DOCKETED	
Docket Number:	18-IRP-01
Project Title:	Integrated Resource Plan
TN #:	263805
Document Title:	Review of Modesto Irrigation District 2024 Integrated Resource Plan
Description:	N/A
Filer:	Mikayla Roberts
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/3/2025 3:31:27 PM
Docketed Date:	6/3/2025

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

California Energy Commission

STAFF REPORT

Review of Modesto Irrigation District 2024 Integrated Resource Plan

June 2025 | CEC-200-2025-013

California Energy Commission

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ACKNOWLEDGEMENTS

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ABSTRACT

Senate Bill 350 (De León, Chapter 547, Statutes of 2015), established Public Utilities Code Section 9622, which requires the California Energy Commission to review the integrated resource plans of identified publicly owned utilities to ensure they meet various requirements specified in the law, including greenhouse gas emission reduction targets and renewable energy procurement requirements.

Integrated resource plans are long-term planning documents that outline how publicly owned utilities will meet demand reliably and cost effectively while achieving state policy goals and mandates. Modesto Irrigation District (MID) submitted its *2024 Integrated Resource Plan* and supplemental information for review on April 2, 2024. The MID Integrated Resource Plan filing includes energy and peak forecasts, compliance with capacity procurement requirements, and risk evaluations of their Conforming Portfolio. This staff paper presents the results of the California Energy Commission staff review of the *Modesto Irrigation District 2024 Integrated Resource Plan*.

Keywords: Publicly owned utility, integrated resource plan, Modesto Irrigation District, MID, demand, resources, portfolio, generation, transmission, distribution, Renewables Portfolio Standard, forecast, energy efficiency, transportation electrification, demand response, greenhouse gas, GHG, emissions, system reliability

Please use the following citation for this report:

Tavares, Alyssa, Brian McCollough, 2025. *Review of Modesto Irrigation District 2024 Integrated Resource Plan*. California Energy Commission. Publication Number: CEC-200-2025-013.

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EXECUTIVE SUMMARY

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities with an annual electrical demand exceeding 700 gigawatt-hours to adopt an integrated resource plan. Those plans must meet certain requirements, targets, and goals, including greenhouse gas emission reduction targets and renewable energy procurement requirements identified in Public Utilities Code (PUC) Section 9621. The California Energy Commission's *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines* require the utilities to file an integrated resource plan with data and supporting information sufficient to demonstrate that they meet these requirements and the targets and planning goals from 2018 to 2030. Under PUC Section 9622, the California Energy Commission must review the integrated resource plans for consistency with the requirements of PUC Section 9621.

Modesto Irrigation District aims to pursue a supply portfolio that satisfies reliability planning and budgeting while also demonstrating compliance with the Modesto Irrigation District Board of Directors' policy and federal and state laws. The resource planning process also seeks to minimize risk at the least possible cost while also meeting statutory and regulatory requirements for greenhouse gas emissions, Renewable Portfolio Standard requirements, and operational and transmission constraints. To meet renewable energy mandates and greenhouse gas emission standards, the Modesto Irrigation District is focusing on:

- **Long-term demand capacity procurement**: The current policy of the utility is to procure supply capacity equal to 115 percent of the expected peak demand, with 70 percent of that supply capacity sourced from long-term resources and 30 percent from short-term resources.
- **Proven clean technologies**: The utility plans to make use of renewable resources available at utility-scale today, including solar, wind, and battery storage while also seeking a diverse, balanced power resource mix that meets their customer's needs.
- **Renewable energy credits:** The Modesto Irrigation District plans to meet its Renewable Portfolio Standard requirements by continuing to apply current-year and banked renewable energy credits and purchases of tradable renewable energy credits.
- **Financial impact and options**: The utility strives to provide its customers with just and reasonable, low and stable electric rates. In addition, rebate incentives are offered for behind the meter solar programs and electric vehicle incentives are offered to residences or businesses.

In reviewing the *Modesto Irrigation District 2024 Integrated Resource Plan* and determining consistency with the requirements of Public Utilities Code Section 9621, CEC staff relied on the four standardized reporting tables and narrative descriptions in the integrated resource plan filing, as well as analysis and verification of the materials submitted. Staff presents the following conclusions in accordance with the requirements:

- *Achieving Greenhouse Gas Emissions Targets and Renewables Portfolio Standard Requirements:* The utility plans to meet the greenhouse gas emission reduction requirements by 2030 of Public Utilities Code Section 9621(b)(1), and the renewable energy procurement requirement of Public Utilities Code Section 9621(b)(2). Renewable PPAs and

banked and tradable renewable energy credits allow Modesto Irrigation District to meet these requirements through 2030.

- *Meeting Planning Goals:* The values reported in standardized forms along with the analysis and discussion in the integrated resource plan filing demonstrate the utility intends to meet planning goals related to retail rates, reliability, transmission and distribution systems as set forth in Public Utilities Code Section 9621(b)(3). Modesto Irrigation District evaluated reliability, costs, and compliance through their production cost simulations while satisfying these requirements.
- *Considering Peak Needs:* The utility has considered the role of existing renewable generation, grid operational efficiencies, energy storage, and distributed resources, including energy efficiency, in helping to ensure the utility's energy and reliability needs in the hours that encompass the peak hour as set forth in PUC Section 9621(c). The Modesto Irrigation District utilized an econometric regression model along with weather scenarios to develop the annual peak demand results. Their 1-in-2 and 1-in-10 system peak demand forecasts and energy requirements are expected to have an annual growth of less than 1 percent from the years 2023 to 2030.
- *Addressing Resource Procurement Types:* The integrated resource plan filing addressed the procurement requirements for energy efficiency and demand response, energy storage, transportation electrification, portfolio diversification, and resource adequacy as set forth in PUC Section 9621(d). The Modesto Irrigation District's planned procurement of renewables includes long-term solar, wind, and other renewables. The utility plans to supplement this through the purchase of short-term renewable energy credits.

CHAPTER 1: Demand Forecast and Procurement

Introduction

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities (POU) with an annual electrical demand exceeding 700 gigawatt hours (GWh) to develop integrated resource plans (IRPs).[1] IRPs are electricity system planning documents that describe how utilities plan to meet their energy and capacity resource needs while achieving policy goals and mandates, meeting physical and operational constraints, and fulfilling other priorities such as reducing impacts on customer rates. SB 350 requires the governing board of a POU to adopt an IRP and a process for updating it at least once every five years starting no later than January 1, 2019.[2] Modesto Irrigation District (MID) filed its initial IRP with the CEC on March 5, 2019 and was deemed compliant by the CEC in September of 2019.
Public Utilities Code (PUC) Section 9622 requires the California Energy Commission (CEC) to review POU IRPs to ensure they achieve PUC Section 9621 provisions. If the CEC determines an IRP is inconsistent with the requirements of PUC Section 9621, the CEC shall provide recommendations to correct the deficiencies. The CEC adopted the *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines (Guidelines)* to govern the submission of the POU's IRPs.[3]

This chapter outlines the CEC's review process and provides an overview of MID and its IRP development process. In addition, the chapter addresses the *Guidelines* requirements that POUs provide a demand forecast and a procurement plan as part of its IRP.

Modesto Irrigation District

MID is an independent, publicly owned utility that provides electricity, irrigation water, and drinking water for the City of Modesto. They provide electrical service to an area of approximately 568 square miles in portions of San Joaquin, Stanislaus, and Tuolumne counties. Additional details are described below.

- MID was founded in 1887 and began providing power to its customers in 1923.
- The utility transmits and distributes electricity on more than 1,800 miles of power lines throughout its service area.

1 Public Utilities Code Section 9621

2 Public Utilities Code Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1.

3 *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines*, https://www.energy.ca.gov/publications/2022/publicly-owned-utility-integrated-resource-plan-submission-and-review-guidelines.

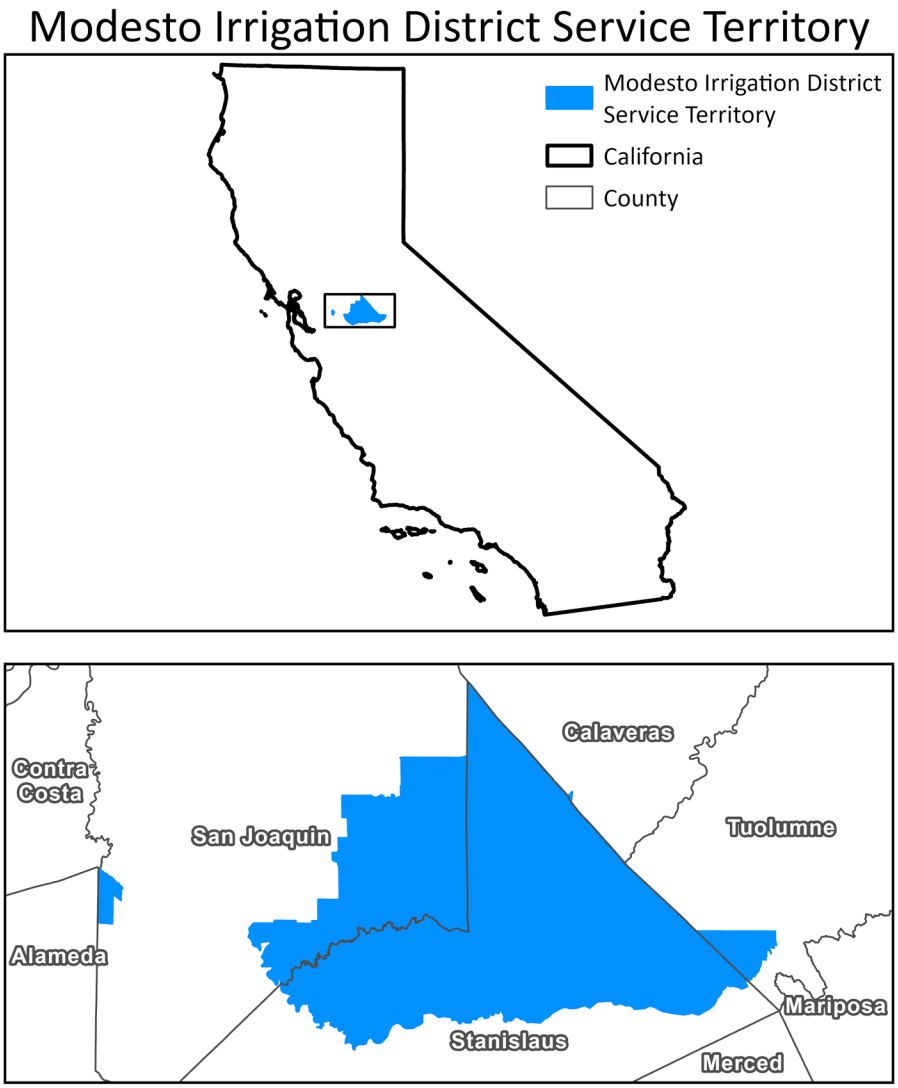
- Approximately 102,000 residential customers and more than 10,000 commercial customers receive electric service from MID.[4]

A locally elected Board of Directors sets policy for MID. The Board members represent geographical divisions within the MID service area, and each Board member is elected to a four-year term of office by registered voters. MID owns 413 megawatts (MW) of natural gas capacity and has 62 MW of ownership interest in Don Pedro, a large hydroelectric facility. The utility also supplements their energy needs with power purchase agreements (PPAs).[5]

4 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 1-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

5 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 2-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

Figure 1: Map of Modesto Irrigation District Service Territory



Source: California Energy Commission

MID Planning Process

The *MID 2024 IRP* presents the utility's plan for reliability planning and budgeting. It also demonstrates compliance with MID Board policies and federal and state laws and provides a frame of reference for development of new and revised Board policies. The planning horizon covers the period of 2021 through 2030.

Throughout their IRP process, MID examined compliance requirements, identified strategic planning gaps, and considered resource options. MID developed this IRP based on results from its 2023 load forecast and 2023 resource plan. After assessing demand, MID then developed an optimal and reliable portfolio. They used this to identify a compliant and risk-controlled

portfolio, which then led them to identify a final Conforming Plan that is the basis for the *MID 2024 IRP*. The Board formally voted for adoption of the *MID 2024 IRP* on December 5, 2023.[6]

Energy and Peak Demand Forecast, Method and Assumptions

The *Guidelines* identify the need for a forecast of energy and peak demand to determine whether a POU's IRP is consistent with the requirements of PUC Section 9621.[7] The *Guidelines* also state that the POU must provide information on the method used in developing the demand forecast if a POU uses a forecast other than the CEC's adopted demand forecast.[8]The demand forecast and supporting information provided in the IRP present an adequate representation of future energy and peak demand that meets the *Guidelines* requirements.

MID developed forecasts for energy and peak demand. Peak demand refers to the highest amount of customer electric load in any hour and is usually expressed in MW. Net energy for load, expressed in megawatt-hours (MWh), informs the energy forecast. The forecasts are based on a set of econometric models describing the hourly load in the region as a function of several weather variables such as surface temperature and solar irradiance, calendar variables such as day of the week and holidays, and demographic variables such as population and average regional income. MID uses an internal model referred to as the 2023 Long-Term Demand and Energy Forecast to develop its energy and peak demand forecasts. The forecasting model factors in both demand and supply. The demand-side forecast models include projections for customer solar, energy efficiency, and electric vehicle charging load. Historical impacts of interruptible and demand response program events are also incorporated in the demand-side of the model while future impacts of these programs are incorporated in the supply-side.

The total net energy for load forecast has a compound annual growth rate of 0.56 percent from 2023 to 2030, which has slightly increased from the annual energy growth rate of 0.43 percent from 2013 to 2022. Figure 2 shows the forecasted total net energy for load from MID's modeling framework, which indicate a value of 2,933 GWh in the year 2030. By contrast, the CEC's forecast of energy requirements for MID is 2,967 GWh, which is comparable.

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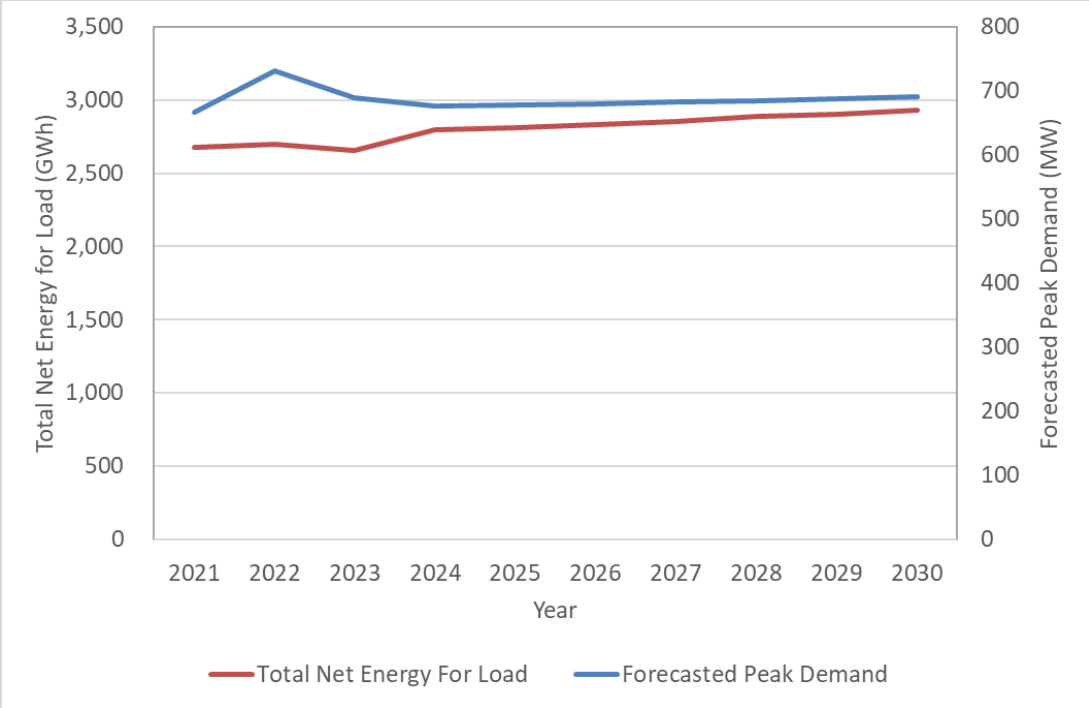
6 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, Resolution 2023-57. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

The standardized tables are updated with actual data for 2023 while the IRP's 2023 values reflect the modeled values.

7 *POU IRP Guidelines*, Chapter 2, E., Pp 5-6

8 Given the timing of these POU IRP submittals the adopted forecast vintage is the 2022 CED Update. California Energy Demand Update, 2022-2035

Figure 2: MID's Total Net Energy for Load and Forecasted Peak Demand



Source: CEC analysis of the *MID 2024 IRP*

The 1-in-2 peak demand forecast has a compound annual growth rate of 0.51 percent from 2023 to 2030, which is a slight drop from the 1.6 percent annual growth rate between 2013 and 2022. By 2030, light duty plug-in electric vehicles (EVs) are expected to contribute 18 MW to the 1-in-2 peak demand. However, customer-side solar is expected to output 45 MW by 2030. MID's solar forecast model could be predicting customer-side generation that offsets the demand generated by the growth of EVs in MID's territory leading to this reduced growth rate. The CEC Energy Demand 2023-2040 Forecast – Planning Forecast 1-in-2 Net Electricity Peak Demand, projects 736 MW peak demand for MID in 2030, which is higher than the *MID 2024 IRP* forecast of approximately 692 MW as seen in Figure 2. This discrepancy could be attributed to the differences in how the CEC and MID calculate and incorporate Additional Achievable Energy Efficiency. The CEC planning forecast also incorporates Additional Achievable Fuel Substitution and Additional Achievable Transportation Electrification. MID's forecasting incorporates a machine solar forecast model that projects distributed solar generation to offset 191.7 GWh of system energy consumption annually by the end of 2030.

Another consideration is the treatment of weather in the forecast. MID utilized weather scenarios to derive their forecasts after the econometric regression model was constructed. There were 119 weather scenarios created from 17 years of historical weather data (from

2006 to 2022)[9]. After ranking the forecast results from the weather scenario sets from highest to lowest, the 50th percentile result was selected as the annual peak value. By contrast, the CEC's forecast takes into account weather variables that are informed by climate projections. This could be another possible reason for the discrepancy between the CEC and MID forecasts.

Resource Procurement Plan

The *Guidelines* require that POUs report the mix of resources they plan to use to meet demand through 2030.[10] POUs are also required to provide an IRP with data and supporting information sufficient to demonstrate that the POUs' plan to meet the various targets and goals. Staff has determined that the *MID 2024 IRP* filing meets these requirements. The following is a discussion of the utility's existing resources, procurement strategy, the portfolio analysis underlying resource selections, and the resources in 2030 identified in the standardized reporting tables.

Existing Resources

MID owns an existing range of resources from natural gas-fired power plants to hydroelectric facilities. Table 1 shows electric facilities that are owned by MID.[11]

Table 1: Electric Facilities Owned by MID

Electric Facilities	Fuel Type	Capacity (MW)
Woodland 1	Natural Gas	50
Woodland 2	Natural Gas	83
Woodland 3	Natural Gas	49.2
Ripon	Natural Gas	94
McClure	Natural Gas/Diesel	108
Don Pedro[12]	Large hydroelectric	62
New Hogan	Small hydroelectric	3.3
Stone Drop	Small hydroelectric	0.26

9 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 7-4. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

10 POU IRP Guidelines, Chapter 2.F., P. 6.

11 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 2-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

12 The total nameplate capacity is 203 MW. MID's ownership interest in Don Pedro is 62 MW.

Source: CEC, Energy Assessments Division, Based on the *MID 2024 IRP* filing

As seen in Table 1, the Woodland, Ripon, and McClure natural gas units form the majority of MID's utility-owned generation. Claribel, an additional natural gas facility, is scheduled to begin offering 12 MW of capacity in 2028, increasing to 48 MW in 2031. The Don Pedro, New Hogan, and Stone Drop hydroelectric facilities are all RPS-eligible.

In addition to MID's thermal and hydro generation, MID generates or receives energy through PPAs. Lodi Energy Center is a natural gas facility owned by the Northern California Power Agency with 30 MW of capacity. Rights to its generation output are retained through MID's partnership with the Northern California Power Agency. MID also receives 5 MW of Renewable Energy Credits (RECs), from Central Valley Project hydro generation through a contract with the Western Area Power Administration.

The MID RPS portfolio currently includes power purchases from four wind generation projects: Big Horn I, Big Horn II, Star Point, and High Winds. Big Horn I has 25 MW and Big Horn II has 33 MW of capacity; both projects are purchased as part of the Modesto-Santa Clara-Redding Public Power Agency. MID is the sole off-taker of Star Point (98.7 MW) and High Winds (50 MW). MID has also procured the output from two solar photovoltaic projects located outside its service area: the Mustang Two Barbaro and Blythe Solar IV projects that offer 50 MW and 62.5 MW of capacity, respectively. The utility also procures energy from the locally situated McHenry Solar Farm that offers 25 MW of capacity. MID also receives surplus energy from behind-the-meter solar photovoltaic systems.[13]

In 2023, MID's electric resource mix had no coal while natural gas supplied 15.8 percent, solar supplied 13 percent, wind supplied 13.5 percent, and hydroelectric supplied 9.1 percent. Unspecified/system power comprised the final 48.6 percent.

Resource Portfolio Evaluation

MID considered three supply resources in its portfolio assessment: utility-owned generation, RPS-eligible renewable resources within and outside the state, and market purchases. The utility performed its own production cost modeling simulations to validate the feasibility and performance of different portfolios. Production cost simulations are used to determine an optimized portfolio that is reliable, follows compliance requirements, and minimizes risk at the least possible cost. MID incorporates sensitivities and probability estimates in their resource planning process through their load forecast and planning scenarios.

To develop a valid resource mix, MID calculates the capacity shortage and adjusts the supply stack until capacity requirements are met. Once the adjustment process is complete, the production cost model is used to check the feasibility of the adjusted supply stack. In 2013, MID's Board adopted a resolution requiring MID to plan on covering 70 percent of its total

13 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 5-2. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

demand and planning reserve margin (PRM) needs through long-term capacity commitments. At the time MID filed its IRP, this long-term capacity procurement was expected to be met in 2024.[14]

Once the capacity procurement requirement is met, MID conducts a risk evaluation. This is done to minimize exposure to market volatility by implementing a Value-at-Risk limit and position limits. The Value-at-Risk limit is expressed as a dollar amount that caps the amount of money that the utility is willing to risk over a specified period. Position limits for both electric power and natural gas procurement set boundaries for how much of MID's expected energy and natural gas needs must be hedged in the current year and in forward years. These position limits are set by the MID Board of Directors.

After evaluating the feasibility, economics, reliability, compliance, and risk, MID generated a final Conforming Portfolio. The Conforming Portfolio is presented as the utility's preferred plan in the *MID 2024 IRP*. This Conforming Portfolio is expected to reliably serve demand at a reasonable long-term cost while achieving compliance and allowing for flexibility to respond to future policy changes. The MID Board of Directors approved the Conforming Portfolio prior to the *MID 2024 IRP* being submitted to the CEC.

Procurement Strategy

MID relies on a diverse and balanced power resource mix to meet customer needs. The diversified renewable portfolio for MID is currently comprised of the following: owned and long-term contracts of hydroelectric resources, wind and solar power long-term contracts, and a short-term biomass contract.

MID expects to use REC banking and tradable RECs for RPS compliance. CEC regulation allows POUs that procured renewable resources prior to the adoption of mandatory POU RPS targets, to carryover excess renewable generation measured from 2004 through 2010 and use it for RPS compliance in future years. Excess RECs that are not used to meet an RPS goal in a specific year will roll over to a future year and be used for RPS compliance instead of RECs that will be generated in that future year.[15]

In addition, MID is focusing procurement on the following:

- A long-term PPA with RWE Clean Energy for the purchase of the energy output, capacity, and associated environmental attributes from a 52.5 MW share of its 105 MW Mesquite Solar 4 Project. This is paired with 10 MW of lithium-ion battery energy storage capacity.

14 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 8-2. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

15 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 5-3. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

The project commenced operation in February 2024 and is directly connected to the California Independent System Operator system (CAISO).

- PPAs for solar commencing in the year 2025. The contract capacity ranges from 50 MW to 450 MW over the 2025 to 2043 timespan. Some of this resource is interconnected to and delivering the output to the CAISO system, and some of the output is delivered to MID's system.
- PPAs for batteries starting in the year 2025. The contract capacity ranges from 25 MW to 325 MW over the 2025 to 2043 timespan with this output delivered to MID's system.
- PPAs for wind commencing in the year 2028. The contract capacity ranges from 50 MW to 150 MW over the 2028 to 2043 timespan with this resource interconnected to and delivering the output to the CAISO system.
- PPAs for baseload renewables starting in the year 2030. The contract capacity ranges from 15 MW to 45 MW over the 2030 to 2043 timespan with this resource interconnected to and delivering the output to the CAISO system.[16]

MID also evaluated winter and summer peak supply to assess any procurement needs when taking into consideration the addition of a 15 percent PRM. When evaluating the 1-in-10 summer peak demand for 2024 in their production cost simulation, MID determined that a small amount of additional reserve capacity will be needed to meet demand during peak hours which will be met with short-term power purchases. MID's current supply portfolio can meet demand outside of these peak hours. For the 1-in-10 winter peak demand, MID's current supply of utility-owned generation and baseload contracts provide adequate supply.

16 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 8-7. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

CHAPTER 2:
Review for Consistency with PUC Section 9621 Requirements

This chapter summarizes the main elements of the *MID 2024 IRP* and provides CEC staff's findings regarding the consistency with PUC Section 9621 requirements, as well as the *Guidelines*. These findings include whether the utility meets GHG emission reduction targets and RPS energy procurement requirements, as well as planning goals for retail rates, reliability, transmission and distribution systems, net load, and disadvantaged communities. In addition, the IRP must address procurement of energy efficiency and demand response, energy storage, transportation electrification and portfolio diversification.

Greenhouse Gas Emission Reduction Targets

POUs are required to meet the GHG targets established by the California Air Resources Board (CARB), in coordination with the CEC and California Public Utilities Commission (CPUC).[17] The initial GHG targets set by CARB reflect the electricity sector's percentage in achieving the economywide GHG emission reductions of 40 percent from 1990 levels by 2030. Staff finds that MID plans to achieve the established GHG emission target range of 30-53 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) published in the *SB 350 IRP Electric Sector GHG Planning Targets: 2020 Update (2020 CARB Update)*.[13] MID's Conforming Portfolio results comply with the requirement of PUC Section 9621(b)(1).

In 2023, the 2030 electricity sector GHG planning target range was brought into alignment with CARB's *2022 Scoping Plan for Achieving Carbon Neutrality* (*2023 CARB Update*) adopted in September 2023.[18,19] This electricity sector GHG planning target range of 30–38 $MMTCO_2e$, retains the lower bound of 30 $MMTCO_2e$ from CARB's *2020 CARB Update* but reduces the upper bound from the 53 $MMTCO_2e$ to 38 $MMTCO_2e$.[20]. It is important to note that the *2023 CARB Update* electricity sector GHG emission targets were published after the *MID 2024 IRP* analysis was complete. MID's Conforming Portfolio does fall under the 2020 CARB Update target of 30 – 58 $MMTCO_2e$ but not the 2023 CARB Update target of 30 – 38 $MMTCO_2e$.

17 Public Utilities Code Section 9621(b)(1).

18 Senate Bill 350 Integrated Resource Planning Electricity Sector Greenhouse Gas Planning Targets: 2023 Update, https://ww2.arb.ca.gov/sites/default/files/2023-09/sb350-final-report-2023.pdf.

19 CARB's *2022 Scoping Plan for Achieving Carbon Neutrality*, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

20 CARB's *Senate Bill 350 Integrated Resource Planning Electricity Sector Greenhouse Gas Planning Targets: 2020 Update*, https://ww2.arb.ca.gov/sites/default/files/2021-04/sb350-final-report-2020.pdf.

CEC staff reviewed the GHG emissions associated with MID's portfolio of resources in 2030, as identified in its IRP and standardized reporting tables, and independently assessed the emission factors associated with various resources in MID's portfolio to ensure consistency with other data available. In 2030, MID's Conforming Portfolio results in 558,061 $MTCO_2e$, which again, falls within its utility-specific *2020 CARB Update* target of 317,000 – 559,000 $MTCO_2e$, but not the *2023 CARB Update* target of 317,000 – 401,000 $MTCO_2e$.

As seen in **Table 2**, the majority of GHG emissions are from contracts for non-specified energy until the year 2025. After 2025, the majority of GHG emissions come from the Woodland natural gas units. **Table 2** also shows GHG emissions for MID's Conforming Portfolio of resources in 2022, 2025, and 2030.

Table 2: Greenhouse Gas Emissions from MID Resource Portfolio

	Fuel Type	GHG Intensity (MTCO2e/ MWh)	Total Emissions (MTCO2e) 2022	Total Emissions (MTCO2e) 2025	Total Emissions (MTCO2e) 2030
Woodland1	Natural Gas	0.4842	45,708	24,153	14,493
Woodland2	Natural Gas	0.4641	91,826	135,999	151,775
Woodland3	Natural Gas	0.4379	17,643	20,041	28,864
Ripon1	Natural Gas	0.5726	7,908	8,993	9,101
Ripon2	Natural Gas	0.5686	4,769	6,825	7,734
McClure1	Natural Gas	1.0668	1,493	1,661	1,643
McClure2	Natural Gas	0.7632	1,154	1,618	1,618
Lodi Energy Center	Natural Gas	0.3945	34,174	69,038	69,038
Claribel	Natural Gas	NA	0	0	0
ACS Specified Energy[21]	Unspecified/System Power	0.0163	498	0	0
Non-Specified Energy	Unspecified/System Power	0.428	399,526	347,450	0
Future ACS Specified Energy	Unspecified/System Power	0.0163	0	0	8,333

21 An asset-controlling supplier (ACS) is a specific type of electric power entity approved and registered by CARB. ACS get CARB-assigned emission factors.

	Fuel Type	GHG Intensity (MTCO2e/ MWh)	Total Emissions (MTCO2e) 2022	Total Emissions (MTCO2e) 2025	Total Emissions (MTCO2e) 2030
Future Unspecified Resource	Unspecified/System Power	0.428	0	171,265	266,045
Net Spot market purchases (sales)	System	0.428	371,713	187,825	196,177
Emissions Adjustment	Undelivered RPS Energy	NA	-173,001	-244,439	-196,760
Total Portfolio emissions	**NA**	**NA**	**803,413**	**730,429**	**558,061**

Source: CEC, Energy Assessments Division, Based on *MID 2024 IRP* filing

Also seen in Table 2, the GHG emissions from MID's Conforming Portfolio shows a steady decrease from 2022 to 2030, which is likely due to the phasing out of non-specified energy contracts and decreasing net spot market purchases.

Renewables Portfolio Standard Planning Requirements

PUC Section 9621(b)(2), as established by SB 350, requires that POU IRPs ensure procurement of at least 50 percent renewable energy resources by 2030, consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3. In 2018, SB 100 (de León, Chapter 312, Statutes of 2018) increased the RPS requirement for 2030 from 50 to 60 percent by 2030.[22] Staff reviewed the renewable procurement table, the discussion in the IRP filing, and the renewable procurement plan submitted. Staff finds that MID's plans are consistent with the RPS procurement requirements and all interim compliance periods, as well as the requirements of PUC Section 9621(b)(2).

MID's Conforming Portfolio includes the addition of renewable resources starting in 2025. MID anticipates that their diversified portfolio of RPS resources as well as tradable and banked RECs will account for at least 60 percent of retail sales in 2030, which will meet the RPS target.

22 Public Resources Code Section 399.11(a).

Retail Rates

SB 350 (PUC Section 9621(b)(3)) requires POUs to develop IRPs that enhance each POU's ability to fulfill its obligation to serve its customers at just and reasonable rates, minimizing impacts to ratepayer bills. Staff reviewed the analysis and information MID presented in its IRP filing on the rate and bill impacts from different resource portfolios they evaluated. Staff finds the *MID 2024 IRP* is consistent with the rates discussion, as required in PUC Section 9621(b)(3).

MID believes it is possible to achieve its compliance obligations for RPS and GHG emissions while providing their customers with low and stable electric rates. MID generally has electric rates lower than adjacent investor-owned utilities. From 2012 to 2022, MID did not raise rates for their customers. In 2022, MID raised rates due to inflation and fuel costs. MID identified the following three risk components when evaluating future retail rates: energy supply costs, capital expenditures, and market volatility. The largest impacts on energy supply costs include: eligible renewable procurement, debt service, power purchases, utility owned gas generation, transmission, greenhouse gas, and special programs. In addition, MID recognizes that energy markets are very active and volatile. To safeguard customer exposure to market volatility, MID has a Risk Management Program, which is maintained by their Board of Directors. This program provides controls for the operational, price, and credit risks of MID's power trading and natural gas acquisition operations.[23]

System and Local Reliability

SB 350 requires filing POUs to adopt an IRP that ensures system and local reliability and addresses resource adequacy requirements.[24] Staff reviewed the *MID 2024 IRP* filing capacity reporting table and discussion and finds that MID has planned for sufficient resources to maintain a reliable electric system. In addition, MID's selected portfolio of resources contains sufficient capacity to meet anticipated resource adequacy requirements in 2030. Staff finds that this IRP is consistent with the SB 350 reliability requirements in PUC Section 9621(b)(3) and resource adequacy requirements in PUC Section 9621(d)(1)(E).

In 2022, MID completed a North American Electric Reliability Corporation (NERC)/Western Electricity Coordinating Council (WECC) Annual Electric Transmission System Assessment study that measures compliance with NERC/WECC Reliability Standards in addition to its operational flexibility. MID plans to meet electricity demand by following NERC and WECC requirements and standards for reliability and operations as well as the standards identified by MID itself for meeting the needs of their customers.

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23 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 11-4. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

24 Public Utilities Code section 9621(b)(3).

MID relies on a 1-in-10 loss of load event (LOLE) to define its resource adequacy needs. Its resource adequacy is based on the sum of the probability-adjusted 1-in-10 peak demand and a PRM of 15% of forecasted 1-in-10 peak demand, with adjustments for resources such as hydro and firm energy imports. MID assessed its summer and winter supply stack under these conditions.

For the summer, the demand through hour ending 16:00 will be met with the current supply portfolio with a small amount of additional reserve capacity needed to meet demand during peak hours. This additional reserve capacity will be met with short-term power purchases. For the winter, MID's current supply of utility owned generation and baseload contracts will provide adequate supply to meet demand.

A 5-year capital improvement plan identifies projects that may be needed to maintain system reliability. Along with maintaining this plan, MID also joined the Western Energy Imbalance Market in early 2021 to help improve the efficiency of its real time resource dispatch.[25]

Local Capacity Needs

The NERC/WECC Annual Electric Transmission System Assessment identified the Mountain House Substation Expansion and 69 kV lines as an area of improvement for a local system capacity and redundancy upgrade to serve the community of Mountain House.[26] MID has been the sole load serving entity in the city of Mountain House since 2001, which was authorized under Public Utilities Code Section 9610.

Flexible Capacity Needs

As determined by the NERC/WECC Annual Electric Transmission System Assessment, MID will be able to deliver customer loads in a safe, reliable, operationally flexible, and cost-effective manner while maintaining compliance with NERC/WECC planning criteria.

MID's assessment demonstrated that the MID transmission system can meet the needs of their customers as well as NERC/WECC standards. However, the study also identified areas of improvement. MID currently has two projects in progress, a Clough – Stockton 69kV Line Re-route and Westley 230 kV Bus Differential Relays. Additional projects that are expected to occur in the near-term are listed below.

- Mountain House Substation Expansion and 69kV Lines (local system capacity and redundancy upgrade)
- Spare Claus Transformer (reliability upgrade)

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25 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 3-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

26 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 9-5. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

- Hershey Tap Upgrade (reliability upgrade)
- Standiford 115 kV Bus and Transformer Upgrade (address affecting generator interconnection overloads)

Transmission and Distribution Systems

PUC Section 9621(b)(3) requires filing POUs to adopt an IRP that achieves the goal of strengthening the diversity, sustainability, and resilience of the bulk transmission and distribution systems and local communities, as further specified in PUC Section 454.52(a)(1)(G). Staff determined that the *MID 2024 IRP* filing demonstrates plans to maintain and enhance its transmission and distribution systems, which will adequately deliver resources to its service area to meet the requirement. Staff also finds that MID conducted sufficient planning to address the capacity and reliability of its distribution system. As such, staff finds the *MID 2024 IRP* is consistent with the transmission and distribution requirements set forth above.

Transmission System

MID is a member of the Transmission Agency of Northern California (TANC), which along with Pacific Gas & Electric (PG&E) and other entities, owns the California-Oregon Transmission Project (COTP). COTP is a 339-mile, 1,600 MW, 500 kV transmission project located between southern Oregon and central California.

MID had COTP transmission rights to 320 MW of firm capacity southbound. This capacity stepped down to 311 MW in 2024. MID also had rights to 314 MW of firm capacity northbound, though that capacity also stepped down to 305 MW in 2024.

The 230 kV Westley-Tracy transmission line is MID's connection to the COTP via the Western Area Power Administration's 500 kV Tracy substation. PG&E also provides bidirectional transmission service connected to the COTP under the "South of Tesla Principles" agreement that gives Modesto 102 MW of firm capacity.

MID has several other bulk transmission facilities including:

- Westley Switching Station: a 230 kV station jointly owned with Turlock Irrigation District.
- Rosemore 230 kV transmission substation
- Parker 230 kV transmission substation
- Standiford 115 kV transmission substation
- Santa Cruz 115 kV transmission substation
- Clause 115 kV transmission substation[27]

27 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 9-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

Distribution System

MID's distribution system consists of over 1,000 miles of distribution lines and 35 distribution substations over a 160 square mile service territory. Its traditional 12 kV distribution system includes all of Modesto and the surrounding communities of Empire, Waterford, and Salida. MID also serves portions of the cities of Riverbank at 12 kV; Ripon, Escalon, and Oakdale at 17 kV; and the community of Mountain House at 21 kV. MID has six planning areas and two additional areas of Four Cities and Mountain House. Planning areas are defined by electric boundaries that limit load transfers with substations in each area adjacent to each other to provide backup.

MID conducts annual distribution planning for a five-year period that carefully evaluates systems conditions to identify deficiencies and strategize optimal infrastructure investments to address capacity and reliability requirements. Multiple capital projects are scheduled every year to improve the system. Major capital projects scheduled from 2023 – 2028 include the following:

- Mariposa B54 Line Extension (2023)
- Claribel B46 Reconductor (2024)
- New Claribel Transformer (2024 – 2025)
- Enslen B62 Reconductor (2025)
- New Claribel Feeder (2025)
- Stoddard B46 Line Extension (2028)
- Briggsmore B48 Line Extension (2028)[28]

Disadvantaged Communities and Localized Air Pollutants

MID is making efforts to minimize localized air pollutants and GHG emissions. CEC staff reviewed the *MID 2024 IRP* filing to determine the extent to which it minimizes local air pollutants with a priority placed on disadvantaged communities. Approximately 35 percent of MID electric service area residents live within disadvantaged communities.

MID recognizes that cash flow concerns and lack of available credit may present barriers that limit the ability of low-income customers to invest in energy efficiency. In addition, many low-income households are renters, and energy efficiency improvements may depend on the willingness of the landlord to make investments. To help address the issue of affordability, MID offers a Community Alternative Rate for Electric Service program for qualifying low-income customers. This program reduces the fixed monthly charge from $30.00 to $12.00 and applies a 23 percent discount of the first 850 kWh of energy used each month for a period of up to three years. The utility also offers a weatherization program, which is described further

28 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 9-6. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

under the Energy Efficiency and Demand Response Resources section. For EV purchases, there are rebates based on the number of persons in the household and/or total household income.[29]

Net Energy Demand in Peak Hours

SB 338 (Skinner, Chapter 389, Statutes of 2017) requires POUs to consider existing renewable generation, grid operation efficiency, energy storage, distributed energy resources, and energy reduction measures (such as energy efficiency and demand response) to reduce the need for new or additional gas-fired generation and distribution and transmission resources (PUC Section 9621(c)). The *MID 2024 IRP* includes a discussion of how it considers preferred resources to meet peak demand when selecting resources for its portfolio. MID's Conforming Portfolio is consistent with this requirement.

MID plans to meet peak energy demand with a balanced mix of power resources, including solar and wind. Behind-the-meter solar resources help offset mid-day demand, while their existing renewable generation support meeting peak demand. Additionally, MID utilizes "Power Smart" and "Interruptible" demand response (DR) programs to reduce load when needed, which are described under the Energy Efficiency and Demand Response Resources section. The utility also promotes renewable energy and energy efficiency (EE) through customer programs like the SB 1 solar rebate and lighting rebates, alongside its DR initiatives.[30]

Additional Procurement Goals

PUC Section 9621(d)(1) requires filing POUs to address procurement of energy efficiency and demand response, energy storage, transportation electrification, and a diversified portfolio, which are discussed in the next section. The resource adequacy provisions of this code section are discussed in the system reliability section above.

Energy Efficiency and Demand Response Resources

CEC staff finds that the *MID 2024 IRP* is consistent with the requirement in PUC Section 9621(d)(1)(A) as it includes a discussion of energy efficiency and demand response programs it plans to implement and quantifies the amount of energy efficiency savings it plans to achieve.

MID submitted two documents to the docket (Modesto Irrigation District – 2024 Integrated Resource Plan, TN#:255421) which demonstrate their commitment to reduce carbon emissions as they integrate EE and DR in their forecasting process. The MID Board of Directors

29 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 10-1. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

30 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 8-6. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

adopted EE targets from 2022 through 2031, and MID appears to be meeting these targets. MID's historical EE is based on the incremental gross energy savings from EE programs implemented from 2015 to 2022. Hourly EE savings are based on measure-specific load shapes developed for the MID IRP forecast.[31]

MID offers an EE program to their customers called the Weatherization Program. This program provides EE measures to rental or owner-occupied low-income customer homes. The program's scope may include replacement of broken windows, refrigerator, microwave, swamp coolers, or installation of insulation, sunscreens, weather stripping, and some types of home repairs. Customer eligibility is determined by the same income qualifications as the MID Community Alternative Rate for Electric Service Program. Customer demand for the program typically exceeds its annual budget amount.

MID is making an effort to achieve the EE doubling goal set forth within SB 350. The "Power Smart" and "Interruptible" programs are DR programs MID is implementing, which were described under the Net Energy Demand in Peak Hours section above. Because these DR programs are called upon, they are considered supply resources for capacity planning purposes. The utility has demonstrated, throughout their IRP, that they are working to incorporate EE into their planning process. The CEC recommends that MID consider outlining a pathway for additional DR programs/pilots into their service area.

Energy Storage

CEC staff finds that the *MID 2024 IRP* is consistent with the requirement in PUC Section 9621(d)(1)(B) to address procurement of energy storage as it discussed the potential role of energy storage on its system. Assembly Bill 2514 (Skinner, Chapter 469, Statutes of 2010) also requires POUs to evaluate the potential of energy storage systems as a resource and establish procurement targets if appropriate.

The MID Board of Directors adopted a policy through Resolution 2014-72 that finds mandatory energy storage procurement targets were not appropriate for MID after determining that there were no operational or reliability needs for these targets. MID will instead evaluate energy storage on an economic basis and operational fit. Using this approach, MID has executed a long-term power purchase agreement with RWE Clean Energy for the purchase of the energy output, capacity, and associated environmental attributes from a 52.5 MW share of its 105 MW Mesquite Solar 4 Project with 10 MW of lithium-ion battery storage capacity.

There is a growing need for new dispatchable resources to support increased renewable penetration and load growth. Due to this and increasing targets for emission reductions and renewable energy procurement, MID is actively encouraging project developers and power merchants to offer hybrid (PV plus storage) in all recent and upcoming resource solicitations.

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31 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 7-9. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

Since MID still considers energy storage on an economic basis as opportunities arise, stand-alone energy storage systems are also encouraged. MID applies competitive solicitation and robust economic analysis to each potential resource to ensure technical and cost portfolio fit and recognizes that there will be a reduced pool of options as GHG emitting generating resources are phased out. The proliferation and maturation of the battery energy storage industry means that energy storage dispatchability offers reliability benefits that accommodate for this. Therefore, the utility expects that energy storage will be a meaningful component of capacity procurement in the planning horizon.[32]

Transportation Electrification

CEC staff finds that the *MID 2024 IRP* is consistent with the requirements of PUC Section 9621(b)(4) and (d)(1)(C) as it addresses transportation electrification, projecting for light-duty electric vehicle growth, and includes details of the utility's rate design, incentives, rebates to encourage transportation electrification, and customer education efforts.

MID's demand and energy forecast incorporates the electric vehicle forecast and assumptions from the CEC's "Light Duty Plug-In Electric Vehicle Energy and Emission Calculator" developed in December 2018. By the end of 2030, the projected electric vehicle contribution to MID's load is expected to be 110.6 GWh, with an average annual growth rate of 24.2 percent since the year 2024. MID's share of electric vehicles within California is estimated to be 0.56 percent in 2030, or approximately 33,000 light-duty plug-in electric vehicles.

Although MID does not offer a specific rebate for EV purchases, they do extend other financial EV incentives. MID provides a time-of-use rate for residential customers who own a registered plug-in battery electric vehicle or plug-in hybrid electric vehicle. This designated "EV-D" rate is structured to incentivize EV charging during off-peak hours. In addition, MID offers a $500 rebate to customers who purchase a Level 2 EV charger for their residence or business.[33]

MID has an online EV portal that provides informational comparisons of EV models and Level 2 chargers, an EV commute calculator that estimates monthly savings, locations of public EV charging stations, a list of rebates and incentives, and information of time-of-use rate plans. In addition, the utility is also evaluating EV charging station installation standards for single-family dwellings, multi-family dwellings, and workplaces. MID recently began participating in the Low Carbon Fuel Standard program administered by CARB. This program is designed to decrease the carbon intensity of California's transportation fuel pool.[34] MID is researching if

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32 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 5-5. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241-4.

33 Modesto Irrigation District staff. April 2024. Modesto Irrigation District – 2024 Integrated Resource Plan, page 6. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=255421&DocumentContentId=91241.

34 California Air Resources Boad. https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard

this program can assist in new MID programs that would decrease barriers for consumers to participate in the EV market.

Portfolio Diversification

PUC Section 9621(d)(1)(D) requires that POUs address the procurement of a diversified portfolio of resources consisting of short-term and long-term electricity, electricity related, and demand response products. Based on staff's review of the *MID 2024 IRP*, MID's standardized tables and Conforming Portfolio indicate that the utility has addressed this requirement. MID's Conforming Portfolio includes a diversified mix of resources comprised of wind, solar, hydroelectric, natural gas combustion, and battery storage. This mix of resources was identified for their Conforming Portfolio after validating its feasibility, economics, reliability, compliance, and risk.

APPENDIX A: Abbreviations

Acronym	Term
BANC	Balancing Authority of Northern California
CAISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
COTP	California-Oregon Transmission Project
CPUC	California Public Utilities Commission
DERs	Distributed Energy Resources
DR	Demand Response
DSGS	Demand Side Grid Support
EE	Energy Efficiency
EV	Electric vehicle
GHG	Greenhouse gas
GWh	Gigawatt-hours
IEPR	Integrated Energy Policy Report
IRP	Integrated resource plan
kV	Kilovolt
kWh	Kilowatt-hour
LOLE	Loss of Load Event
MID	Modesto Irrigation District
MMTCO2e	Million metric tons of carbon dioxide equivalent
MTCO2e	Metric tons of carbon dioxide equivalent
MW	Megawatt
MWh	Megawatt-hour
NERC	North American Electric Reliability Corporation
PG&E	Pacific Gas & Electric
POU	Publicly owned utility

Acronym	Term
PPA	Power purchase agreement
PRM	Planning Reserve Margin
PUC	Public Utilities Code
PV	Photovoltaic (solar)
REC	Renewable Energy Credit
RPS	Renewables Portfolio Standard
SB	Senate Bill
SB 1020	Senate Bill 1020 (Laird, Chapter 361, Statutes of 2022)
SB 350	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)
SMUD	Sacramento Municipal Utility District
TANC	Transmission Agency of Northern California
WECC	Western Electricity Coordinating Council

APPENDIX B: Glossary

Term	Definition
1-in-10 Loss of Load Event (LOLE)	One day in ten years loss of load event.
Behind-the-meter resources	Generation and storage located at the customer site. More generally, it can refer to any device located at the customer site that affects the consumption of grid-provided energy (appliance control systems, for example)
California Air Resources Board (CARB)	The "clean air agency" in California government. CARB's main goals include attaining and maintaining healthy air quality, protecting the public from exposure to toxic air contaminants, and providing innovative approaches for complying with air pollution rules and regulations.
California Energy Commission (CEC)	The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The Energy Commission's seven major areas of responsibilities are: • Forecasting statewide energy demand. • Licensing of power plants and transmission lines sufficient to meet those needs. • Promoting energy conservation and efficiency measures. • Promoting the development of renewable energy. • Promoting the transition to clean transportation fuels. • Investing in energy innovation. • Planning for and supporting the state's response to energy emergencies. Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account, and other sources.
Demand forecast	A forecast of electricity demand served by the electric grid, measured by peak demand and energy consumption. Some factors that determine load forecast include economics, demographics, behind-the-meter resources, and retail rates.

Term	Definition
Demand response	Providing wholesale and retail electricity customers with the ability to choose to respond to time-based prices and other incentives by reducing or shifting electricity use, particularly during peak demand periods, so that changes in customer demand become a viable option for addressing pricing, system operations and reliability, infrastructure planning, operation and deferral, and other issues.
Distributed energy resources	Small-scale power generation technologies (typically in the range of 3 to 10,000 kilowatts) located close to where electricity is used (for example, a home or business) to provide an alternative to or an enhancement of the traditional electric power system.
Greenhouse gas (GHG)	Any gas that absorbs infra-red radiation in the atmosphere. Greenhouse gases include water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), halogenated fluorocarbons (HCFCs), ozone (O3), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).
Index+	A contract structure where energy with attributes such as a Renewable Energy Credit is purchased at a price based on a market index plus an additional fixed amount for the attribute. The attribute is assigned to the purchaser and the energy is settled in an energy market at its index price.
Integrated Energy Policy Report (IEPR)	Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the Energy Commission to prepare a biennial integrated energy report. The report contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors. The report provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies, enhance the state's economy, and protect public health and safety.
Integrated resource plan (IRP)	A plan adopted by the governing board of a POU under PUC Section 9621.
IRP filing	An IRP adopted by the filing POU's governing board that is electronically submitted to the Energy Commission, along with the standardized tables and supporting Information, by the filing POU or authorized representative.
Plug-in electric vehicle (EV)	A vehicle that uses one or more electric motors for propulsion. Electric vehicles include battery-electric and plug-in hybrid vehicles.
Public Utilities Code (PUC)	The set of laws that regulates public utilities in California, including natural gas, telecommunications, private energy producers, and municipal utility districts.
Renewable Energy Credit (REC)	Renewable Energy Credit (1 MWh renewable energy = 1 REC) is a tradable, non-tangible energy commodity representing proof that 1 megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource.

Term	Definition
Renewable Portfolio Standard (RPS)	A regulation that requires a minimum procurement of energy from renewable resources, such as wind, solar, biomass, and geothermal.
Renewable Portfolio Standard (RPS) Eligible	Consistent with the California Code of Regulations, Title 20, Section 3201 (k), means an electrical generating facility that the Energy Commission has determined meets the definition of a ”renewable electrical generation facility” in Section 399.12 (e) of the Public Utilities Code, including a facility satisfying the criteria of Section 399.12.5 of the Public Utilities Code, and has certified as an RPS-certified facility.
Senate Bill 1020 (Laird, Chapter 361, Statutes of 2022)	This bill revised state policy to require eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified