Platte River Power Authority’s path to a zero-carbon future

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About
Platte River Power Authority

Platte River Power Authority is a not-for-profit wholesale electricity generation and transmission provider that delivers safe, reliable, environmentally responsible and financially sustainable energy and services to its owner communities of Estes Park, Fort Collins, Longmont and Loveland for delivery to their utility customers.

**Began operations:** 1973

**General manager:** Jason Frisbie

**Governance:** Platte River is governed by an eight-person board of directors designed to bring relevant expertise to the decision-making process. The board includes two members from each of the owner communities.

**The organization:** Platte River is a not-for-profit political subdivision of the State of Colorado

**Employees:** 252

**Peak municipal demand:** 688 MW on July 10, 2018

**Projected deliveries of energy (2019):** 4,273,534 MWh

**Projected deliveries of energy to owner communities (2019):** 3,229,726 MWh

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**Our vision**

To be a respected leader and responsible power provider improving the region’s quality of life through a more efficient and sustainable energy future.

**Our mission**

While driving utility innovation, Platte River will safely provide reliable, environmentally responsible and financially sustainable energy and services to the owner communities of Estes Park, Fort Collins, Longmont and Loveland.

**Our values**

- Safety
- Operational excellence
- Integrity
- Sustainability
- Service
- Respect
- Innovation
Current generation portfolio

- Rawhide Unit 1 (coal/baseload) 280 MW
- Rawhide Units A-F (natural gas/peaking) 388 MW
- Craig Units 1 & 2 (18% interest/coal) 151 MW
- WAPA hydropower 90 MW
- Rawhide solar (PPA) 30 MW
- Wind generation (PPAs) 78 MW
- **TOTAL:** 1,017 MW
Evolution of generation resources

<table>
<thead>
<tr>
<th>Baseload resources</th>
<th>First in Colorado to provide wind</th>
<th>Peaking units</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 MW</td>
<td>6 MW</td>
<td>388 MW</td>
</tr>
<tr>
<td>1979-80 Craig 1 &amp; 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>151 MW</td>
<td></td>
<td></td>
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<tr>
<td>1984 Rawhide Unit 1</td>
<td></td>
<td></td>
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<tr>
<td>250 MW</td>
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</table>

Unit 1 will close 12/31/25
Evolution of generation resources

Non-carbon energy

- **2009**: Silver Sage (12 MW)
- **2014**: Spring Canyon (60 MW)
- **2016**: Rawhide Flats (30 MW)
- **2020**: Roundhouse (225 MW)
- **2020**: Rawhide Prairie (20 MW, 2 MWh storage)
Projected deliveries to owner communities

**2019**
Approx. 30% non-carbon

- Coal: 65%
- Wind: 18%
- Hydro: 8%
- Solar: 6%
- Purchases: 2%
- Natural gas: 1%

**2021**
Approx. 50% non-carbon

- Coal: 48%
- Wind: 28%
- Hydro: 19%
- Solar: 3%
- Purchases: 1%
- Natural gas: 1%
Regulatory climate change

2007 Colorado adopts a renewable portfolio standard requiring municipal utilities serving more than 40,000 customers to generate 10% of their electricity from renewable sources (C.R.S. § 40-2-124)

2019 Colorado adopts carbon reduction “targets” for retail utilities providing service to 500,000 customers

• 80% reduction of carbon dioxide emissions “associated” with retail sales from 2005 levels by 2030
• 100% “clean energy” by 2050 if “technically and economically feasible [and] in the public interest”
Zero Net Carbon (ZNC) modeling

- In July 2017, Platte River’s Board of Directors approved a study focused on modeling a 100% non-carbon resource scenario for all four owner communities.

- The initial study was based on a zero net carbon (ZNC) model, a portfolio consisting of excess carbon-free (or lower carbon) generation that, when sold in a market, can offset carbon produced by fossil fuel-fired generation.

- Platte River retained Pace Global, a Siemens business, to provide an independent assessment of the feasibility of Platte River achieving and maintaining a zero net carbon generation supply portfolio by 2030.
Key assumptions

- All coal generation to be retired by 2030
- Maintain required resource adequacy / reserve margin of 15%
- Maintain existing hydro power positions
- Maintain existing renewable positions and add as necessary to meet ZNC targets
- Retain existing CTs as a “free capacity option”; however, the units are not required to run
- Battery peak credit of 75% for 4-hour lithium ion battery
- Determine the least-cost feasible generation mix that achieves the ZNC target considering a range of technology options (e.g. solar, wind, gas combined cycle, combustion turbines, reciprocating engines, lithium ion battery storage)
# Study process

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Define “market” carbon emission rate – 1,803 lb/MWh based on the market today</th>
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</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Assume an initial renewable energy requirement as a percent of load</td>
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<td>Step 3</td>
<td>Determine the least-cost portfolio that meets Platte River’s defined reserve margin requirements (15%)</td>
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<td>Step 4</td>
<td>Determine if ZNC requirement is met in 2030 and beyond</td>
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<td>Step 5</td>
<td>Adjust renewable energy requirement as a percent of load and repeat steps 3 and 4 until the ZNC requirement is met</td>
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</table>
ZNC study conclusions

• ZNC could be implemented but will require investment, higher cost and additional market risk.
• Platte River would serve about 75% of load with zero carbon generation and would offset the remaining 25% with sales of zero carbon generation to the market.
• Platte River would buy about 600 MW of solar and 350 MW of wind by 2030 and build about 286 MW of new gas-fired generation.
• Lithium ion battery storage is not economic for meeting firming and capacity needs at this time.
• Higher rates (~ 20%) would be required to achieve a ZNC portfolio.
ZNC study flaws

• Does not eliminate carbon emissions, nets out carbon by selling to third parties
• Creates significant inefficiencies due to required overbuild of generation resources
• Assumes unlimited access to a market and willing buyers at market rates
Resource Diversification Policy

• Platte River’s Board of Directors adopted a policy in December 2018 directing staff to work towards a goal of a 100% non-carbon resource mix by 2030.

• The policy requires Platte River to maintain its core pillars of reliable, environmentally responsible and financially sustainable generation.

• The policy incorporates contingencies that must be satisfied in light of market and technological constraints.
Contingencies to meet zero carbon goal

- Participation in an organized regional market
- Battery storage must improve and costs decline
- Other storage solutions, including end-user storage, must be incorporated
- Transmission and distribution infrastructure must be improved and better integrated
- Grid management systems must advance and improve
- Rate structures must be developed to facilitate system integration
What we are doing now

- Accelerating our required 5-year integrated resource plan, taking into account zero carbon and zero coal options
- Expanding participation in the Joint Dispatch Agreement and pursuing membership in the CAISO Western Energy Imbalance Market
- Aggressively pursuing renewable resources, including an additional 150 MW of solar generation
- Entering into short-term market transactions to sell the output of available resources until they can be fully integrated into our system