Platte River Power Authority

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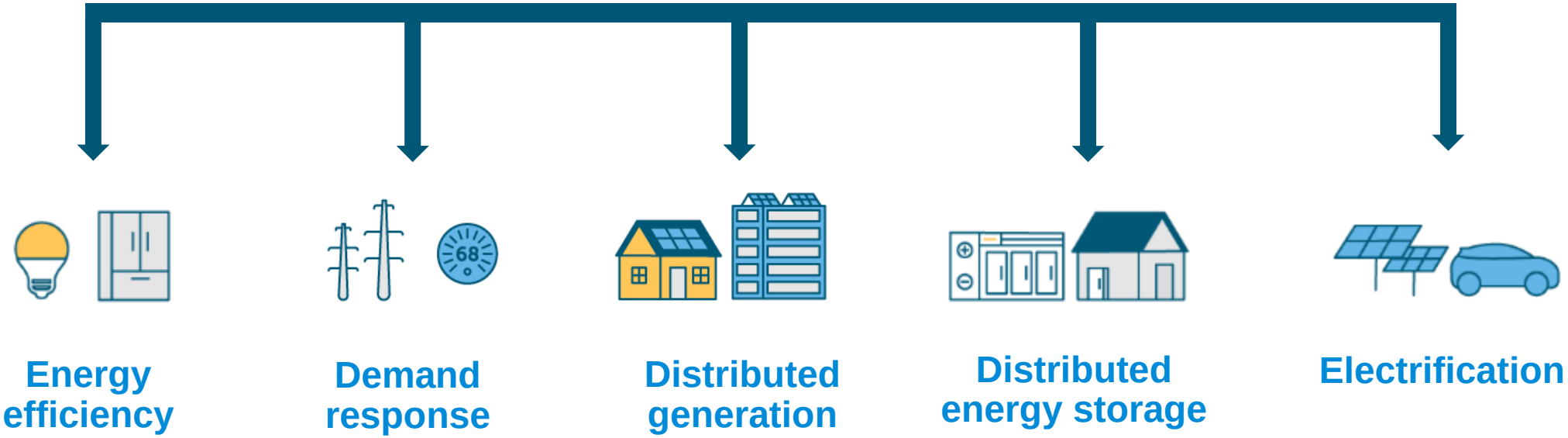
Board of Directors

April 25, 2024

Evolution of distributed energy solutions

Bryce Brady, manager, distributed energy solutions

Distributed energy solutions



Energy efficiency

Demand response

Distributed generation

Distributed energy storage

Electrification

Utility of the past

- Building customer relationships
- Single focus: energy efficiency

Powering up the future

- Customer needs and behavior
- Electrification and flexibility
- Integration with owner communities
- Feeding the virtual power plant (VPP)

What are customers asking?

- How do I reduce my carbon footprint?
- Where do I start on my upgrades?
- Can I change how I use energy?
- Can you connect me with a qualified contractor?
- How do I disconnect my gas service?
- Should I buy an electric vehicle now or wait?
- I already did energy efficiency upgrades, what do I do next?
- Can you help my business meet our sustainability goals?
- What should I do first, install solar or a new electric heat pump?

Saving money or energy with efficiency is no longer the main drivers of action

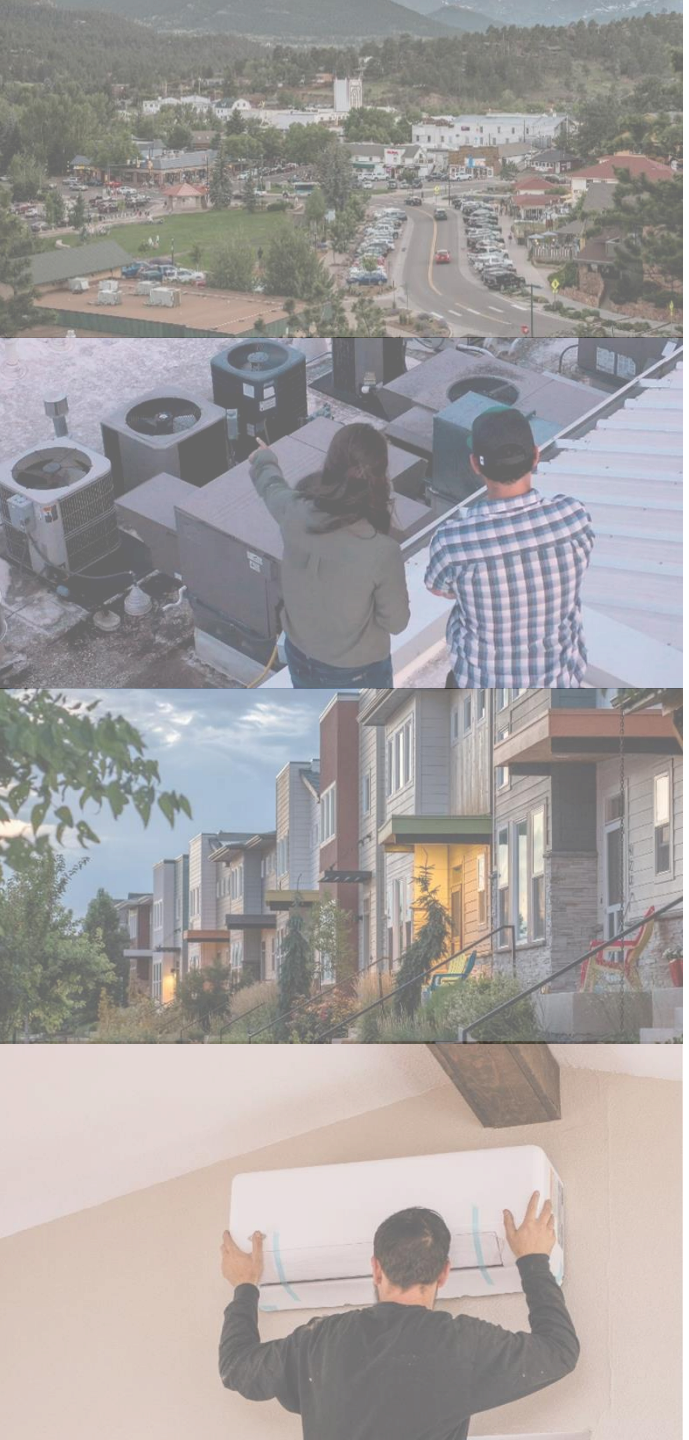
What are utilities needing?

Many goals and perspectives are competing for resources

- Equity must be considered in all programs
- Carbon reduction
- Incorporate building performance standards
- Use available budgets
- Home overhauls for income qualified
- Expand program goals to match various initiatives beyond traditional efficiency efforts
- Contractor training and workforce development
- Flexibility and control programs

Utility of the past powering the future

How do we transition?



Efficiency Works™

Using a trusted resource to connect with customers

Efficiency Works is a **regional utility collaboration** that provides guidance and resources to enable **customers** to **use energy effectively**, work toward a noncarbon energy future and build strong, resilient communities for customers served by Platte River Power Authority and its owner communities of Estes Park, Fort Collins, Longmont and Loveland.

The power of the customer

Is it working?

Residential building electrification

2022

- 0 upgrades
- $0 invested
- 0 MWh impact
- 0 local contractors

2023

- 327 upgrades
- $474,235 invested
- 1,781 MWh impact
- 20+ local contractors

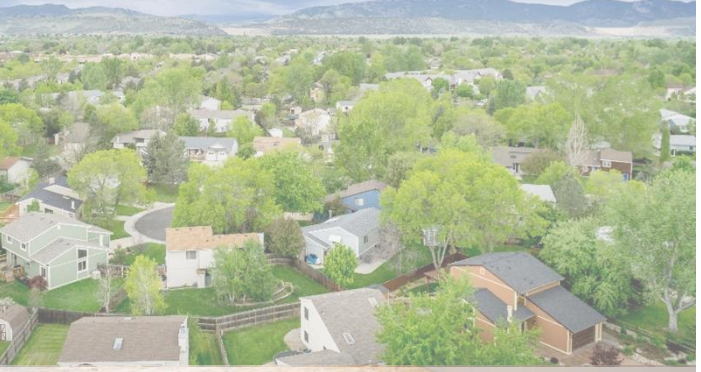
CO_2 reduction

2024 (so far)

- 39 upgrades
- $61,835 invested
- 228 MWh impact
- 13 local contractors so far

CO_2 reduction



Residential income qualified

2022

- $64,035 invested on home upgrades
- 0.27 MWh savings per participant

2023

- $708,041 invested on home upgrades and services
- Leveraged additional $672,000 of external funds for customer upgrades
- 3.27 MWh savings per participant
- Included building electrification efforts

Helping others

Changing lives

One participant gave feedback as,

"*According to my Fort Collins home energy report my home is now one of the most efficient on the street, and its all thanks to the Efficiency Works Care program completing my upgrades.*"

School education

2021-2022

- 1,759 grades 9-12
- 68 classrooms
- ~12% of HS students

C

2022-2023

- 2,399 4th graders
- 101 classrooms
- ~65% of 4th graders

B +

2023-2024 (so far)

- 2,620 4th graders (and counting)
- 92 classrooms (and counting)
- ~73% of 4th graders when done

A

Electric vehicles

2024

- Now - Building EV fleet programming services
- Late 2024 – Development of EV charge management programming

2023

- Public EV charging incentives
- Expansion of information on EV website platforms
- Launched EV fleet planner tool

2022

- Educational EV shopper website launched

Commercial HVAC system optimization

2022

- 43 upgrades completed
- 222 MWh savings
- $458,118 invested
- 7 local contractors

2023

- 54 upgrades completed
- 2,549 MWh savings
- $1.1M invested
- 6 local contractors

2024 (so far)

- 68 upgrades underway
- 5,320 MWh savings underway
- $1.2M planned investments
- 12 local contractors involved

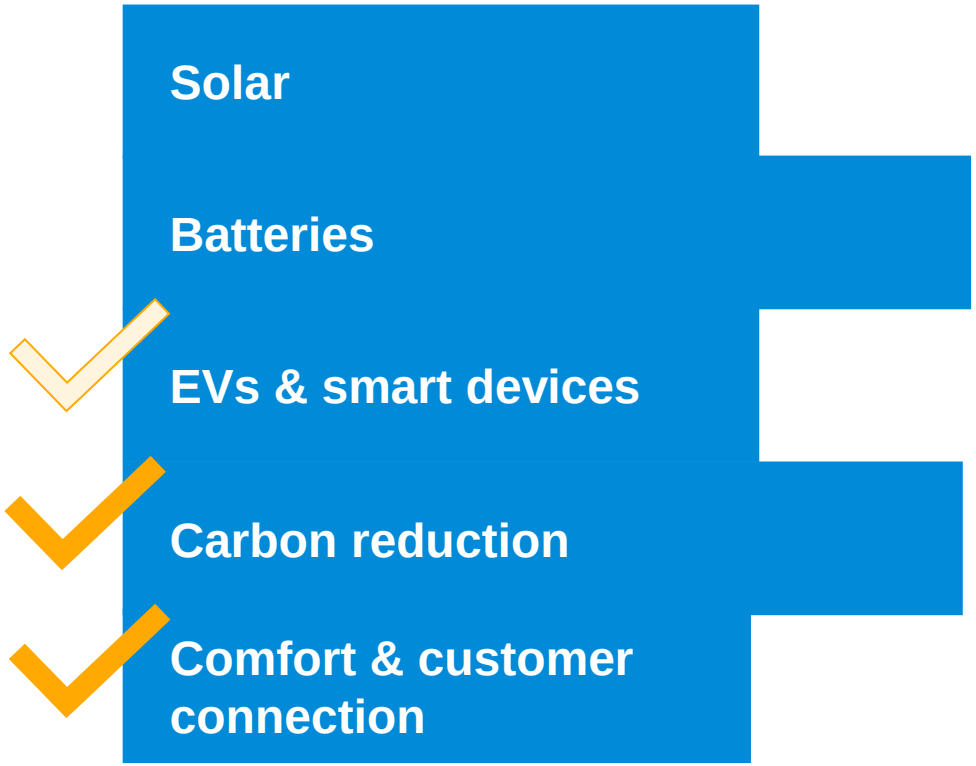
Functional → **Peak performance**

Powering forward

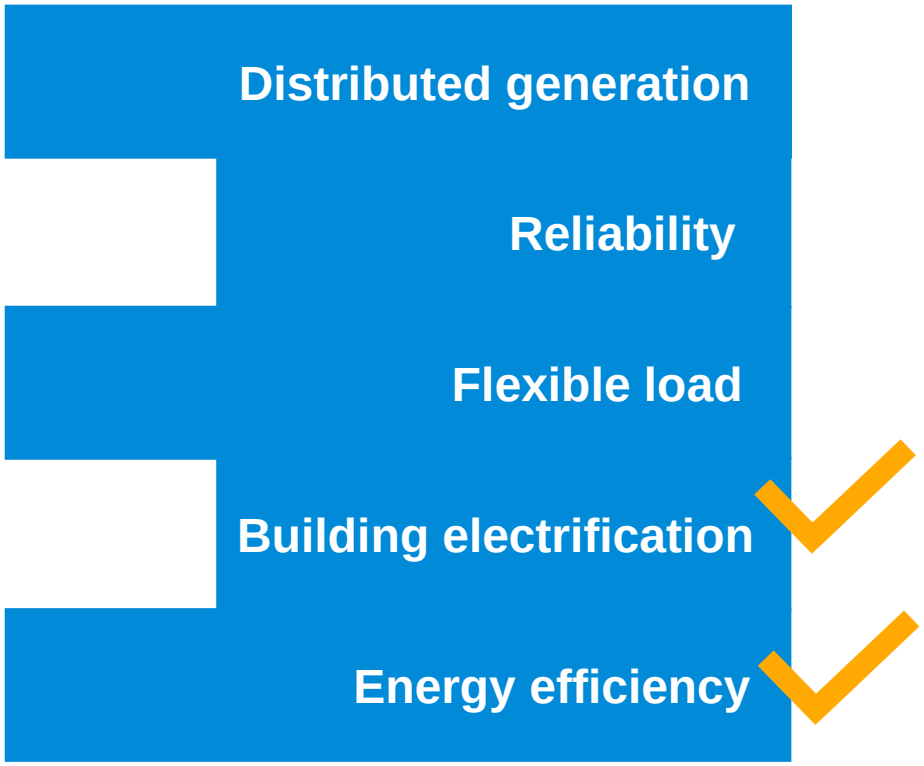
Where to next?

Building the future utility

Distributed energy solutions (customer)



Distributed energy resources (utility)

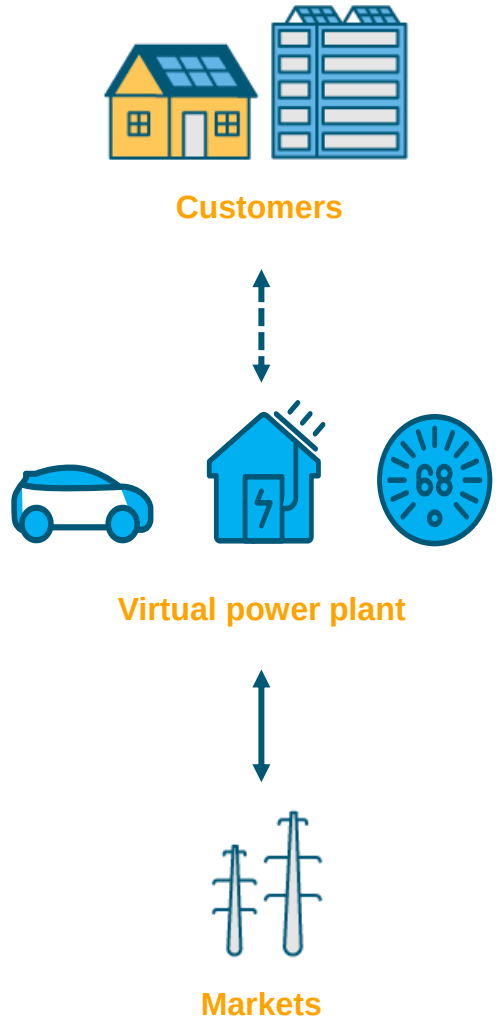


Distributed energy resources

Working together as building blocks

Solar	Distributed generation
Batteries	Reliability
EVs & smart devices	Flexible load
Carbon reduction	Building electrification
Comfort & customer connection	Energy efficiency

Virtual Power Plant



Powering on

Coming soon

- Efficiency Works website rebuild
- Expansion of services to support the virtual power plant (VPP)
- Customer energy programs giving us the power

Questions

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April 25, 2024

VPP series: achieving dispatchable capacity with a VPP

Paul Davis, manager, distributed energy resources

Virtual power plant (VPP)

Dispatchable capacity for Platte River and the owner communities

Based on integrated flexible distributed energy resources (DER)

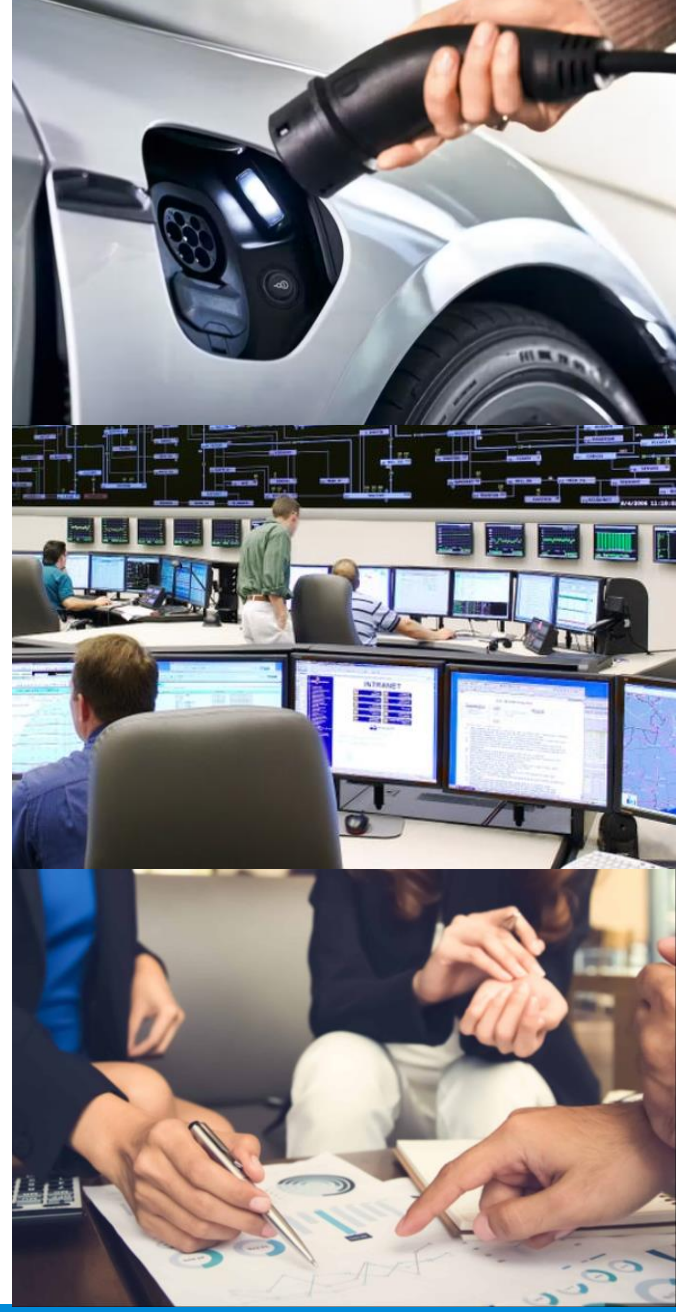
- Customer DERs
- Utility DERs

Dispatchable capacity that can provide electric system benefits

- Decarbonization
- Reliability (power supply and delivery)
- Managing costs of DER
- Making better use of intermittent, noncarbon generation

Operated through advanced technologies

- Communication, monitoring and control
- Analytics and optimization
- Data engineering and management



DERs, flexible DERs and the VPP

Flexible *potential*

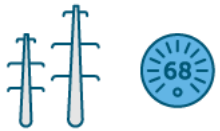
Flexibility managed in a VPP

Energy efficiency

Save energy and save money by using energy more efficiently

Electrification

Reduce greenhouse gases by replacing fossil fuel use with increasingly decarbonized electricity



Demand response

Shift energy to align electric use to renewable availability and to decarbonize the electric system in a cost effective and reliable manner

Electric vehicles, batteries and traditional demand response

Distributed energy storage

Distributed generation

Improved visibility and grid support from on-site noncarbon generation

Solar generation

Electric system benefits (…and challenges)

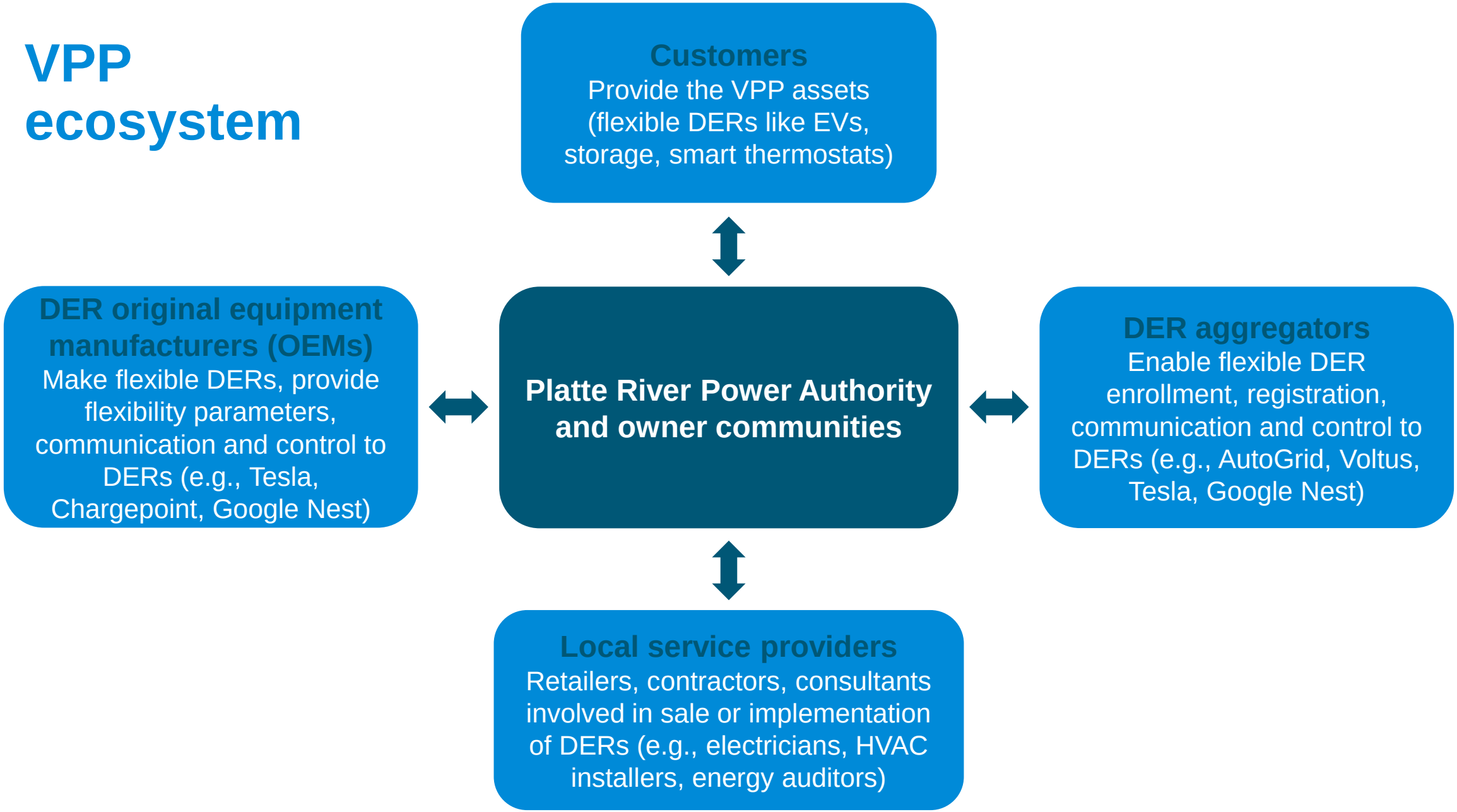
VPP benefits

- Visibility / forecasting improvement
- Dispatchable resource
  - Resource adequacy
  - Energy value
  - Ancillary services (operating and regulating reserves)
  - Distribution system capacity / reliability

VPP challenges

- Achieving a VPP that is visible, measurable, predictable and responsive in *near real time*
- Value stacking vs. mutually exclusive benefits
- Coordination among:
  - Owner communities
  - Platte River
  - “VPP ecosystem…”

VPP ecosystem



VPP potential: what is possible

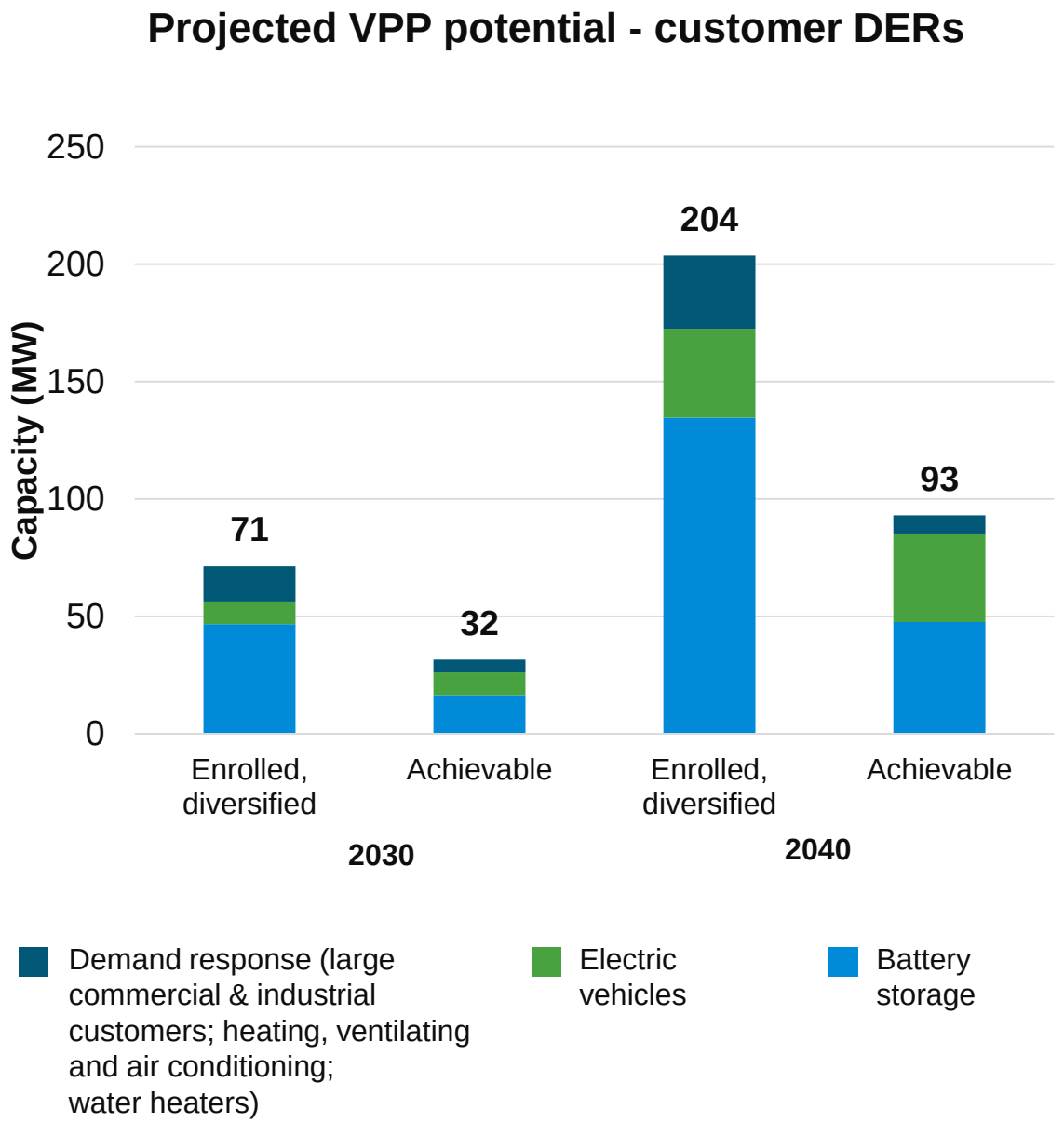
DER potential study (2023)

VPP potential from flexible customer DERs

- Enrolled, diversified
- Achievable

VPP to also include

- Distribution-scale storage: 4 x 5 MW, 4 hour planned in 2027
- Distributed solar for visibility: 155 MW forecast by 2030
- Potential total capacity accounted for in VPP: 207 MW (~25% of 2030 peak)



Building the VPP: two scopes of work

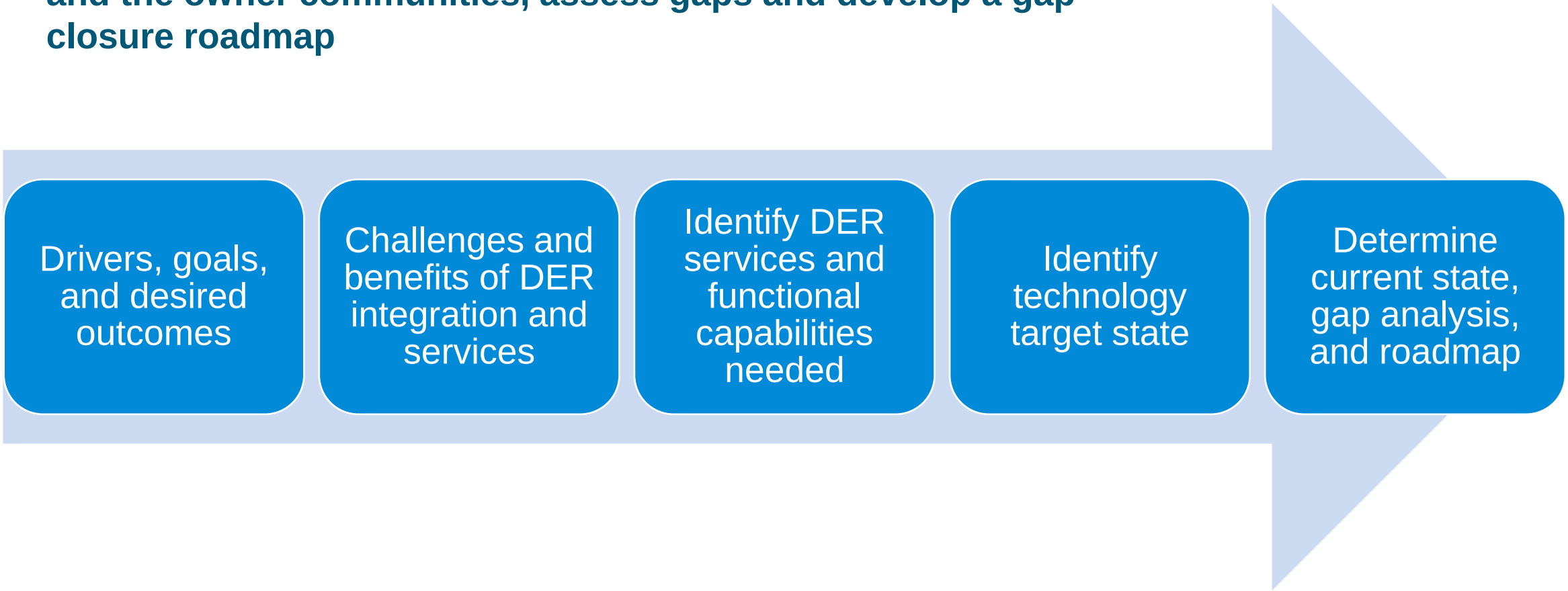
Two related scopes of work are associated with VPP development

1. VPP customer programs - flexible DER assets
    - How customers become aware of, learn about, participate in and benefit from participation
2. VPP enabling systems – flexible DER management
    - Platte River and owner community systems
        - Communication, monitoring, control
        - Analytics and optimization
        - Data

These scopes may be developed in parallel and must be interoperable.

VPP enabling systems: gap assessment and roadmap

A deliberative process to gather requirements from Platte River and the owner communities, assess gaps and develop a gap-closure roadmap



VPP enabling systems

Shared systems

- Enterprise distributed energy resource management system (Enterprise DERMS)
- Owner community DERMS – tenant of enterprise DERMS or an independent DERMS
- Data management systems

Platte River systems

- Market management systems
- Automatic generation control
- Energy management system

Owner community systems

- Customer information system
- Advanced metering infrastructure and meter data management system
- Geographic information system
- Advanced distribution management system (ADMS) providing “advanced apps”: as-operated network model and power flow modeling

Other systems may be needed depending on what we learn as the systems above are implemented and integrated

Next steps

- Board resolution in support of VPP
- Collaboration with owner communities
- RFP for DERMS and VPP programs, vendor selection (through late 2024)
- Contracting with DERMS, VPP program provider (late 2024 – early 2025)
- Work with vendor(s) to design system and programs (2025)
- **Assess completeness of contracted services and fill remaining gaps (2025)**
- Begin system and program implementation (timeline to be determined with input from vendors)

Questions

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April 25, 2024

Reservoir update

Chris Fields, senior fuels and water resources engineer

Reservoir update

Agenda

- Water supply update
- Chimney Hollow reservoir
  - Project status
  - Video
- Water resources reference document

Reservoir update

Water supply update

- Pop quiz: what is Colorado’s largest reservoir?

Reservoir update

Water supply update

- Pop quiz: what is Colorado’s largest reservoir?
  - Answer: snowpack!

Reservoir update

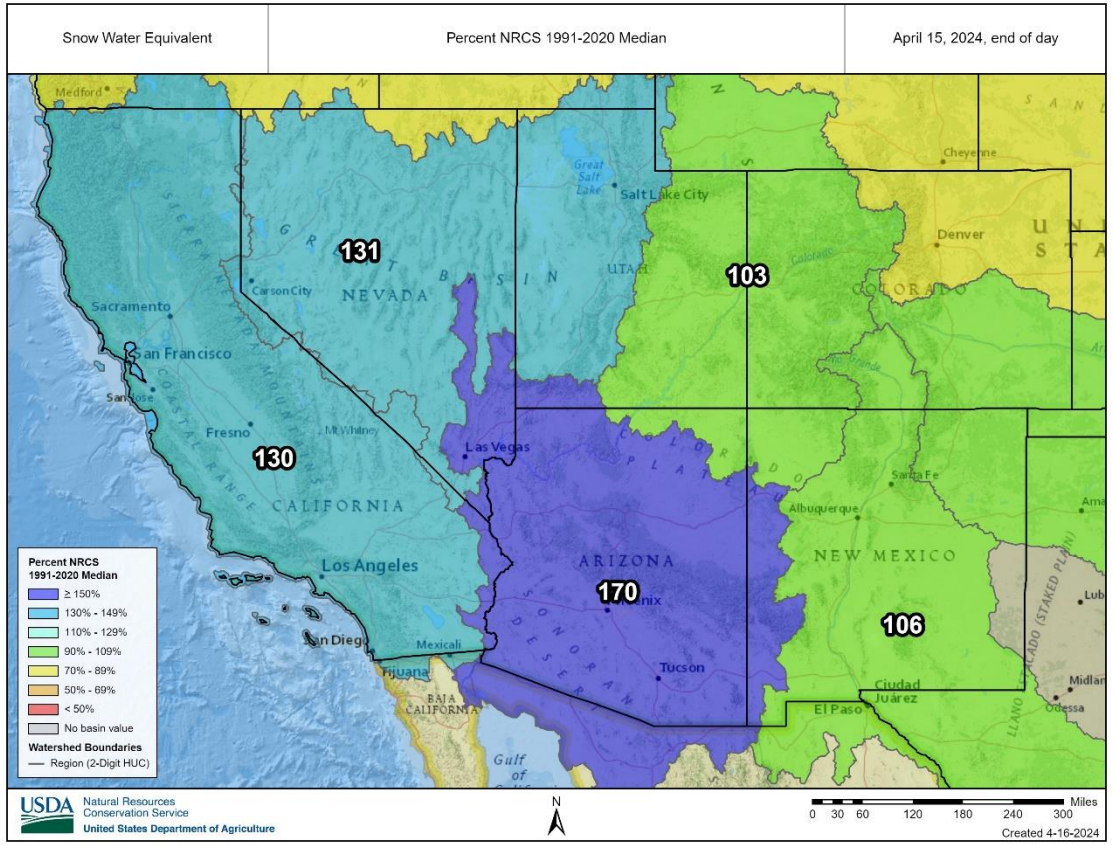
Water supply update

- Pop quiz: what is Colorado's largest reservoir?
  - Answer: snowpack!
- Reservoir factoids
  - Colorado reservoir storage ≈ 2.5-million-acre feet
  - Colorado snowpack ≈ 20-million-acre feet

Reservoir update

Water supply update

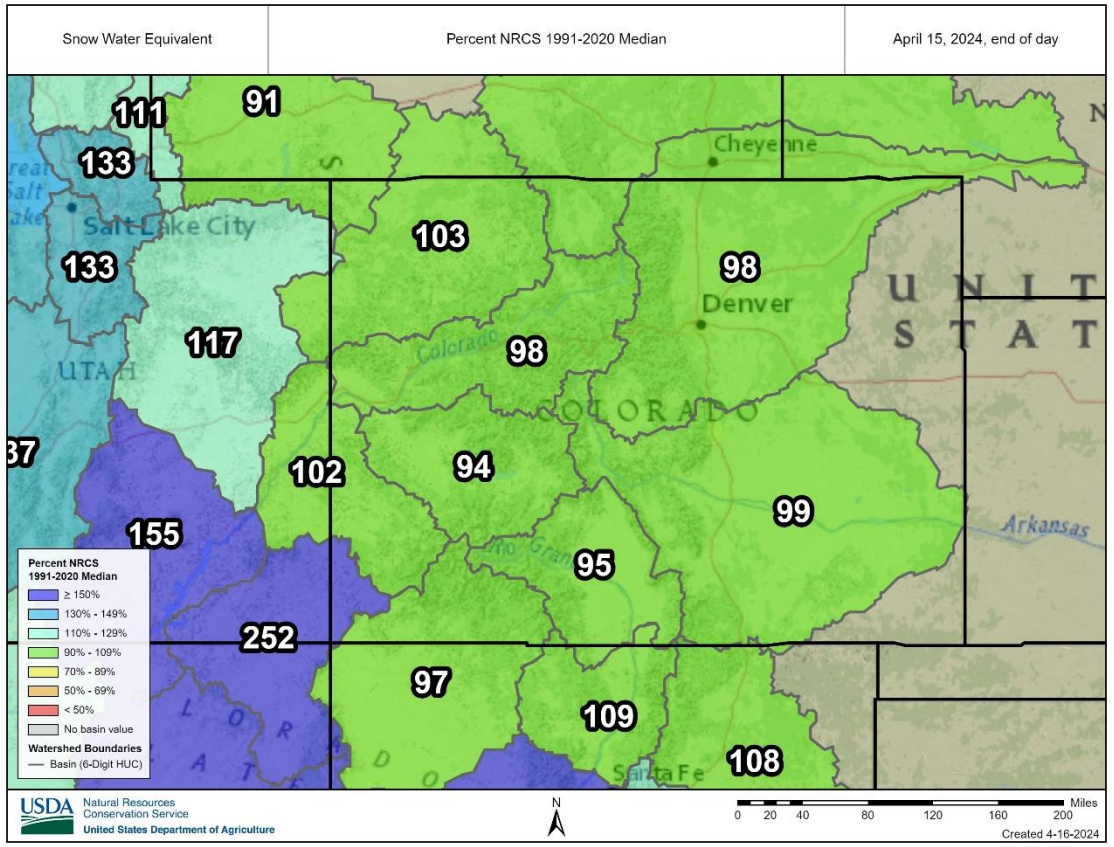
- Snowpack conditions
  - Colorado River
    - Upper basin – 103% of average
    - Lower basin – 170% of average
  - Lake Powell
    - Below-average runoff – 80%-85% of average
    - Dry soil heading into winter



Reservoir update

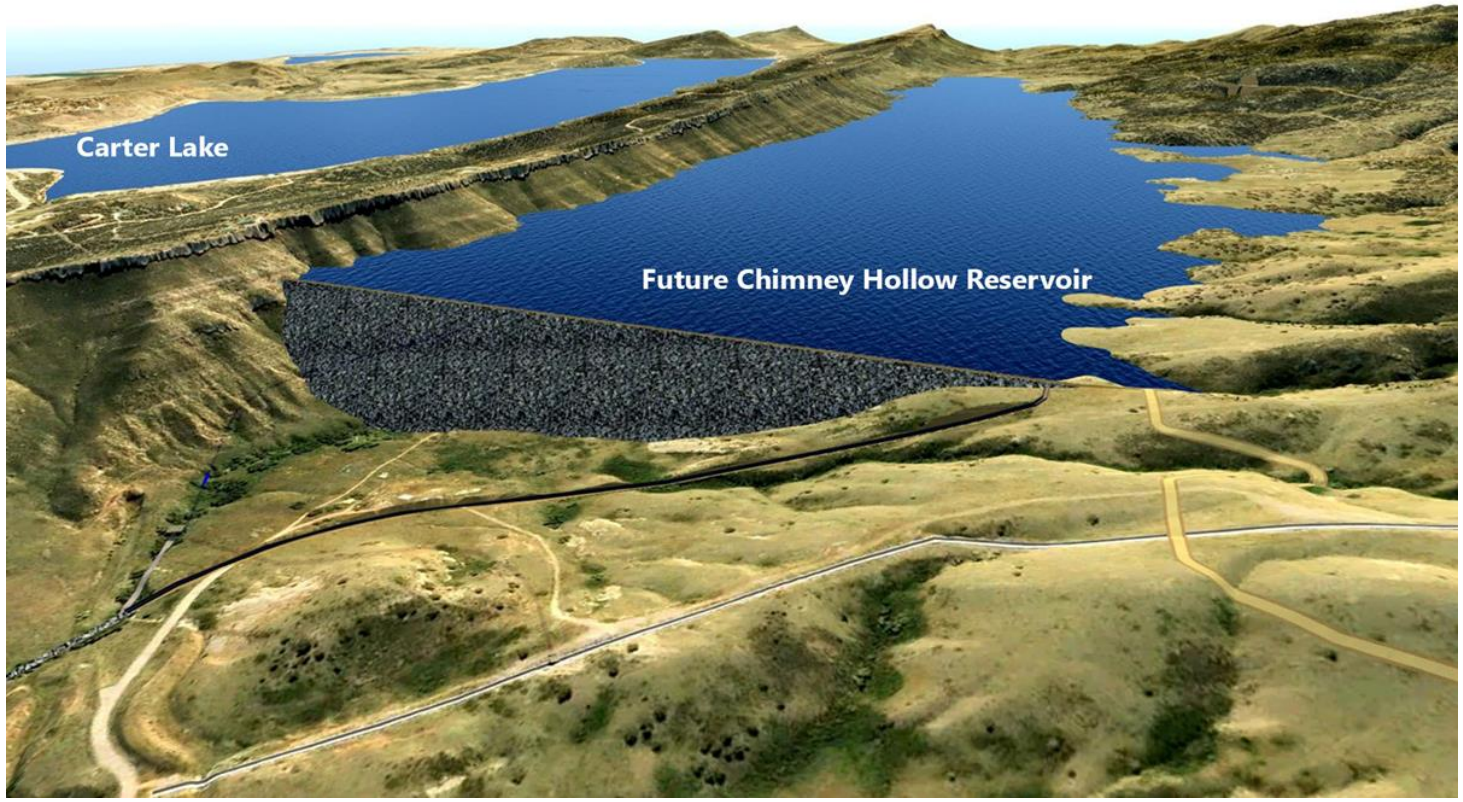
Water supply update

- Snowpack conditions
  - Colorado headwaters
    - Peak – 107% of average
    - Current – 98% of average
  - C-BT and Windy Gap forecast
    - Below-average runoff – 90% of average
    - Lake Granby will spill
    - Windy Gap will not pump



Reservoir update

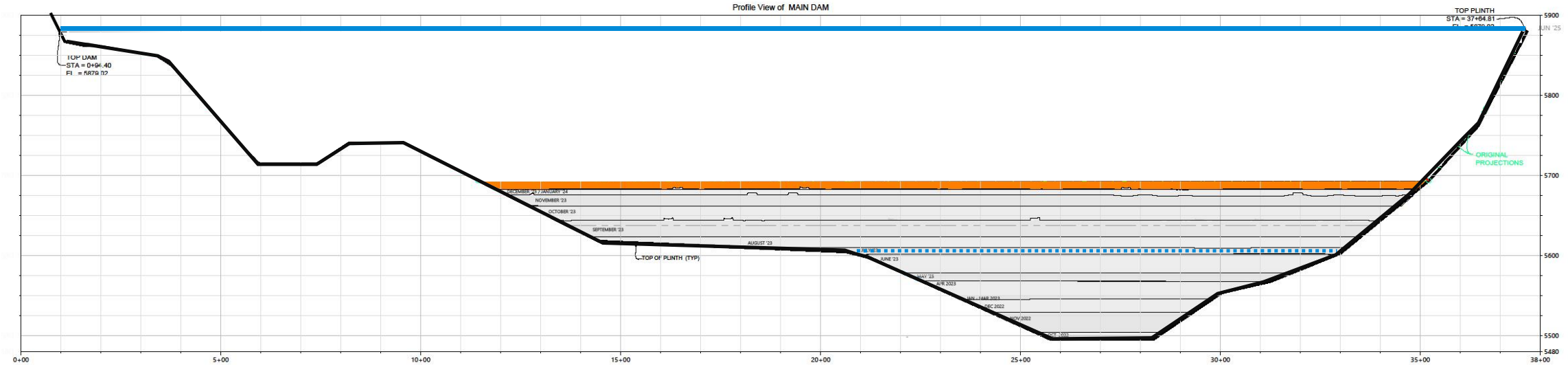
Chimney Hollow reservoir



Reservoir update

Chimney Hollow reservoir

- Main Dam update
  - 185 feet tall (final height is 350 feet); increasing at 3.75 feet/week
  - Double shift work has resumed: two 12-hour shifts, six days per week



Reservoir update

Chimney Hollow reservoir

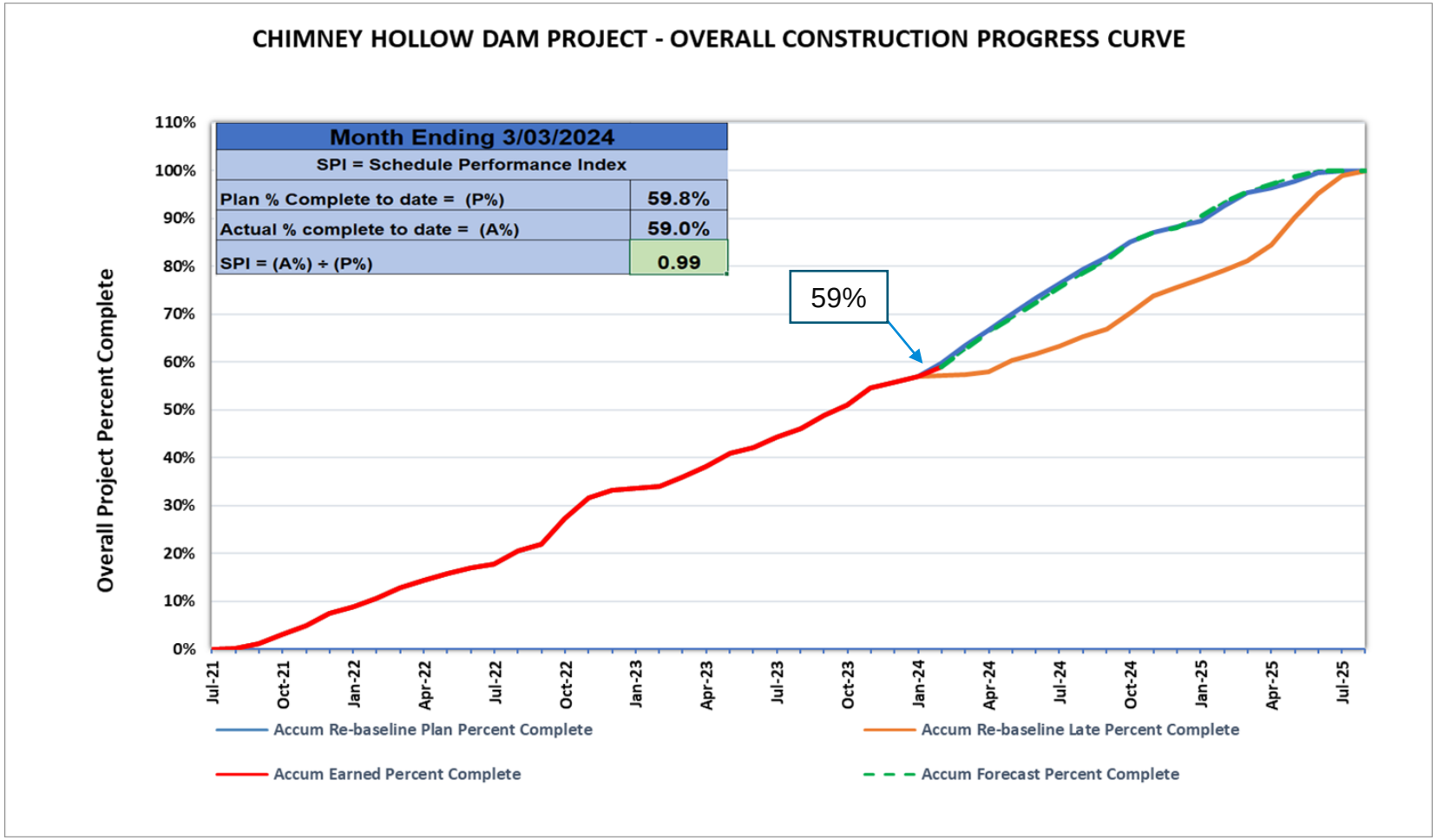
- An inlet/outlet tunnel will house a pipeline used to fill the reservoir and make deliveries to water users
- Tunnel excavation started on the downstream portion in April 2022, then moved to the upstream portion seven months later
- The two portions of the tunnel were connected on March 15

A roadheader was used to hole through and connect the upstream and downstream tunnel sections.

Reservoir update

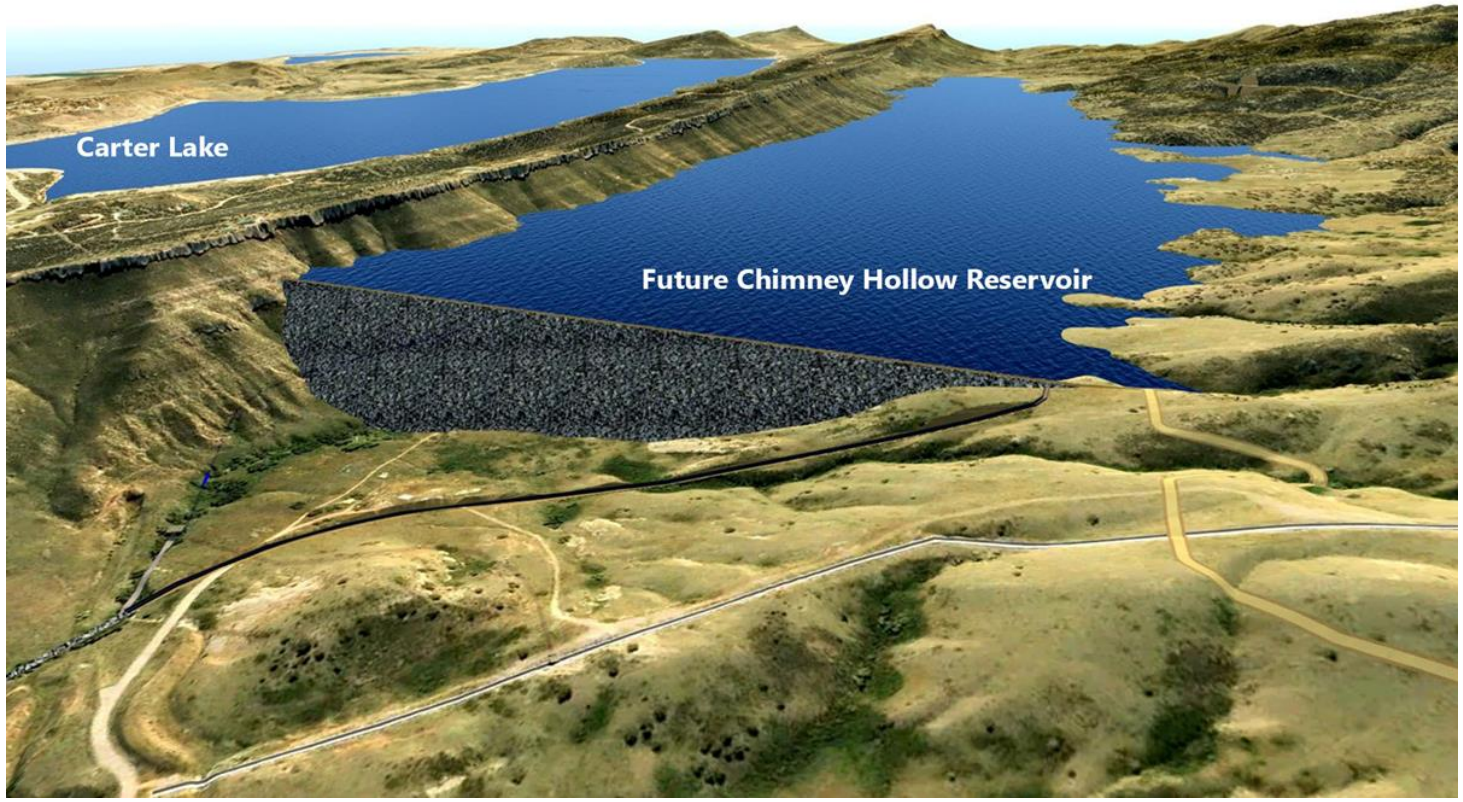
Chimney Hollow reservoir

- Schedule performance
  - 59% complete as of March 3, 2024
- Target completion: Fall 2025



Reservoir update

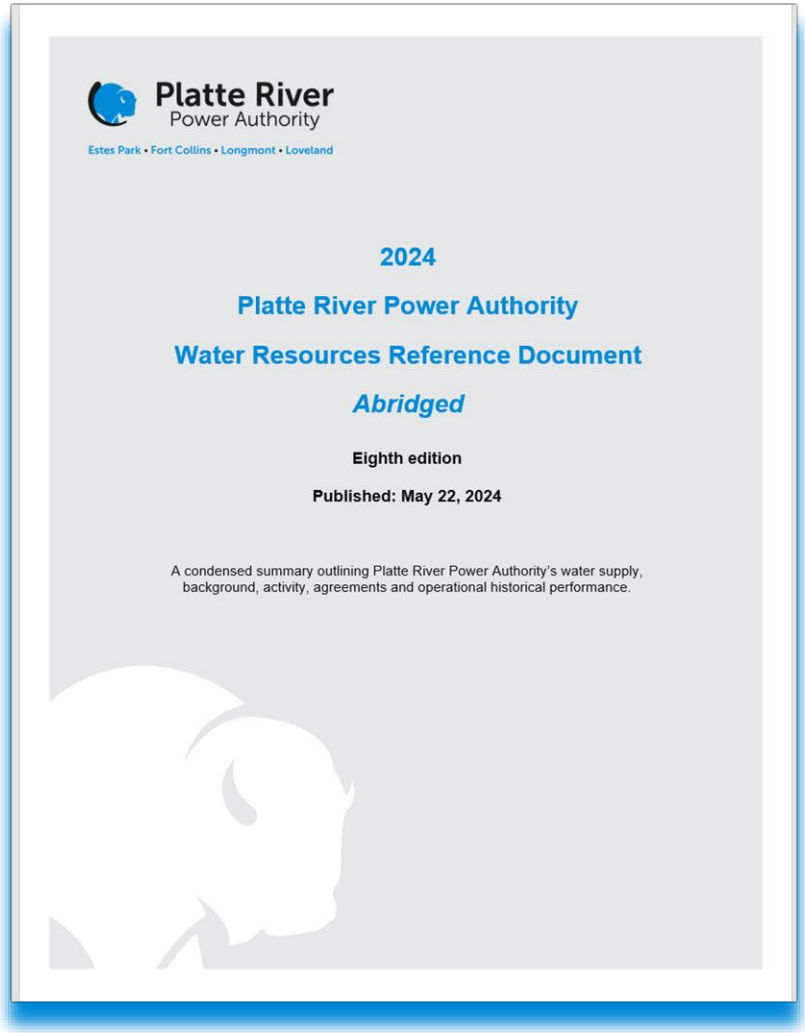
Chimney Hollow reservoir



Reservoir update

Water resources reference document

New condensed version coming in May…stay tuned!



Questions

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Board of Directors

April 25, 2024

IRP community engagement update

Eddie Gutiérrez, chief strategy officer

Upcoming Council and board presentations

- Estes Park
  - Town Board: July 9
- Fort Collins
  - Energy Board: August 8
  - Council: August 13
- Longmont
  - Council: June 25
  - Sustainability Advisory Board: August 21
- Loveland
  - Utilities Commission: July 17
  - Council: July 23

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April 25, 2024

March operational results

Owner community load	Budget	Actual	Variance	% variance	
Owner community demand	447 MW	412 MW	(35 MW)	(7.8%)	■
Owner community energy	263 GWh	250 GWh	(13 GWh)	(5.0%)	■
Net variable cost* to serve owner community energy	$5.1M	$4.1M	($1.0M)	(16.0%)	●
	$19.48/MWh	$16.37/MWh	($3.11/MWh)		

*Net variable cost = total resource variable costs + purchased power costs - sales revenue

Market impacts to net variable cost

Downward pressure	
Generation and market outcomes pushing costs lower	
Coal generation fuel savings	$1.2M
Lower wind generation volume	$0.80M

Upward pressure	
Generation and market outcomes pushing costs higher	
Lower bilateral and market sales volume	$0.91M
Higher market purchases pricing	$0.49M

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

YTD operational results

Owner community load	Budget	Actual	Variance	% variance	
Owner community demand	1,423 MW	1,389 MW	(34 MW)	(2.4%)	■
Owner community energy	811 GWh	787 GWh	(24 GWh)	(3.0%)	■
Net variable cost* to serve owner community energy	$15.2M	$12.4M	($2.8M)	(16.0%)	●
	$18.80/MWh	$15.78/MWh	($3.02/MWh)		

*Net variable cost = total resource variable costs + purchased power costs - sales revenue

Market impacts to net variable cost

Downward pressure	
Generation and market outcomes pushing costs lower	
Coal generation fuel savings	$2.4M
Lower wind generation volume	$2.0M

Upward pressure	
Generation and market outcomes pushing costs higher	
Lower bilateral and market sales volume	$2.0M
Higher market purchases pricing	$0.75M

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

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Board of Directors

April 25, 2024

Financial summary

Category	March variance from budget ($ in millions)		YTD variance from budget ($ in millions)	
Net income	$3.0	●	$4.3	●
Fixed obligation charge coverage	.80x	●	.46x	●
Revenues	$(0.9)	■	$(1.9)	■
Operating expenses	$3.5	●	$6.8	●
Capital additions	$2.3	●	$11.7	●

2% ● Favorable | 2% to -2% ◆ At or near budget | < -2% ■ Unfavorable

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