



# Board of directors

Sept. 28, 2023

Energy leaders since 1973

# Rate tariff schedules review

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Shelley Nywall, director of finance





# Agenda

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- No change in charges from May presentation
  - Firm Power Service
  - Other rate tariff schedules
    - Standard Offer Energy Purchase
    - Wholesale Transmission Service
    - Large Customer Service
- Approval request in October (on consent agenda)

# Firm Power Service (FP-24)

5.0% average wholesale rate increase (budget to budget)

			2024
Average \$/MWh			\$71.26
Owner community charge			\$13,059
Demand charges			
Transmission	\$/kW-mo of noncoincident billing demand		\$6.68
Generation: summer	\$/kW-mo of coincident billing demand		\$6.61
Generation: nonsummer	\$/kW-mo of coincident billing demand		\$4.92
Energy charges			
Fixed	\$/kWh for all energy supplied		\$0.01681
Variable	\$/kWh for all energy supplied		\$0.02427

# Other tariff schedules

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## Standard Offer Energy Purchase (Tariff SO-24)

- 7.8% increase to \$0.02191

## Wholesale Transmission Service (Tariff WT-24)

- Correction to annual charge (error)
- Original effective date June 1

## Large Customer Service (Tariff LC-24)

- Charges established through separate contract
- Changes tied to firm power service tariff and annual budget

# Summary

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- Owner community rates staffs were given rates information in May to facilitate their budgeting process
- Next steps
  - Request board adoption in October of the 2024 Rate Tariff Schedules with a Jan. 1, 2024 effective date

# Questions



**Platte River**  
Power Authority  
Energy leaders since 1973



# Board of directors

**Sept. 28, 2023**

**Energy leaders since 1973**

# Proposed 2024 Strategic Budget work session

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Jason Harris, senior manager, financial reporting  
and budget



# Agenda

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- Budget
  - Schedule
  - Process
  - Budget document
  - Trends
  - 2024 overview
- Capital 5-year forecast



# Budget schedule

## September

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- Board work session

## October

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- Updates and budget discussion
  - Model prices and resource updates
  - Sales contracts
  - Wheeling and ancillary service rate adjustments
  - Medical expense update
  - Departmental O&M updates
  - Capital project updates
- Public hearing

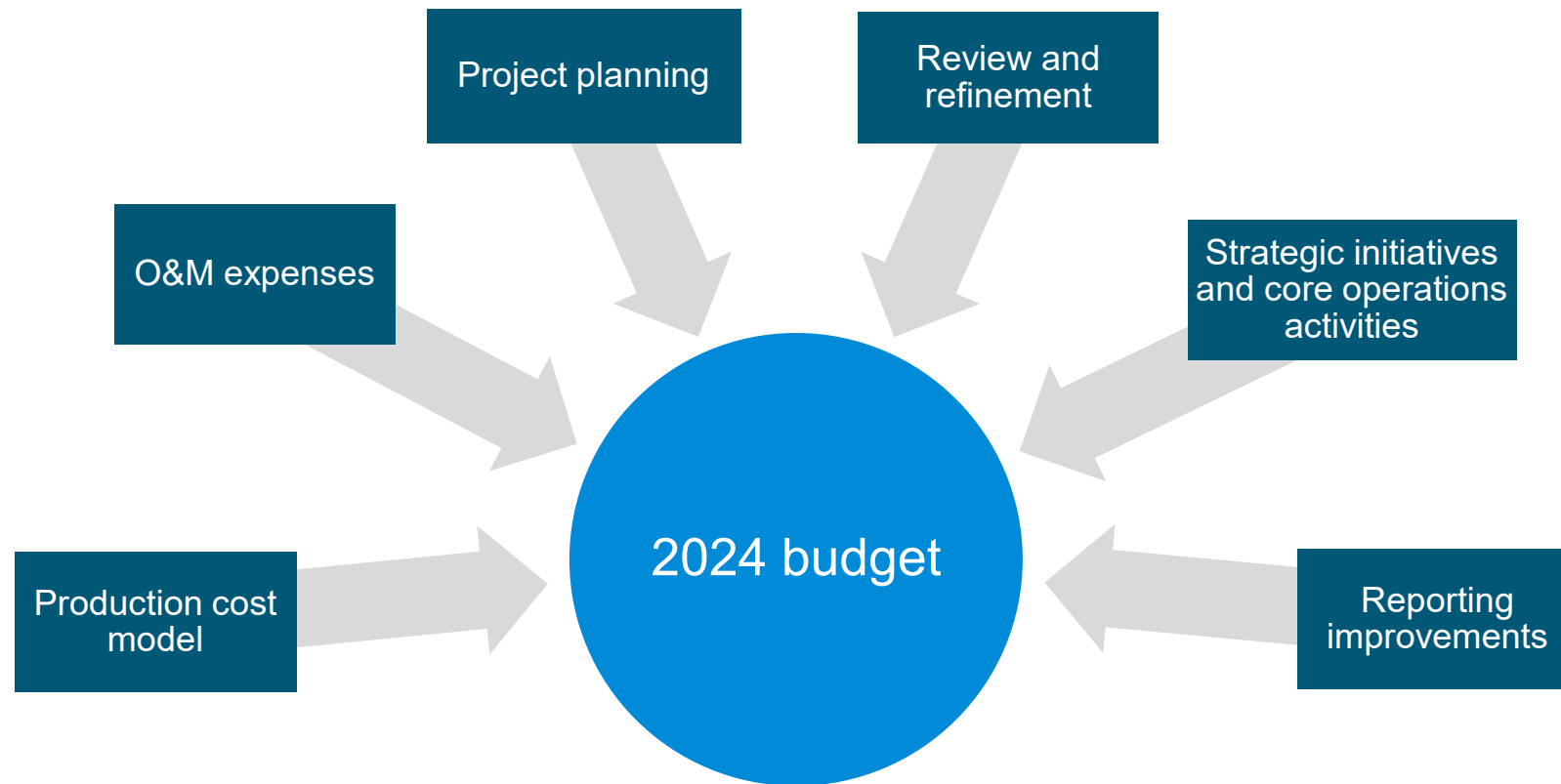
## December

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- Board adoption
- File with the State of Colorado

# Budget process

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# Budget document

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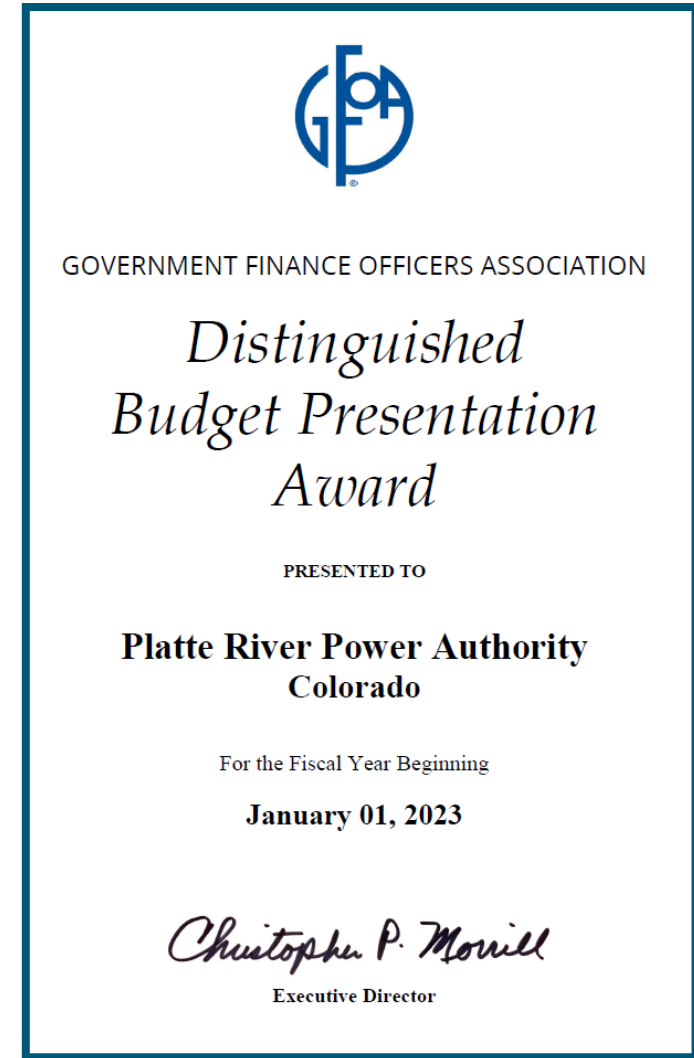
- Overview
  - Background information about the organization, the owner communities, significant initiatives, goals and departmental objectives
- Summary
  - Budget discussion and support for our foundational pillars, strategic initiatives and core operations
- Budget
  - Financial results, comparisons to the strategic financial plan and budget schedules
- Additional information
  - Process for developing the budget and information on financial governance
  - Final document will have table showing changes from proposed

# Budget document

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## GFOA Distinguished Budget Presentation Award received for the 2023 document

- Recognition that the budget document meets program criteria and excels as a policy document, financial plan and communications tool
- Fourth consecutive year receiving the award



# Trends

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## Revenues

- Moderate owner community load growth
- Stable surplus sales
- Increasing interest income from higher rates

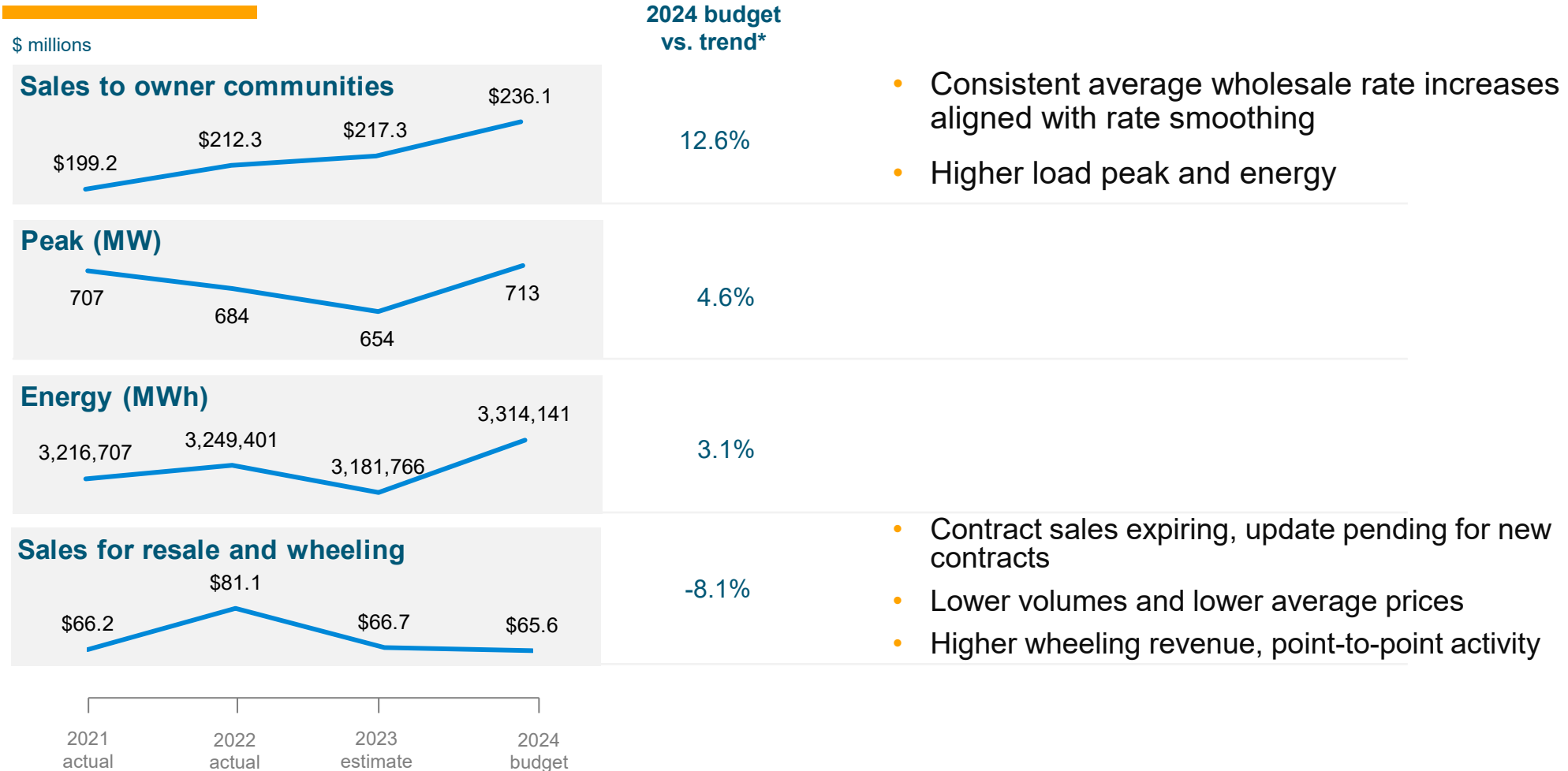


## Expenditures

- Infrastructure advancements and investments
- Resource diversification, markets, DER
- Focus on managing controllable expenses while advancing strategic initiatives and the RDP goal

- Volume and price volatility, participation in WEIS
- Lower contract sales as several expire, pending update for new long-term sales contracts signed
- Higher purchase power volumes as WEIS market participation continues
- Investments in future resources
- Increasing baseload and peaking unit flexibility
- Continued exposure to price volatility

# Revenue trends



\* Trend represents 3-year average of 2021 and 2022 actuals and 2023 estimate.

# Expense trends

\$ millions

## Purchased power

\$54.6      \$53.4      \$63.2      \$58.9

2024 budget  
vs. trend\*

3.2%

- Participation in WEIS, higher volumes at higher average prices but still economical

## Fuel

\$47.5      \$66.5      \$41.8      \$52.8

1.7%

- Higher coal prices, lower natural gas prices
- Lower coal generation, replaced with WEIS purchases and lower sales for resale as capacity factors are lower

## Production and transmission

\$60.5      \$67.5      \$77.4      \$76.7

12.0%

- 2021 Rawhide Unit 1 major outage
- 2023 Rawhide Unit 1 minor outage
- Last Rawhide Unit 1 major outage scheduled for 2025

## Administrative and general

\$21.4      \$25.6      \$31.8      \$36.3

38.3%

- Investments in:
  - Staffing and benefits
  - Community engagement
  - Resource planning

## Distributed energy resources

\$7.0      \$8.4      \$10.7      \$13.8

58.9%

- Investments in staffing, benefits, strategy and program development
- 2021-2022 lower due to COVID-19/economy, lost pipeline of projects
- 2023-2024 refocus programs for increased participation, new DER initiatives

2021 actual      2022 actual      2023 estimate      2024 budget

\* Trend represents 3-year average of 2021 and 2022 actuals and 2023 estimate.



## **2024 overview**

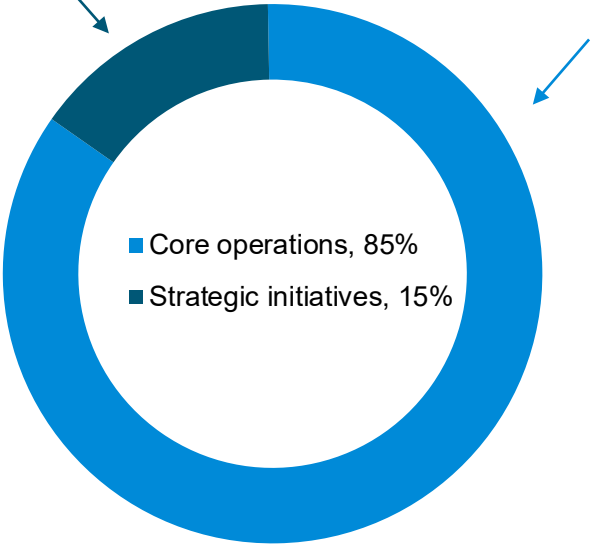
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# 2024 Strategic Budget focus

Foundational pillars		
1. System reliability	2. Environmental responsibility	3. Financial sustainability

2023 Strategic Plan,  
4 initiatives



- 1) Baseload and peaking generation, transmission, energy efficiency programs
- 2) PPAs for existing renewable resources & hydropower

Operating expenses and capital additions: \$275.4 million

# 2024 Strategic Budget focus



## Operating and capital: \$275.4 million Strategic initiatives, \$41.4 million, 15%

### Resource diversification planning and integration, \$27.4 million, 10%

- Dispatchable resource design and air permitting
- Noncarbon resources infrastructure and planning
- DER, including DERMS, beneficial electrification and program development
- 2024 IRP development
- RTO West planning
- Operational flexibility

### Community partner and engagement, \$2.2 million, 1%

- Public engagement for the RDP, IRP, DER and DES programs

### Workforce culture, \$2.1 million, 1%

- Workforce evolution and development

### Process management and coordination, \$9.7 million, 3%

- Enterprise resource planning software
- Enterprise risk management
- Project management

## Revenues \$313.3 million

- **Owner communities** – 0.4% load increase, 5% average wholesale rate increase
- **Sales for resale** – Decrease in volume of energy sold, increased market prices, increased wheeling revenues

## Core operations, \$234 million, 85%

### Rawhide Energy Station and Craig Generation Station

- Preventive and proactive maintenance and capital improvements for reliability, safety, efficiency and environmental compliance

### Purchased power

- All renewable resource PPAs
- Reduction in projected hydropower energy, consistent wind and solar

### Transmission

- Substation switchgear and transformer upgrades and replacements
- Drake transmission line rebuild engineering

### Energy efficiency programs

- Continued collaboration under the Efficiency Works™ brand

### Other expenses

- 14 net new positions to support organization changes and strategic initiatives

# Financial results

Strategic financial plan indicators	Target minimums	2023 budget	2024 budget	Increase (decrease)	
Net income as a percentage of projected operating expenses <sup>(1)</sup>	3%	9%	11%	↑	22.2%
Fixed obligation charge coverage ratio	1.50x	2.43x	2.58x	↑	6.2%
Debt ratio	< 50%	25%	24%	↓	(4.0%)
Unrestricted days cash on hand	200	422	439	↑	4.0%

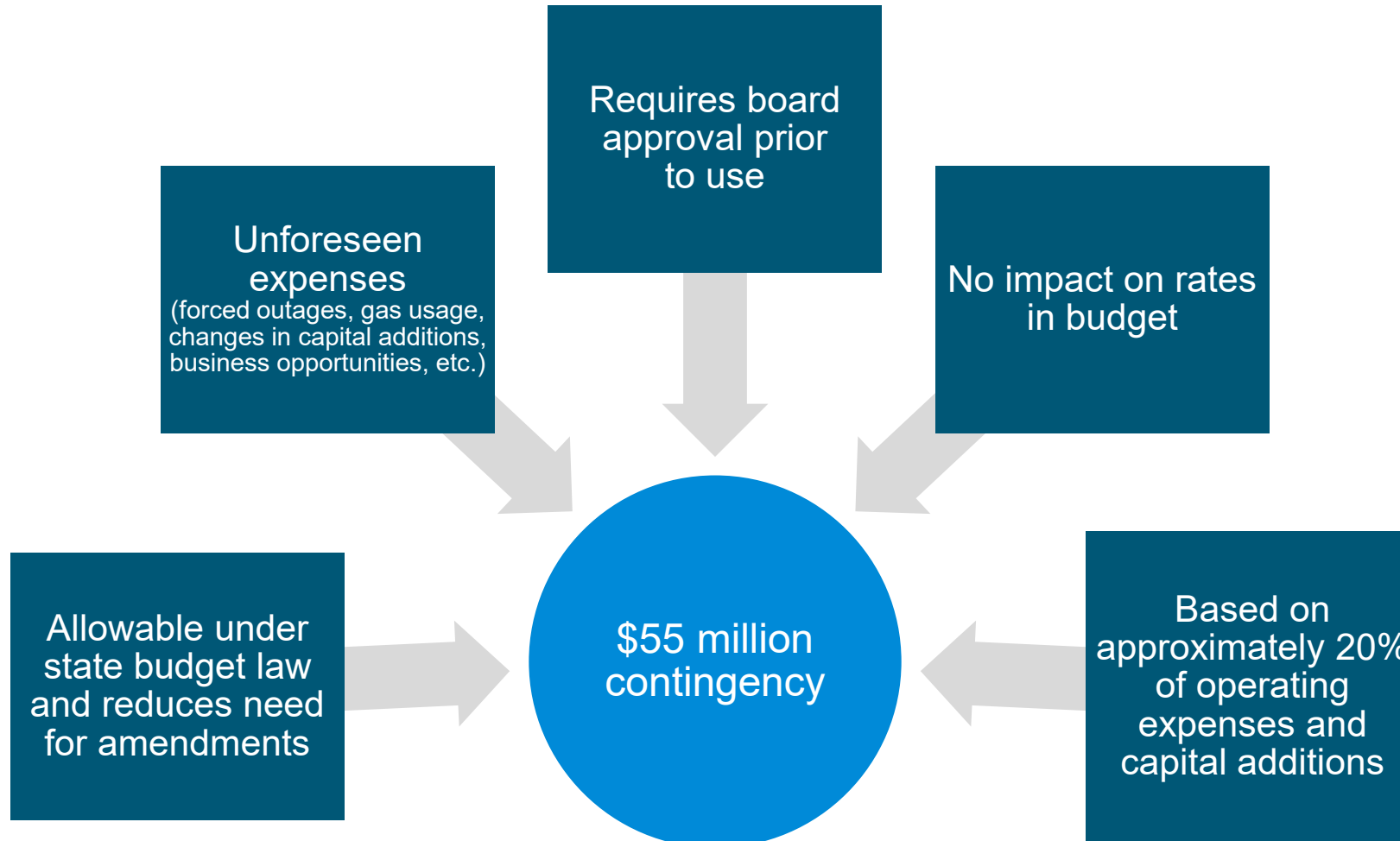
<sup>(1)</sup> Excludes projections for a portion of revenues that will be deferred to a future period and will be reflected in year-end results

Budget results (\$ millions)	2023 budget	2024 budget	Increase (decrease)	
Total revenues	\$ 305.0	\$ 313.3	↑	2.7%
Total expenditures	\$ 298.6	\$ 294.0	↓	(1.5%)
Board contingency	\$ 52.0 <sup>(2)</sup>	\$ 55.0	↑	5.8%

<sup>(2)</sup> Contingency transfer to be determined later in the year.

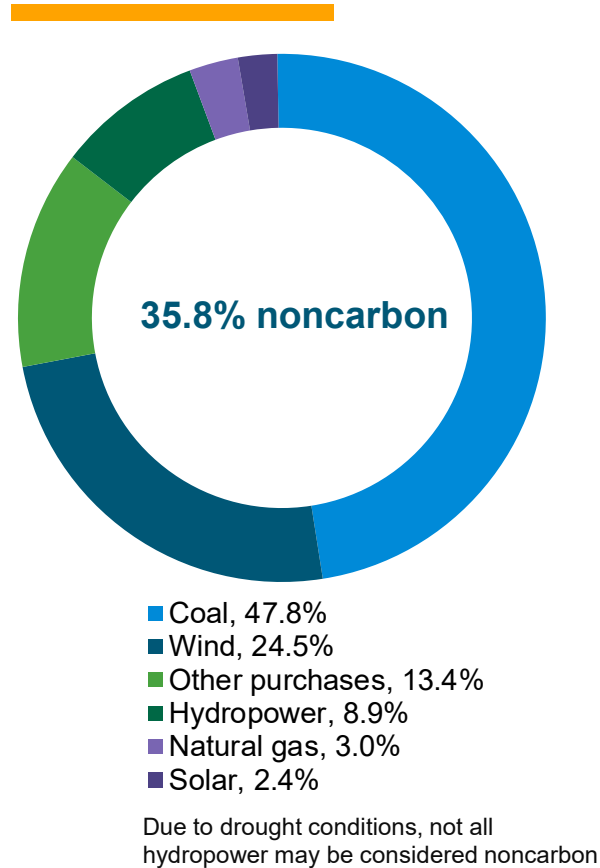
# Budget contingency

Reserved to the board



# 2024 system energy

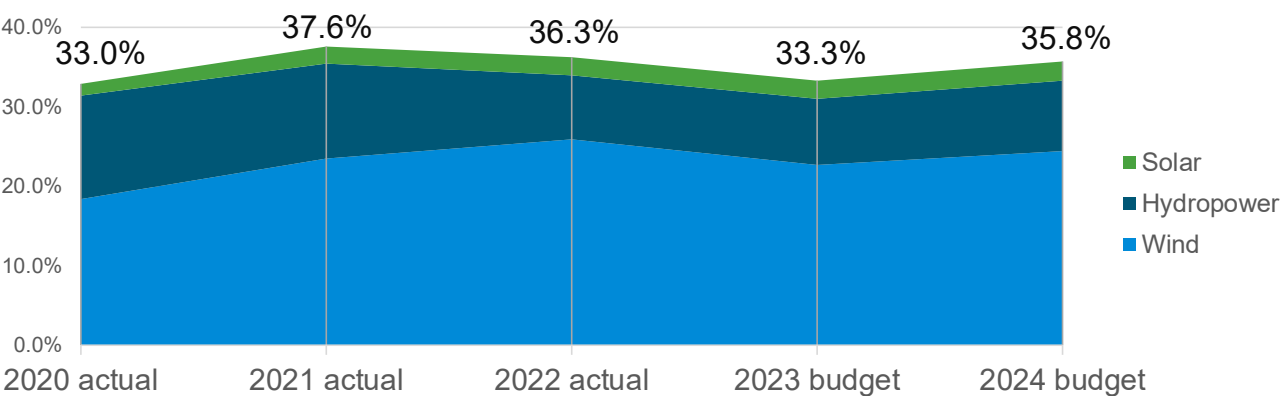
Includes renewable energy certificate allocations to carbon resources



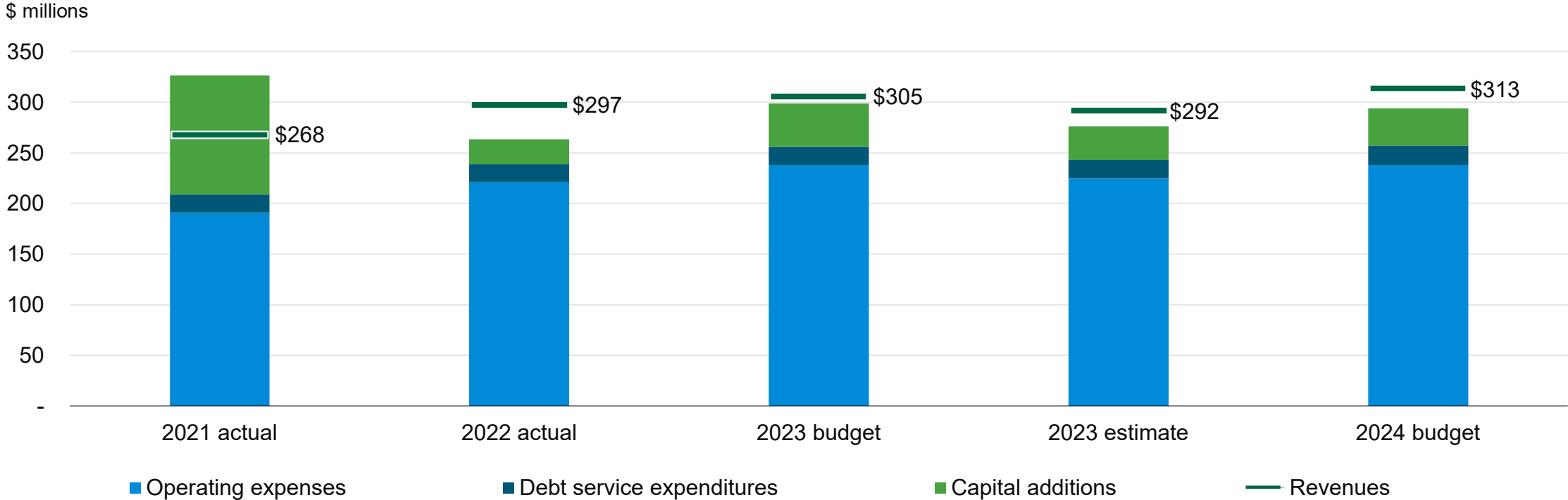
## Significant changes from 2023 budget

- 7.3% decrease in system energy (due to less sales for resale)
- 9.0% of system decrease in coal due to lower sales for resale volumes and economic dispatch in WEIS
- 6.0% of system increase in other purchases due to market conditions and economic dispatch in WEIS




## Noncarbon energy trend



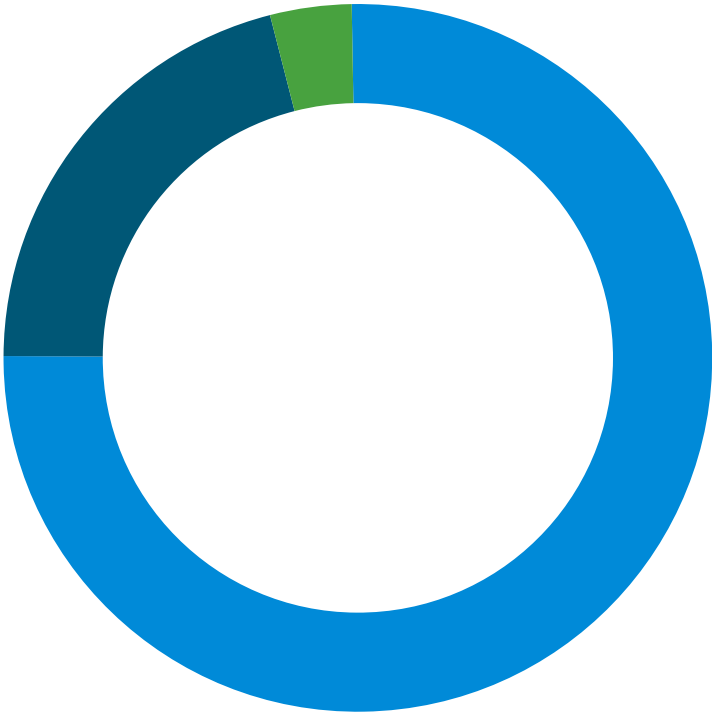
# Revenues and expenditures



# 2024 revenues

Variance	
Sales to owner communities	\$12 M 
Sales for resale	(\$9.1 M) 
Interest and other income	\$5.4 M 




Sales to owner communities	<ul style="list-style-type: none"><li>• Loads developed on 10-year load forecast and energy changes from energy efficiency</li><li>• Energy deliveries increase 0.4%</li><li>• Coincident billing demand increase 1.2%</li><li>• Average wholesale rate increase 5%</li></ul>
Sales for resale and wheeling	<ul style="list-style-type: none"><li>• Energy and market prices – hourly model</li><li>• Continuation of long-term contracts</li><li>• Increase in wheeling revenues due to demand for short-term point-to-point service</li></ul>
Interest and other income	<ul style="list-style-type: none"><li>• Interest income higher due to increase in rates, cash and investment balances</li></ul>



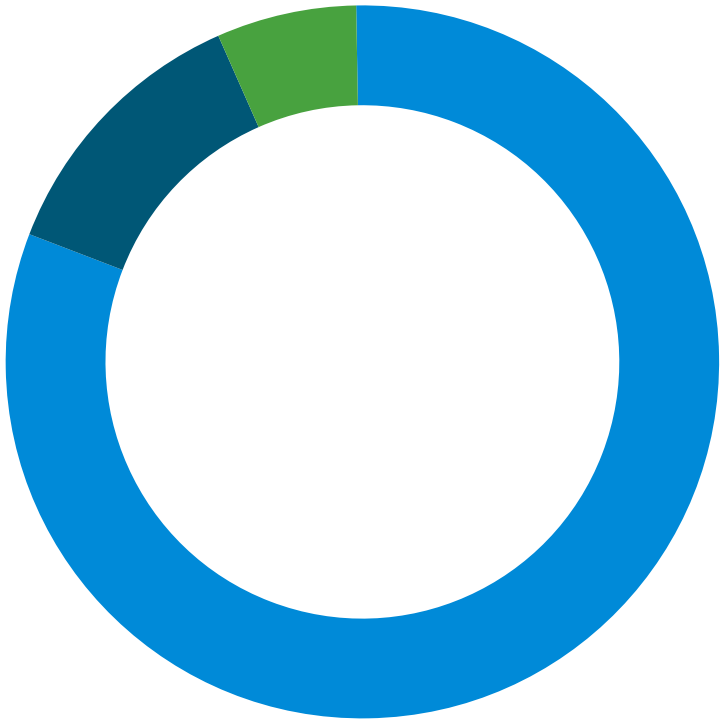
- Sales to owner communities, 75%
- Sales for resale and wheeling, 21%
- Interest and other income, 4%

\$313.3 million | variance from 2023 budget: \$8.3 M 

# 2024 expenditures

Variance	
Operating	\$0.3 M 
Capital	(\$5.8 M) 
Debt	\$0.9 M 

Purchased power	<ul style="list-style-type: none"><li>Long-term contracts for noncarbon resources stable</li><li>Other purchases (price/qty) – hourly model</li><li>Increase due to WEIS market economic dispatch</li></ul>
Fuel	<ul style="list-style-type: none"><li>Generation – hourly model</li><li>Coal prices based on long-term contracts, increase</li><li>Natural gas based on modeling, decrease</li></ul>
Production	<ul style="list-style-type: none"><li>O&amp;M – Rawhide, Craig, CTs, power ops</li><li>No maintenance outages</li></ul>
Transmission	<ul style="list-style-type: none"><li>O&amp;M – lines, substations, SCADA, fiber, telecom</li></ul>
Administrative and general	<ul style="list-style-type: none"><li>Support groups</li><li>O&amp;M – HQ facilities</li></ul>
Distributed energy resources	<ul style="list-style-type: none"><li>Energy efficiency</li><li>DER including beneficial electrification</li></ul>



- Operating expenses, 81%
- Capital additions, 13%
- Debt expense, 6%

**\$294 million | variance from 2023 budget: (\$4.6 M) **



# Salaries and benefits

## Salaries

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- Regular wages increase \$5.2 M
  - 14 net new positions \$2.0 M
  - Available for salary and market adjustments \$2.0 M
  - Other adjustments including less time allocated to billable projects \$0.8 M
  - Additional 2023 market adjustment \$0.4 M
- Overtime decrease \$0.1 M

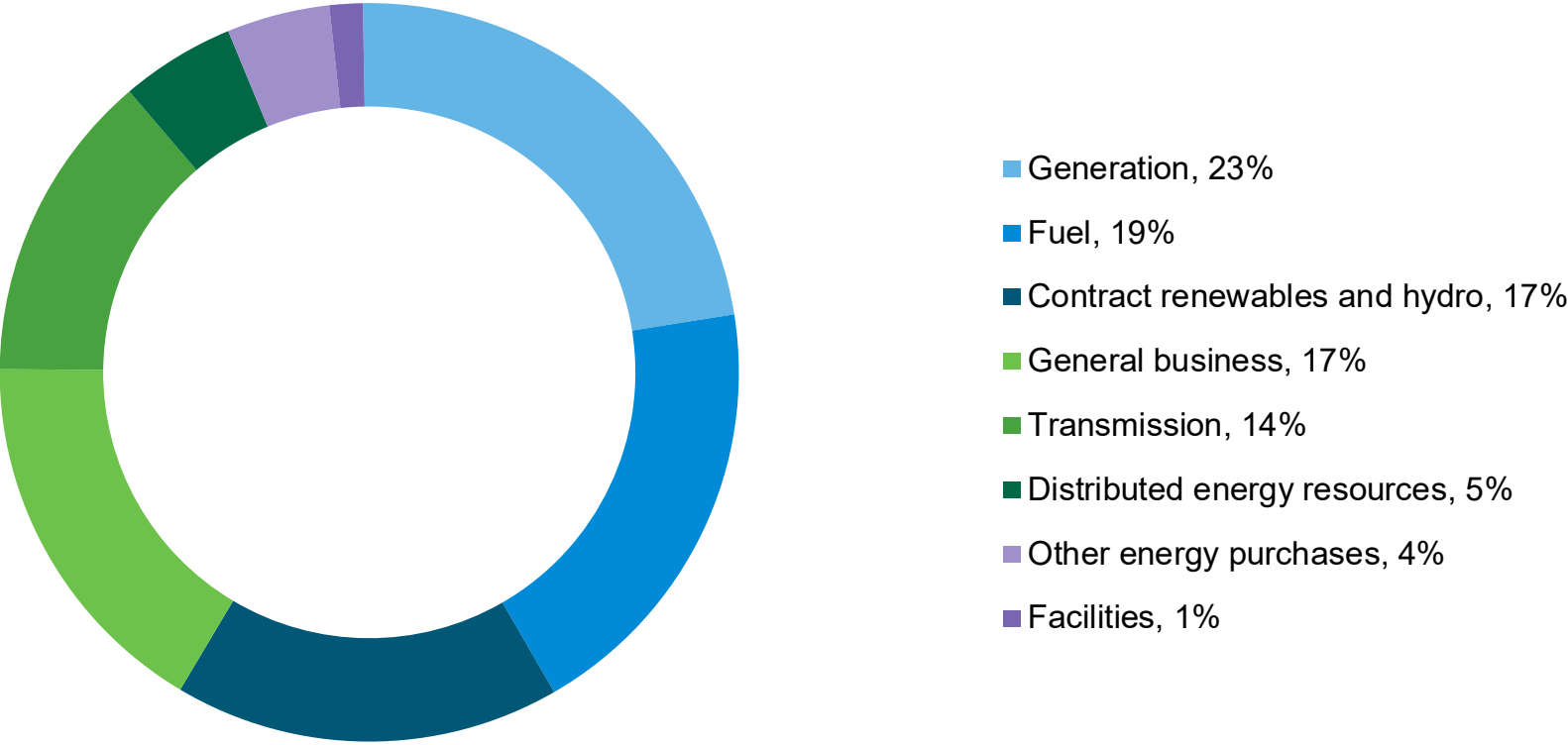
## Benefits

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- Increase of \$2.7 M
  - Defined benefit \$2.1 M
  - Social security \$0.4 M
  - Defined contribution \$0.2 M

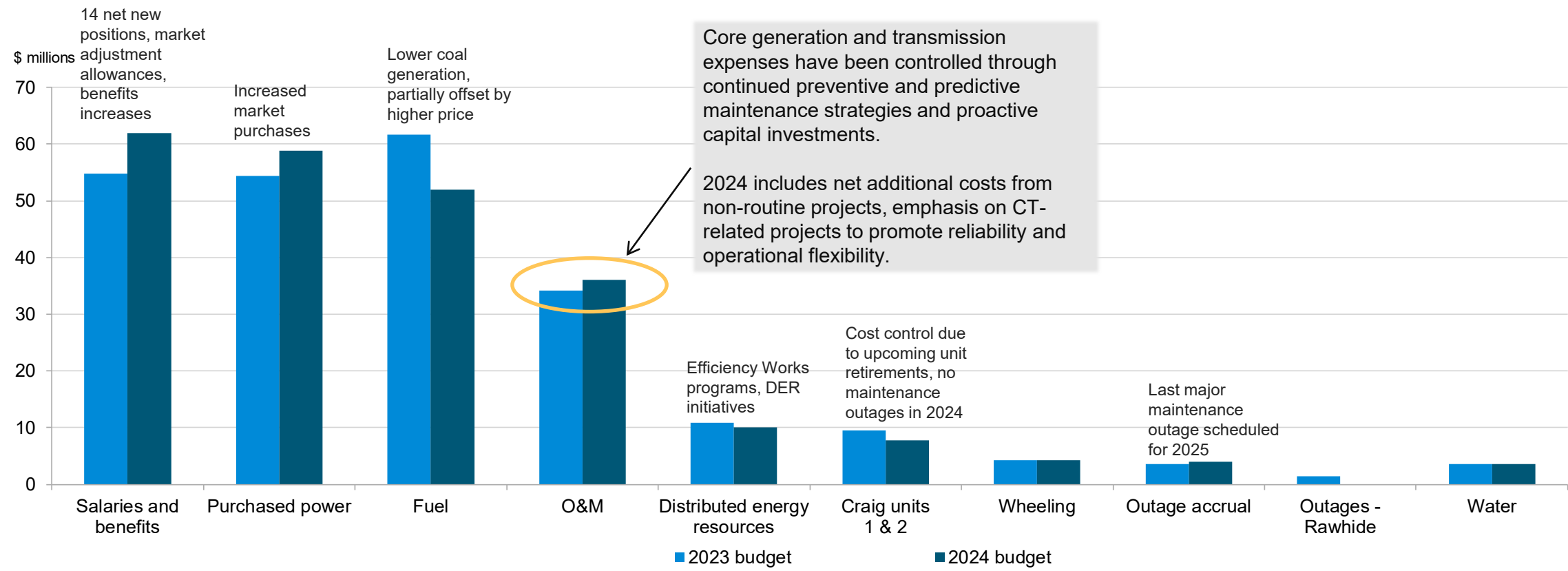
# Operating expenses and capital additions

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**\$275.4 million | variance from 2023 budget: (\$5.5 M) ↓**

# Operating expenses



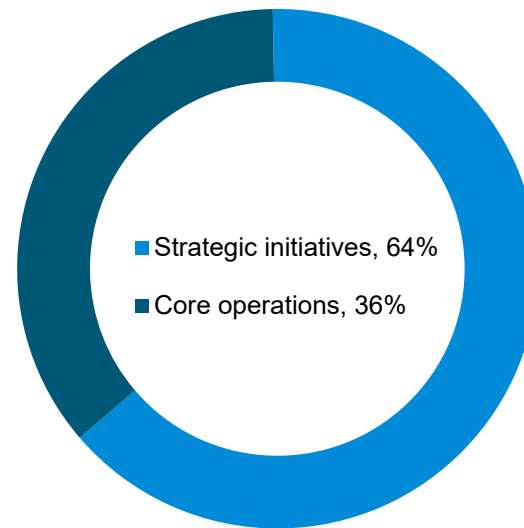
**\$238.5 million | variance from 2023 budget: \$0.3 M**

# 2024 capital additions

**\$36.9 million**

## Strategic projects

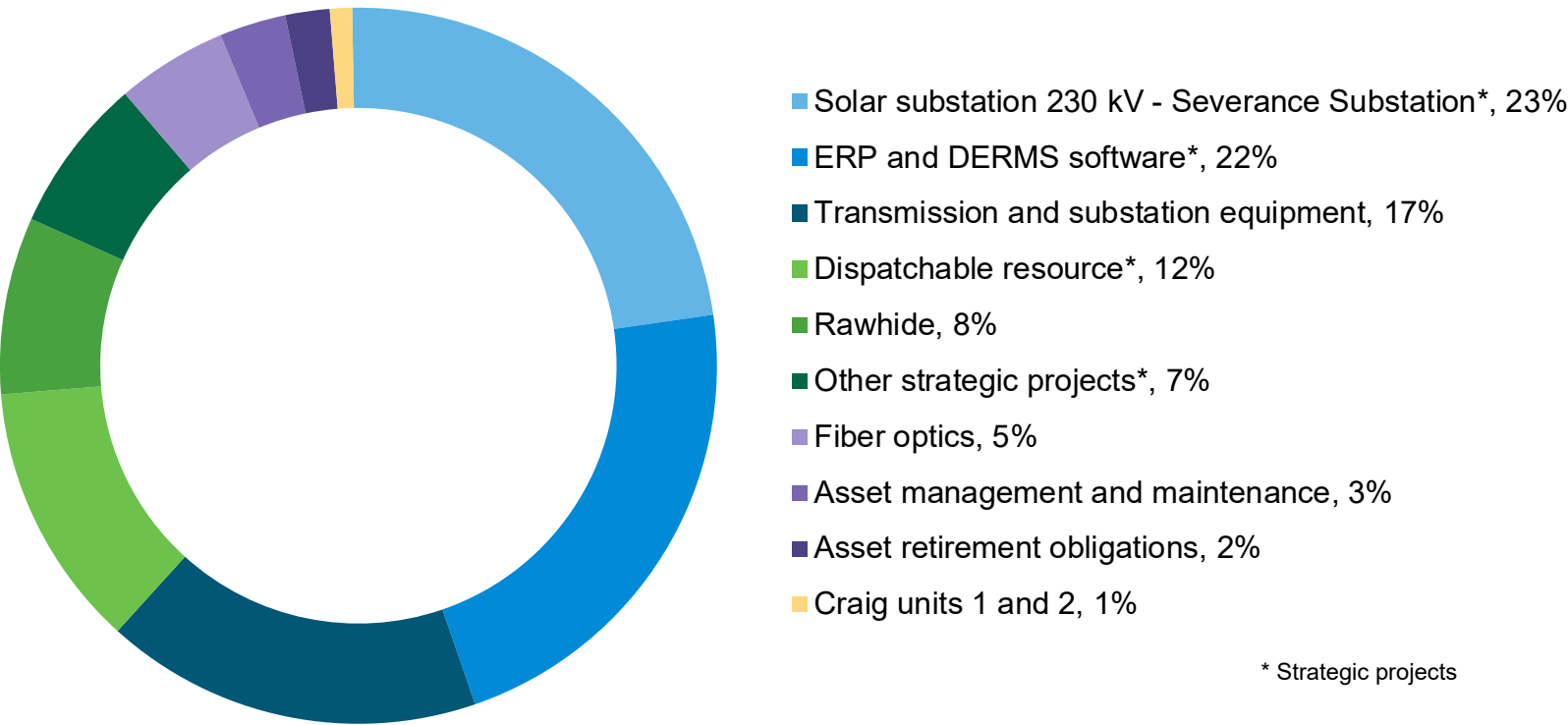
- Dispatchable resource – Rawhide
- Evaporative cooling - combustion turbine Unit F
- Hydrogen dryer and auto-purge - combustion turbine Unit F
- Solar substation 230 kV - Severance Substation
- Distributed energy resources management system
- Regional transmission organization market software
- Operations analytics software
- Enterprise resource planning software



## Core projects

- Compressor blade upgrade - combustion turbine Unit F
- Gas control valve replacement - combustion turbine Unit F
- Transformer T3 replacement - Timberline Substation
- Transformer T1 replacement - Longs Peak Substation
- Circuit breaker replacement 592, 596 - Ault Substation WAPA
- Circuit breaker replacement 492, 1092, 3124, 3224 - Ault Substation WAPA
- Fiber optic cable replacement - Long-Haul East (Loveland to Longmont)
- Trapper Mine post-mining reclamation

# 2024 capital additions



\* Strategic projects

**\$36.9 million | variance from 2023 budget: (\$5.8 M) ⬇**

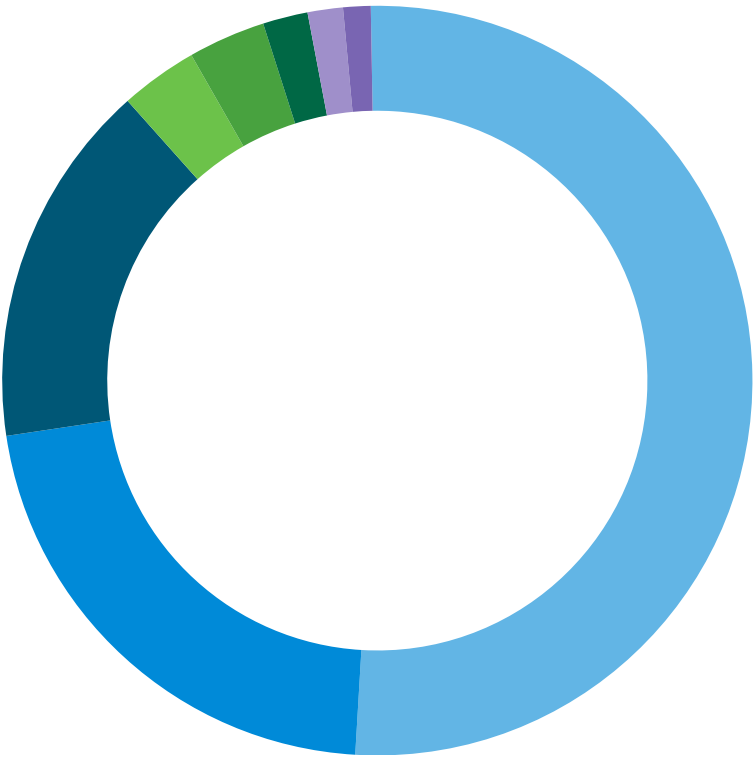
Excludes estimated 2023 capital carryovers of \$7.8 million

## Capital 5-year forecast



# Capital 5-year forecast

Years 2024-2028 | \$466.2 million

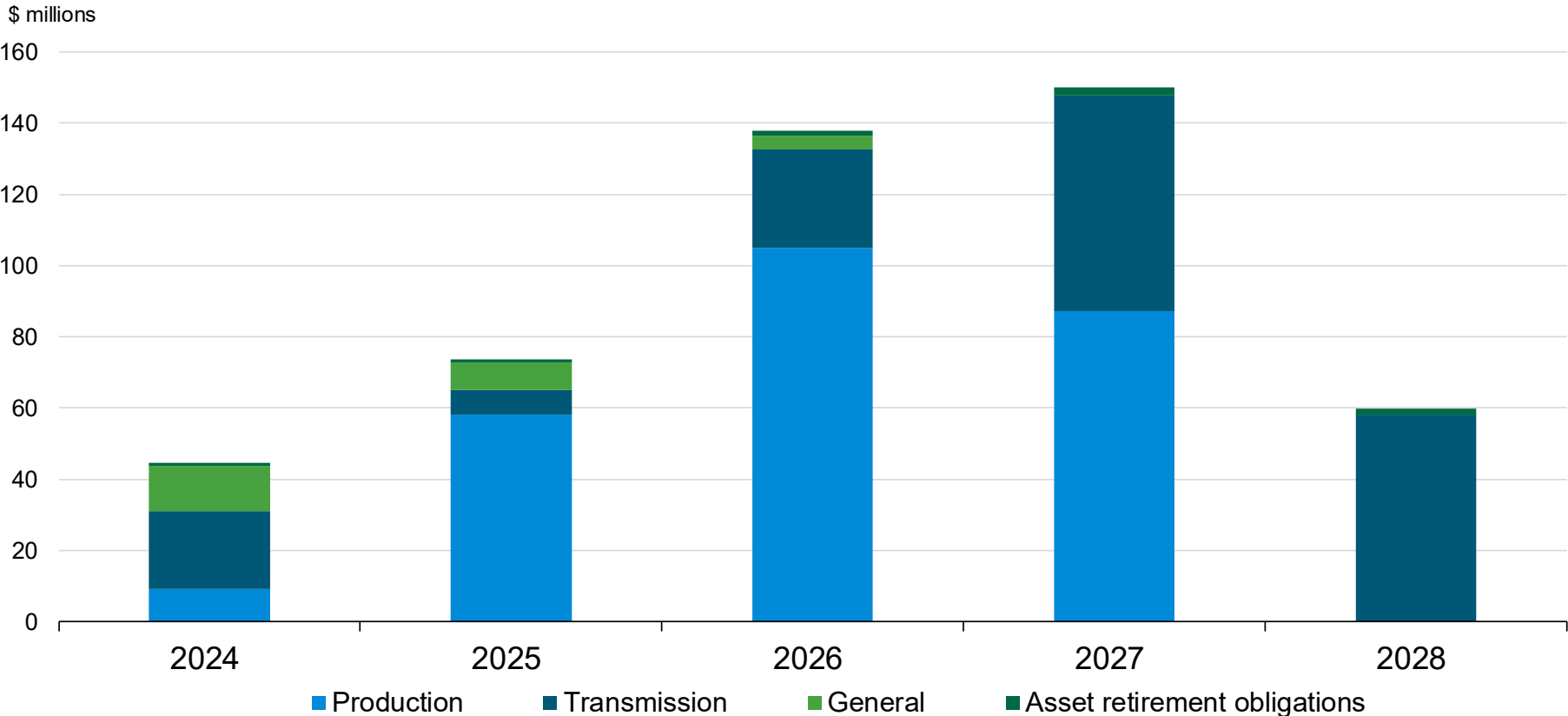


- Dispatchable resource, 51%
- Transmission and interconnection - noncarbon resources, 22%
- Transmission and substations, 16%
- ERP and DERMS software, 3%
- Rawhide, 3%
- Asset management and maintenance, 2%
- Asset retirement obligations, 2%
- Rawhide outages, 1%

Includes estimated 2023 capital carryovers of \$7.8 million

# Capital 5-year forecast

Years 2024-2028 | \$466.2 million



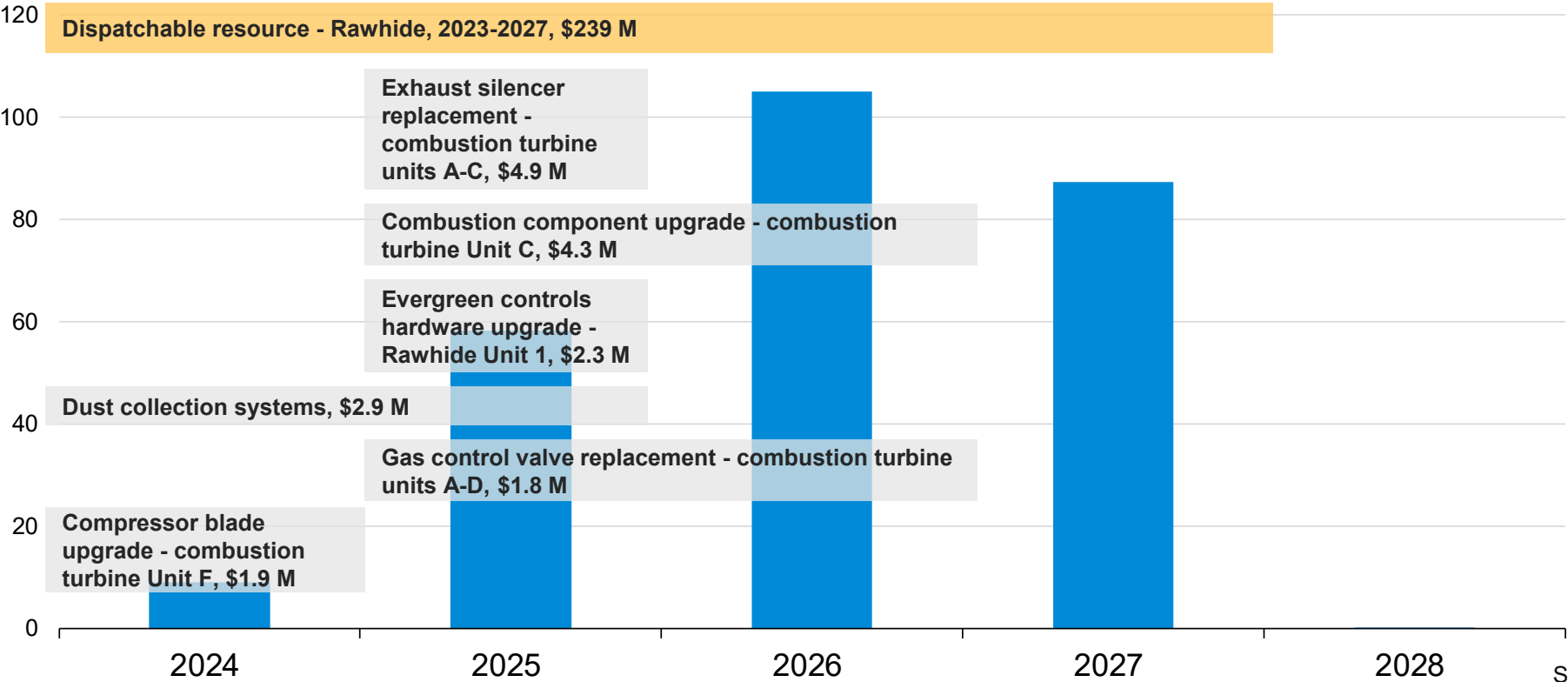


# Capital 5-year forecast

Represents 92% of total

Production additions: \$259.8 million

\$ millions



Stated amounts represent total project cost. May have had costs prior to 2024 or extend past 2028.

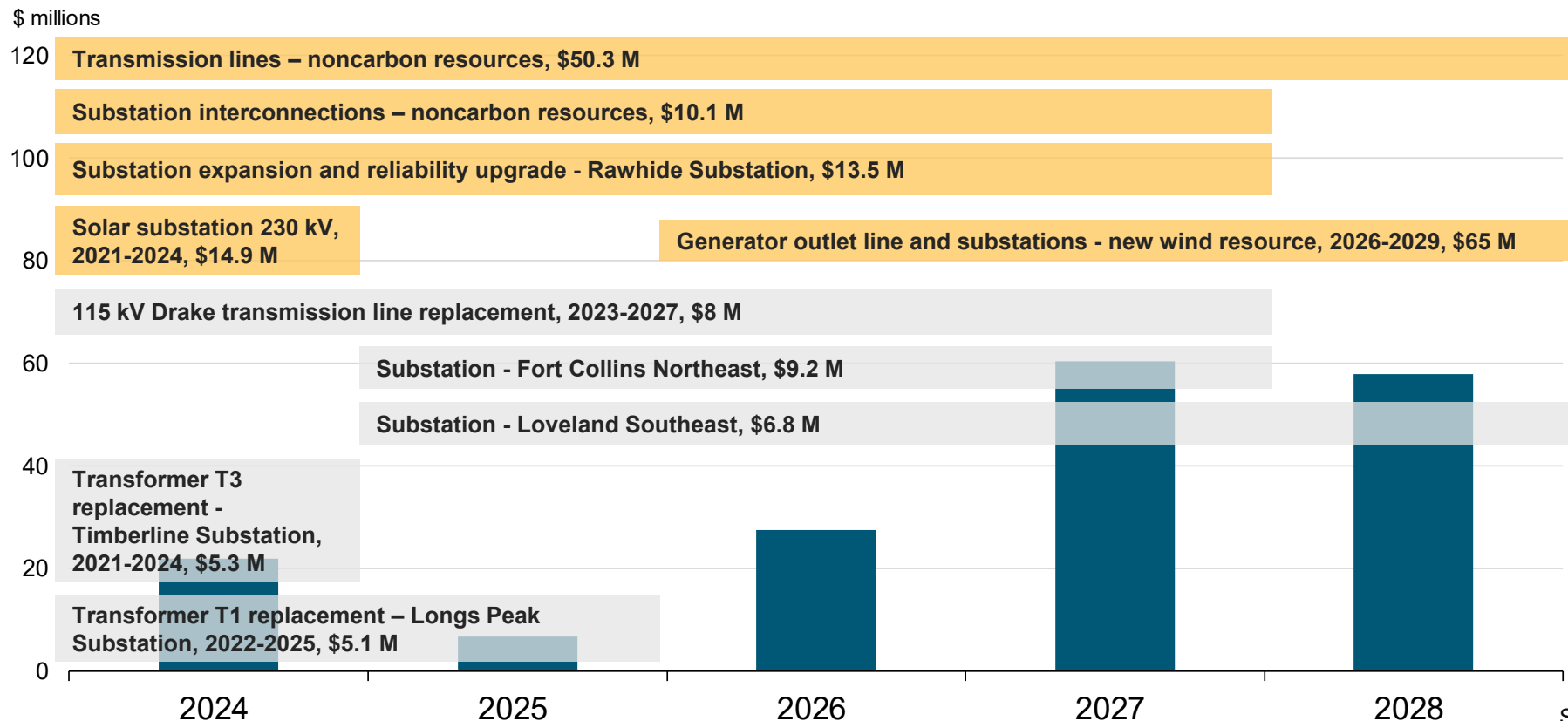
# Capital 5-year forecast

## Transmission additions: \$174.7 million

Represents 73% of total

9 projects 100% reimbursable, \$7.9 M gross

- Substation perimeter walls
  - Airport Substation
  - Crossroads Substation
  - Drake Substation
  - Richard Lake Substation
- Switchgear replacement
  - Airport Substation
- Transformer replacement
  - Valley Substation
- Transmission line modifications
  - Highway 287
  - I-25 widening
- HVAC unit replacements (annual)

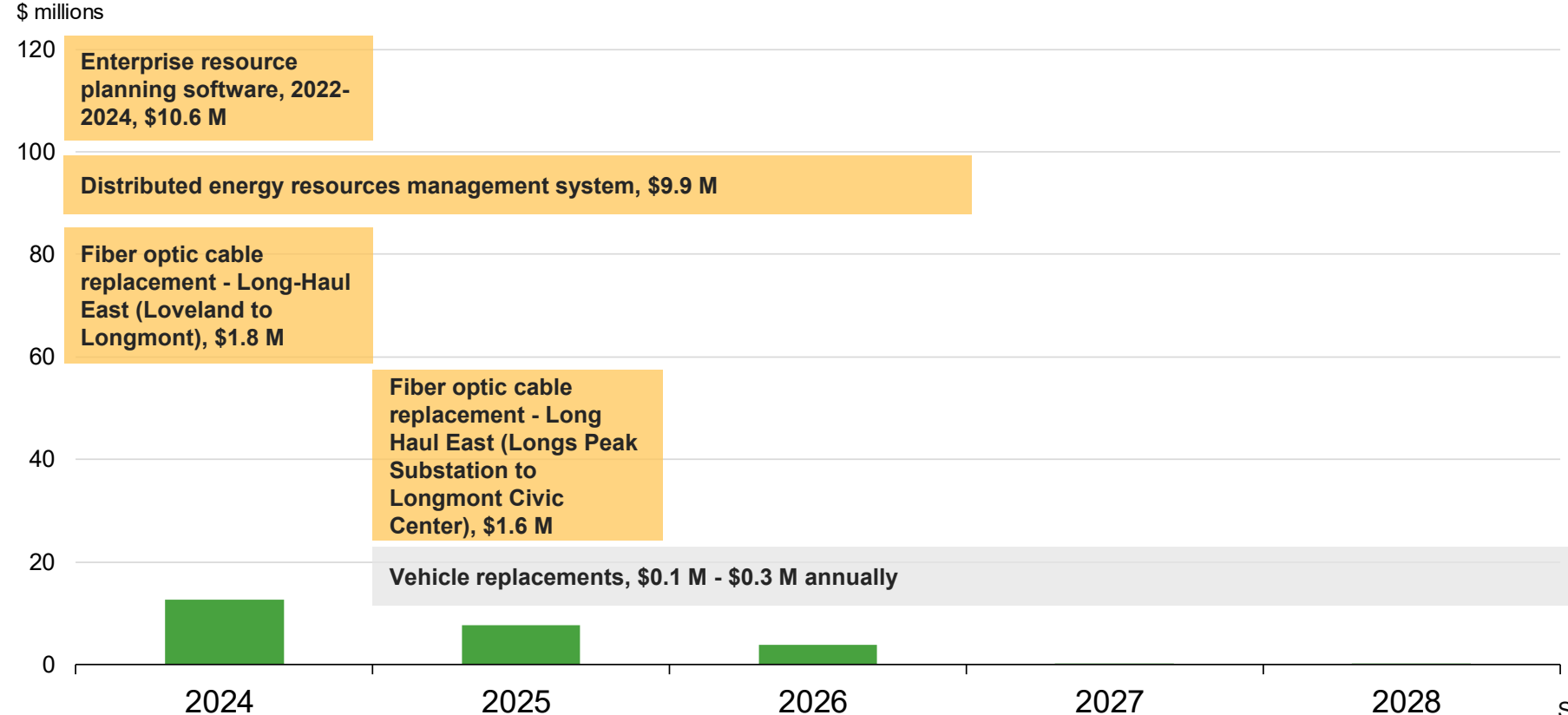


Stated amounts represent total project cost. May have had costs prior to 2024 or extend past 2028.

# Capital 5-year forecast

General additions: \$24.6 million

- General additions include:**
- Facilities upgrades
  - Information technology equipment
  - Communication equipment
  - Vehicles
- Represents 77% of total**



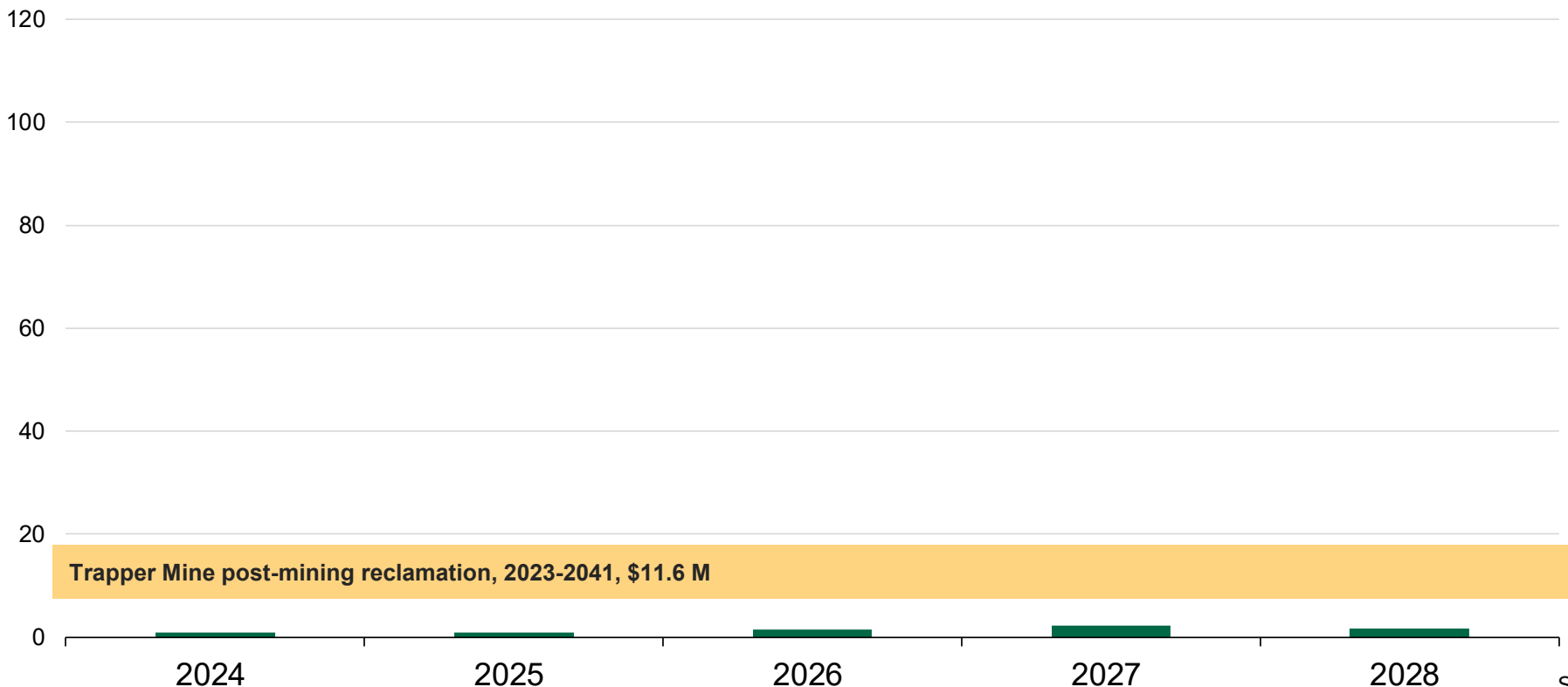
Stated amounts represent total project cost. May have had costs prior to 2024 or extend past 2028.

# Capital 5-year forecast

Represents 100% of total

Asset retirement obligation additions: \$7.1 million

\$ millions



Stated amounts represent total project cost. May have had costs prior to 2024 or extend past 2028.

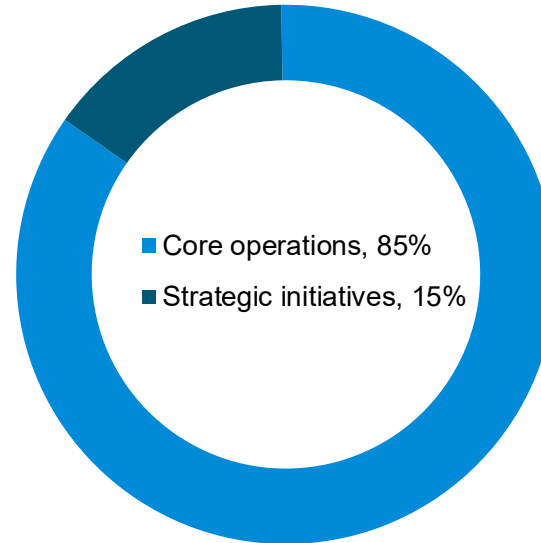
# Highlights – 2024 Strategic Budget



Operating expenses and capital additions: \$275.4 million

## Strategic initiatives

- Resource diversification planning and integration (dispatchable resource, noncarbon resources, distributed energy resources, integrated resource plan, organized energy markets)
- Community partner and engagement
- Workforce culture
- Process management and coordination (ERP, enterprise risk management, project management)



## Core operations

- Baseload and peaking generation, transmission, energy efficiency
- PPAs for existing renewable resources & hydropower
- Predictive maintenance
- Proactive capital investments to maintain reliability, efficiency and environmental compliance

## Revenues

- Stable owner community loads
- Decreasing sales for resale
- Increasing wheeling and interest income
- 5% average wholesale rate increase

**2024 budget: \$349 M**

# Questions



**Platte River**  
Power Authority  
Energy leaders since 1973



## Reference: budget details

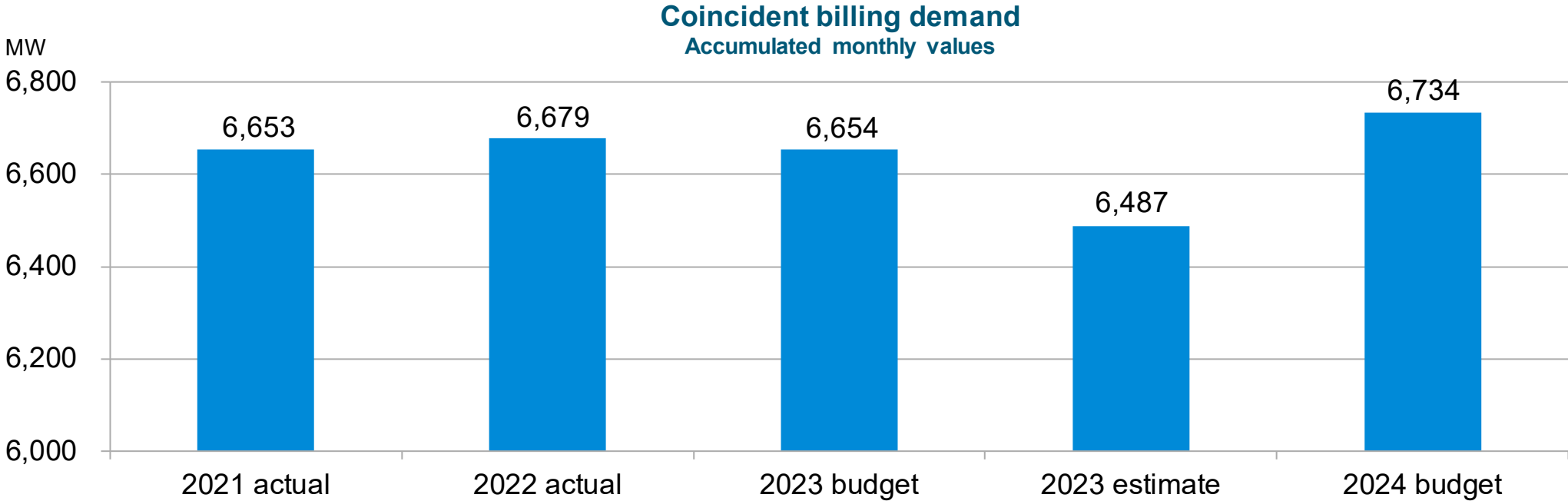
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### Not presented

Small differences may exist in the following tables compared to the budget document due to rounding.

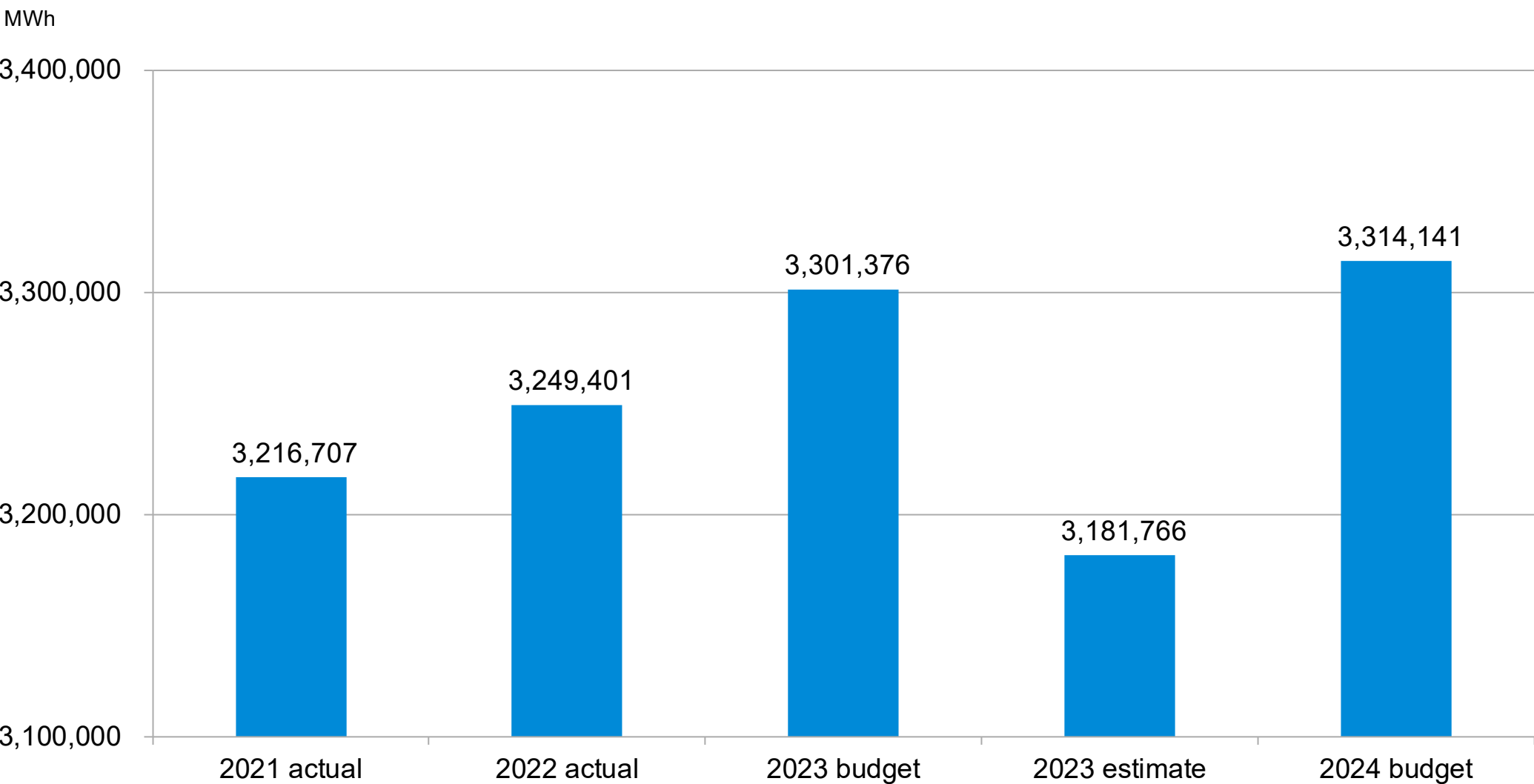
# Sales to owner communities

(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Sales to owner communities</b>				0.4% higher loads and a 5% average wholesale rate increase
Owner community charge	\$ 15.4	\$ <b>15.2</b>	⬇️ \$ (0.2)	
Demand	79.7	<b>82.9</b>	⬆️ 3.2	
Energy	129.0	<b>138.0</b>	⬆️ 9.0	
<b>Total</b>	\$ 224.1	\$ <b>236.1</b>	⬆️ \$ 12.0	



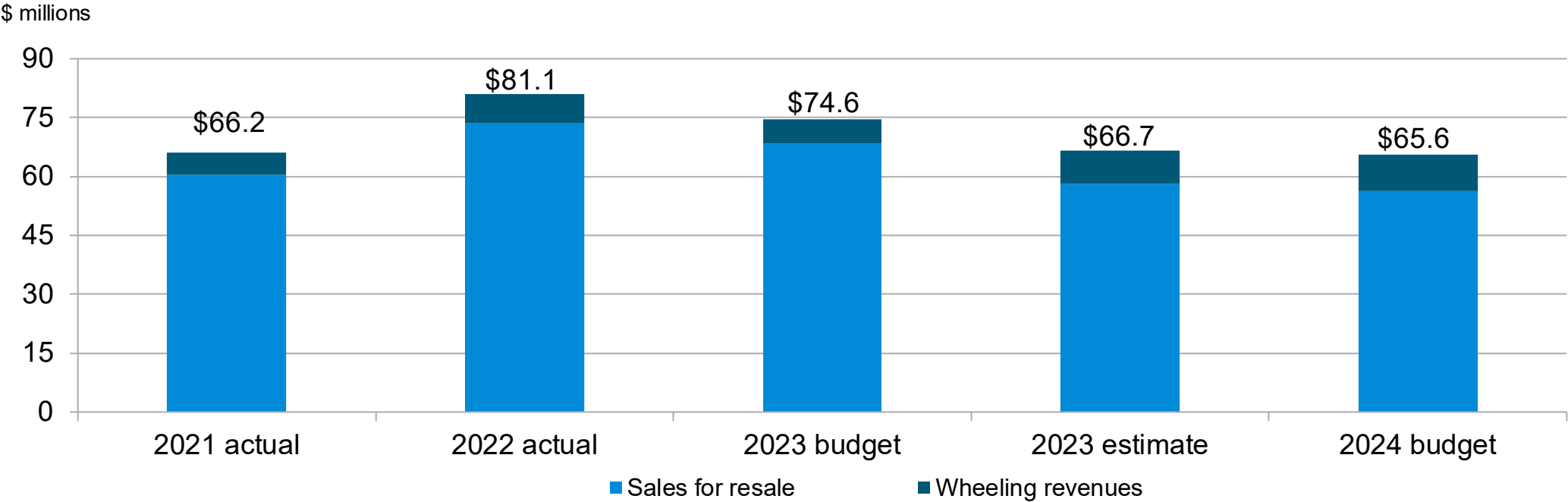


# Sales to owner communities energy



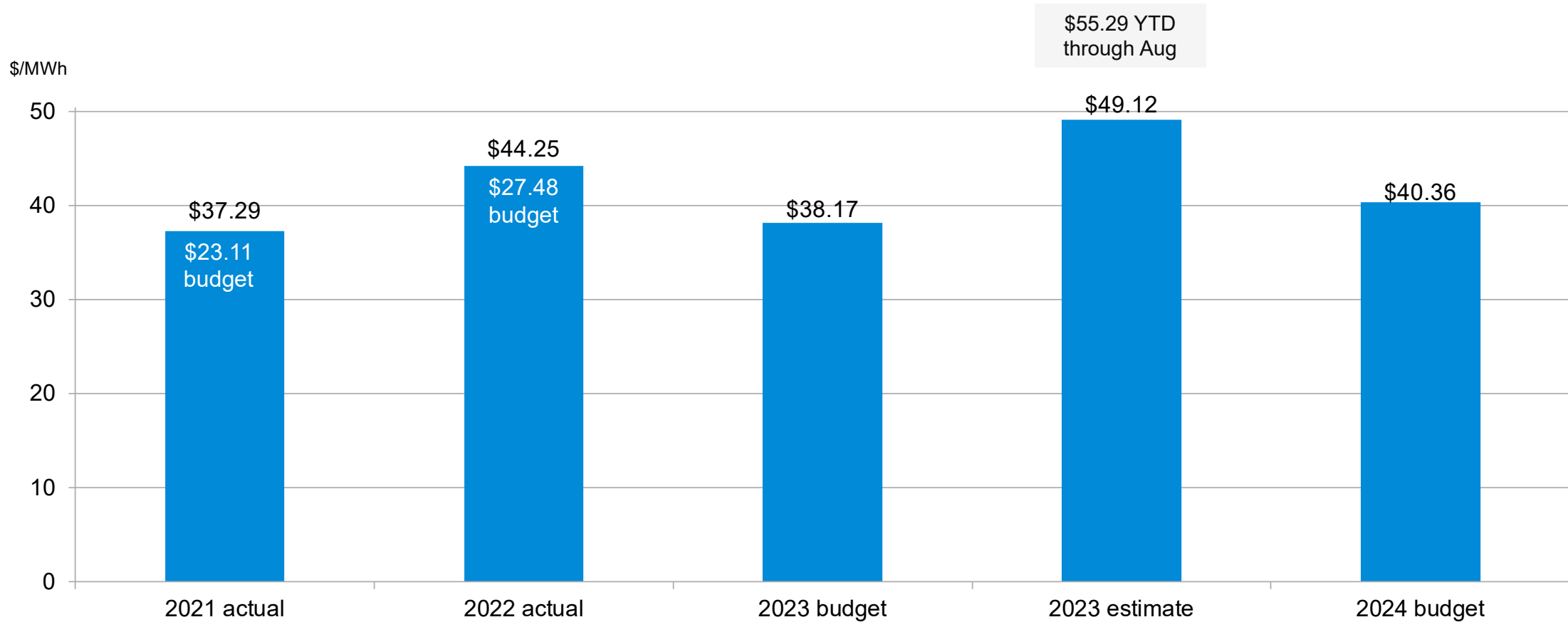
# Sales for resale and wheeling

(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Sales for resale and wheeling</b>				
Long-term	\$ 14.9	\$ 11.5	⬇️ \$ (3.4)	Decreased volume as one contract expires and lower calls on a capacity contract
Short-term	53.6	45.0	⬇️ (8.6)	Decreased volume
Wheeling	6.1	9.1	⬆️ 3.0	Point-to-point transmission service new to budget
<b>Total</b>	\$ 74.6	\$ 65.6	⬇️ \$ (9.0)	



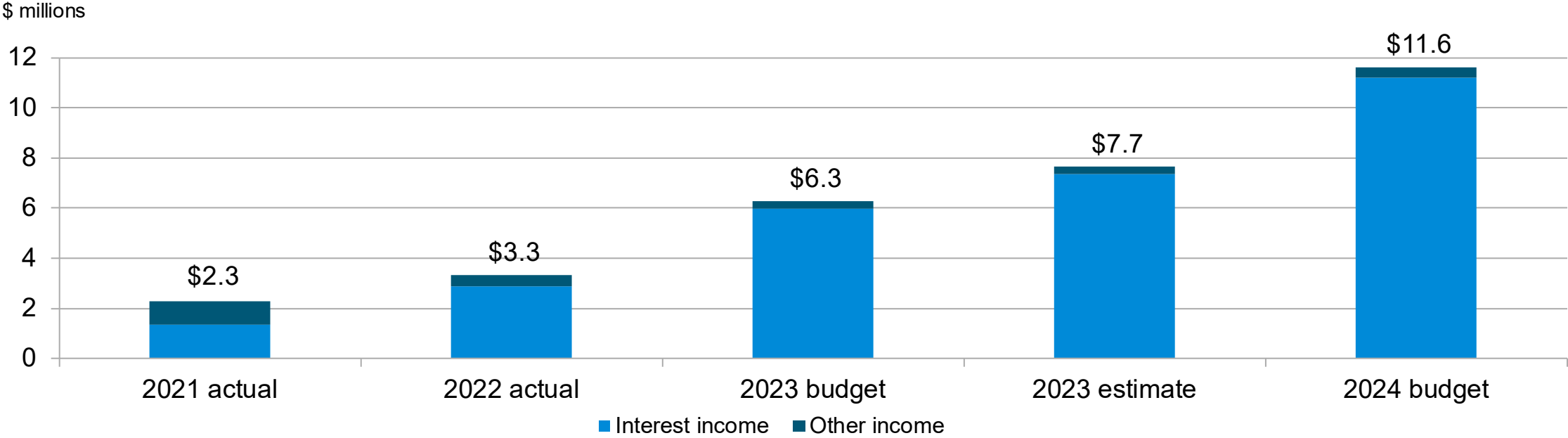
# Sales for resale average price

Includes energy and capacity



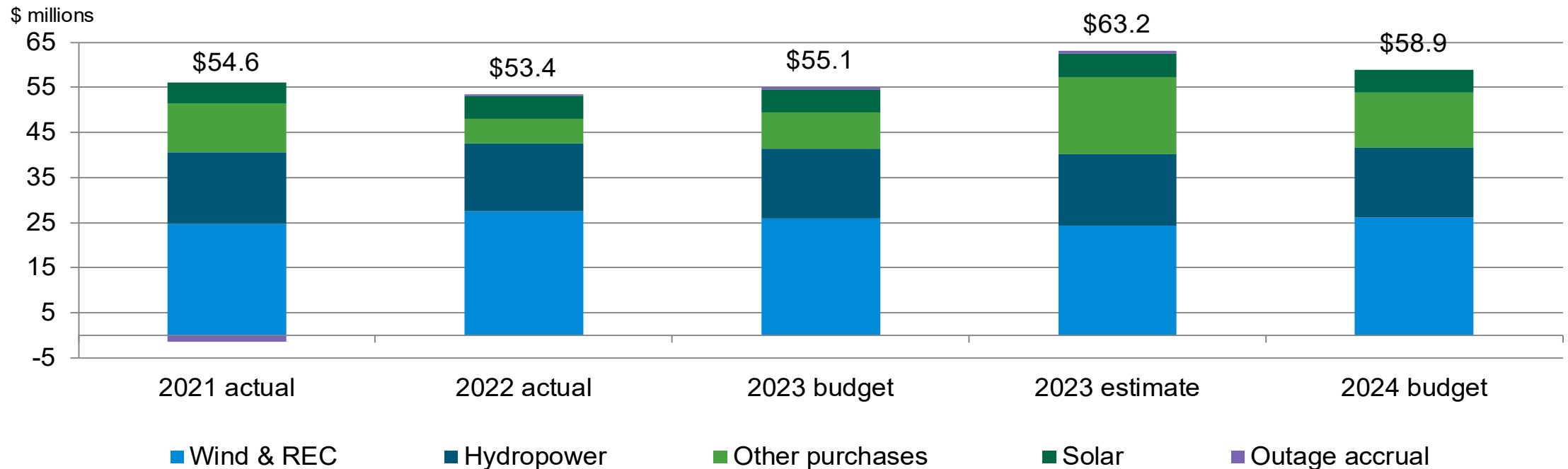
# Other revenues

(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
Other revenues				
Interest income	\$ 6.0	\$ 11.2	⬆ \$ 5.2	Increase in interest rates and higher cash and investment balances
Other income	0.3	0.4	⬆ 0.1	
Total	\$ 6.3	\$ 11.6	⬆ \$ 5.3	



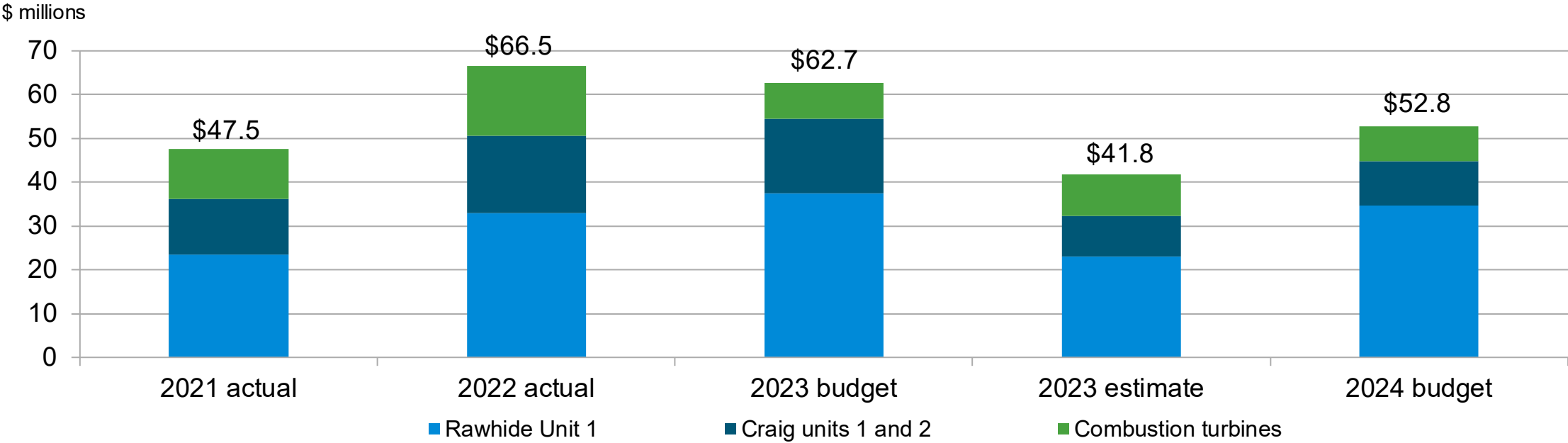
# Purchased power

(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Purchased power</b>				
Wind and RECs	\$ 25.9	\$ 26.2	⬆️ \$ 0.3	Contract rate escalations and model assumptions
Hydropower	15.5	15.3	⬇️ (0.2)	Decrease in CRSP energy delivered (3.2%)
Other purchases and reserves	8.0	12.4	⬆️ 4.4	Increased energy purchases and higher average prices in WEIS
Solar	5.0	5.0	➡️ -	
Outage accrual	0.7	-	⬇️ (0.7)	No accrual necessary in 2024
<b>Total</b>	\$ 55.1	\$ 58.9	⬆️ \$ 3.8	

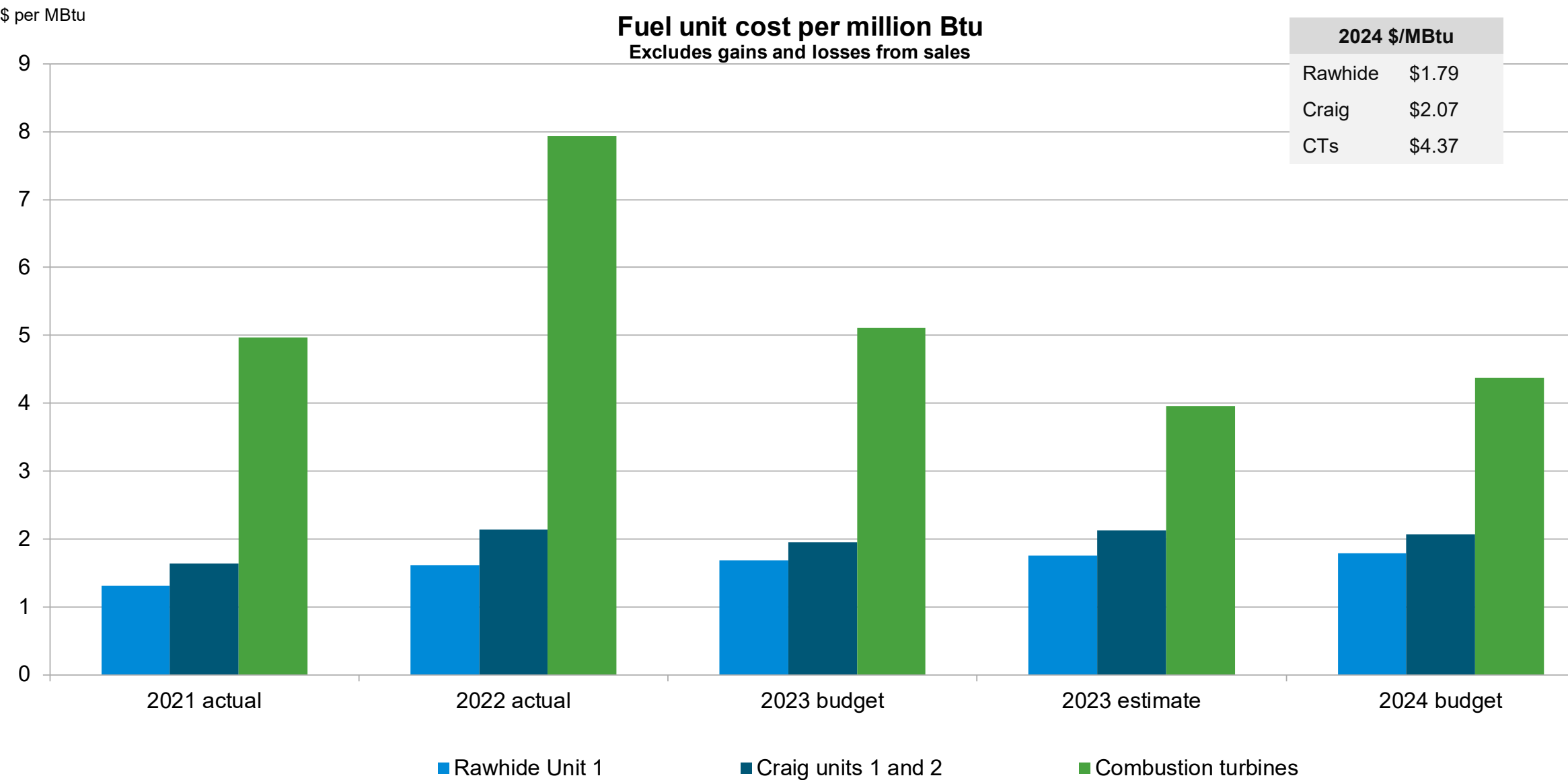


# Fuel expense

(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Fuel expense</b>				
Rawhide Unit 1	\$ 37.5	\$ 34.6	⬇️ \$ (2.9)	Capacity factor of 75.8% due to generation decrease of 13% partially offset by a price increase of 7%
Craig units 1 and 2	16.9	10.2	⬇️ (6.7)	Capacity factor of 35.2% due to generation decrease of 44% partially offset by a price increase of 6%
Combustion turbines	8.3	8.0	⬇️ (0.3)	Price decrease of 14% partially offset by a generation increase of 12%
<b>Total</b>	\$ 62.7	\$ 52.8	⬇️ \$ (9.9)	



# Fuel expense



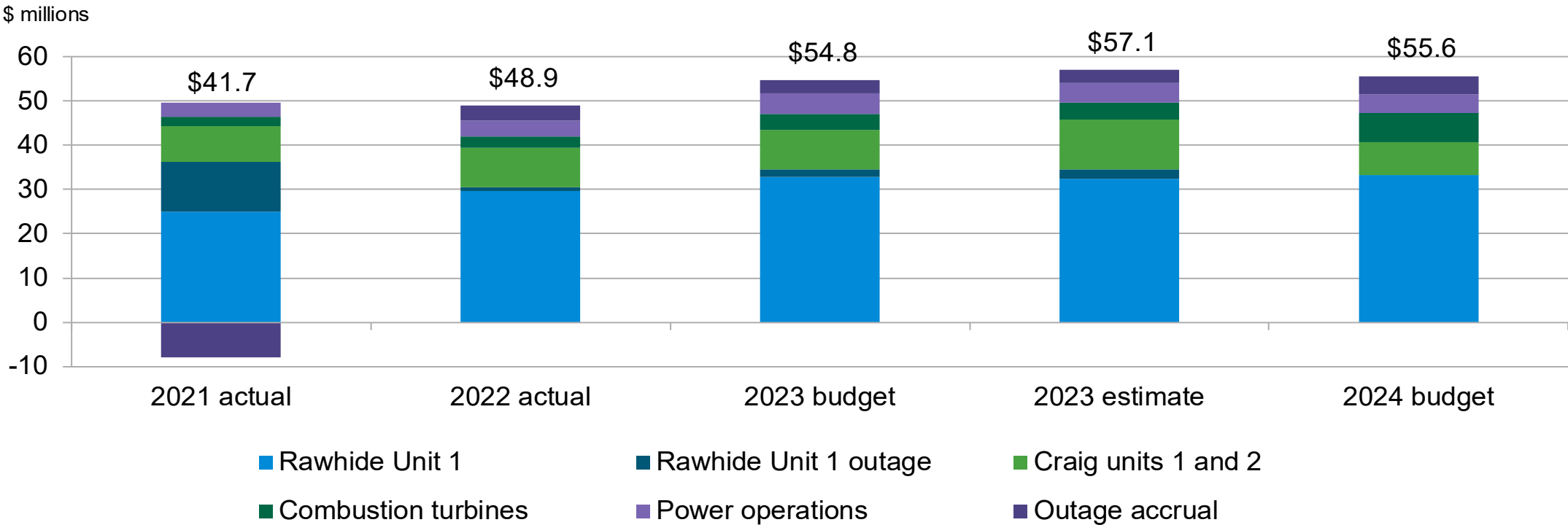
2024 \$/MBtu	
Rawhide	\$1.79
Craig	\$2.07
CTs	\$4.37

# Production expenses

New position:

- Purchasing agent

(\$ millions)	2023 budget	2024 budget	Increase (decrease)		Explanation
<b>Production expenses</b>					
Rawhide	\$ 37.4	\$ 37.3	⬇️	\$ (0.1)	Increased non-routine projects, personnel expenes and major outage accrual, partially offset by 2023 minor outage expenses
Craig units 1 and 2	9.0	7.4	⬇️	(1.6)	Decreased due to the completion of the scheduled maintenance outage on Craig Unit 2 in 2023
Combustion turbines	3.5	6.5	⬆️	3.0	Increased non-routine projects, maintenance and personnel expenses
Power operations	4.9	4.4	⬇️	(0.5)	Decreased SPP WEIS implementation costs due to entering the market
<b>Total</b>	\$ 54.8	\$ 55.6	⬆️	\$ 0.8	



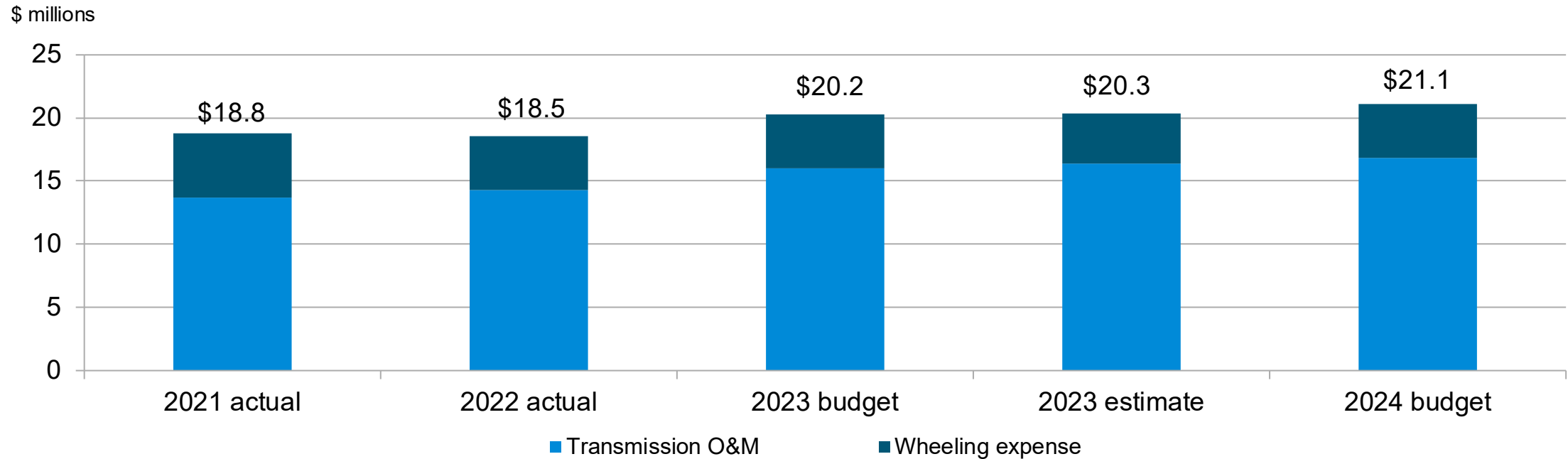


# Transmission expenses

## New positions:

- System electrical engineer
- Substation apprentice
- Fiber optic program manager

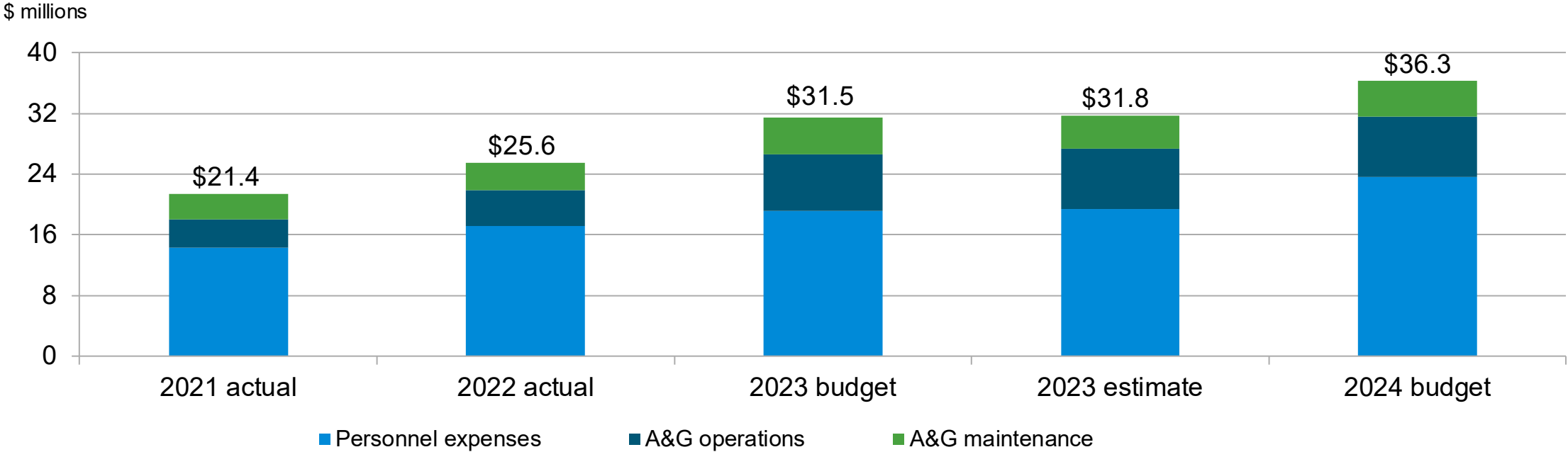
(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Transmission expenses</b>				
Transmission	\$ 16.0	\$ <b>16.8</b>	⬆ \$ 0.8	Increase in personnel expenses partially offset by a decrease in non-routine projects
Wheeling	4.2	<b>4.3</b>	⬆ 0.1	
<b>Total</b>	\$ 20.2	\$ <b>21.1</b>	⬆ \$ 0.9	



# Admin and general expenses

- New positions:
- Communications (2)
  - Human resources business partner
  - General counsel (2)
  - Transition and integration services (2)
  - Financial services (2)

(\$ millions)	2023 budget	2024 budget	Increase (decrease)		Explanation
<b>Administrative and general</b>					
Operations	\$ 26.6	\$ 31.6	⬆	\$ 5.0	Increased personnel expenses for new positions and market adjustments, additional expense for consulting related to energy transition and future resources
Maintenance	4.9	4.7	⬇	(0.2)	Decreased computer maintenance partially offset by an increase for landscaping
<b>Total</b>	\$ 31.5	\$ 36.3	⬆	\$ 4.8	

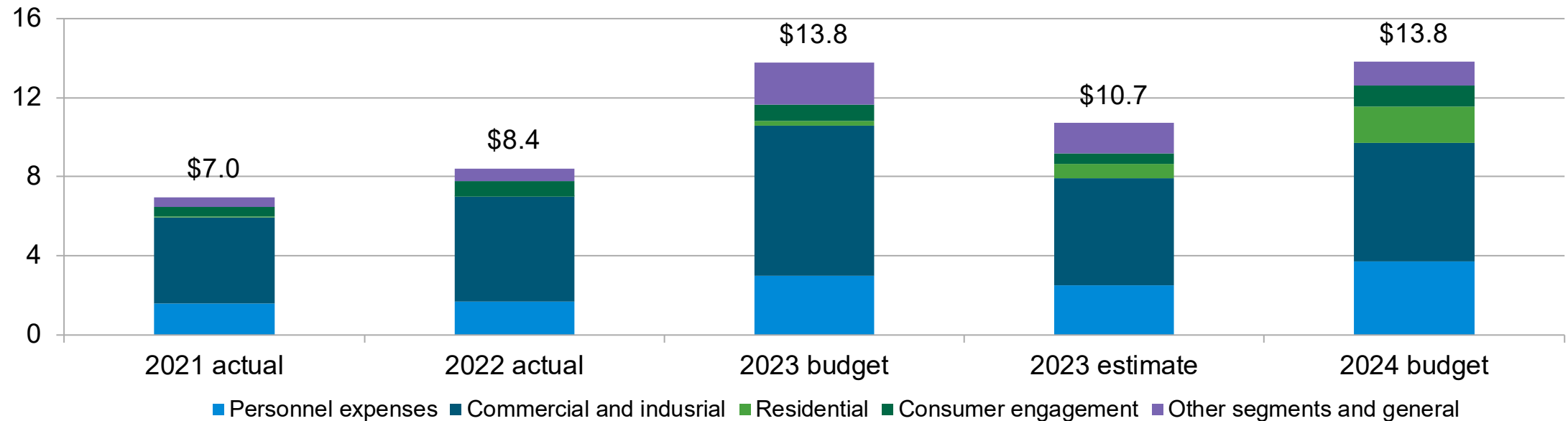


New positions:  
• DER system integrator

# Distributed energy resources

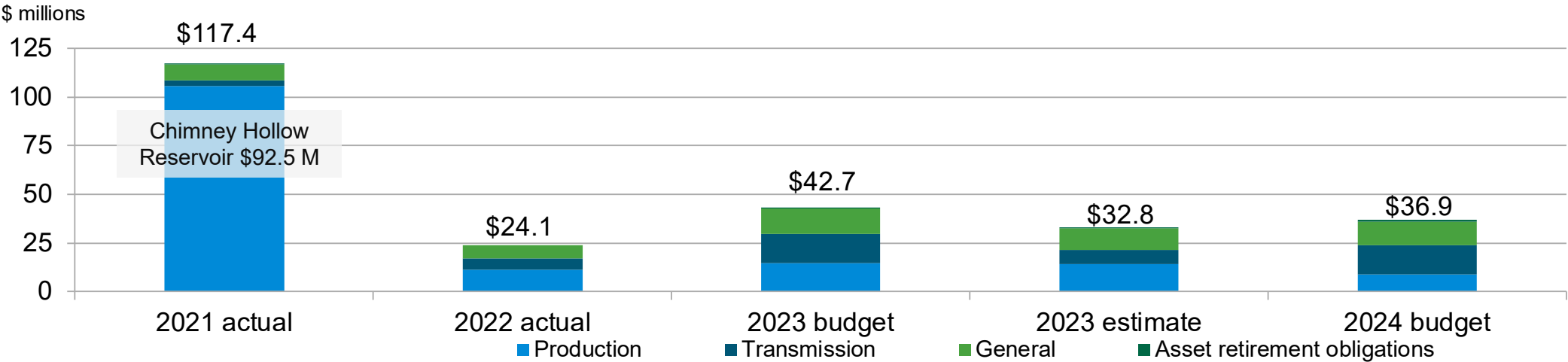
(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Explanation
<b>Distributed energy resources</b>				
Personnel expenses	\$ 3.0	\$ 3.7	⬆ \$ 0.7	Increased personnel expenses for new positions and market adjustments
Commercial and industrial	7.6	6.0	⬇ (1.6)	Decrease in commercial incentives, partially offset by an increase in business audits
Residential	0.2	1.9	⬆ 1.7	Increase due to shift of owner community directive funds to Platte River common funds
Consumer engagement	0.8	1.0	⬆ 0.2	
Other segments and general	2.2	1.2	⬇ (1.0)	Decrease in DER planning scope to focus on DERMS
<b>Total</b>	\$ 13.8	\$ 13.8	↔ \$ -	

\$ millions



# Capital additions

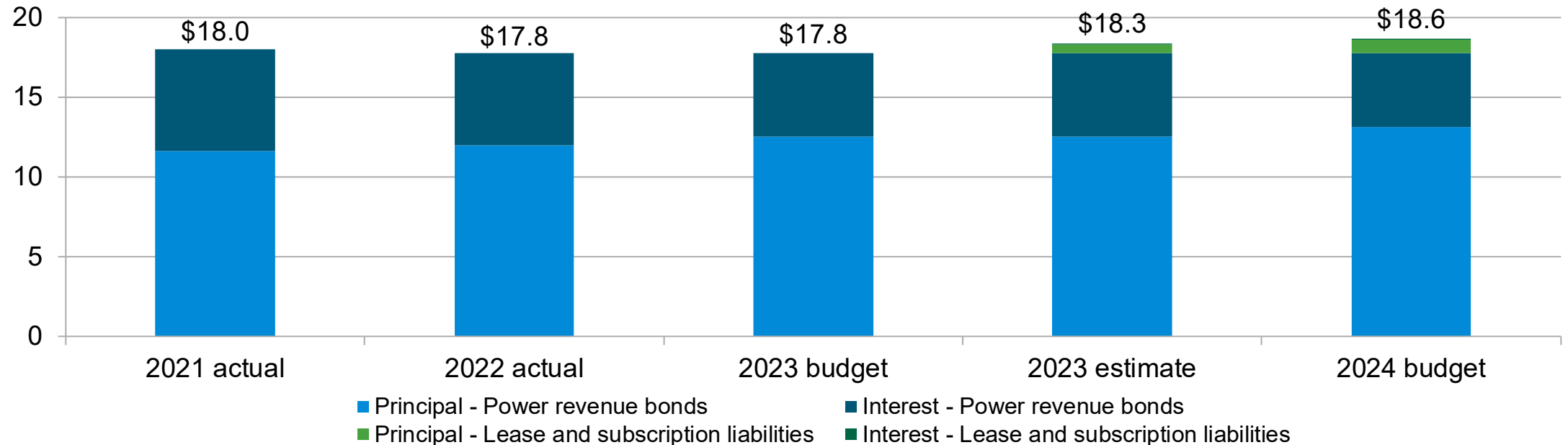
(\$ millions)	2023 budget	2024 budget	Increase (decrease)	Projects
<b>Capital additions</b>				
Production	\$ 14.7	\$ 8.7	⬇️ \$ (6.0)	2023 projects include combustion component upgrade - CT Unit D, pipeline reroute Rawhide pipeline, simulator evergreen upgrade - Rawhide Unit 1 and monofill upgrade - Rawhide. 2024 projects include dispatchable resource, compressor blade upgrade combustion turbine Unit F and evaporative cooling combustion turbine Unit F
Transmission	14.9	14.9	➡️ -	Solar substation 230 kV - Severance Substation, transformer T3 replacement - Timberline Substation, relay panel and breaker replacements - Airport Substation and transformer T1 replacement - Longs Peak Substation
General	13.0	12.3	⬇️ (0.7)	Enterprise resource planning software, distributed energy resources management system, and fiber optic cable replacement - Long Haul East (Loveland to Longmont)
Asset retirement obligations	0.1	1.0	⬆️ 0.9	Trapper Mine post-mining reclamation
<b>Total</b>	\$ 42.7	\$ 36.9	⬇️ \$ (5.8)	



# Debt service expenditures

(\$ millions)	2023 budget	2024 budget	Increase (decrease)		Explanation
<b>Debt service expenditures</b>					Series JJ and Series KK power revenue bonds, lease and subscription liabilities relating to accounting standards
Principal - power revenue bonds	\$ 12.6	\$ 13.2	⬆	\$ 0.6	New accounting standard (GASB 96) implemented during 2023
Principal - lease and subscription liabilities	\$ -	\$ 0.8	⬆	\$ 0.8	
Interest - power revenue bonds	5.2	4.6	⬇	(0.6)	
Interest - lease and subscription liabilities	\$ -	\$ -	↔	\$ -	
<b>Total</b>	\$ 17.8	\$ 18.6	⬆	\$ 0.8	

\$ millions





# Board of directors

**Sept. 28, 2023**

**Energy leaders since 1973**

# Dispatchable resource implementation

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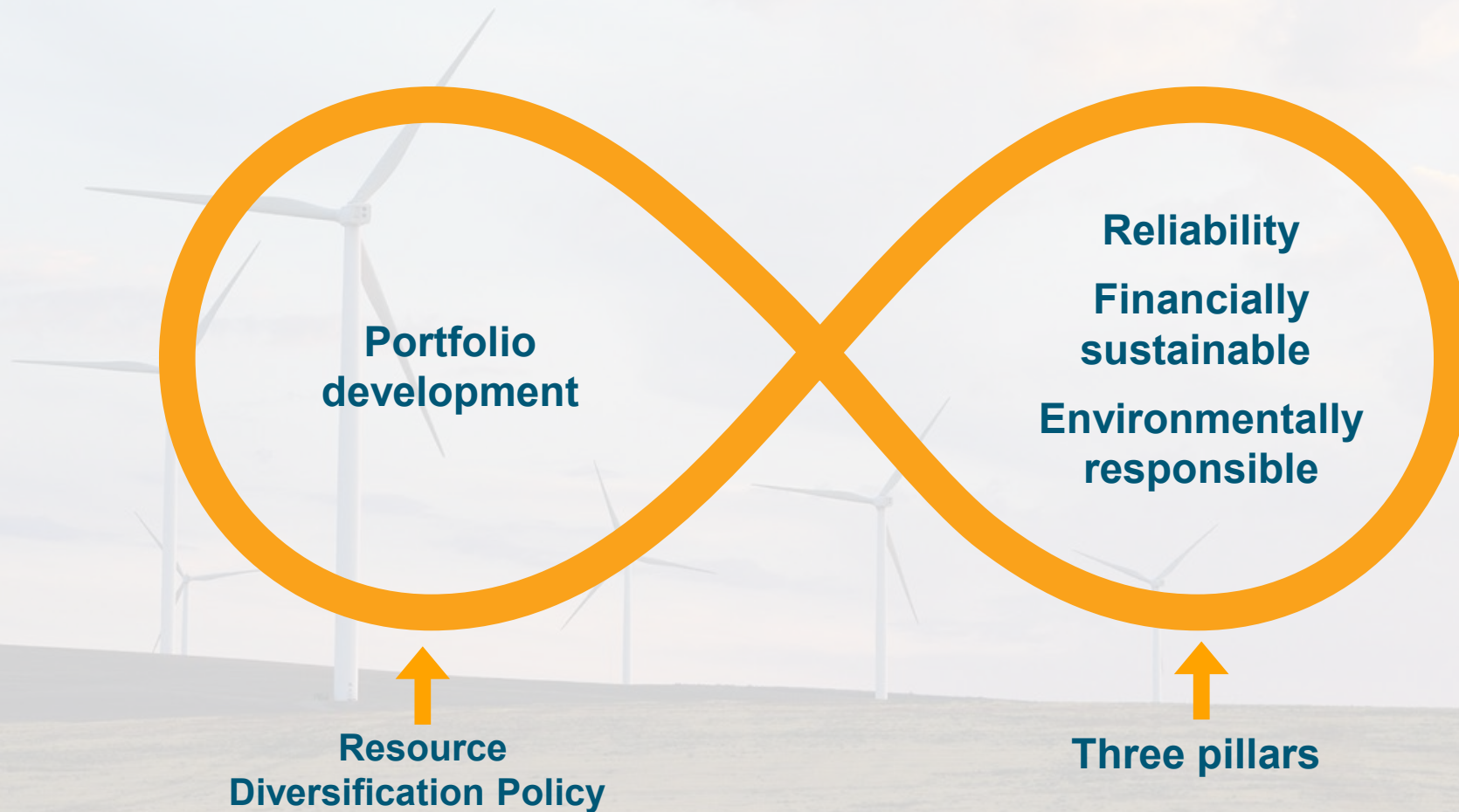
Raj Singam Setti, chief transition and integration officer

M. Masood Ahmad PhD, resource planning manager

Tyler Michie, plant operations manager



# Clean energy transition





# Dispatchable capacity selection teams

## Technology selection

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- Masood Ahmad
- Pat Connors
- Brodie Griffin
- Tyler Michie
- Mark Siano
- Chris Wood
- Matt Tribby

## Steering committee

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- Travis Hunter
- Darren Buck
- Pat Connors
- Leigh Gibson
- Jennifer Hammitt
- Matt Tribby
- Jace Staponski
- Masood Ahmad
- Chris Wood

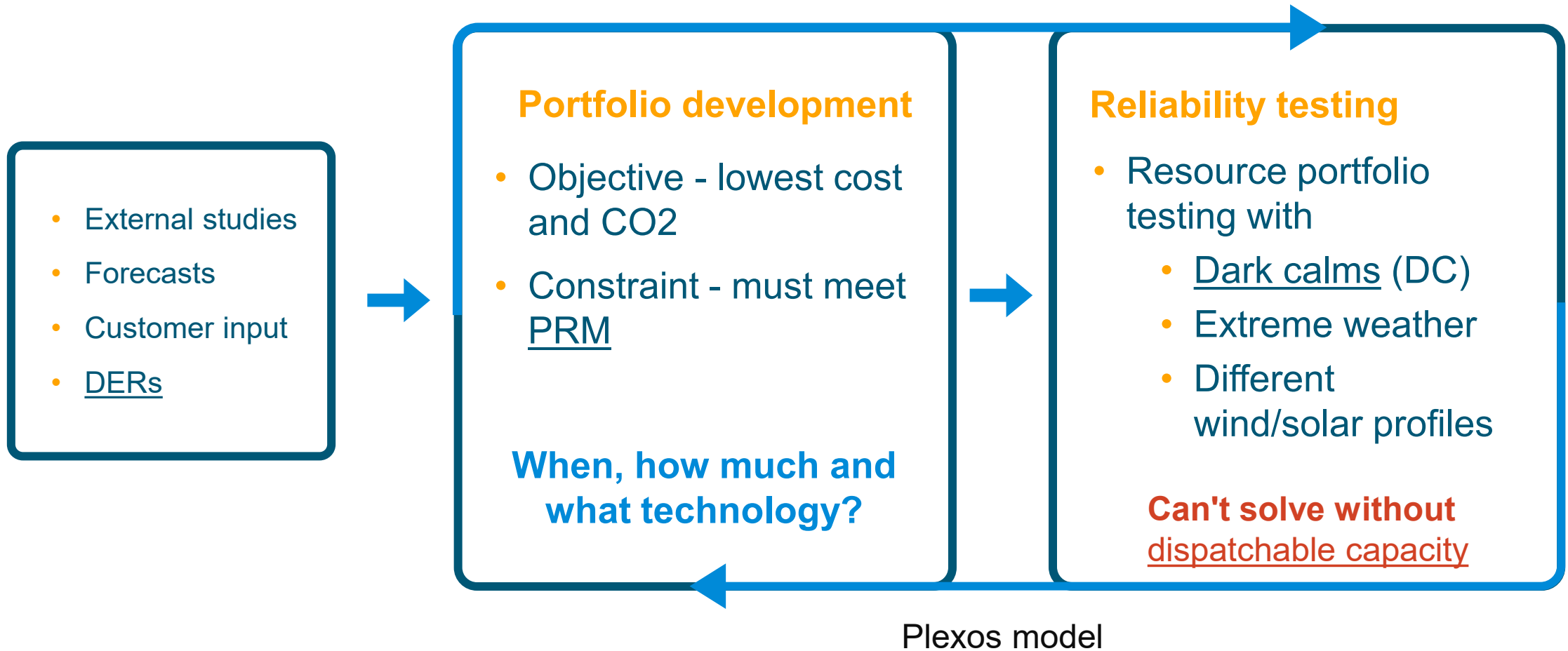
# Agenda

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- Justification for building dispatchable capacity
  - Reliability, risk mitigation and economics
  - Third party assessment of our portfolio
  - Third party assessment of new technology readiness for 100% noncarbon supply
  - Recommended portfolio
- Dispatchable technology selection
  - Process
  - Recommendation

# Resource plan development process

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# Our prior work and industry assessment validate the need for dispatchable capacity

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- **2020 Integrated Resource Plan:** 104 MW (using average weather)
- **Resource Plan update 2022:** 166 MW (using Feb. 2021 extreme weather)

**Other utilities and organizations are reaching the same conclusion – up until long duration energy storage is available, dispatchable capacity is required to complement renewable generation**

# Independent assessment by Black & Veatch

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B&V analyzed our power supply needs in 2030 (after retiring 431 MW of coal)

- They recommend adding 280-300 MW of new dispatchable capacity to ensure reliability
- They could not develop a reliable portfolio even by adding 10,000 MW of new solar and storage
- B&V used Plexos model (same as the one Platte River uses)
- B&V did stochastic and deterministic modeling
  - In stochastic modeling – DC event can occur any time during the year
  - In deterministic modeling – DC event occurs during the peak demand period

# Independent assessment of low or noncarbon options by Black & Veatch

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Technology	Findings – cost, suitability, availability, timings
Long duration energy storage	Will likely be an option during the next decade
Hydrogen	Will likely be an option during the next decade
Small modular reactor	May be available in the middle of next decade, but not suitable to follow load and renewables
Pump storage	Possible option for a few hours of storage – no identified sites nearby
Carbon sequestration	Possible by next decade, but cost will be very high for our low capacity factor, dispatchable generation needs

## Recommendation:

Build dispatchable peaking generation for 2030 needs and progressively convert to green hydrogen fuel when available

# Select portfolios

- Tested 25 portfolios
- Each portfolio simulated 504 times
- 155 MW distributed solar and 32 MW of Virtual Power Plant (VPP)

	No new dispatchable resource	Least cost portfolio	Recommended portfolio
<b>Carbon free resources (MW)</b>			
Wind	600	566	568
Solar	842	373	407
Hydro	<u>70</u>	<u>70</u>	<u>70</u>
Total carbon free resources	1,512	1,009	1,045
<b>Dispatchable Resources (MW)</b>			
Storage 4 hr	3,149	90	139
Storage 100 hr	0	0	10
New dispatchable capacity	0	<b>240</b>	200
<b>Existing CTs</b>	<b>388</b>	<b>388</b>	<b>388</b>
VPP	32	32	32
<b>Total portfolio (MW)</b>	<b>5,081</b>	<b>1,759</b>	<b>1,814</b>
Incremental capital cost, \$billion	<b>\$4.6 - \$6.9</b>	\$0.70-\$1.1	\$0.80 - \$1.2
CEP* compliance	Exceed	Exceed	Exceed

\* Colorado Clean Energy Plan – requires 80% CO2 reduction by 2030 from 2005 actual emissions



## **Dispatchable technology selection**



# Process for recommending the most suitable dispatchable technology

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Followed a multi track process				
<b>Internal team</b> <ul style="list-style-type: none"><li>• Resource planning</li><li>• Portfolio strategy</li><li>• Operation</li><li>• Engineering</li><li>• Transmission</li><li>• Environmental</li></ul>	<b>Vendor engagement</b> <ul style="list-style-type: none"><li>• GE</li><li>• Mitsubishi</li><li>• Mitsubishi Aero</li><li>• Siemens</li><li>• Wartsila</li><li>• Pro Energy</li></ul>	<b>B&amp;V process</b> <ul style="list-style-type: none"><li>• Screening</li><li>• Operational characteristics</li><li>• Levelized cost of energy</li><li>• Operational flexibility</li><li>• Reliability</li><li>• Fuel versatility</li><li>• Emissions</li><li>• Constructability</li><li>• Market performance</li></ul>	<b>Decision matrix</b> <ul style="list-style-type: none"><li>• More weights to the attributes related to three pillars</li><li>• Multiple sub-categories</li><li>• Qualitative and quantitative attributes evaluated</li></ul>	<b>Industry engagement</b> <ul style="list-style-type: none"><li>• Cheyenne</li><li>• Drake</li><li>• Pueblo</li><li>• Meetings with utilities</li></ul>

# Evaluation criteria



Criteria	Weight
<b>Reliability</b> – availability and failure rate at normal and extreme weather	30%
<b>Emissions</b> - minor modification, NOx, CO2, VOCs, rates etc.	25%
<b>Cost</b> – capital cost and levelized cost of energy (LCOE)	20%
<b>Operational flexibility</b> – ramp rates, turn down, minimum run and down times, etc. to complement/integrate renewables	10%
<b>Fuel versatility</b> – gas, back up liquid fuels, H2	5%
<b>Constructability</b> – supply chain, domestic vs. foreign parts	5%
<b>Market performance</b> – how these technologies are performing, A/S	5%

# Screening

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- Identified 58 options across all major manufacturers:
  - Reciprocating internal combustion engines (RICE)
  - Aeroderivative turbines
  - Frame turbines
  - Simple-cycle or combined-cycle (CC) configurations
- Obtained operational characteristics to filter to 7 possible candidates for additional evaluation
- Built capital cost estimates and performed LCOE analysis

# Overview

Characteristic	Units	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Plant size	MW	171	169	159	179	177	216	168
Capital cost	\$M	\$300	\$307	\$269	\$218	\$252	\$489	\$347
Capacity cost	\$M/MW	\$1.8	\$1.8	\$1.7	\$1.2	\$1.4	\$2.3	\$2.1
Efficiency	%	40.1%	34.6%	35.4%	38.7%	35.1%	48.1%	47.8%

Unit sizes range from 17-105 MW.

# Outside engagement

## Vendor

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- Data and criteria validation
- Early-stage project definition
- How is industry employing the technologies?
- What implementation strategies do you offer?
- What is the distinctive value proposition?

## Industry

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- First-hand operating and maintenance experience
- Performance characteristics
- Market performance
- Pain points
- What would have done differently?
- How did you structure the project?
- How are the assets leveraged?

# Decision category – reliability

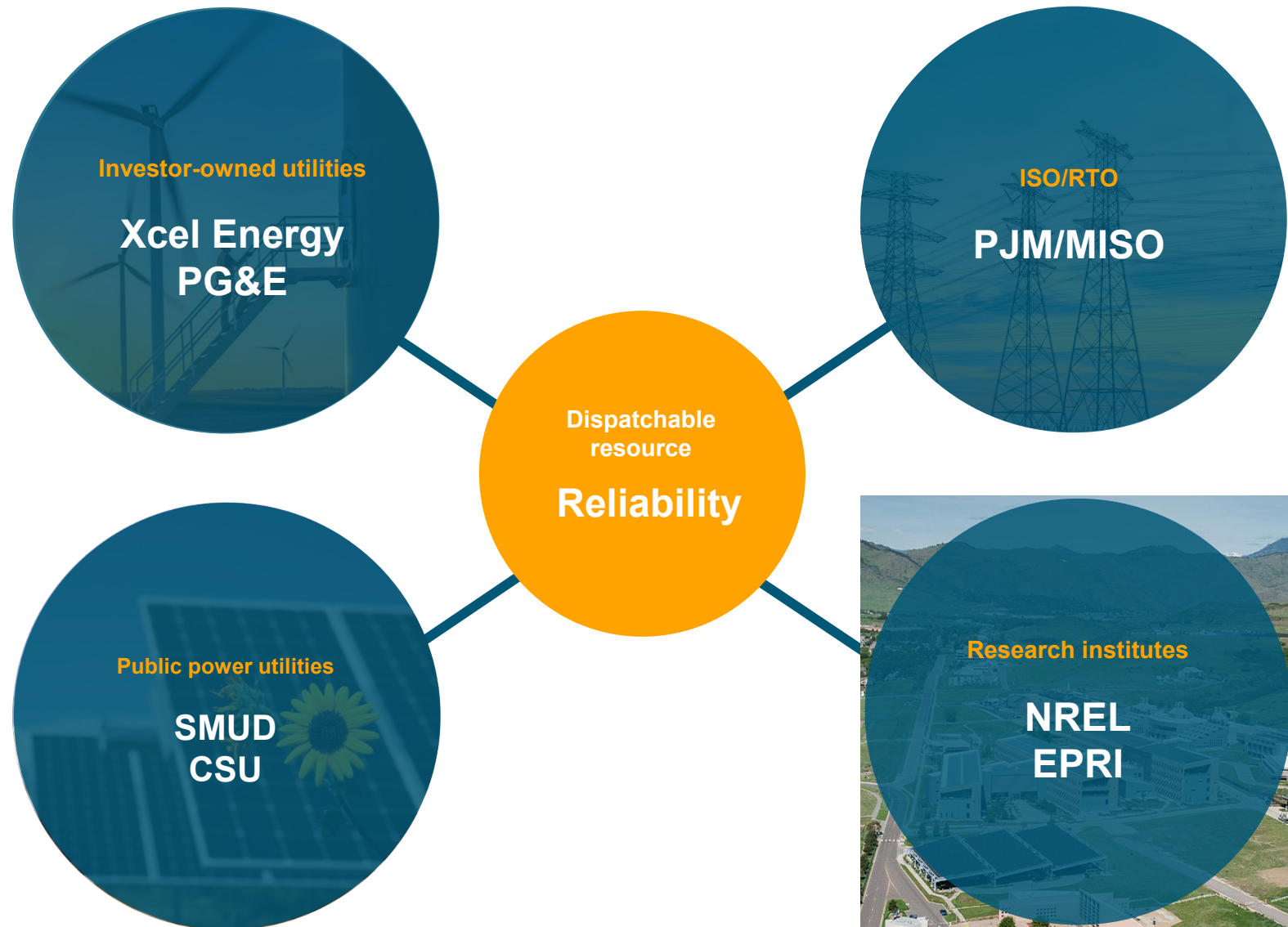
		Values				Score				Weight	Weighted score			
Qualification	Units	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4		Option 1	Option 2	Option 3	Option 4
Number of shafts	Number	10	6	4	2	9.0	8.3	7.5	5.0	8%	0.72	0.67	0.60	0.40
Third party support	Yes/No	No	Yes	Yes	No	0.0	10.0	10.0	0.0	2%	0.00	0.20	0.20	0.00
Risk from major maintenance duration	Yes/No	Yes	No	No	Yes	0.0	10.0	10.0	0.0	2%	0.00	0.20	0.20	0.00
Equivalent availability factor	%	92.8	98.0	98.0	90.0	4.8	10.0	10.0	2.0	2%	0.10	0.20	0.20	0.04
Forced outage factor	%	2.2	0.9	0.9	1.5	4.1	10.0	10.0	6.0	2%	0.08	0.20	0.20	0.12
Start reliability	%	97.6	99.3	99.3	99.3	1.5	10.0	10.0	10.0	5%	0.07	0.50	0.50	0.50
Installed power generation MW in US	MW	432	374	15,700	4,173	3.0	3.0	10.0	6.0	5%	0.15	0.15	0.50	0.30
Cold weather reliability	L/M/H	High	High	High	Medium	10.0	10.0	10.0	5.0	3%	0.30	0.30	0.30	0.15
Need for gas compression	Yes/No	No	No	Yes	Yes	10.0	10.0	0.0	0.0	1%	0.10	0.10	0.00	0.00
Category total											1.52	2.52	2.70	1.51

# Relative scores from the decision matrix

Qualification	Weight	Option 1	Option 2	Option 3	Option 4
Reliability	30%	1.52	2.52	2.70	1.51
Emissions	25%	0.70	2.41	2.34	1.69
Costs	20%	1.55	1.47	1.55	2.00
Operational flexibility	10%	0.90	0.91	0.88	0.80
Fuel versatility	5%	0.05	0.36	0.36	0.42
Constructability	5%	0.45	0.45	0.45	0.35
Market performance	5%	0.40	0.50	0.45	0.45
Total weighted score	100%	5.57	8.62	8.72	7.21

## Recommendation:

Aeroderivative turbines are the dispatchable technology best suited to meet Platte River's power supply requirements, ensuring system reliability while facilitating the continued development of noncarbon resources





# Conclusion

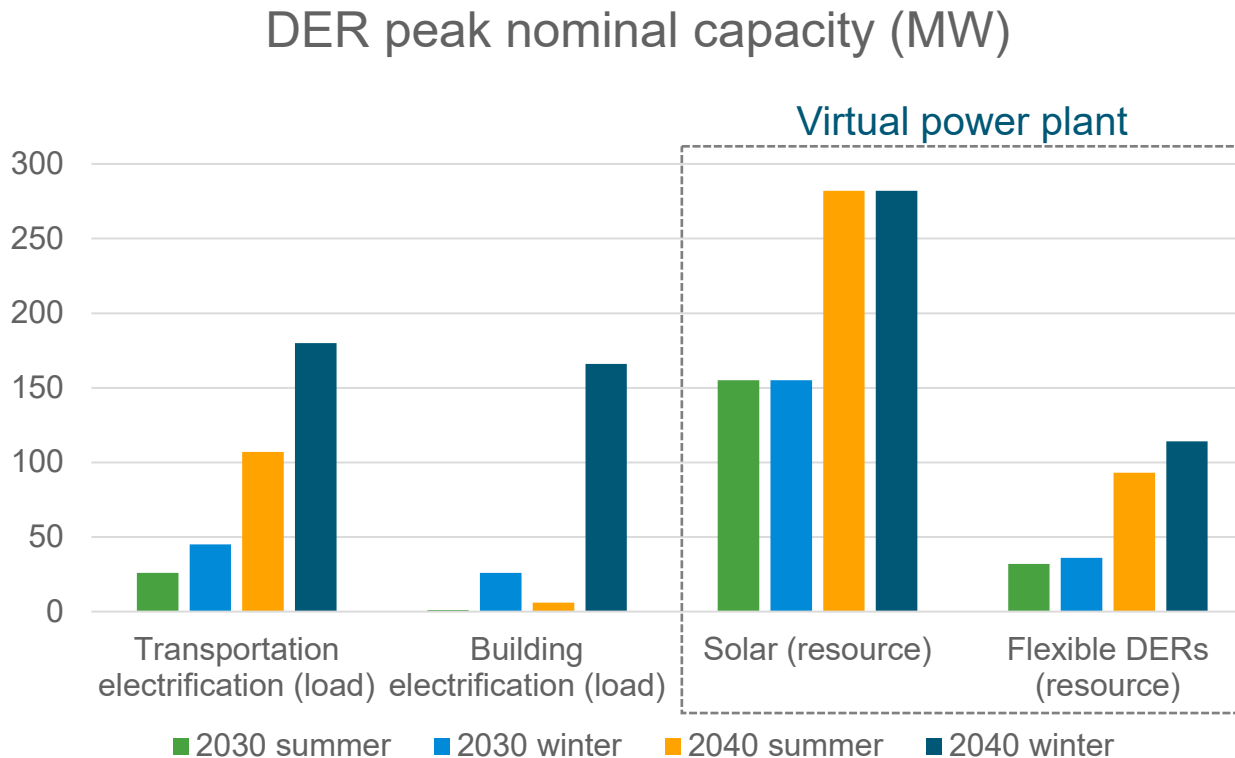
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- Platte River will need at least 200 MW of dispatchable capacity to complement renewables and storage upon retirement of Rawhide Unit 1 to ensure **reliable**, **economic** and **low risk** power supply to its customers
- We define dispatchable capacity as the state of the art, flexible, lowest emitting, hydrogen capable, turbine technology. It will:
  - Complement intermittent renewable generation when it's not sunny or windy
  - Initially use natural gas fuel, but will be able to burn renewable natural gas and/or green hydrogen if and when they become commercially and economically available



**Back up slides**

# DER forecast



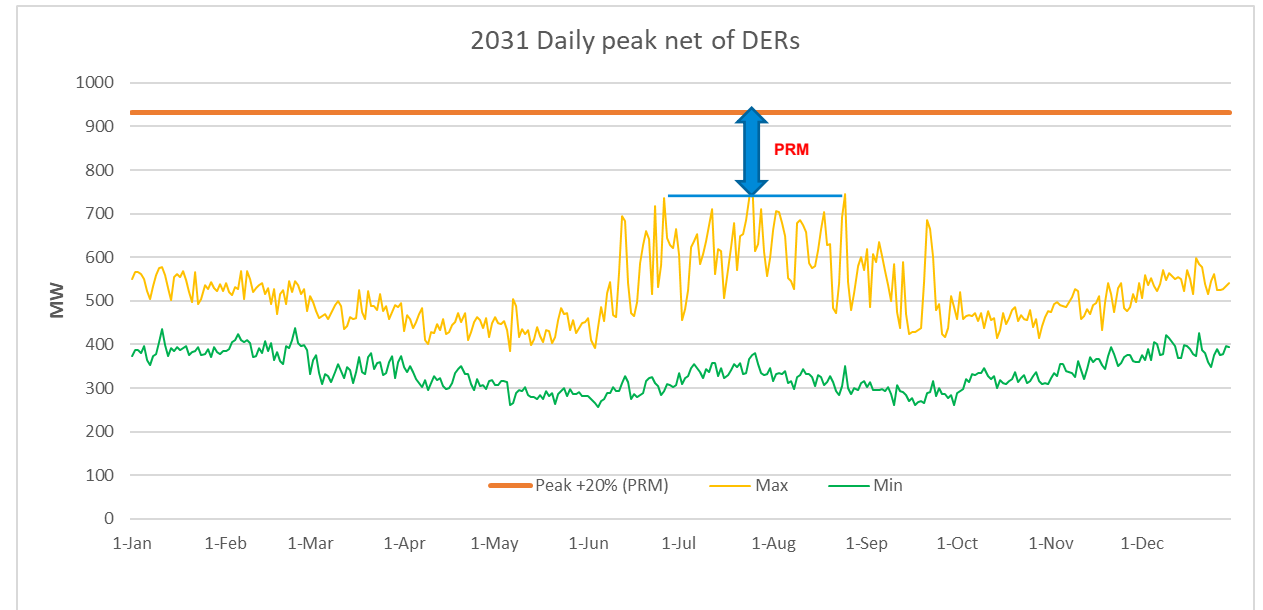
## Flexible DER capacity

- Capacity assessed based on ability to provide a four-hour resource during evening peaks
- Electric vehicle charge management, battery storage management and traditional demand response
- Distributed energy resource management system (DERMS) and related systems are in planning and development



# Planning reserve margin (PRM) requirement

- Each utility must carry PRM. Market can help in emergencies, but it is not guaranteed
- PRM used to be 15% but with the addition of intermittent renewables it is going up
- Independent assessment from external advisors suggested we will need 20-25% PRM
- WECC study recommends 22-25% PRM for our area
- Texas studies show they may need to raise PRM to 18.5%

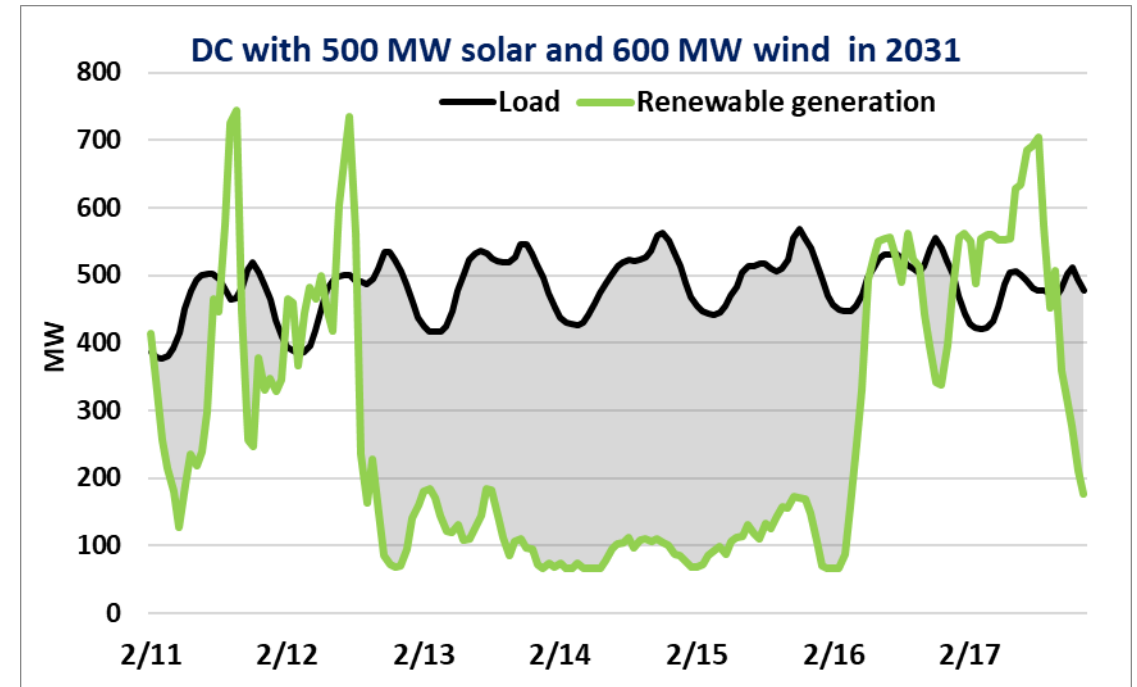


Renewable generation, DERs and 4-hour battery storage can provide PRM but their ELCC drops significantly as more resources are added, due to intermittency and energy limitations. Traditional thermal generation are better suited to provide PRM. 100 MW of wind or solar can only provided 5-10 MW of PRM, while 100 MW of dispatchable generation or long duration energy storage (when developed) can provide 90 MW of firm capacity.



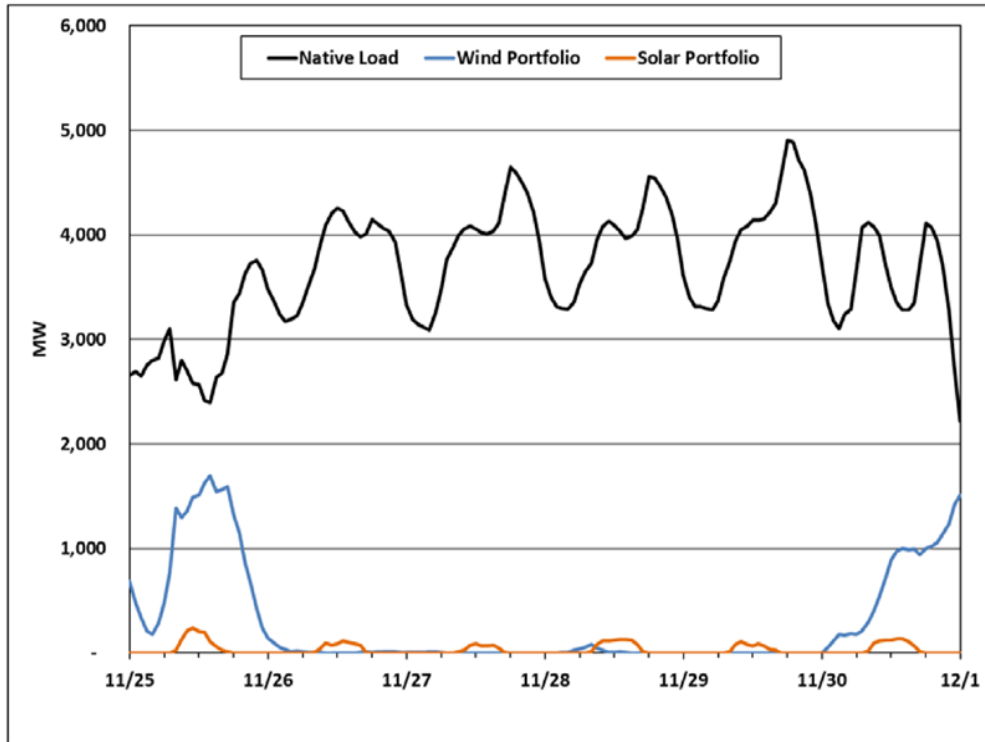
# Reliability during dark calms (DC) and extreme weather events (EWE)

- This is DC experienced during the winter storm Uri in 2021. We scaled up the load and generation to 2031
- The only way to supply noncarbon energy during DC is to rely:
  - Long duration energy storage (LDES), that once charged will last many days
  - Traditional generation burning noncarbon fuel like hydrogen
- 3,000 MW of currently available 4-hour Li Ion battery, along with the existing CTs will cover this DC
- Based on our analysis, we will need about 13,000 MW of 4-hour storage – which is not practical
- Can a market help? Maybe, but we cannot plan for it.
  - Usually, severe weather patterns cover large areas. Most likely, all the neighboring utilities will be having similar shortages as we saw during Uri.
  - Even if we can find power, it will be very expensive. Our quick analysis showed it will cost almost 40% of our annual power supply cost. This was observed for many small utilities after Uri.
- During winter severe weather, there are challenges of getting fuel as well, which means on-site storage will be required

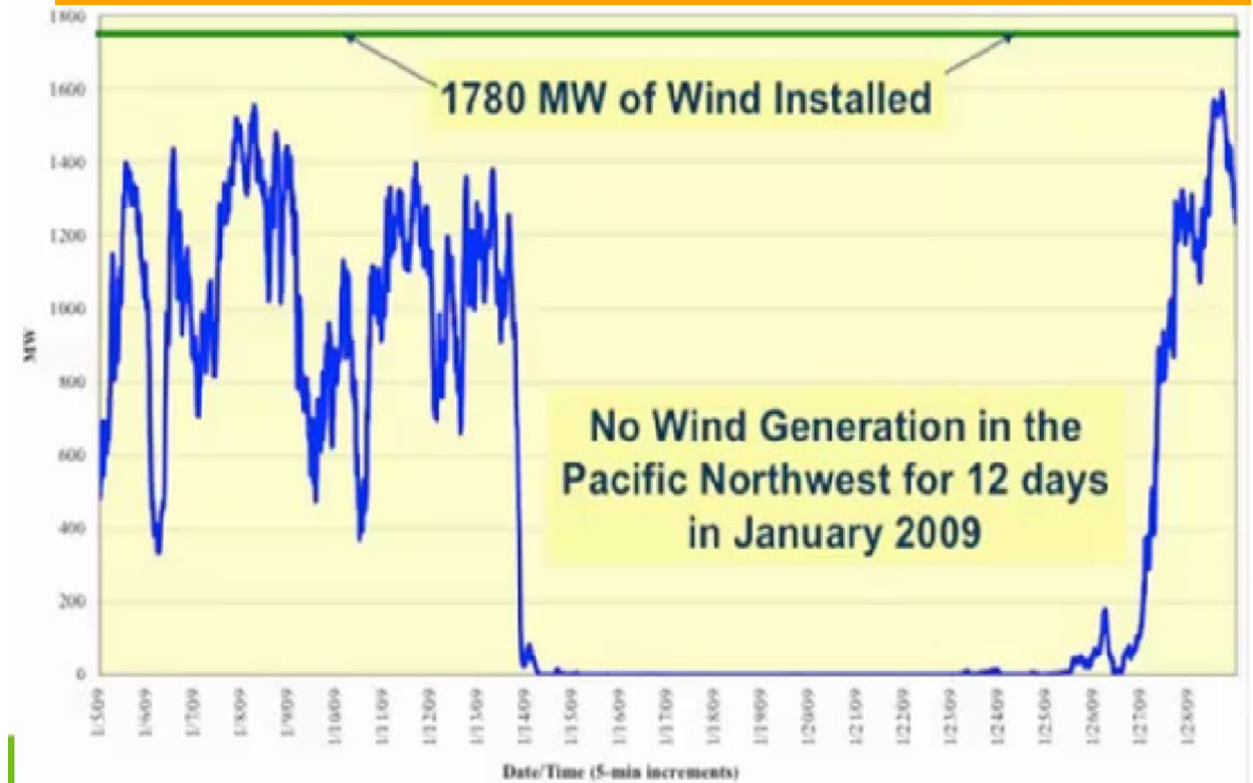


# Recent dark calm experiences

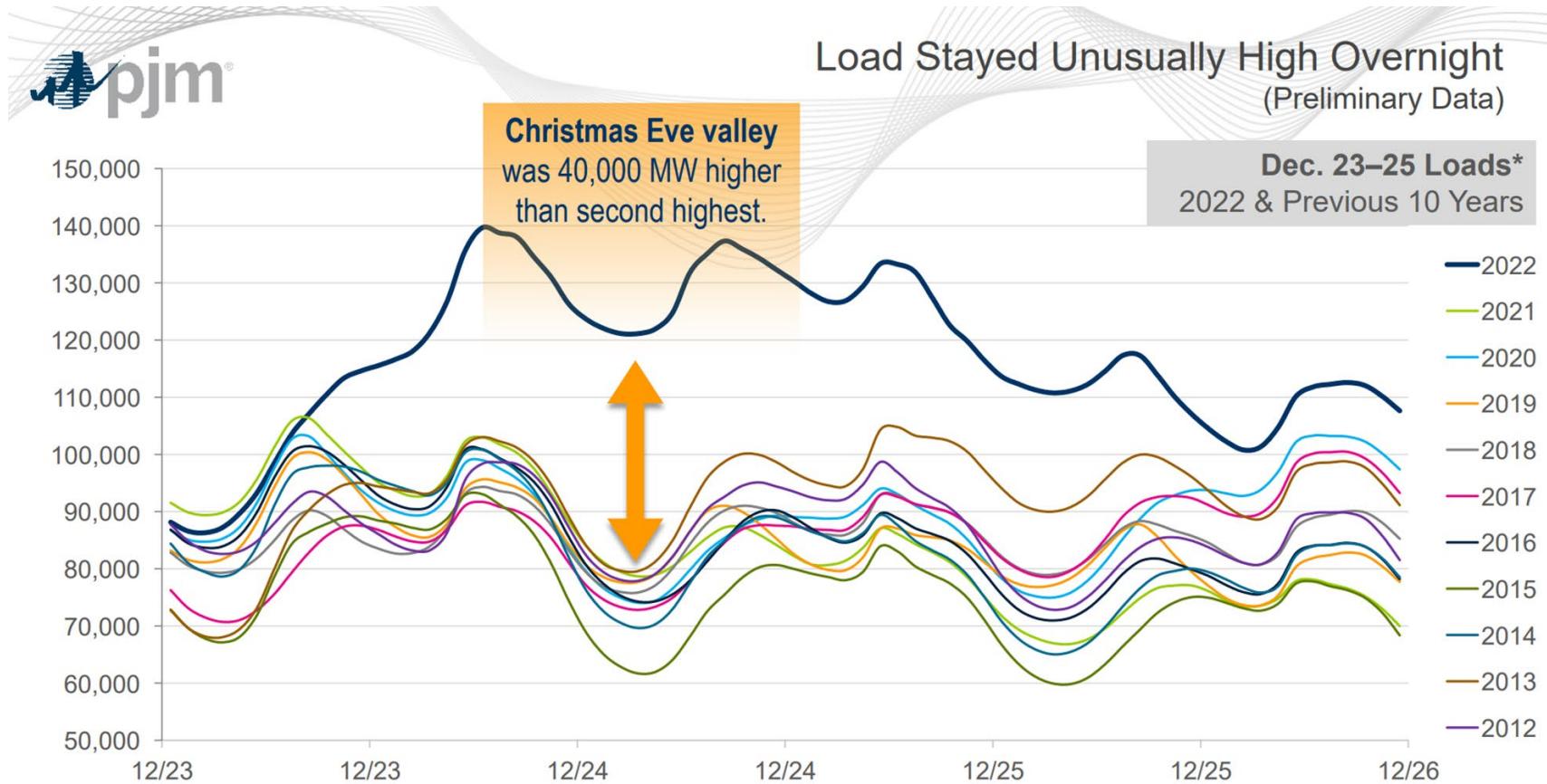
PSCo November 2015



Pacific Northwest January 2009



# Recent extreme weather event - PJM 2022



# What is dispatchable capacity?

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A dispatchable resource is a resource where power output can be changed quickly to complement renewable generation intermittency. A dispatchable generation resource will balance load and renewable generation in real time. It can start, stop, speed up and slow down quickly to produce more or less generation when needed.

**Examples:** battery storage, a quick start CT or RICE unit. Current battery storage technology lasts only 4-hours and will not be sufficient in dark calms or extreme weather events. Once long duration energy storage (LDES) is developed, it will provide dispatchable capacity

## A dispatchable capacity resource is:

- State of the art
- Flexible
- Lowest emitting
- Hydrogen capable
- Aero-derivative (based on jet engine technology)
- Proven
- Reliable
- Able to quickly start and stop
- Provide power when it's not sunny or windy
- Initially burn natural gas and capable of burning biodiesel, renewable natural gas and green hydrogen when they become available in commercial quantities at economical prices





# Questions



**Platte River**  
Power Authority  
Energy leaders since 1973



# Board of directors

Sept. 28, 2023

Energy leaders since 1973

# IRP community engagement update

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Eddie Gutiérrez, chief strategy officer



# Key highlights from engagement

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- Extreme weather modeling and climate change
- What is a dispatchable resource?
- Energy market and resource planning
  - Source of "other purchases"
- Electrification efforts and growth in demand/load
- Equity
- Behavioral change vs. adding more resources

# Community meetings

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## Longmont

### Completed

- Longmont Sustainability Advisory Board
- Longmont Neighborhood Group

### Planned

- Climate Action Sunday (community event)
- City council
- Latino chamber of commerce
- Longmont economic development partnership
- Equitable climate action team

## Loveland

### Completed

- City council
- Loveland Utilities Commission

### Planned

- City council
- League of Women Voters
- Downtown Development Authority
- FUEL – Loveland's young professional group
- Renewables Now Loveland
- Loveland Chamber of Commerce Ambassadors

# Community meetings

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## Estes Park

### Completed

- Town board
- League of Women Voters
- Estes Park Sierra Club

### Planned

- Chamber of Commerce
- Rotaries

## Fort Collins

### Completed

- Fort Collins Energy Board
- Colorado State University
- Fort Collins Natural Resources Advisory Board
- COSSA
- Northern Colorado Renewable Energy Society

### Planned

- City council
- Fort Collins Sustainability Group
- Larimer County



## **Fall marketing campaign**

# Marketing campaign

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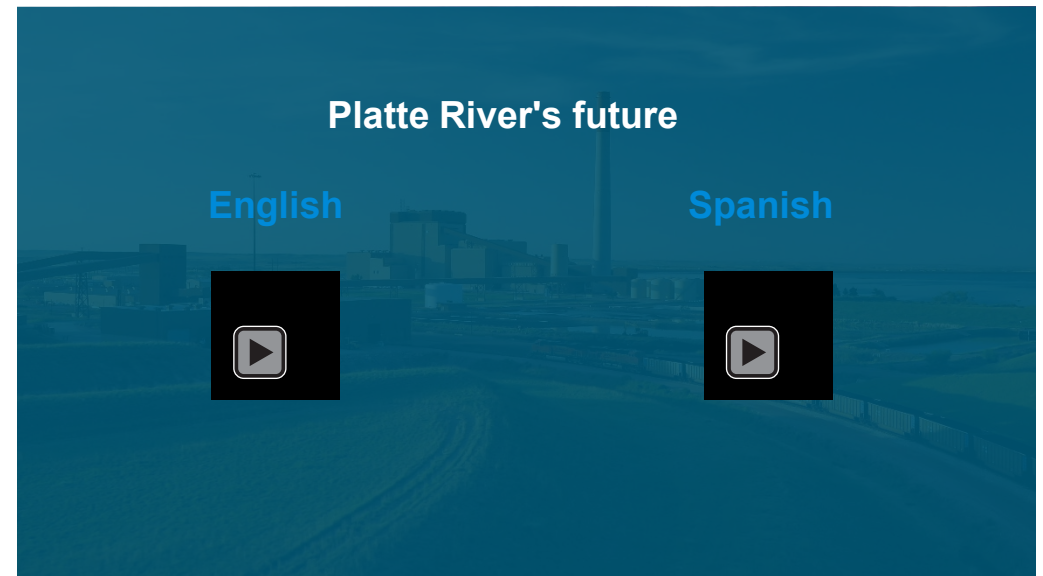
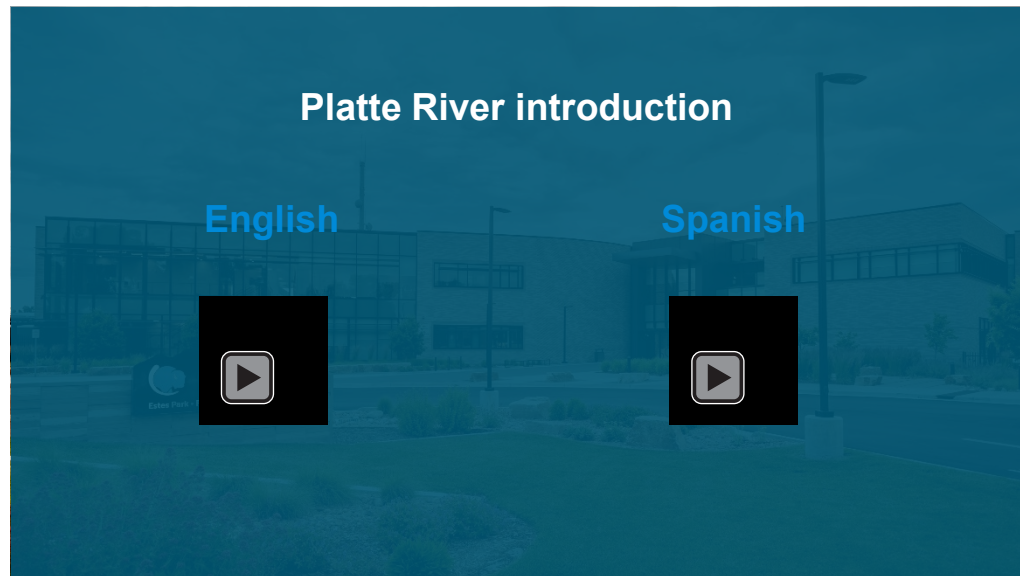
## Overview

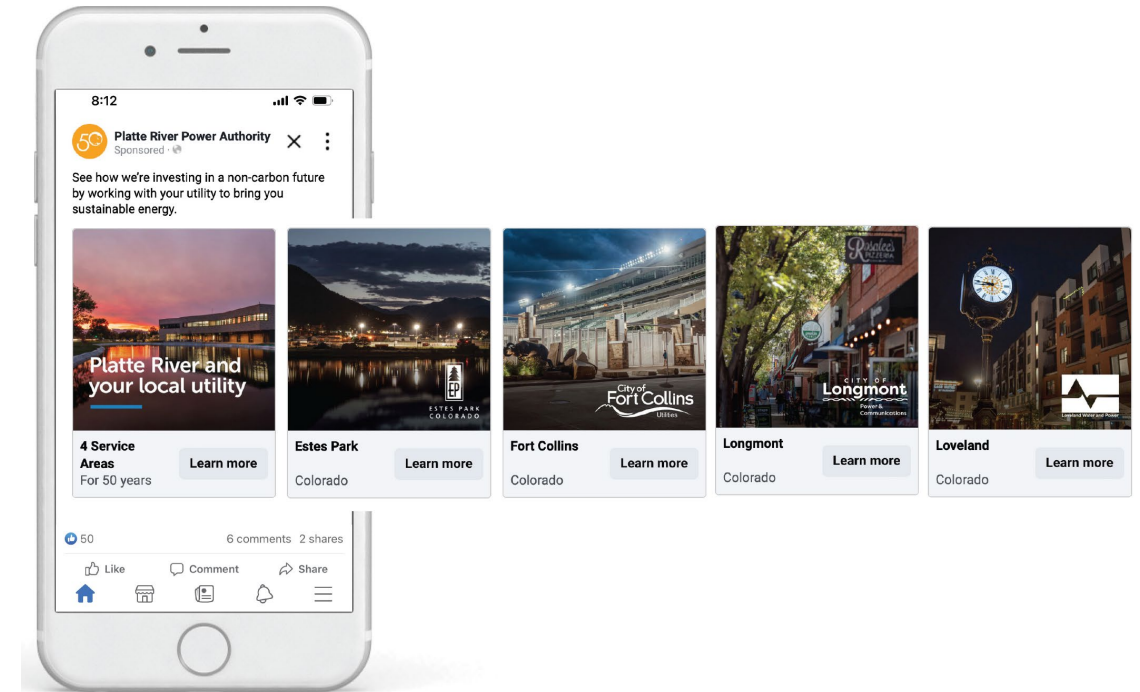
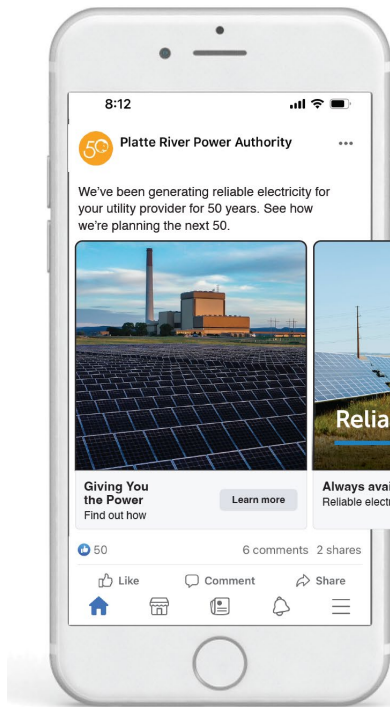
- Celebrating 50 years of serving Estes Park, Fort Collins, Longmont and Loveland
- Highlights our commitment to the principles that have shaped our history and will direct our transition to a noncarbon energy future
- As we plan for the next 50 years, we remain committed to our foundational pillars:
  - Reliability
  - Environmental responsibility
  - Financial sustainability



# The *giving you the power* campaign

Radio ads, digital billboards, newspaper and digital ads, social media ads and posts







# Marketing strategy

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- Celebrate 50 years of reliable power and ongoing collaboration with our owner communities
- Wholistic approach utilizing all platforms: digital, print, out of home
- Educate and inform on ongoing resource planning, align with 2024 IRP efforts and related community engagement
  - Proactive media approach
  - Website page with more information and continued transparency
  - Educational social media campaigns
  - Continue to schedule community meetings

# Questions



**Platte River**  
Power Authority  
Energy leaders since 1973



# Board of directors

**Sept. 28, 2023**

**Energy leaders since 1973**

# August operational results

Category	August variance		YTD variance	
Owner community demand	3.2%	●	(1.9%)	◆
Owner community energy	(5.0%)	■	(4.0%)	■
Surplus sales volume	(15.4%)	■	(33.6%)	■
Surplus sales price	69.2%	●	38.4%	●
Purchase volume	(485.7%)	■	(135.4%)	■
Purchase price	(7.3%)	■	(54.3%)	■
Coal generation	(52.9%)	■	(43.6%)	■
Combustion turbine generation	(6.4%)	■	59.3%	■
Net variable cost to serve owner community load*	(81.5%)	●	(14.5%)	●

Variance key: Favorable: ● | Near budget: ◆ | Unfavorable: ■

\*Total resource variable costs plus purchased power costs less sales revenue



# Board of directors

**Sept. 28, 2023**

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# August financial summary

Category	August variance from budget (\$ in millions)		YTD variance from budget (\$ in millions)	
Change in net position*	\$4.8	●	\$12.8	●
Fixed obligation charge coverage	1.46x	●	.45x	●
Revenues	\$2.8	●	\$(4.9)	■
Operating expenses	\$1.4	●	\$15.7	●
Capital additions	\$1.2	●	\$18.9	●

Variance key: Favorable: ● | Near budget: ◆ | Unfavorable: ■

\* August and YTD change in net position was impacted by \$0.5 million and \$2.2 million unrealized gains on investments, respectively.



# Board of directors

**Sept. 28, 2023**

**Energy leaders since 1973**