

# 2023 IRP Overview

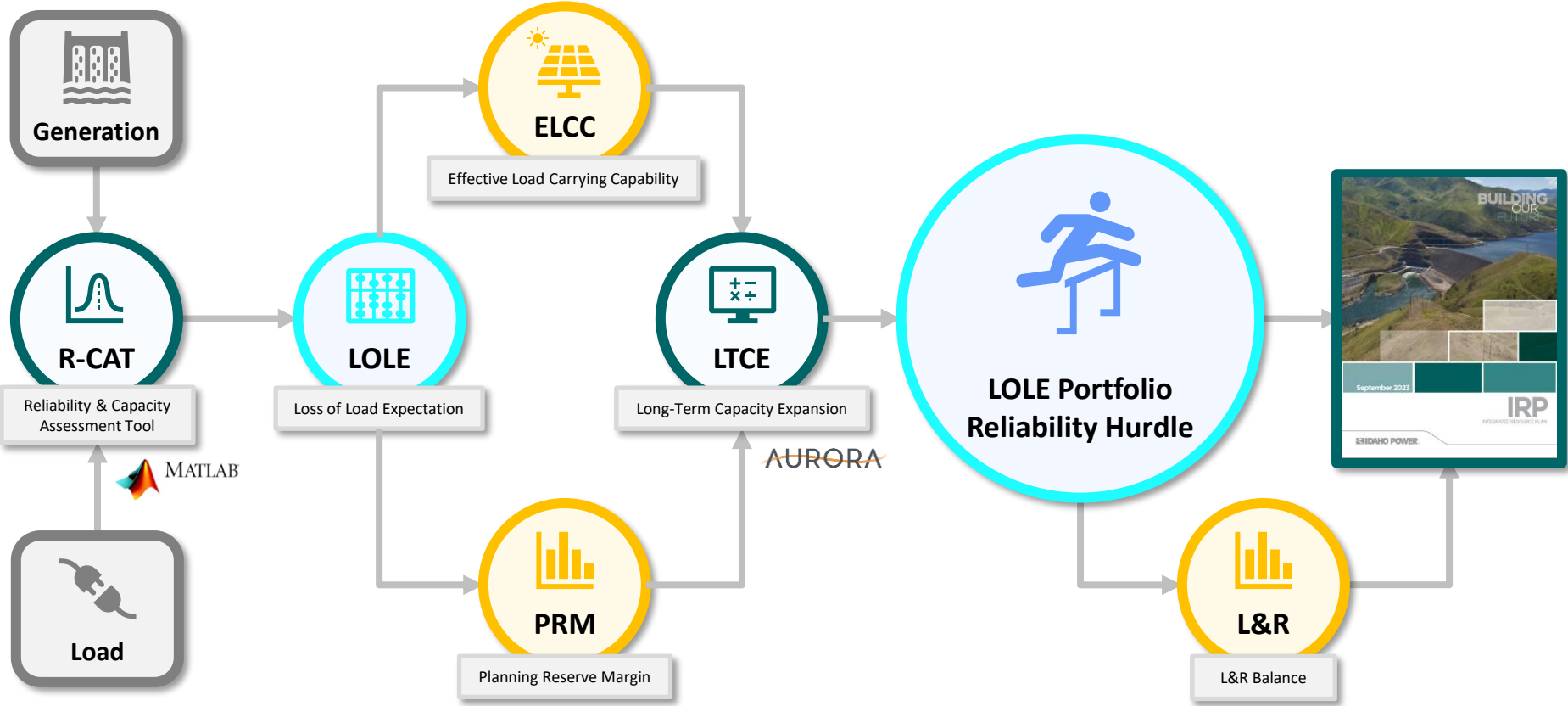
Jared Hansen  
Jared Ellsworth



# Schedule

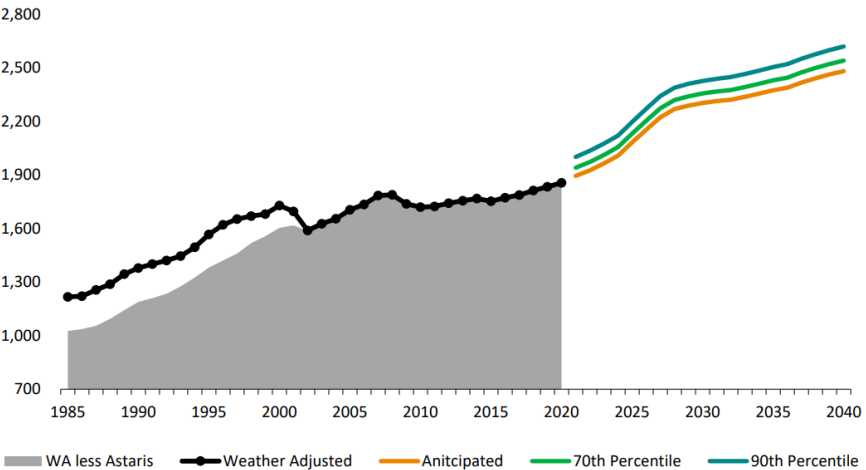
| Meeting                                | Date           | Topics                                                                     |
|----------------------------------------|----------------|----------------------------------------------------------------------------|
| Energy Efficiency Subcommittee Meeting | May 4, 2022    | Energy Efficiency                                                          |
| IRPAC Meet & Greet                     | Aug 30, 2022   |                                                                            |
| IRPAC Meeting #1                       | Sept 8, 2022   | 2021 IRP Review, 2023 IRP Overview, Carbon Outlook, Transmission Update    |
| IRPAC Meeting #2                       | Oct 13, 2022   | Forecasts (Natural Gas, CSPP, Energy & Demand)                             |
| IRPAC Meeting #3                       | Nov 10, 2022   | Hydro System, EE, DR, Future Supply-Side Resources, Modeling Scenarios     |
| IRPAC Meeting #4                       | Dec 8, 2022    | Reliability & Capacity Assessment, Bridger Coal to Natural Gas Conversion  |
| IRPAC Meeting #5                       | Jan 12, 2023   | T&D Deferral, Solar on Underutilized Lands, Stochastics, Resource Adequacy |
| IRPAC Meeting #6                       | Feb 9, 2024    | Portfolio Development Update                                               |
| IRPAC Meeting #7                       | March 9, 2023  | Analysis Inputs Update, RFP Update                                         |
| IRPAC Meeting #8                       | April 27, 2023 | Analysis Update, Transmission Update                                       |
| IRPAC Meeting #9 Analysis Review       | Aug 15, 2023   | Modeling Update, Preliminary Results                                       |
| IRPAC Meeting #10 Final Results        | Aug 31, 2023   | Analysis Results, Preferred Portfolio and Action Plan                      |

# 2023 IRP Introduces New Methods

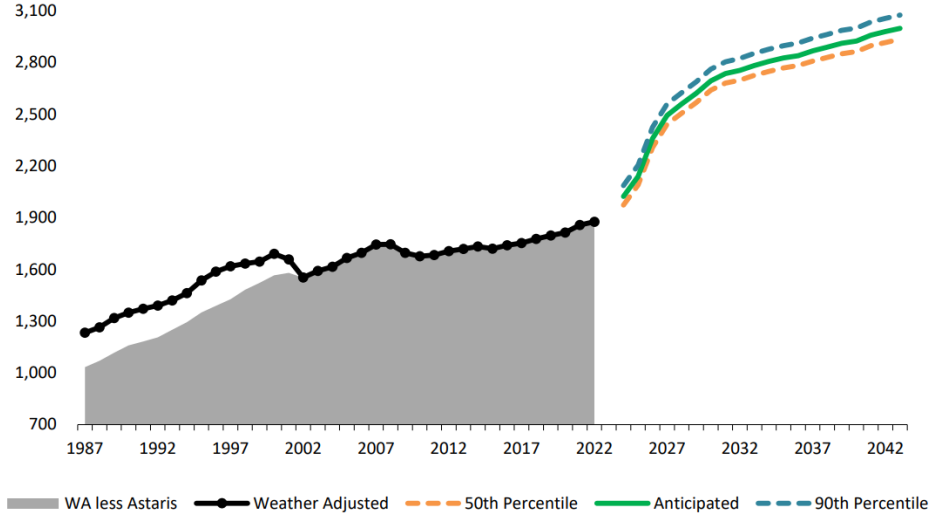


# Load Forecast

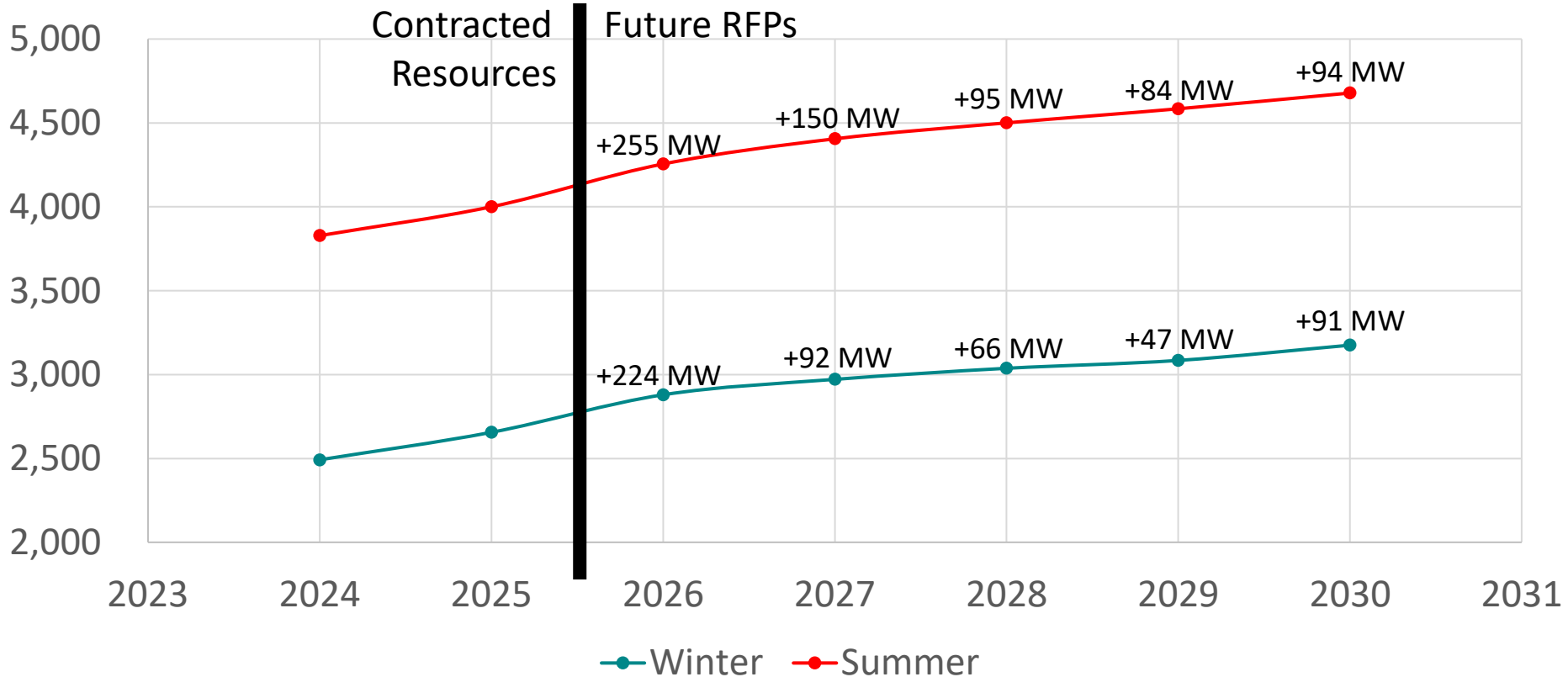
Then: 2021 IRP



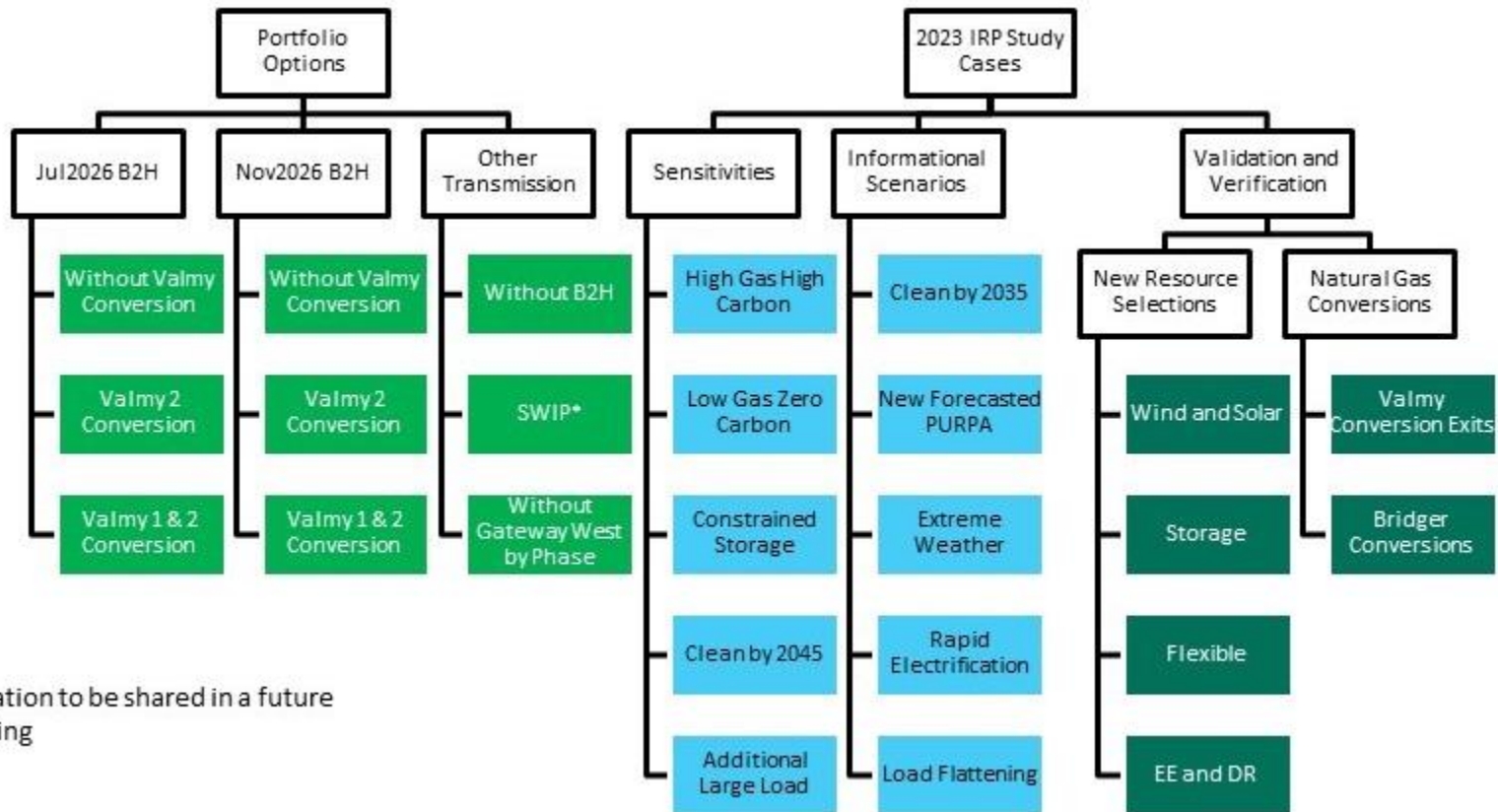
Now: 2023 IRP



# 2023 IRP Load Forecast

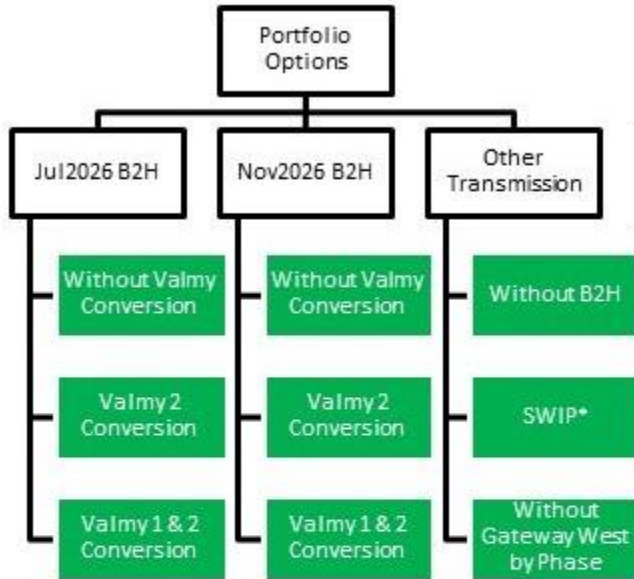


# 2023 IRP Analysis



\*Information to be shared in a future proceeding

# 2023 IRP Analysis



\*Information to be shared in a future proceeding

## 2023 IRP Key Decisions

- B2H
  - Confirm
  - In-service date impacts
- Valmy units 1 & 2 coal-to-gas conversion
- SWIP
- Gateway West

# Resource Comparison Summary

## 2021 IRP Preferred Portfolio

The last coal generation unit exit was planned in 2028.

Emissions gradually reduced to approximately 1.8M short tons of CO<sub>2</sub> by the end of the plan.

The B2H transmission line was identified as a least-cost resource.

The plan included a conversion of Bridger coal units 1 and 2 to natural gas operation.

700 MW of wind plus 1,405 MW of solar were included.  
1,685 MW of battery storage was included.

An additional 100 MW of DR was selected.

A total of 440 MW of cost-effective EE was selected.

GWW was not included.

No new firm capacity generation resources were identified.

## 2023 IRP Preferred Portfolio

Coal generation units have planned conversions to natural gas with the last taking place by 2030.

CO<sub>2</sub> emissions fall to just over 500-k short tons by the end of the plan—less than half the emissions as the previous IRP.

B2H continues to be a least-cost resource.

Bridger units 1, 2, 3, and 4 as well as Valmy units 1 and 2 are identified for a natural gas conversion.

1,800 MW of wind plus 3,325 MW of solar are included.  
1,453 MW of storage was included, including 200 MW of long-duration storage.

An additional 160 MW of DR is selected.

A total of 360 MW of EE is selected.

GWW is identified as necessary for system reliability and to enable incremental renewables.

Two hydrogen peaking units are selected in 2038 to replace the Bridger natural gas converted units.



# 2023 IRP Resources

## Preferred Portfolio—Valmy 1 & 2 (MW)

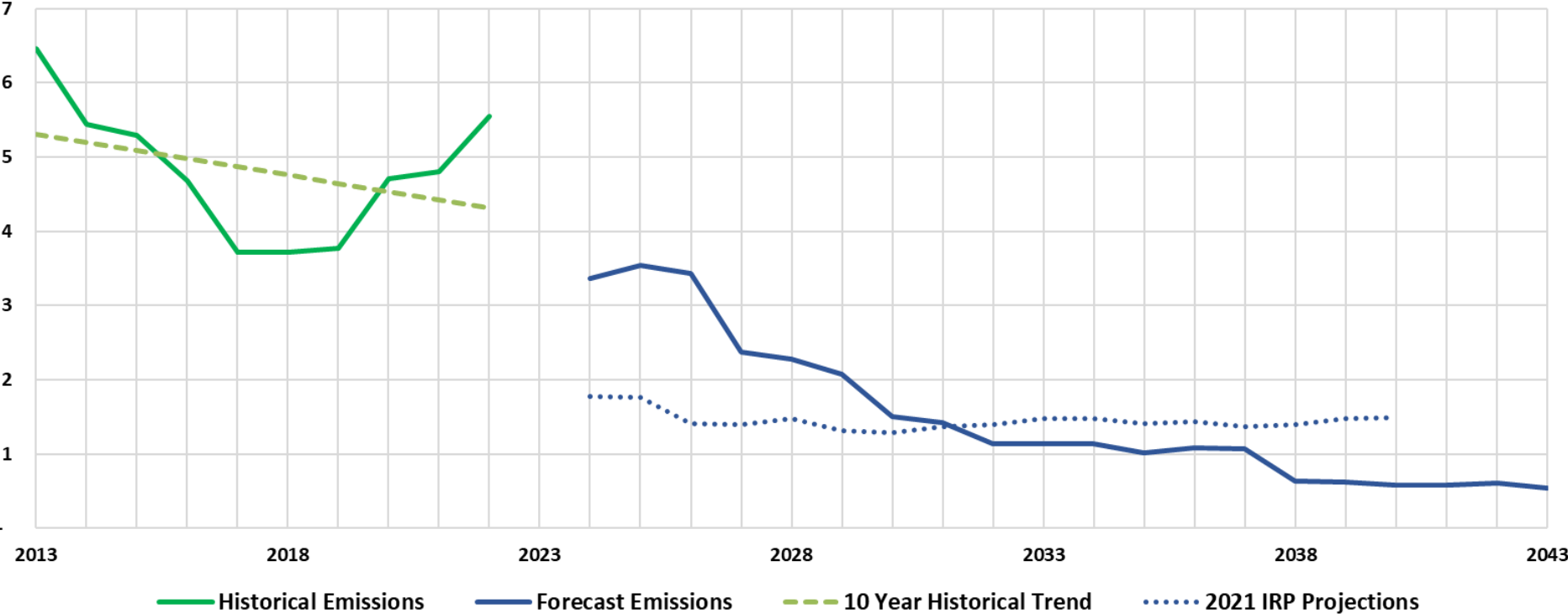
| Year             | Coal Exits | Gas        | H2         | Wind         | Solar        | 4 Hr         | 8 Hr       | 100 Hr     | Trans.  | Geo       | DR         | EE Forecast |
|------------------|------------|------------|------------|--------------|--------------|--------------|------------|------------|---------|-----------|------------|-------------|
| 2024             | -357       | 357        | 0          | 0            | 100          | 96           | 0          | 0          | 0       | 0         | 0          | 17          |
| 2025             | 0          | 0          | 0          | 0            | 200          | 227          | 0          | 0          | 0       | 0         | 0          | 18          |
| 2026             | -134       | 261        | 0          | 0            | 100          | 0            | 0          | 0          | Jul B2H | 0         | 0          | 19          |
| 2027             | 0          | 0          | 0          | 400          | 375          | 5            | 0          | 0          | 0       | 0         | 0          | 20          |
| 2028             | 0          | 0          | 0          | 400          | 150          | 5            | 0          | 0          | 0       | 0         | 0          | 21          |
| 2029             | 0          | 0          | 0          | 400          | 0            | 5            | 0          | 0          | GWW1    | 0         | 20         | 22          |
| 2030             | -350       | 350        | 0          | 100          | 500          | 155          | 0          | 0          | 0       | 30        | 0          | 21          |
| 2031             | 0          | 0          | 0          | 400          | 400          | 5            | 0          | 0          | GWW2    | 0         | 0          | 21          |
| 2032             | 0          | 0          | 0          | 100          | 100          | 205          | 0          | 0          | 0       | 0         | 0          | 20          |
| 2033             | 0          | 0          | 0          | 0            | 0            | 105          | 0          | 0          | 0       | 0         | 20         | 20          |
| 2034             | 0          | 0          | 0          | 0            | 0            | 5            | 0          | 0          | 0       | 0         | 40         | 19          |
| 2035             | 0          | 0          | 0          | 0            | 0            | 5            | 0          | 0          | 0       | 0         | 40         | 18          |
| 2036             | 0          | 0          | 0          | 0            | 0            | 5            | 0          | 0          | 0       | 0         | 40         | 17          |
| 2037             | 0          | 0          | 0          | 0            | 0            | 55           | 50         | 0          | 0       | 0         | 0          | 17          |
| 2038             | 0          | -706       | 340        | 0            | 0            | 155          | 50         | 200        | 0       | 0         | 0          | 17          |
| 2039             | 0          | 0          | 0          | 0            | 0            | 5            | 50         | 0          | 0       | 0         | 0          | 15          |
| 2040             | 0          | 0          | 0          | 0            | 400          | 5            | 0          | 0          | GWW3    | 0         | 0          | 14          |
| 2041             | 0          | 0          | 0          | 0            | 200          | 5            | 0          | 0          | 0       | 0         | 0          | 14          |
| 2042             | 0          | 0          | 0          | 0            | 200          | 55           | 0          | 0          | 0       | 0         | 0          | 14          |
| 2043             | 0          | 0          | 0          | 0            | 600          | 0            | 0          | 0          | 0       | 0         | 0          | 14          |
| <b>Sub Total</b> | <b>841</b> | <b>261</b> | <b>340</b> | <b>1,800</b> | <b>3,325</b> | <b>1,103</b> | <b>150</b> | <b>200</b> |         | <b>30</b> | <b>160</b> | <b>360</b>  |

**Total 6,888**

| Year | Units       | Event         |
|------|-------------|---------------|
| 2024 | Bridger 1&2 | NG Conversion |
| 2026 | Valmy 1&2   | NG Conversion |
| 2030 | Bridger 3&4 | NG Conversion |
| 2038 | Bridger 1-4 | End of Life   |

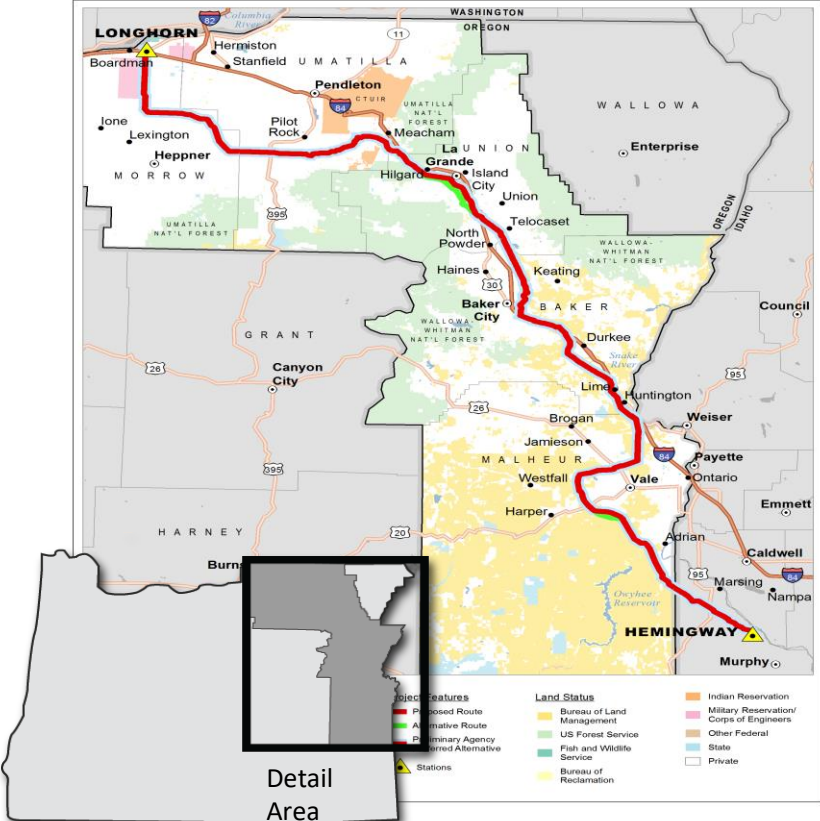
# Emissions

Total CO2 Emissions (Million Metric Tons)



# Boardman to Hemingway

(B2H) Project



Detail Area

# B2H Ownership Following 2023 Agreements



|       | W→E Capacity | E→W Capacity |
|-------|--------------|--------------|
| (45%) | 750 MW       | 180 MW       |

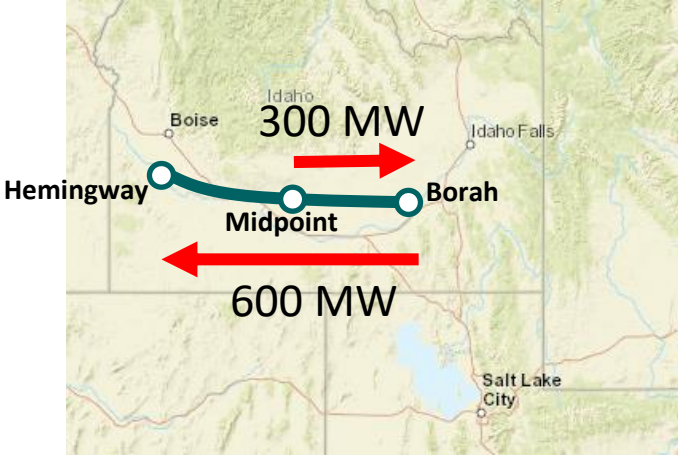


|       |        |        |
|-------|--------|--------|
| (55%) | 300 MW | 820 MW |
|-------|--------|--------|

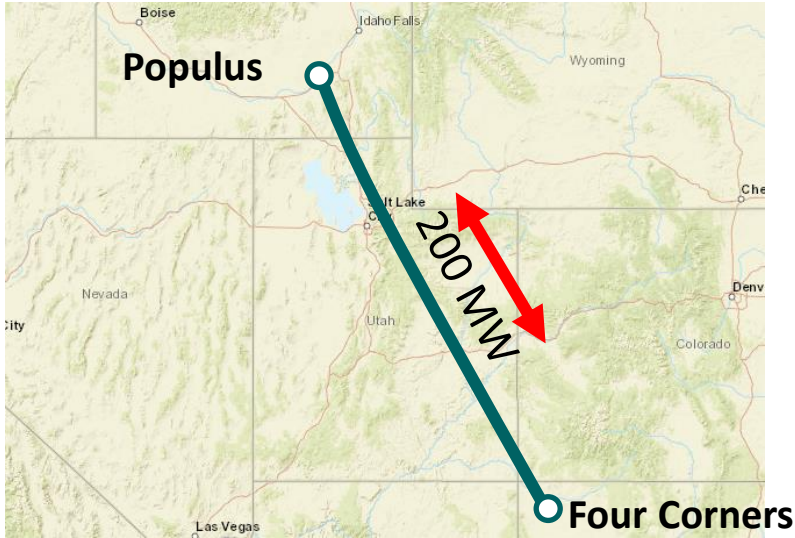
# Idaho Power — PacifiCorp

## Transaction Joint Purchase and Sale Agreement

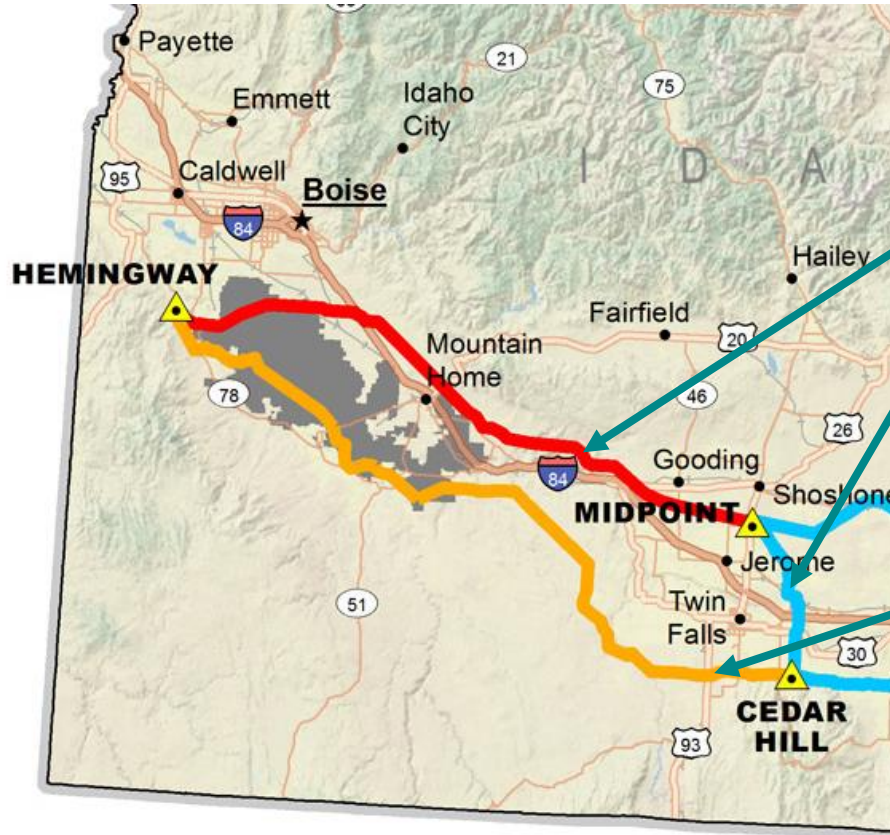
Idaho Power to PacifiCorp (Assets)



PacifiCorp to Idaho Power (Assets)



# Gateway West Evaluation



Gateway West  
Phase 1

Gateway West  
Phase 2

# Transmission Value

## Boardman to Hemingway

- Preferred Portfolio (with B2H) Net Present Value (NPV)—\$9,746 million
- Portfolio without B2H Portfolio NPV—\$10,582 million
- B2H NPV Cost Effectiveness Differential—\$836 million

## Gateway West

- Preferred Portfolio (with GWW) NPV—\$9,746 million
- Portfolio without GWW NPV—\$10,326 million
- GWW NPV Cost Effectiveness Differential—\$580 million

# B2H Timing Value

Preferred Portfolio (June 2026 B2H) Net Present Value (NPV)—\$9,746 million

Portfolio with B2H in November 2026 NPV—\$9,767 million

B2H Timing Differential—\$21 million



# 2023 IRP Near-Term Action Plan

Table 1.3 Near-Term Action Plan (2024–2028)

| Year        | Action                                                                                                                            |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 2023–2024   | Continue exploring potential participation in the SWIP-N project                                                                  |
| 2024        | Add 100 MW of solar and 96 MW of four-hour storage                                                                                |
| Summer 2024 | Convert Bridger units 1 and 2 from coal to natural gas                                                                            |
| 2024–2028   | Add 95 MW of cost-effective EE between 2024 and 2028                                                                              |
| 2024–2028   | Explore a 5 MW long-duration storage pilot project                                                                                |
| 2025        | Add 200 MW of solar                                                                                                               |
| 2025        | Add 227 MW of four-hour storage                                                                                                   |
| 2025–2028   | Install cost effective distribution-connected storage                                                                             |
| Summer 2026 | Bring B2H online                                                                                                                  |
| Summer 2026 | Convert Valmy units 1 and 2 from coal to natural gas                                                                              |
| 2026–2028   | If economic, acquire up to 1,425 MW of combined wind and solar, or other economic resources                                       |
| 2027        | Include 14 MW of capacity associated with WRAP                                                                                    |
| 2028        | Bring the first phase of GWW online (Midpoint–Hemingway #2 500-kV line, Midpoint–Cedar Hill 500-kV line, and Mayfield substation) |

# Reliability Threshold Adjustment

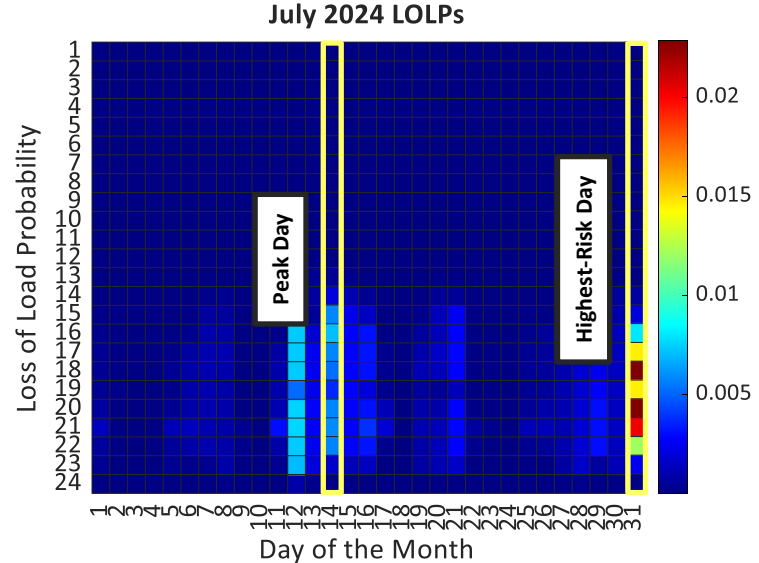
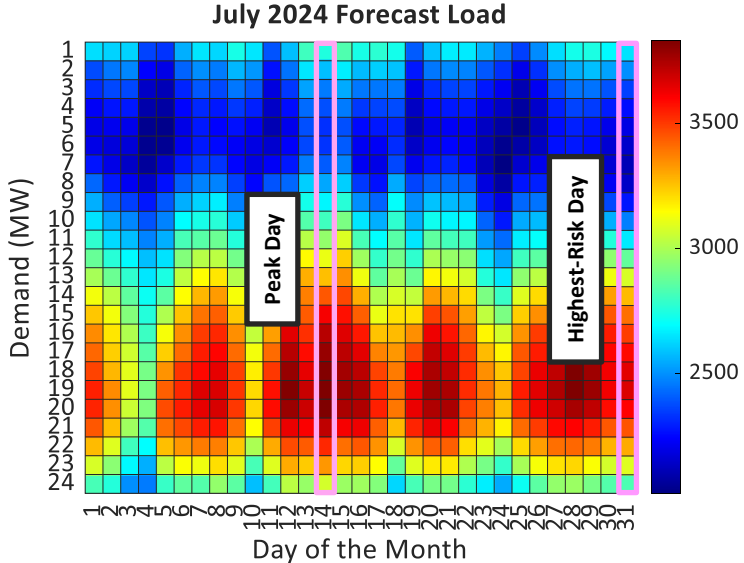
Then: 2021 IRP

LOLE = 0.05 event-days  
per year

Now: 2023 IRP

LOLE = 0.1 event-days  
per year

# L&R Balance Adjustment



| 2024 Day     | Load  | Variable & Energy Limited Resources |      |     |       |     |      |              | Load Minus VERs & ELRs |
|--------------|-------|-------------------------------------|------|-----|-------|-----|------|--------------|------------------------|
|              |       | Solar                               | Wind | RoR | COGEN | DR  | BESS | Solar + BESS |                        |
| Peak Load    | 3,830 | 226                                 | 105  | 195 | 139   | 260 | 76   | 40           | 2,789                  |
| Highest-Risk | 3,653 | 245                                 | 7    | 197 | 131   | 0   | 91   | 40           | 2,942                  |

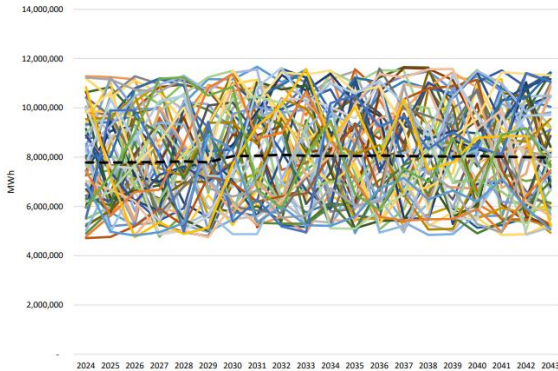
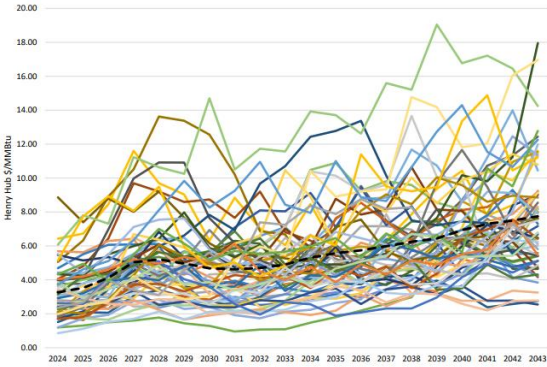
# Capacity Positions

Table 10.6 Preferred Portfolio annual capacity positions (MW)

| Year | July 2026 B2H &<br>Valmy 1 & 2 Gas Conversion |
|------|-----------------------------------------------|
| 2024 | 11 Length                                     |
| 2025 | 3 Length                                      |
| 2026 | 224 Length                                    |
| 2027 | 284 Length                                    |
| 2028 | 211 Length                                    |
| 2029 | 126 Length                                    |
| 2030 | 134 Length                                    |
| 2031 | 131 Length                                    |
| 2032 | 157 Length                                    |
| 2033 | 137 Length                                    |
| 2034 | 126 Length                                    |
| 2035 | 117 Length                                    |
| 2036 | 108 Length                                    |
| 2037 | 111 Length                                    |
| 2038 | 45 Length                                     |
| 2039 | 54 Length                                     |
| 2040 | 62 Length                                     |
| 2041 | 56 Length                                     |
| 2042 | 49 Length                                     |
| 2043 | 57 Length                                     |

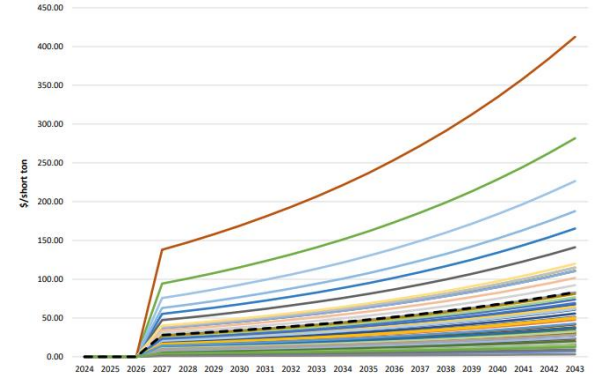
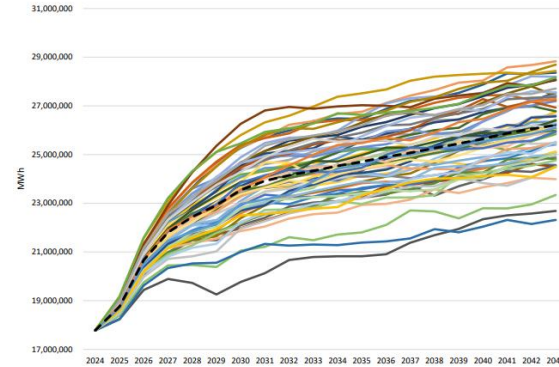
# Stochastic Variables

## Natural Gas Sampling (Nominal \$/MMBtu)



## Hydro Generation Sampling (Annual MWh)

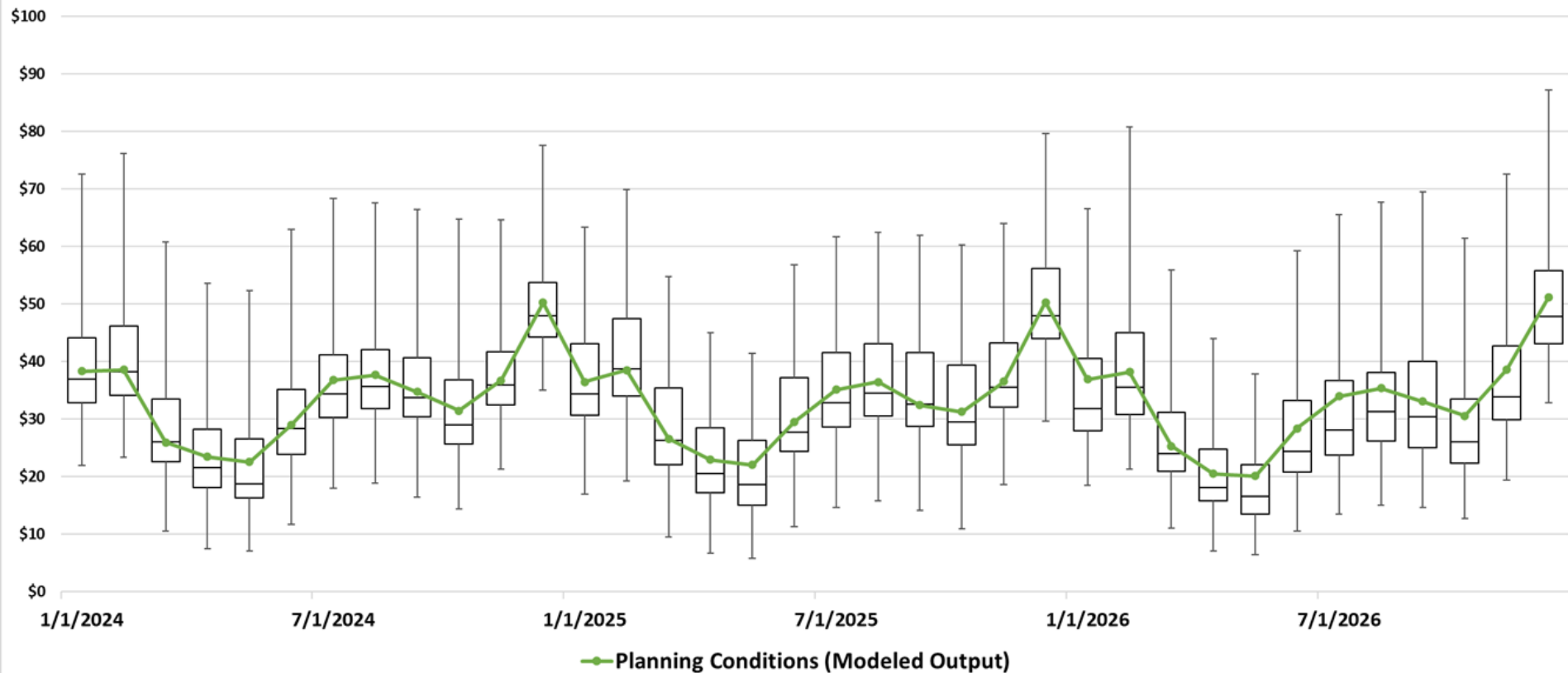
## Customer Load Sampling (Annual MWh)



## Carbon Price Sampling (Annual MWh)

# Market Prices

## Monthly IPC Zonal Prices 2024-2026 (\$/MWh)



# Validation & Verification

**Table 10.4 2023 IRP validation and verification tests**

| <b>Portfolio</b>                  | <b>NPV years 2024–2043 (\$ x 1,000,000)</b> |
|-----------------------------------|---------------------------------------------|
| Preferred Portfolio (Valmy 1 & 2) | \$9,746                                     |
| V&V Without Bridger 3 & 4         | \$9,945                                     |
| V&V Valmy 1 & 2 Early Exit        | \$9,803                                     |
| V&V Wind +30% Cost                | \$10,397                                    |
| V&V Nuclear                       | \$10,013                                    |
| V&V Energy Efficiency             | \$10,042                                    |
| V&V Demand Response               | \$9,816                                     |