



**Platte River**  
Power Authority

Estes Park • Fort Collins • Longmont • Loveland

# 2024 Integrated Resource Plan

Fort Collins Council | August 13, 2024

# **2024 IRP introduction**

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**Jason Frisbie, general manager and chief executive officer**

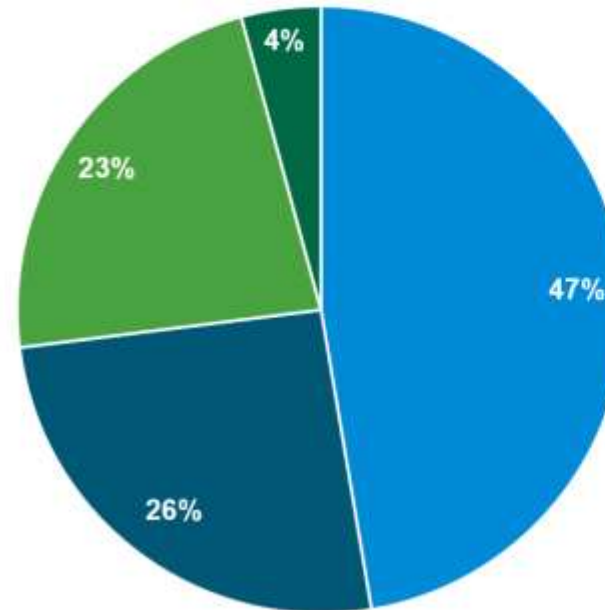


# IRP introduction

- An IRP is a planning process that integrates customer demand and resources with utility resources to meet a utility's future electricity needs as per the policy and guidelines of the governing body.
- In our case, IRP is a 20-year plan to meet:
  - Goals of Resource Diversification Policy (RDP)
  - State Clean Energy Plan
- Typical IRP process is repeated every 3-5 years to plan for industry changes including:
  - Technological progress
  - Consumer preferences
  - Regulatory mandates
- The Western Area Power Administration requires us to prepare an IRP every five years. We have accelerated the filing of our IRPs due to our 2030 RDP goal.

## 2024 projected deliveries of energy to owner communities

3,314,141 MWh



### ■ Fort Collins

1,531,251 MWh

78,450 annual customers

### ■ Longmont

871,049 MWh

42,863 annual customers

### ■ Loveland

768,375 MWh

39,782 annual customers

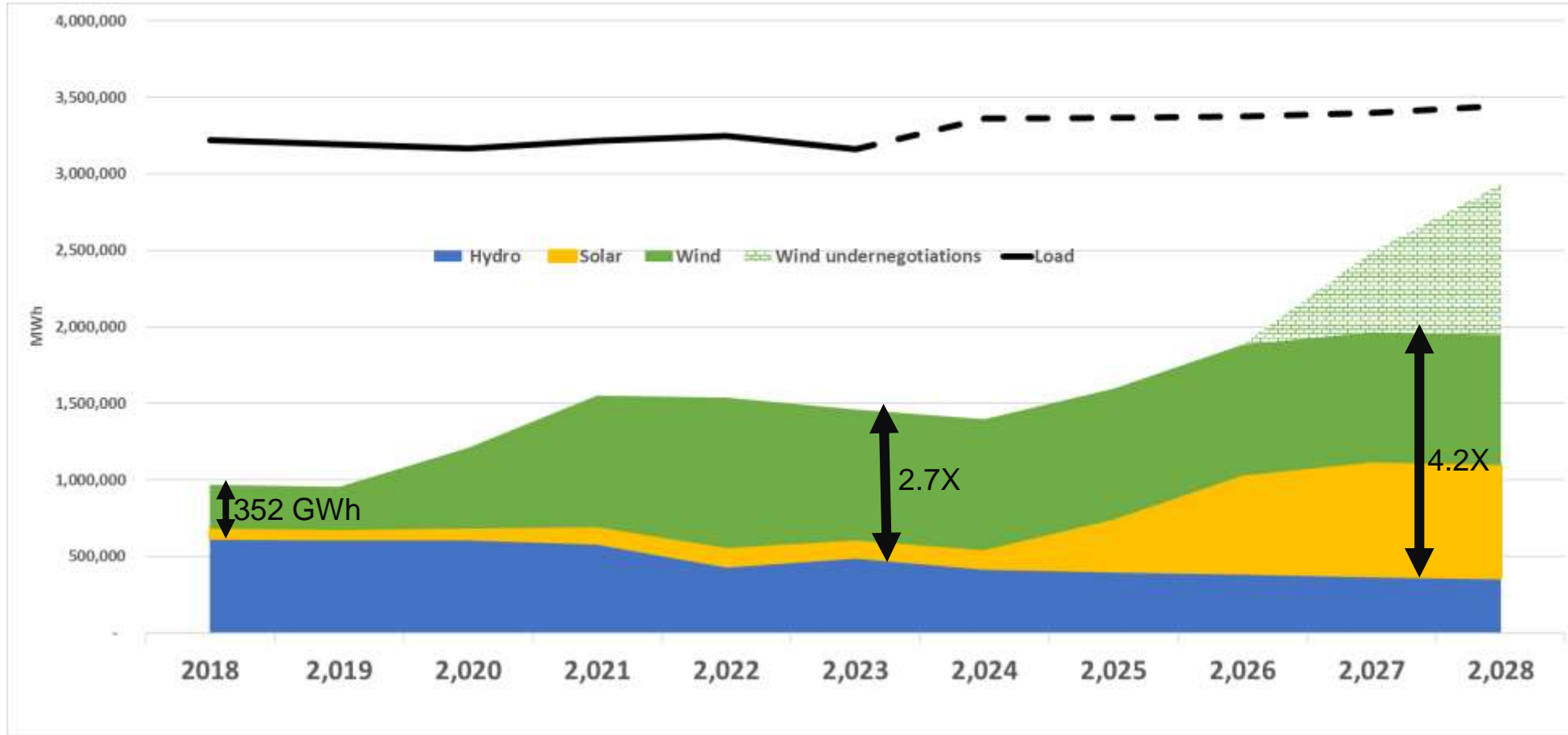
### ■ Estes Park

143,466 MWh

11,000 annual customers



# Renewables added since 2018



# Modeling and community engagement recap

- **Planning process:**
  - Process started in fall 2022.
  - Engaged nine external consultants from across the country to carry out research and studies.
  - Developed over 25 portfolios with 100s of hours computer time.
  - Selected five portfolios and recommended one for implementation.
- **Community engagement:**
  - 36 unique engagement events reaching hundreds of people across our service region.
  - Three major events at our headquarters in Fort Collins.
  - Dedicated IRP microsite with Q&A repository, IRP studies and IRP updates.
  - Dedicated email address for people to submit questions and from which people received answers and updates.
  - Public education and media.



# **2024 IRP results**

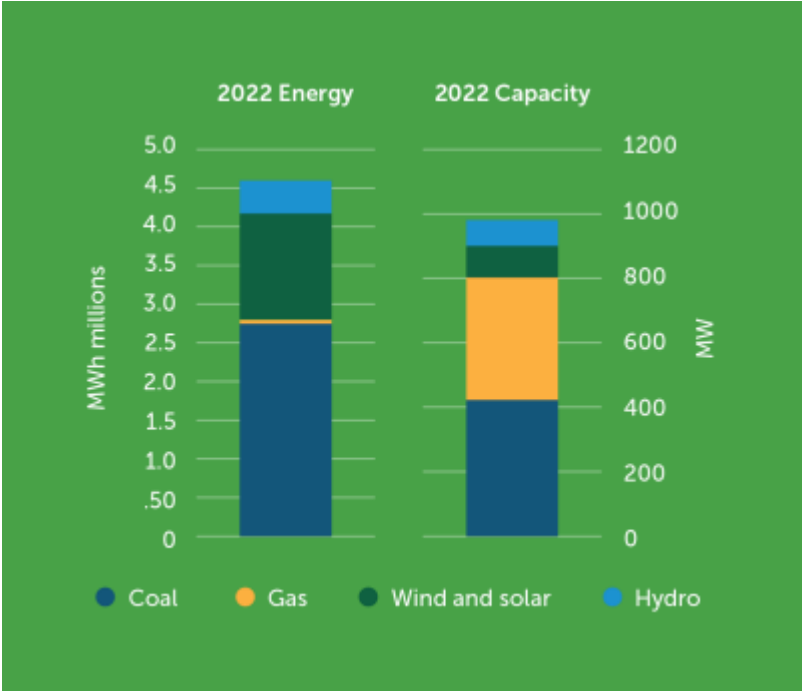
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**Dr. Masood Ahmad, senior manager, resource planning**



# IRP challenge: energy vs. capacity

Create a transition plan to retire 431 MW of coal, currently providing over half of the low-cost energy and reliable capacity. Replace this with low or no-carbon energy and capacity within six years.



Replace more than 2 million MWh of energy and equivalent capacity

Focus mostly on energy – but capacity or reliability is also critical



Solar



Battery storage



Wind



VPP

# Grid need: energy, capacity and flexibility

- Reliable grid operation requires **energy**, **capacity** and **flexibility**. The IRP must plan for all three attributes.
- While wind and solar are excellent sources of energy, they are not able to provide capacity and flexibility. These two vital attributes must be procured from other sources for successful grid operation.

Resource type	Energy	Power/capacity	Flexibility	Feasibility for Platte River
Nuclear	✓	✓	Limited	
Coal	✓	✓	✓	
Gas	✓	✓	✓	✓
Hydro with storage	✓	✓	✓	
Wind	✓			✓
Solar	✓			✓
Storage	✓	✓	Limited	✓
Geothermal	✓	✓	Limited	
VPP	✓	✓	Limited	✓

**Energy** – ability to do the work. Push electrons through the wires that do all the work.

**Power/capacity** – instantaneous energy. Energy at a fixed predictable rate or energy on demand.

**Flexibility** – Ability to change the power output on demand.



# IRP process overview

## External Studies

- Power and Commodity Price Forecast
- Extreme weather and Dark calm analysis
- Reliability – PRM and Effective Load Carrying Capability (ELCC analysis)
- Emerging technologies screening
- Dispatchable capacity requirements

## Renewable Resource Costs

- All Renewable RFP issued
- Research Institute – National Renewable Energy Lab (NREL) & Electric Power Research Institute (EPRI)

## Distributed Energy Resources

- Building electrification
- Assess Electric Vehicle (EV) and Distributed Generation (DG) impacts
- Load shapes

## Load Forecast

- Base, high and low scenarios
- IRP model peak and energy demand

## Core IRP modeling and evaluation

When, how much and what technology?

### Portfolio Development

- Objective lowest cost and CO2
- Constraint: must meet Planning Reserve Margin requirements

### Reliability Testing

- Resource portfolio testing with
  - Dark Calms
  - Extreme weather
  - Wind & solar profiles

### IRP 2024 Filings

- WAPA Filing
- Clean Energy Plan

### Plexos Model

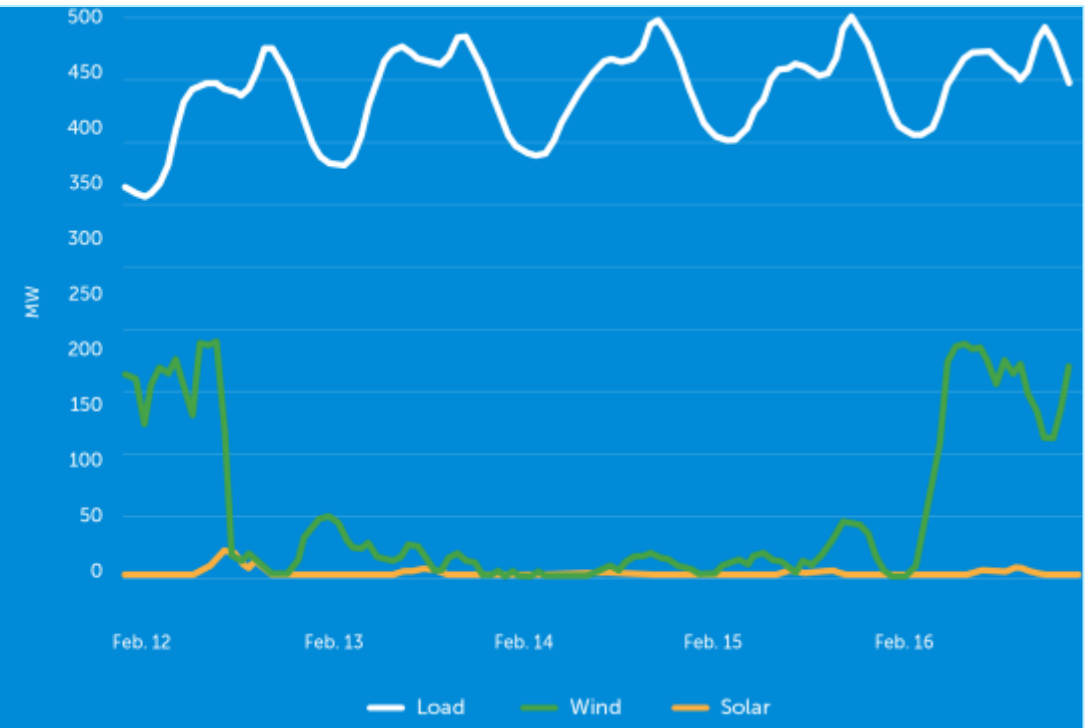
- Model Parameters and Constraints
- Existing Resources

# Renewable intermittency challenges

Summer day supply demand

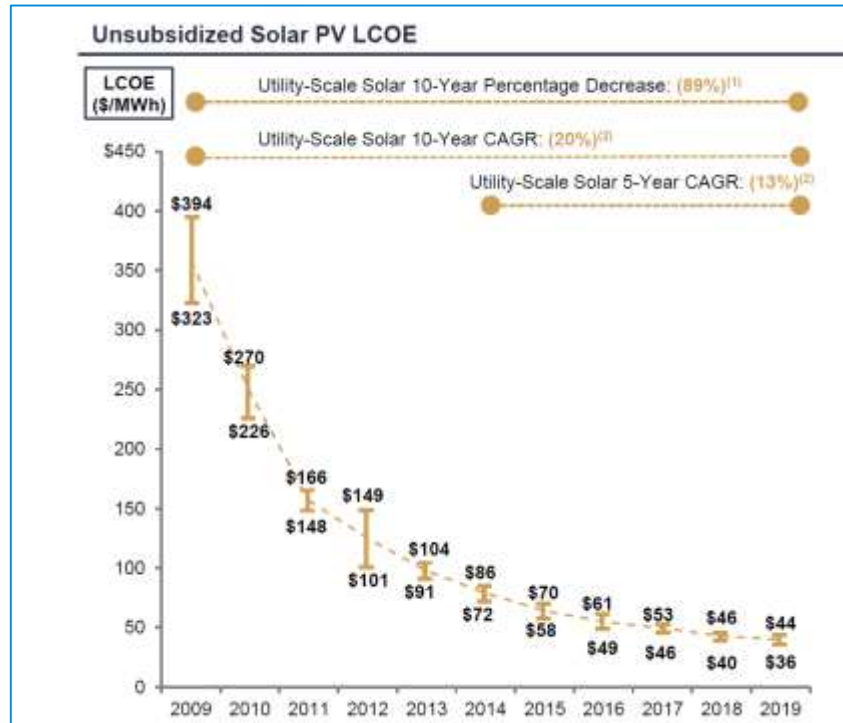


Dark Calm during winter storm Uri, February 2021



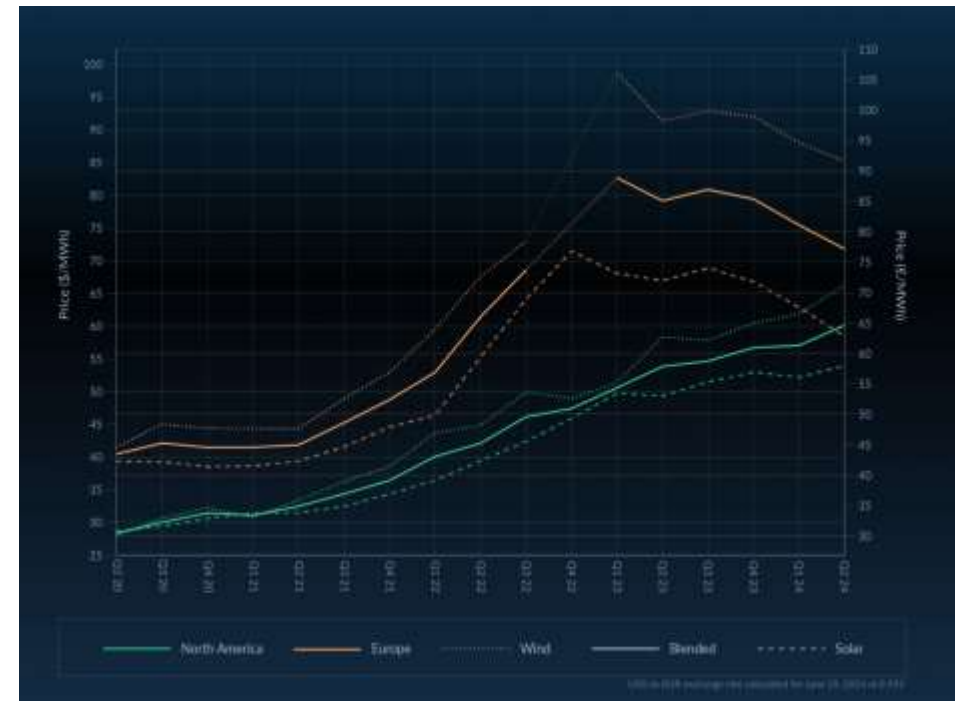
# Renewable cost challenges

Renewable cost at the time of RDP



Source : Lazard LCOE 13

Renewable costs after COVID



Source : Level Ten Q3 PPA Price Index

# Virtual Power Plant capacity

## Customer role:

- Adopt DERs like storage, electric vehicles and smart devices
- Enroll and participate in the VPP

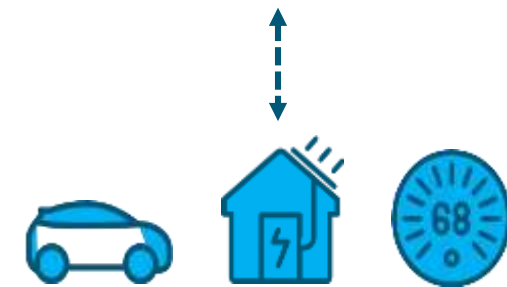
## Platte River and owner community role:

- Invest in new systems, e.g.,
  - DER management systems
  - Advanced distribution management systems
  - Data management systems
- Invest in VPP programs
  - Customer engagement and support
  - Incentives for participation
- Operate the VPP to achieve system benefits

## Virtual Power Plant



Customers



Virtual power plant



Utility systems

# Summary of five portfolios

2005 emissions levels: 3,000,000 tons

Portfolio	Total resource addition in 20 years, MWs								Cost	2030	2035
	Solar	Wind	4-Hr Storage	LDES	Thermal	Distributed Solar	Distributed Storage	Total renewable + storage	NPV, \$ billion	CO2 tons x000	CO2 tons x000
No new carbon	600	885	2850	10	0	337	123	<b>4,805</b>	<b>\$5.34</b>	126	104
Minimal carbon	600	885	1100	110	80	337	123	<b>3,155</b>	<b>\$3.37</b>	127	36
Carbon-imposed cost	550	985	400	160	160	337	123	<b>2,555</b>	<b>\$2.78</b>	196	54
<b>Optimal new carbon</b>	600	885	275	160	200	337	123	<b>2,180</b>	<b>\$2.77</b>	241	74
Additional new carbon	450	985	175	110	280	337	123	<b>2,380</b>	<b>\$2.76</b>	329	98

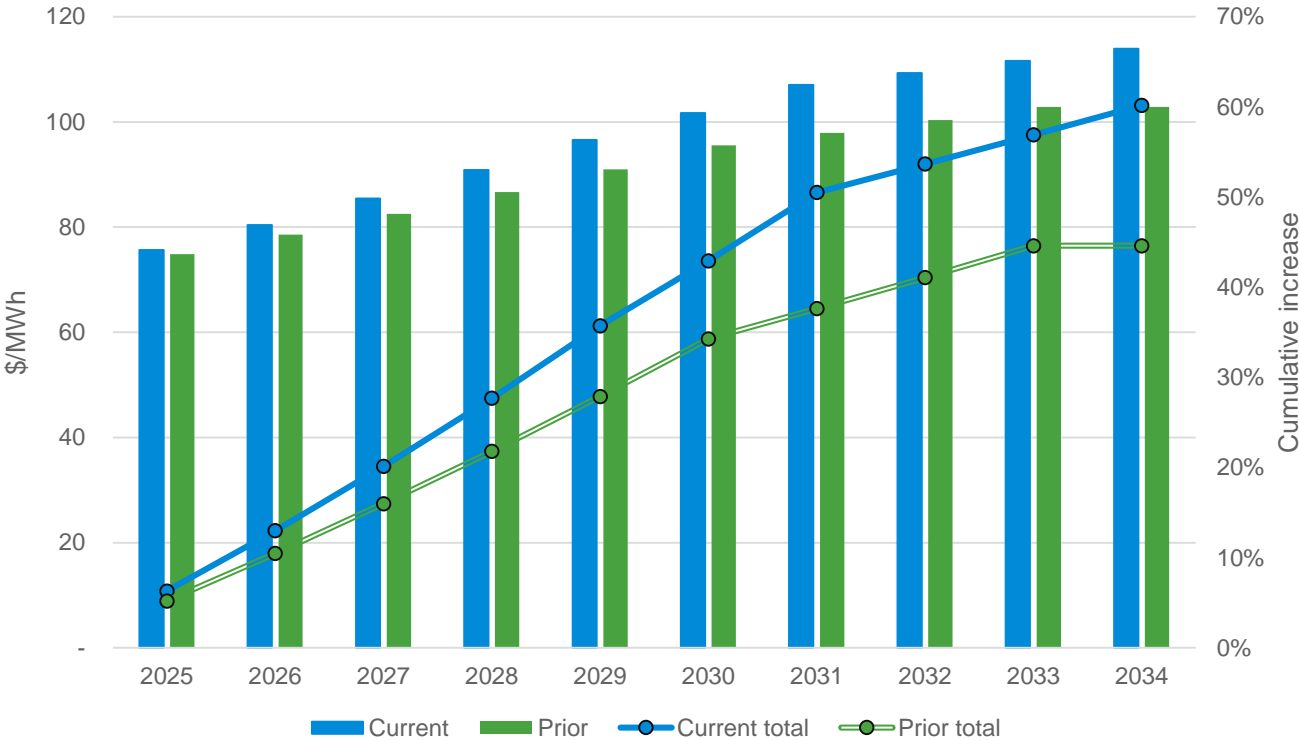
\*All five portfolios include existing frame combustion turbine units at Rawhide

# Wholesale power supply costs

- Current projections
  - 6.3% 2025 – 2029
  - 5.3% 2030 – 2031
  - 2.1% 2032 – 2034
  - 60.2% cumulative 2025 – 2034
  
- Prior projections (May 2023)
  - 5.0% 2025 – 2030
  - 2.5% 2031 – 2033
  - 44.6% cumulative 2025 – 2034

- Increased sustained rate pressure

*\*Projections are subject to change*



# Next steps

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- IRP approved by the board and filed with the Western Area Power Administration (WAPA) in July 2024
- Continue the plan execution on multiple fronts:
  - New resource additions: renewables, storage and dispatchable
  - DER, DERMS and VPP implementation
  - Public engagement and education
  - Continue planning for just transition at Rawhide
- Start 2028 IRP planning

*\*The IRP is a snapshot in time, but planning is a dynamic process. We will continue to optimize our plans as conditions change.*