for the year 2023, the average wind, solar PV, and battery ELCC were found to be 28.9%, 16.7%, and 95.6% respectively. Astrapé calculated average and marginal ELCC values at different penetration levels to provide a matrix of results that could be used in the PNM resource expansion planning optimization. In addition, ELCC values were calculated for demand response resources. The studied resource mix, considering these ELCCs, was found to yield a 0.2 annual LOLE (Loss of Load Expectation) at a 18% planning reserve margin target with market access assumptions that assumed 50 MW during peak net load periods as referenced in Table ES.2. This PRM target was derived using an unforced capacity (UCAP) capacity accounting methodology which considers the ELCC of energy limited or non-dispatchable resources and accounts conventional resources by derating by their EFOR.

Table ES.1 ELCC Results

Wind Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
607	175	28.9%	28.9%
1,000	217	21.7%	10.7%
1,500	262	17.5%	9.0%
2,000	273	13.7%	2.2%
2,500	283	11.3%	1.9%
Solar Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
1,026	172	16.7%	16.7%
1,200	183	15.3%	6.6%
1,500	199	13.3%	5.3%
2,000	210	10.5%	2.2%
2,500	211	8.4%	0.2%
Battery Nameplate Capacity ¹	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
300	287	95.6%	95.6%
500	472	94.4%	92.6%
700	641	91.6%	84.5%
1,000	825	82.5%	61.4%
1,500	945	63.0%	23.9%
DR Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
56	52	92.5%	92.5%
106	92	87.2%	81.3%

Table ES.2. PRM Results

PNM Fleet				Calculation Assuming 200-300 Market Access*		Calculation Assuming IRP Market Access**	
Unit Category	Installed	ELCC %	EFOR (%)	ICAP	UCAP	ICAP	UCAP
EE	16	100	-	16	16	16	16
CC	419	100	4	419	402	419	402
CT	408	100	3	408	395	408	395
DR	56	92	-	52	52	52	52
Geothermal	12	100	24	12	9	12	9
Nuclear	402	100	2	402	394	402	394
Solar	1,026	17	-	171	171	171	171
Solar Battery	300	96	-	287	287	287	287
ST Coal	200	100	20	200	160	200	160
ST Gas	154	100	3	154	149	154	149
Wind	607	29	-	175	175	175	175
LOLE Adjustment				0	0	164	164
Total	3,600			2,294	2,208	2,460	2,374
LOLE				0.2	0.2	0.2	0.2
Peak				2011	2011	2011	2011
PNM PRM	80%			14%	10%	22%	18%

*Market access of 200-300 MW during peak hours

**Market access of 200-300 MW during peak hours, 100-150 MW during summer hours 16-18, and 50 MW during summer hours 19-22

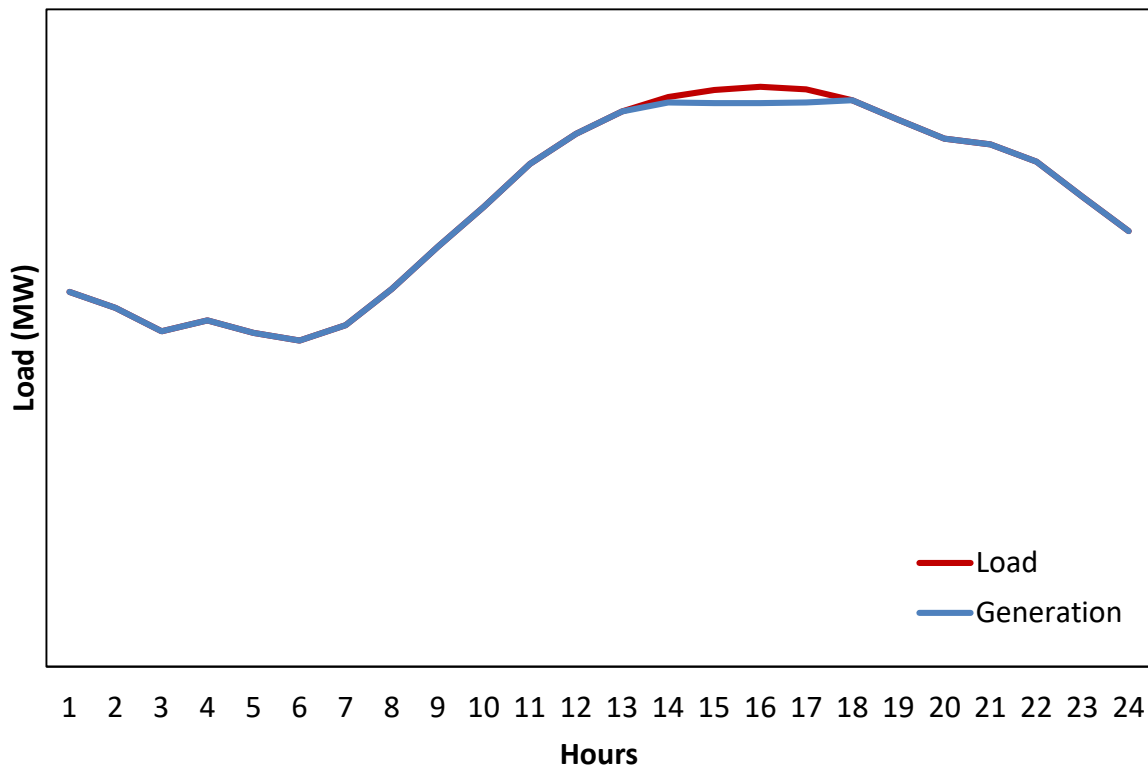
As discussed in more detail in the results section, the reliability of PNM's resulting portfolios was assessed to ensure the portfolios met the 0.2 LOLE reliability target. For the Current Trends and Policy Future (CTP), both the Technology Neutral (TN) and No New Combustion (NNC) Cases met reliability targets in 2025 which demonstrated that the PRM and ELCC framework PNM used in its Encompass modeling was appropriate. Additional futures were analyzed in 2025 and produced results at or near 0.2 LOLE. The year 2040 was also analyzed and even though the results of the 2040 analysis indicate portfolios were able to achieve the 0.2 LOLE target, the results for the year 2040 are significantly less certain than the 2025 analysis. As such it is important for PNM to continue to analyze resource adequacy and perform PRM and ELCC calculations for each IRP to ensure reliability is met during the near term (1-to-5-year time frame). As PNM and neighboring entities move toward higher renewable penetrations and more energy limited storage resources and away from dispatchable resources, resource adequacy analysis and assumptions including neighbor assistance will continue to be critical in order to maintain resource adequacy.

I. Study Framework

SERVM optimizes the commitment and dispatch of resources such that reliability events driven by a lack of capacity achieve specific targets at minimum cost. The reliability target used for this analysis was Loss of Load Expectation (LOLE) and is defined below:

LOLE¹: number of loss of load events due to capacity shortages, calculated in events per year. Figure 1 shows an example of a capacity shortfall which typically occurs across the peak of a day.

Figure 1. LOLE Example (illustration only)



¹ Within the SERV tool, this is defined as LOLE_{CAP}.

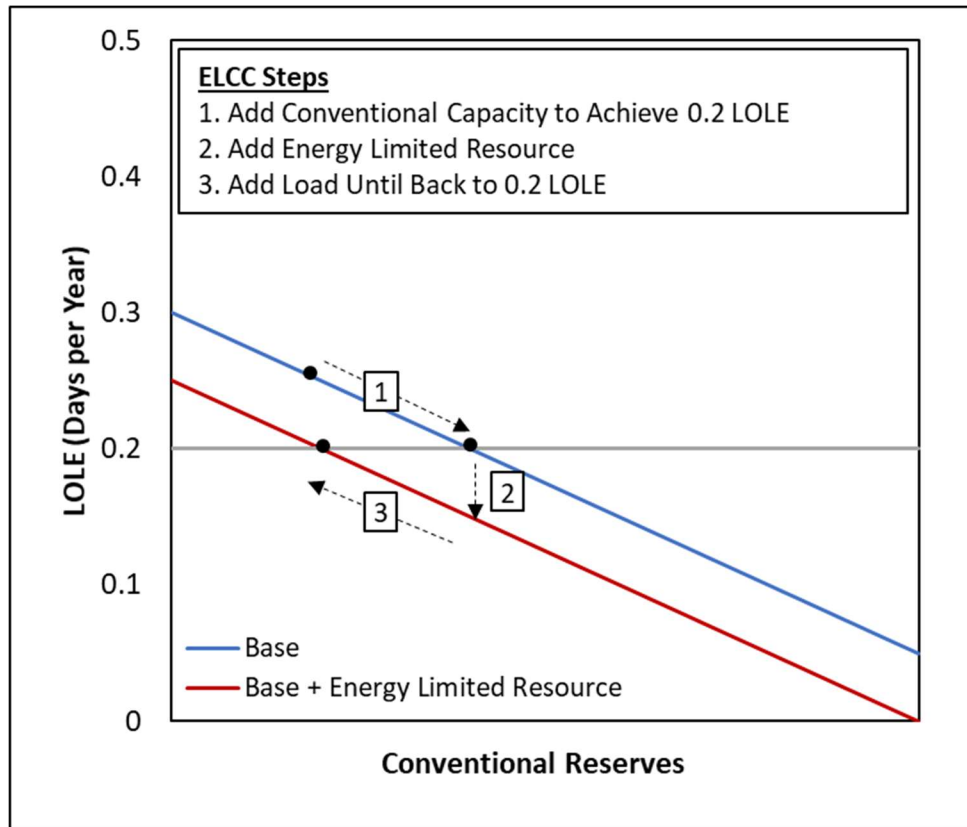
Consistent with the objective to calculate resource ELCC and a PRM, the primary focus of this study is the LOLE metric. SERVIM was simulated in intra-hour mode, and as such models the inherent uncertainty within the system and forces the production cost model to make decisions without perfect knowledge of the load, wind, solar, or conventional generator availability.

Reliability targets for capacity shortfalls (i.e., Figure 1) have been defined by the industry for decades and are most often measured using the metric of LOLE. LOLE measures in terms of expected events every year. For this study, the reliability target of 0.2 LOLE, or 2 days every 10 years was selected as the reliability standard. To meet this standard, plans must be in place to have adequate capacity such that firm load is expected to be shed twice or fewer times in a 10-year period. To measure the PRM for PNM, first the system is simulated given the expected resource mix. Then, load or perfect capacity is added until the system returns to 0.2 LOLE. The sum of installed capacity for conventional resources and ELCC for energy limited / non-dispatchable resources divided by the expected peak determines the PRM.

To measure ELCC of each resource group, the process illustrated below in

Figure 2 was followed and is outlined below.

Figure 2: ELCC Methodology



First, the PNM system was set to 0.2 LOLE. To measure existing solar, wind, and storage resources in 2023, the resource type under study was removed from the system. The LOLE accordingly increased. To return the system back to 0.2 LOLE, perfect capacity was added. The ratio of perfect capacity to capacity removed determines the ELCC. The process was repeated for each resource group individually, as well as all wind, solar, and battery together. The ELCC of the total group determines the aggregate ELCC and is used to correct for any diversity benefits arrived at through the sum of individual ELCC calculations.

A similar process was followed for resource additions beyond the existing fleet in 2023. The resource type under study was added to the PNM system set at 0.2 LOLE, which caused LOLE to decrease. Load was added until the system returned to 0.2 LOLE. The ratio between marginal capacity added and load added

determined the ELCC. The process was repeated for varying technologies and increasing penetrations to calculate average and marginal ELCCs for each resource group.

II. Model Inputs and Setup

The following sections include a discussion on the major modeling inputs associated with the PRM and ELCC analyses.

A. Load Forecasts and Load Shapes

Table 1 displays the modeled peak and energy forecast for 2023 at the time of the Study.

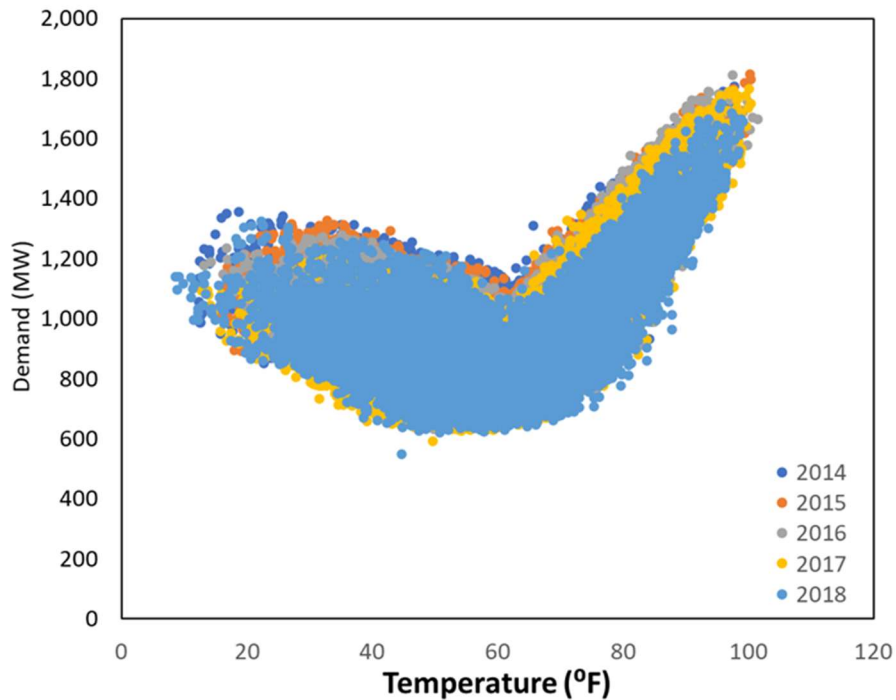
Table 1: Load Forecast Assumptions

	Peak (MW)	Energy (GWh)
2023 Forecast	2,011	10,038

To model the effects of weather uncertainty, 39 historical weather years (1980 - 2018) were developed to reflect the impact of weather on retail load. Based on historical weather and load, a neural network program was used to develop relationships between weather observations and load. An example of the input data for this training process is shown in

Figure 3.

Figure 3: Demand and Temperature Relationship for PNM North



Different weather to load relationships were built for each season. These relationships were then applied to the last 39 years of weather to develop 39 load shapes for 2023. Equal probabilities were given to each of the 39 load shapes in the simulation. The load shapes were scaled to align the normal summer peaks to the Company’s projected load forecast for 2023. Thus the “normal” summer peak reflects an average of the summer peak demands from the 39 load shapes. This data was validated against actual data, a process visualized in

Figure 4, which shows a consistent relationship between load and temperature between the simulated and actual data.

Figure 4: PNM North Summer Load Calibration

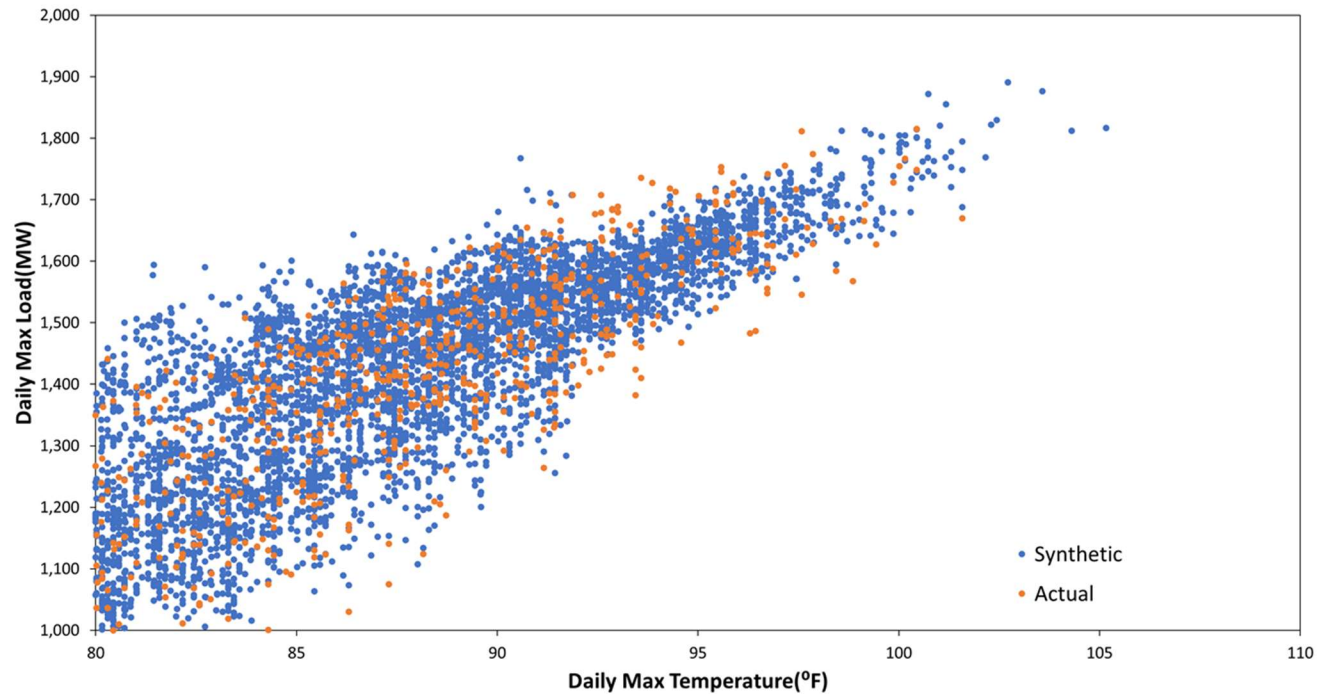
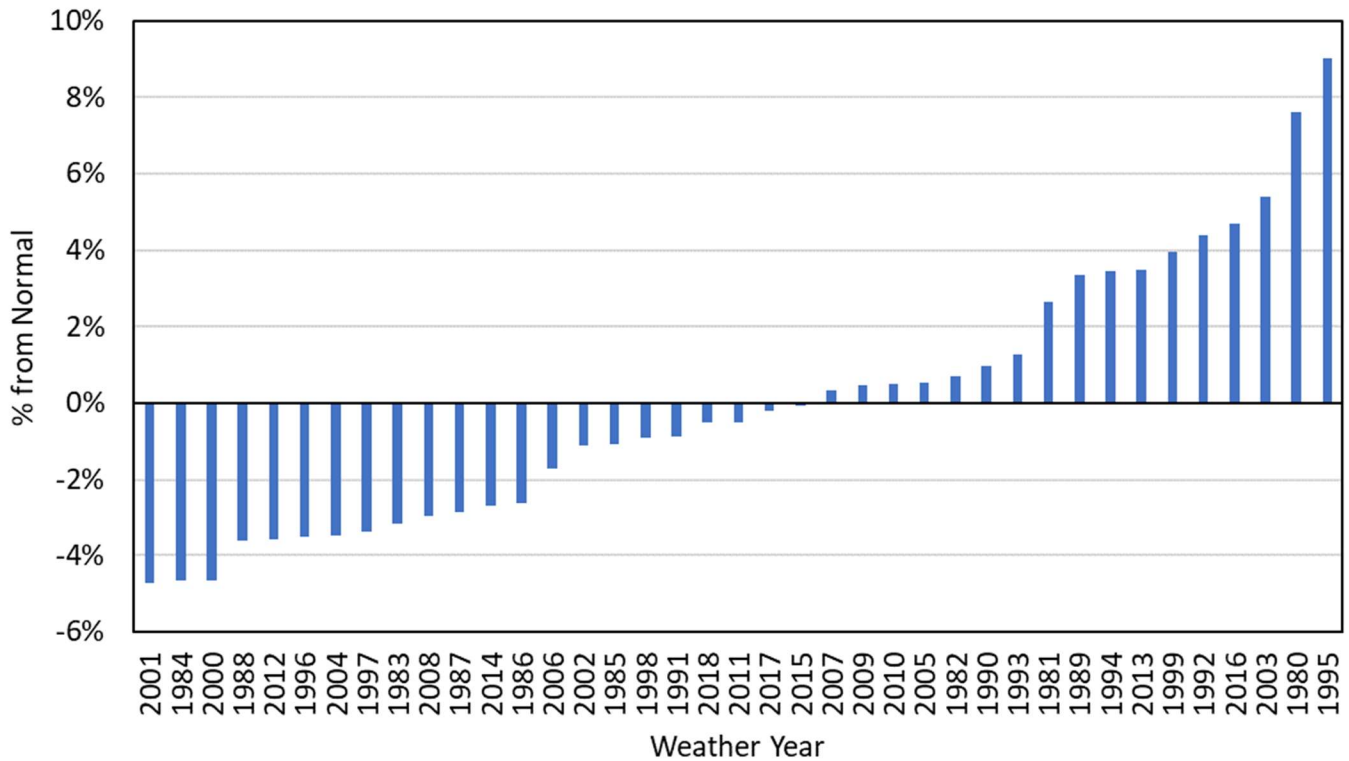


Figure 5 below shows the results of the weather load modeling by displaying the peak load variance for the summer seasons. The y-axis represents the percentage deviation from the 50/50 load forecast. For example, a simulation using the 1995 load shape would result in a summer peak load approximately 9% above normal, while a simulation using the 2001 load shape would result in a summer peak load approximately 5% below normal. Thus, the bars represent the variance in projected peak loads for 2023 based on weather experienced during the historic weather years.

Figure 5: Summer Peak Weather Variability



Economic Load Forecast Error

Economic load forecast error multipliers were included to isolate the economic uncertainty that the Company may have in their long-term load forecasts. To estimate economic load forecast error, the difference between Congressional Budget Office (CBO) GDP forecasts and actual data was fit to a normal distribution. Because electric load grows at a slower rate than GDP, a multiplier was applied to the raw CBO forecast error distribution. The results of this approach are shown in

Table 2.

As an illustration, 11% of the time, it is expected that load will be under-forecasted by 4%. The SERVIM model utilized each of the 39 weather years and applied each of these five load forecast error

points to create 195 different load scenarios. As mentioned previously, each weather year was given an equal probability of occurrence.

Table 2: Economic Load Forecast Error

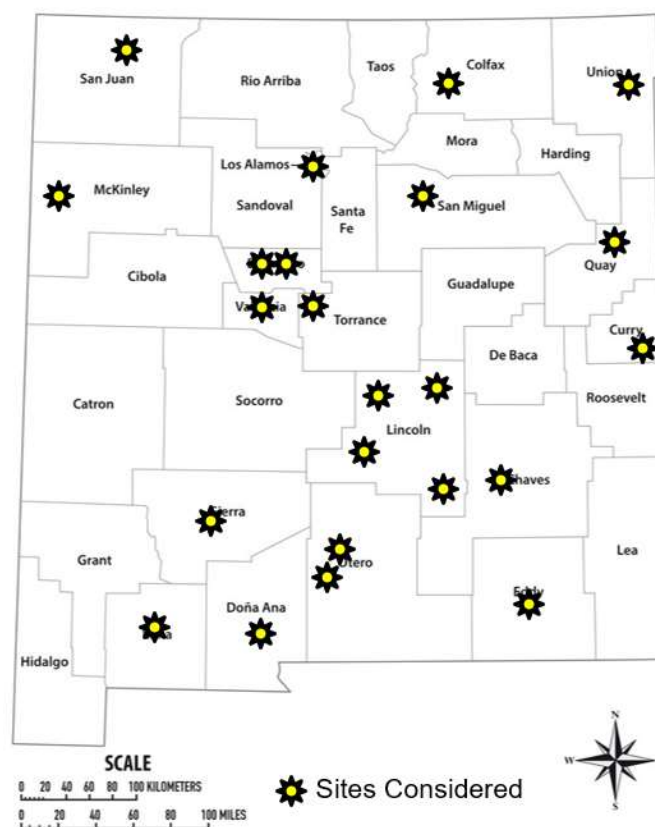
Load Forecast Error Multipliers	Probability (%)
0.96	11%
0.98	23%
1.00	32%
1.02	23%
1.04	11%

B. Solar Shape Modeling

Data was downloaded from the NREL National Solar Radiation Database (NSRDB) Data Viewer using the latitude and longitude locations of the 23 locations provided below for the available years 1998 through 2018. By using 23 locations, the modeling incorporates diversity among future solar projects. Historical solar data from the NREL NSRDB Data Viewer included variables such as temperature, cloud cover, humidity, dew point, and global solar irradiance. The data obtained from the NSRDB Data Viewer was input into NREL's System Advisory Model (SAM) for each year and location to generate the hourly solar profiles based on the solar weather data for fixed and tracking solar PV plants. Inputs in SAM included the DC to AC ratio of the inverter module and the tilt and azimuth angle of the PV array. Data was normalized by dividing each point by the input array size. This served as the basis for solar profiles for the years 1998-2018. Solar Profiles for 1980-1997 were constructed from the 1998-2018 data by developing correlations between daily load shapes and solar profiles. The daily load shapes in the 1980-1997 were compared to daily load shapes in the 1998-2018 data and where close correlations were found, the solar shapes from those days were used.

This process was repeated for each of the 23 locations, shown below. In addition to these hourly shapes, a ~1% EFOR assumption is embedded in solar profiles by adjusting annual capacity factor downwards, and a 0.7% annual degradation factor is applied to existing solar projects, both based on project specific information. The physical locations represented by the solar shapes are shown below in Figure 6 and are overlaid on NREL’s Global Horizontal Solar Irradiance Map².

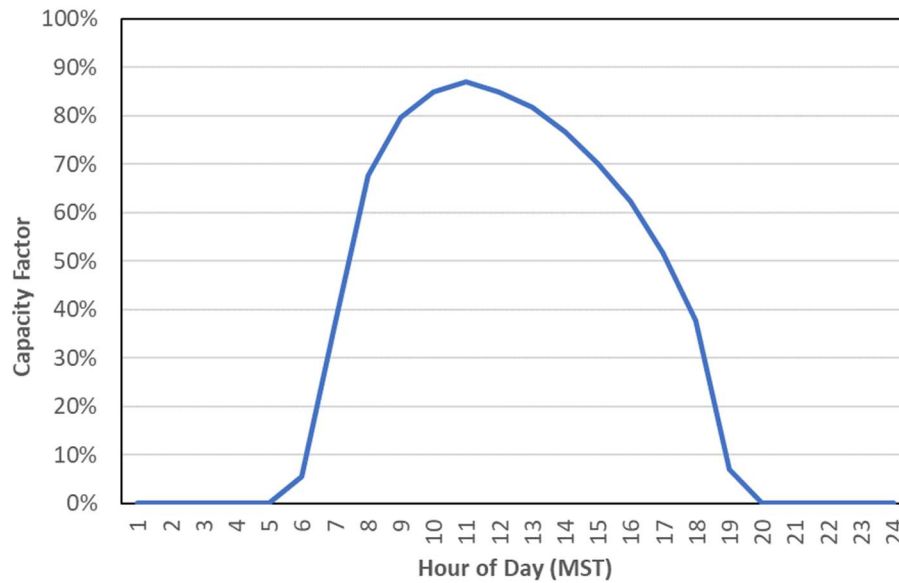
Figure 6: Solar Profile Locations



Average solar output for the expected PNM portfolio by time of day for the summer across the 39 weather years is shown in Figure 7.

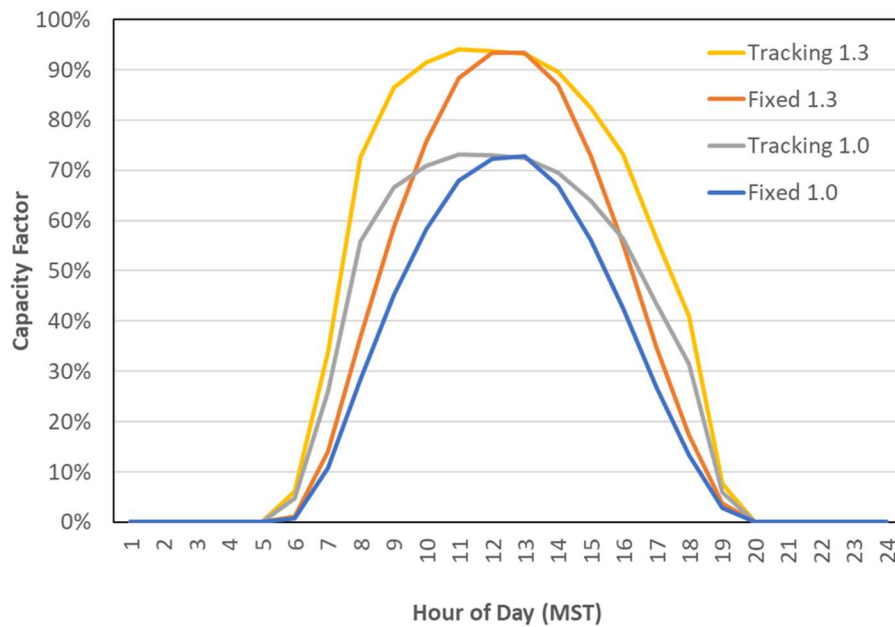
² <https://www.nrel.gov/gis/assets/images/solar-annual-ghi-2018-usa-scale-01.jpg>

Figure 7: PNM Aggregated Solar Profile



Solar output for the raw shapes at various inverter loading ratios (ILRs) is shown below.

Figure 8: Summer Solar Profiles by ILR



C. Wind Shape Modeling

Wind profiles were produced using historic actual data between 2012 and 2018. To construct wind shapes back to 1980, random days were selected from the 2012 to 2018 dataset based on aggregate PNM retail load. Wind projects without existing data were scaled to a capacity factor of 45% and assumed to have similar profiles and locations to existing wind projects in the east part of PNM's service area. To represent this, Incremental wind was calibrated such that new wind was related to existing wind by a Pearson correlation coefficient of 0.75.

Locations for existing and planned wind are shown below in Figure 9. Expected summer production profiles are shown for the aggregate wind portfolio in Figure 10. The aggregate profile includes existing and planned projects.

Figure 9: Wind Sites

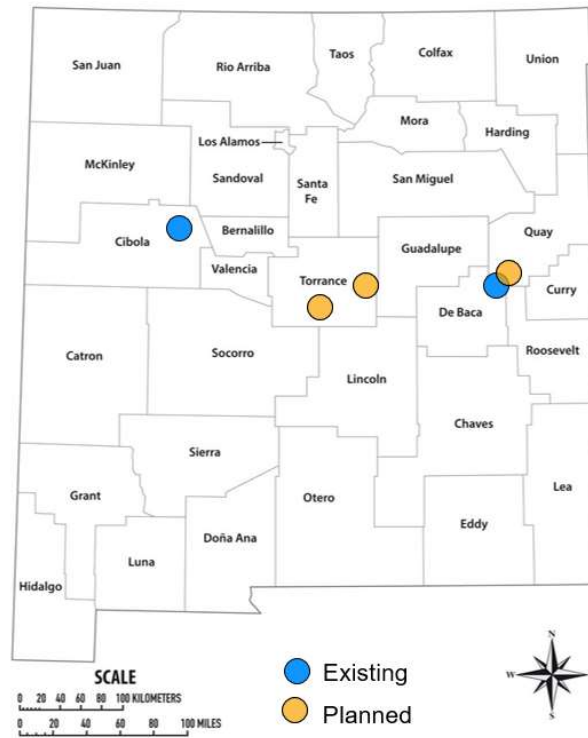
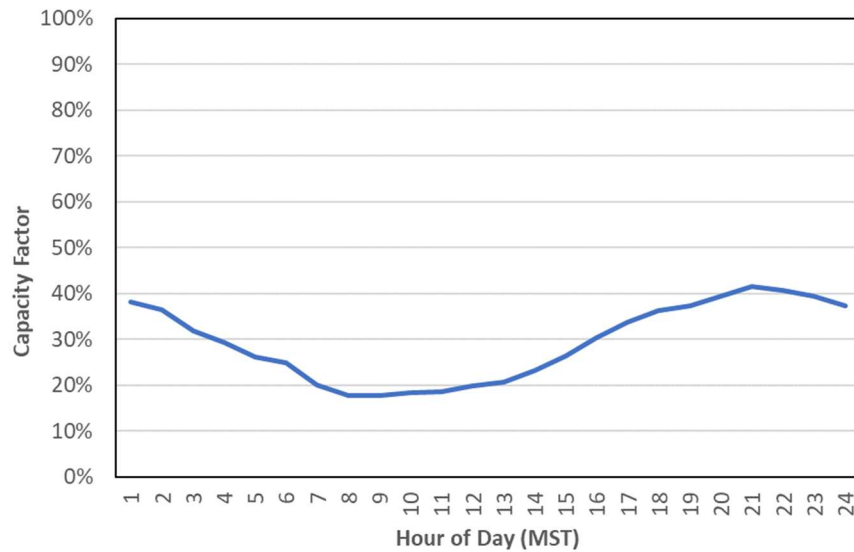


Figure 10: Wind Production Profiles



E. Conventional Thermal Resources and Resource Mix

Conventional thermal resources owned by the company and controlled via Purchase Power Agreements were modeled consistent with the 2023 study year. These resources are economically committed and dispatched to load on a 5-minute basis respecting all unit constraints including startup times, ramp rates, minimum up times, minimum down times, and shutdown times. All thermal resources are allowed to serve regulation (if AGC capable), spinning, and load following reserves as long as the minimum capacity level is less than the maximum capacity.

The PNM system resource mix as studied is provided in the table below.

Table 3: Resources Characteristics

Type	Deliverable Capacity	EFOR (%)
Solar	1,026	1
Wind	607	0
CC	419	4
CT	408	3
Solar Battery	300	1
ST Coal	200	20
Geothermal	12	24
Nuclear	402	2
DR	56	0
ST Gas	154	3

Equivalent Forced Outage Rates are based on historical performance or expected future performance provided by PNM. Unlike typical production cost models, SERVVM does not use an Equivalent Forced Outage Rate (EFOR) for each unit as an input. Instead, historical (GADS) data events are used to create an outage probability distribution for each unit and SERVVM randomly draws from this distribution for each unit to simulate outages. Units without historical data use data from similar units. Outage distributions were scaled to an expected EFOR provided by PNM. Outage distributions are constructed using the following variables.

Full Outage Modeling

Time-to-Repair Hours

Time-to-Fail Hours

Start Probability

Partial Outage Modeling

Partial Outage Time-to-Repair Hours

Partial Outage Derate Percentage

Partial Outage Time-to-Fail Hours

Maintenance Outages

Maintenance Outage Rate

The Maintenance Outage Rate describes the fraction of time in a month that the unit will be on maintenance outage. SERVVM uses this percentage and schedules the maintenance outages during off peak periods. Planned maintenance events are modeled separately and dates are entered in the model representing a typical year.

F. Battery Modeling

300 MW of energy storage was included in the base case, and for 2023 must be charged exclusively from a designated solar facility. These hybrid facilities were modeled with maximum combined output capacity and round-trip losses consistent with project specific information and are economically scheduled and dispatched. In general, these resources charge during the day or at night and then are dispatched during net peak load periods.

G. Demand Response Modeling

Demand Response programs were modeled as resources in the simulations with specific contract limits including availability by season, hours per call, calls per season, and calls per day. For 2023, 56 MW of demand response was included which represents the expectation at the time the study was performed.³ The table below provides modeling characteristics by program. A sensitivity was performed on availability of weekends for incremental DR, the results of which is covered in a later section.

Table 4: DR Assumptions

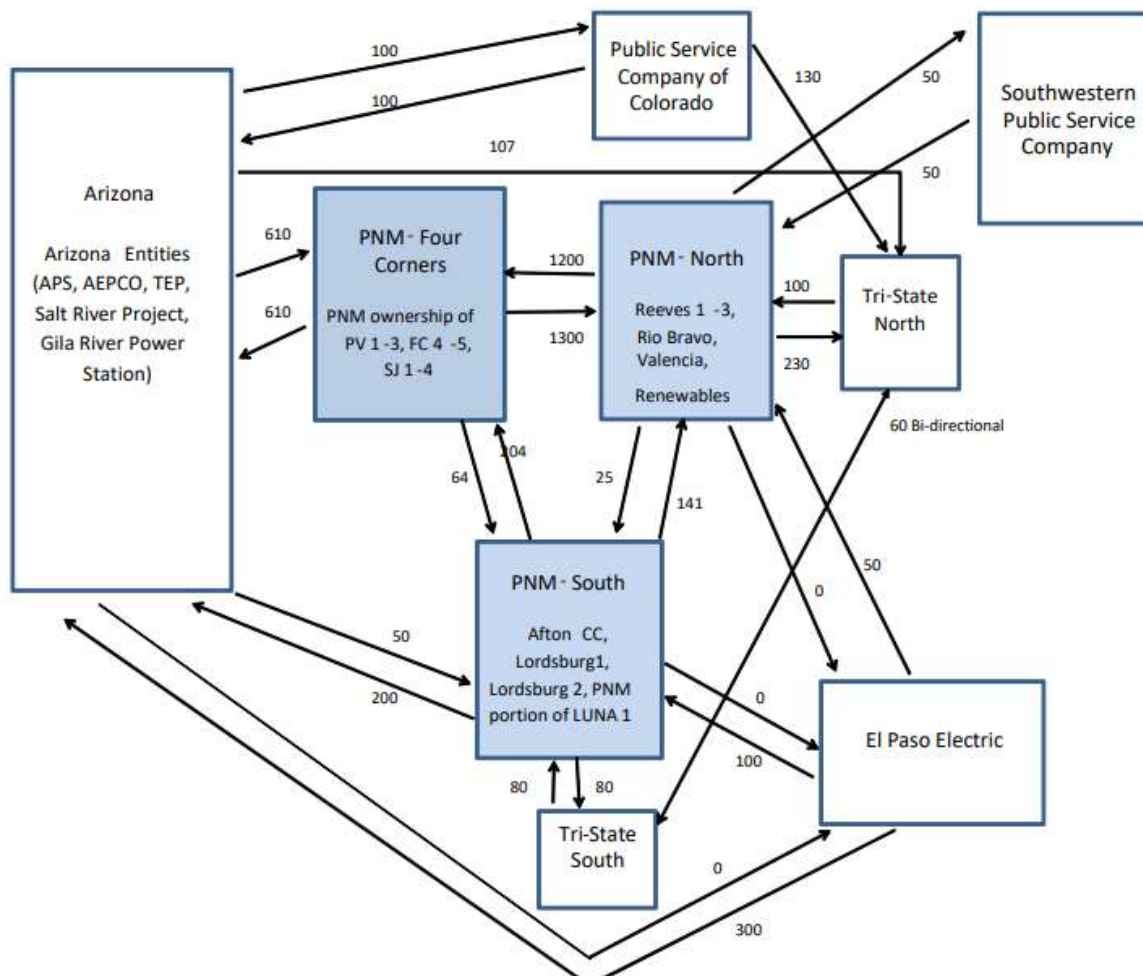
Parameter	Program			
	Power Saver	Peak Saver	Other Existing DR	Incremental DR
Available Months	Summer	Summer	Summer	Year Round
Capacity (MW)	22	10	24	Varies
Hours per Day	4	4	4	4
Hours Per Year Available	100	100	100	400
Weekends Available	N	Y	Y	Varies

³ These assumptions were based on the PRC final order in 19-00195 which was the best information available at the time of the study. Small changes in demand response should not be material to the study since the ELCC of these resources were calculated.

H. Study Topology

The PNM Balancing Area (BA) and neighbors one tier away were modeled with transfer limits as indicated on the chart below. The PNM BA was committed and dispatched as a single region, subject to internal constraints. For the base case set of results, aggregate importability from all neighbors was capped with a distribution between 200 - 300 MW for any hour where gross load within the BA exceeded 85% of the expected peak. For the PRM results, the market constraint was varied as discussed in the results.

Figure 11: Study Topology and Market Assistance



I. Ancillary Services

Ancillary service assumptions are input into SERVVM. SERVVM commits resources to meet energy needs plus ancillary service requirements. These ancillary services are needed for uncertain movement in net load or sudden loss of generators during the simulations. Within SERVVM, these include regulation up and down, spinning reserves, load following reserves, and quick start reserves. Table 5 shows the definition of each ancillary service for this study. An $LOLE_{CAP}$ type event was determined when there was not sufficient generation to serve load and regulation up requirements.

Table 5: Ancillary Services

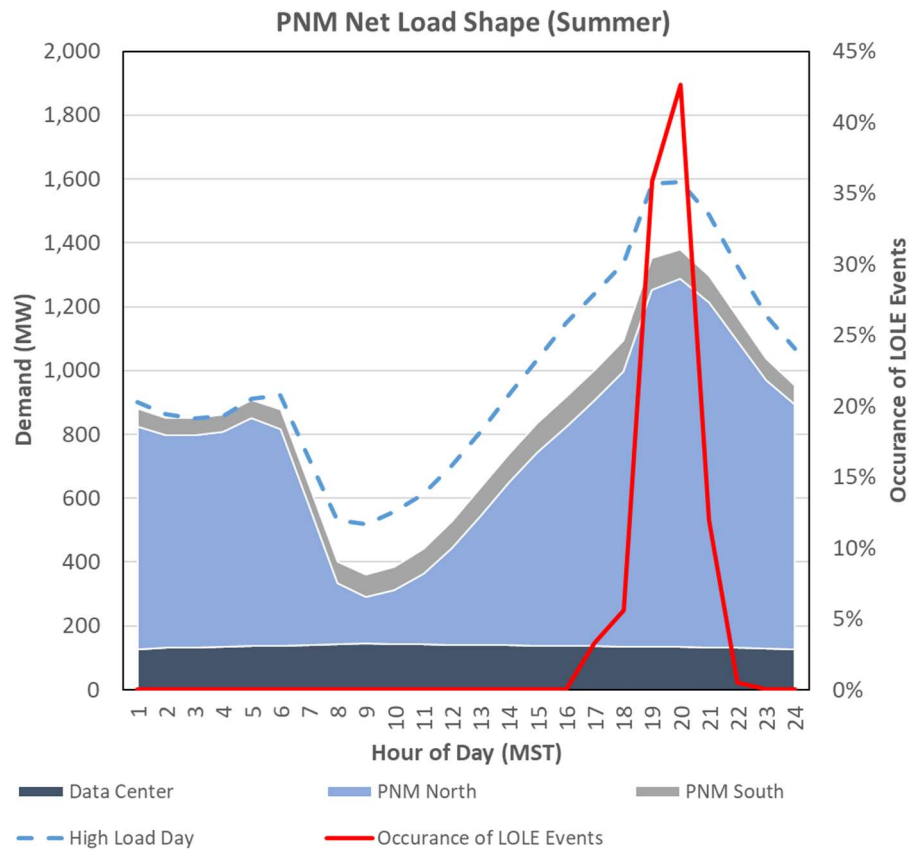
Ancillary Service	Definition
Regulation Down Requirement	10 Minute Product served by units with AGC capability
Regulation Up Requirement	10 Minute Product served by units with AGC capability
Spinning Reserves Requirement	10 Minute Product served by units who have minimum load less than maximum load
Load Following Down Reserves	10 Minute Product served by units who have minimum load less than maximum load
Load Following Up Reserves	10 Minute Product served by units who have minimum load less than maximum load
Quick Start Reserves Requirement	Served by units who are offline and have quick start capability

III. Methodology

Since reliability events are high impact and low probability, a large number of scenarios must be considered to accurately project these events. For this study, SERVUM utilized 39 years of historical weather and load shapes, 5 points of economic load growth forecast error, and 5 iterations of unit outage draws for each scenario to represent the full distribution of realistic scenarios. The number of yearly simulation cases for each Scenario equals $39 \text{ weather years} * 5 \text{ load forecast errors} * 5 \text{ unit outage iterations} = 975 \text{ total iterations}$ for each Scenario studied. Weather years and solar profiles were each given equal probability while the load forecast error multipliers were given their associated probabilities as reported in the input section of the report.

The expected net load shape and occurrence of LOLE events for the PNM system at 0.2 LOLE is shown in the chart below. Given the degree of solar penetration, the high risk LOLE hours are compressed into the twilight hours (MST 18-21).

Figure 12: Expected Net Load Shape and LOLE



IV. Results

Results for the ELCC and PRM analyses are shown in the tables below. Since ELCC is an input into the PRM by way of resource accreditation, the ELCCs are shown first. The first row of each resource category is indicative of the expected PNM system resource mix as of 2023 (607 MW, 1,026 MW solar, 300 MW battery, and 56 MW DR). As discussed in the Study Framework section, the ELCC of the total existing wind, solar, and battery resources determines the aggregate ELCC and is used to correct for any diversity benefits arrived at through the sum of individual ELCC calculations. The additional results beyond the existing capacity represented in the first row of the table show the average and marginal ELCC for that specific resource category, holding others constant at the existing capacity level. For these additional calculations, the study assumes the system is left unchanged and only the ELCC of the additional wind, solar, or battery is being calculated.

Non dispatchable (wind and solar) and energy limited (Battery and DR) all exhibit declining marginal ELCCs as penetration of the respective category increases. All energy storage indicates 4-hour duration. The results are consistent with the occurrence of LOLE events, given that solar is able to provide little marginal benefit at twilight hours, and energy limited resources such as battery and DR are able to provide full output during the narrow window of reliability risk. Further, wind shows a 28.9% ELCC, given that the expected output increases later in the day, coincident with higher risk hours.

Table 6: ELCC Results

Wind Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
607	175	28.9%	28.9%
1,000	217	21.7%	10.7%
1,500	262	17.5%	9.0%
2,000	273	13.7%	2.2%
2,500	283	11.3%	1.9%
Solar Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
1,026	172	16.7%	16.7%
1,200	183	15.3%	6.6%
1,500	199	13.3%	5.3%
2,000	210	10.5%	2.2%
2,500	211	8.4%	0.2%
Battery Nameplate Capacity	Capacity Value MW	Average ELCC ⁴	Marginal ELCC of Tranche
300	287	95.6%	95.6%
500	472	94.4%	92.6%
700	641	91.6%	84.5%
1,000	825	82.5%	61.4%
1,500	945	63.0%	23.9%
DR Nameplate Capacity	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
56	52	92.5%	92.5%
106	92	87.2%	81.3%

The ELCCs identified for the 2023 portfolio were then applied to the resource accreditation of the PNM system at the target LOLE of 0.2, as shown in Table 7. Summing the Installed Capacity (ICAP) resource

⁴ Increased solar PV penetration (which narrows the net demand hours in the evening hours) would potentially increase battery ELCC, all else equal

contributions at 0.2 LOLE yields a 14% PRM target. Summing the Unforced Capacity (UCAP) resource contributions at 0.2 LOLE yields a 10% PRM target. UCAP methodology accounts resources by derating conventional units by their EFOR. The planning standard (which is subject to expected imports) used for the purpose of the IRP is detailed later in the report. As discussed in Section H, these results assume a market constraint of 200-300 MW for any hour where gross load within the BA exceeded 85% of the expected peak.

Table 7: PRM Results

PNM Fleet					Results	
Unit Category	Installed	ELCC %	EFOR (%)		ICAP	UCAP
EE	16	100	-		16	16
CC	419	100	4		419	402
CT	408	100	3		408	395
DR	56	92	-		52	52
Geothermal	12	100	24		12	9
Nuclear	402	100	2		402	394
Solar	1,026	17	-		171	171
Solar Battery	300	96	1		287	287
ST Coal	200	100	20		200	160
ST Gas	154	100	3		154	149
Wind	607	29	-		175	175
Total	3,600				2,294	2,208
LOLE					0.2	0.2
Peak					2011	2011
PNM PRM					14%	10%

V. ELCC and PRM Sensitivities

Sensitivities were performed on energy limited resources (Battery and DR) as well as the target PRM. Sensitivities on energy limited resources concerned the duration of energy capable of being provided or weekday/weekend availability. Sensitivities on the PRM focused on the level of market support that could be depended upon during high load situations.

To determine the effect duration has on battery ELCC, the ELCC of incremental 2 and 6-hour duration batteries was calculated and is provided below. The 300 MW of batteries in the base case were held constant between base results and sensitivities and were not altered from their 4 hour duration. The first column of the following table indicates total storage penetration, so “500” can be interpreted as 300 MW of existing storage, and 200 MW of incremental storage of the respective duration (i.e. 2- or 6-hour).

Table 8: 2 Hour Duration Battery Sensitive

2 Hr	Capacity Value MW	Average ELCC	Marginal ELCC
300 - 4 hour	287	95.6%	95.6%
500	440	88.0%	76.7%
700	562	80.3%	61.2%

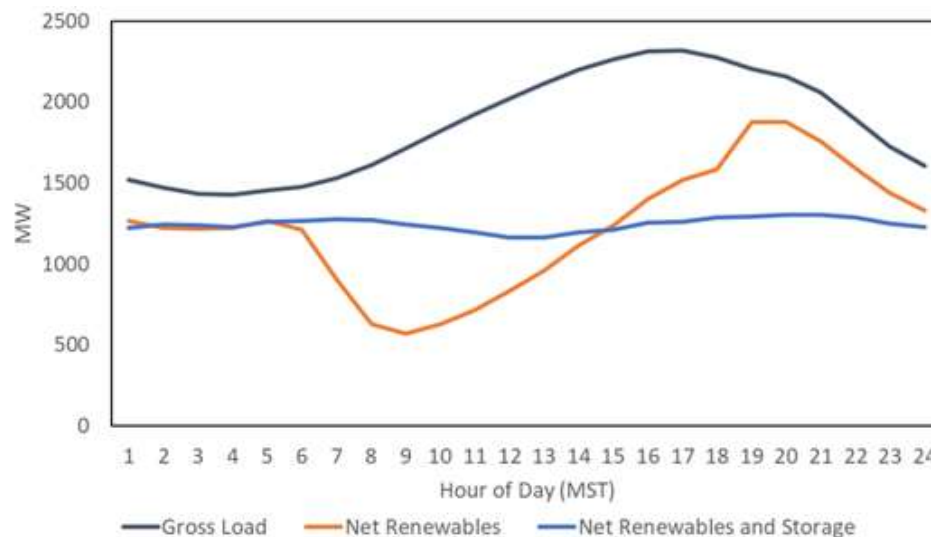
Table 9: 6 Hour Duration Battery Sensitivity

6 Hr	Capacity Value MW	Average ELCC	Marginal ELCC
300 - 4 hour	287	95.6%	95.6%
500	476	95.3%	94.8%
700	647	92.5%	85.5%
1,000	837	83.7%	63.3%
1,500	1,000	66.7%	32.5%

As shown in the tables above, 2-hour duration storage marginal ELCC is substantially lower than 4-hour marginal ELCC at the same penetration. For example, at 500 MW of total battery penetration, 2-hour storage provides a 76.7% marginal ELCC compared to 92.6% for 4-hour. 6-hour provides additional reliability value, but there appears to be diminishing returns per unit of duration added (marginal ELCC increases from 92.6% to 94.8%).

At the 1,500 MW penetration level, 6-hour duration storage shows a 32.5% ELCC. The reason for the declines in marginal ELCC for storage, regardless of duration is visualized in Figure 13. As shown, at high levels of battery penetration the daily net load shape is effectively flat. There is little opportunity for storage to continue lowering the net peak demand.

Figure 13: Net Load Shape After Storage (High Penetration)



Additionally, a sensitivity was performed on availability of DR. Typically, weekdays show relatively higher peak demands given customer usage patterns. This sensitivity was performed to assess if there are additional reliability benefits afforded by being available for weekend demand. A review of the weather

year load shapes indicates extreme high temperatures may occur on weekends and increase loads to levels which may cause reliability events.

The results are shown in the table below, which indicates availability of DR on weekends provides an incremental reliability benefit.

Table 10: DR Sensitivity

DR Nameplate Capacity	Weekend Availability for Incremental DR	Capacity Value MW	Average ELCC	Marginal ELCC of Tranche
56	-	52	92.5%	92.5%
106	Y	92	87.2%	81.3%
106	N	87	86.8%	70.0%

Four sensitivities on market availability were performed on the base PRM results. “200-300 MW of Market Access” indicates the base results, which allows 200-300 MW of aggregate market support during high demand. Two variations of this level of market support were simulated, 1.) “50 MW Cap Peak Hours” and 2.) “0-50 MW Cap Peak Hours” These represent an additional constraint⁵ where market support was further limited during expected net peak load hours. Expected net peak load hours are hours 16-22 in the summer, accounting for the fact that high solar penetration has shifted the net demand to twilight hours. For both of these market variations, summer hours 16-18 assumed 100 – 150 MW of market access. The “50 MW Cap Peak Hours” allowed for 50 MW during summer hours 19-22 and the “0-50 MW Cap peak Hours” allowed market access to vary from 0 – 50 MW during summer hours 19-22.

Two similar sensitivities were performed, “50 MW Cap 24 Hours” and “Island”. The former allows 50 MW of market support any given hour, and Island simulates the PNM system with no amount of purchases or sales with neighboring entities. LOLE vs PRM curves for the base case and each sensitivity is

⁵ In addition to the 200-300 MW constraint during high demand hours

shown below. The intersection between each LOLE vs PRM curve and 0.2 LOLE is the planning reserve margin target. As illustrated in the charts below, The LOLE by PRM level is sensitive to the level of available market support, given that PNM planning to a 14% PRM ICAP could result in 0.2 to over 3 LOLE events per year depending on neighbor resource and transmission availability during reliability critical hours.

Figure 14: LOLE vs PRM ICAP

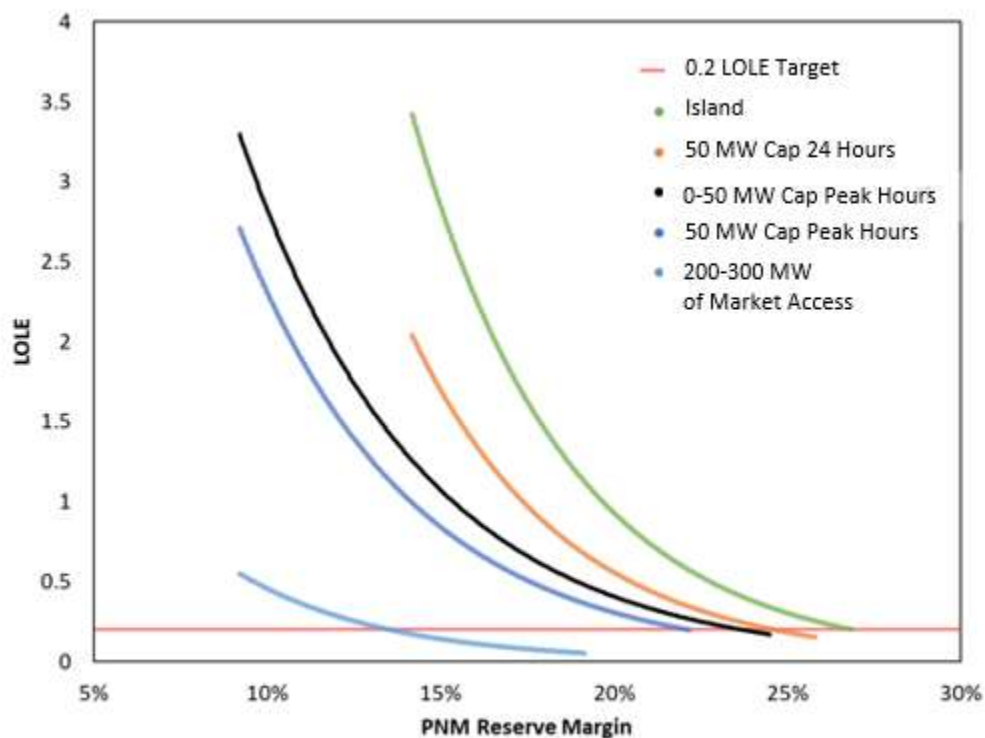
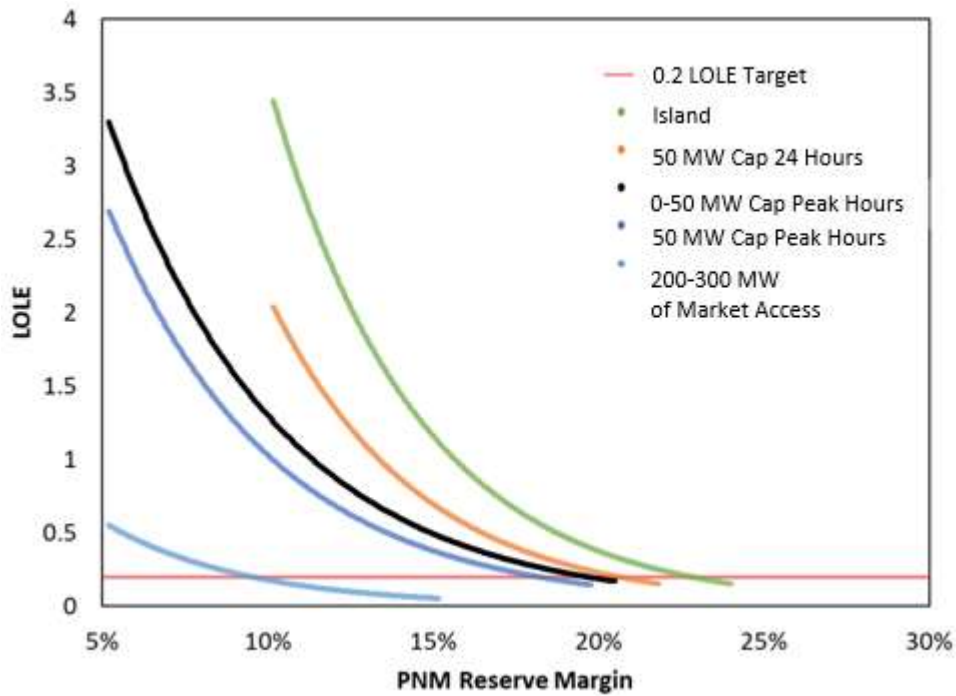


Figure 15: LOLE vs PRM UCAP



The planning target for ICAP and UCAP RM accounting for each level of market support are shown below.

Table 11: RM Targets

Market Support	RM ICAP	RM UCAP
Island	27%	23%
50 MW Cap 24Hrs	25%	20%
0-50 MW Cap Net Peak Hours	24%	20%
50 MW Cap Net Peak Hours	22%	18%
With 200-300 Market	14%	10%

VI. IRP Portfolios Verification

SERVIM was utilized to verify the reliability target had been achieved in 2025 and 2040 in the portfolios for four futures developed as part of PNM'S 2020 IRP: (1) Current Trends and Policy (CTP), (2) Aggressive Environmental Regulation (AER), (3) High Economic Growth (HEG), and (4) Low Economic Growth (LEG). Both "Technology Neutral" and "No New Combustion" scenarios were analyzed as described in PNM's 2020 IRP. This resulted in eight different portfolios that were assessed for the years 2025 and 2040, resulting in 16 model runs. The results of the verification analysis are shown in Table 12, which shows the LOLE result for each portfolio and year studied. In 2025, the LOLE is at or near the 0.2 target for all futures. Only minor adjustments are required for the LEG portfolios to meet a 0.2 LOLE reliability target. This scenario represents minimal resource adequacy risk, as It is likely that the system would have been planned to a higher load level than the one studied (e.g., PNM would likely have planned to a CTP scenario), resulting in a sufficient capacity buffer to ensure reliability if a LEG future were to occur.

For 2040, assumptions regarding PNM's portfolio composition, and reliability characteristics of the neighboring entities is clearly more uncertain. Modeling the system based on current assumptions results in LOLE values below 0.2 LOLE, indicating the resource adequacy standard has been met. By the year 2040, gains in PNM system reliability could be attributable to avoided large single unit contingencies, system size increases, and the potential for storage ELCCs to increase slightly with extremely high renewable penetrations. Of course, this reliability improvement also assumes the same market access assumptions are utilized. To better understand this, a sensitivity was performed for 2040 for the CTP future to test the reliability of each portfolio in lower import environments. As the southwest and overall western region approach 2040, it is expected that similar to PNM, these systems will have increasing renewable and storage penetrations and less dispatchable generation. As this occurs, it is expected that

resource adequacy risk will shift to nighttime hours when there is no solar output. For this reason, additional nighttime constraints were placed on the system to understand the impact. LOLE is significantly higher in 2040 when nighttime import constraints are placed on the system as shown in Table 12. The sensitivity also shows that portfolios with firm capacity (in the form of hydrogen burning combustion turbines) aren't as reliant on market assistance as portfolios that exclude these dispatchable resources. For example, the LOLE only increased to 0.18 events per year with a 200 MW nighttime constraint while the no new combustion case increased to 1.99 events per year. This demonstrates that UCAP PRM and ELCCs should continually be revisited in each planning cycle as new information is made available.

Table 12: Portfolio Verification Results

		Market Access Assumption			
		50 MW Net Peak Hours*	50 MW Net Peak Hours*		
Resources	Future	2025	2040	200 MW**	50 MW**
TN	AER	0.22	0.06		
	CTP	0.19	0.01	0.18	0.79
	HEG	0.15	0.00		
	LEG	0.23***	0.04		
NNC	AER	0.19	0.06		
	CTP	0.18	0.01	1.99	7.18
	HEG	0.16	0.00		
	LEG	0.24***	0.02		

*Consistent with 18% UCAP PRM

**An additional constraint imposed during night-time hours

***Within ~20 MW of 0.2 target

Finally, for the CTP NNC cases, we show the expected resource adequacy risk by month and hour for 2025 and 2040 under each of the market access assumptions shown in Table 12. As additional market access constraints are added to nighttime hours in the 2040 simulations, the shift to nighttime hours risk is significant.

Table 13: % of LOLE by Month and Hour of Day

Market Access: 50 MW Net Peak Hours

2025	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	2%	5%	1%	0%	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1%	0%	12%	27%	19%	10%	2%	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	7%	11%	2%	1%	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Market Access: 50 MW Net Peak Hours

2040	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14%	16%	42%	13%	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	6%	4%	6%	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Market Access: 200 MW limited at night

2040	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%	1%	1%	1%	2%	3%	6%	2%	0%	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	1%
2	0%	0%	0%	0%	0%	1%	1%	0%	0%	-	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%
3	-	-	-	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0%	0%	1%	1%	1%	1%	0%	-	-	-	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%
7	1%	2%	3%	5%	8%	8%	1%	0%	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	1%	1%
8	1%	2%	2%	3%	5%	8%	2%	0%	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	1%	1%
9	0%	0%	0%	0%	1%	1%	1%	0%	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	1%	2%	1%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
11	-	-	-	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0%	0%	0%	1%	2%	3%	5%	1%	-	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%