

**Jeffery C. Allen**  
Chair  
Idaho

**Ed Schriever**  
Idaho

**Doug Grob**  
Montana

**Mike Milburn**  
Montana



## Northwest **Power** and **Conservation** Council

**KC Golden**  
Vice Chair  
Washington

**Thomas L (Les) Purce**  
Washington

**Ginny Burdick**  
Oregon

**Louie Pitt, Jr.**  
Oregon

January 3, 2023

### **MEMORANDUM**

**TO: Power Committee Members**

**FROM: Dylan D'Souza**

**SUBJECT: Idaho Power 2023 Integrated Resource Plan**

#### **BACKGROUND:**

**Presenter:** Jared Ellsworth – Transmission, Distribution and Resource Planning Director  
Ian McGetrick – Senior Resource Planning Analyst

**Summary:** This presentation will summarize the key findings from Idaho Power's 2023 Integrated Resource Plan (IRP).

**Relevance:** The 2023 Integrated Resource Plan is the most recent planning exercise to determine how Idaho Power will serve their customers' needs over the next 20 years. Idaho Power faces increasing loads and transmission constraints, thus their most recent plan features additions of clean resources, conversions of existing resources, transmission additions and improvements, and other preparations to provide adaptability and flexibility. Tracking and understanding where utilities are headed is critical to informing our mid-term assessment and next power plan.

**Workplan:** A.3.2. Coordinate with regional utilities on integrated resource planning and other activities to share plan findings and leverage utility insights and advancements.

**More Info:** <https://www.idahopower.com/energy-environment/energy/planning-and-electrical-projects/our-twenty-year-plan/>

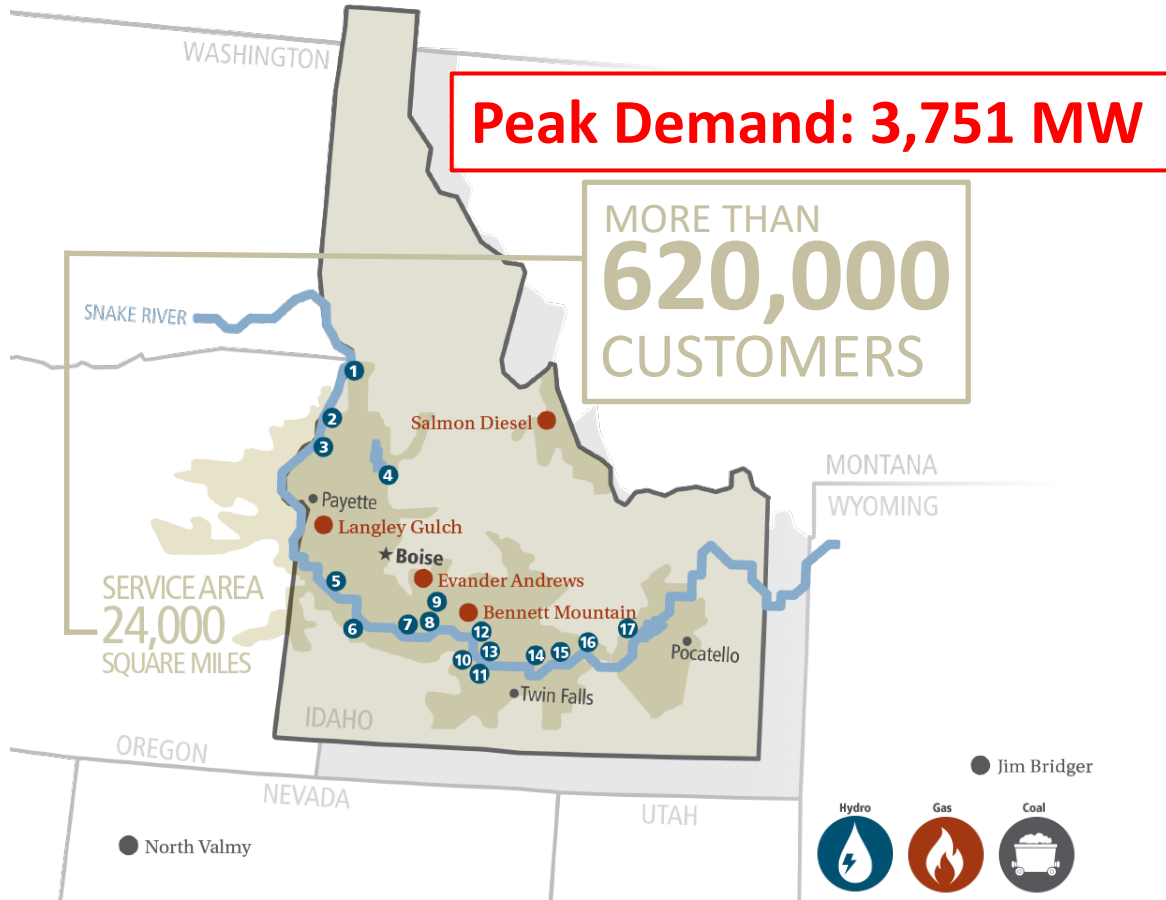
# Idaho Power's 2023 IRP

**Jared Ellsworth** - Transmission, Distribution & Resource Planning Director

**Ian McGetrick** - Senior Resource Planning Analyst



# Communities We Serve



1	Hells Canyon	391,500 kW
2	Oxbow	190,001 kW
3	Brownlee	675,000 kW
4	Cascade	12,420 kW
5	Swan Falls	27,170 kW
6	C.J. Strike	82,800 kW
7	Bliss	75,038 kW
8	Lower Malad	13,500 kW
9	Upper Malad	8,270 kW
10	Lower Salmon	60,000 kW
11	Upper Salmon	34,500 kW
12	Thousand Springs	6,800 kW
13	Clear Lake	2,500 kW
14	Shoshone Falls	14,729 kW
15	Twin Falls	52,898 kW
16	Milner	59,448 kW
17	American Falls	92,340 kW



# Our Clean-Energy Goal

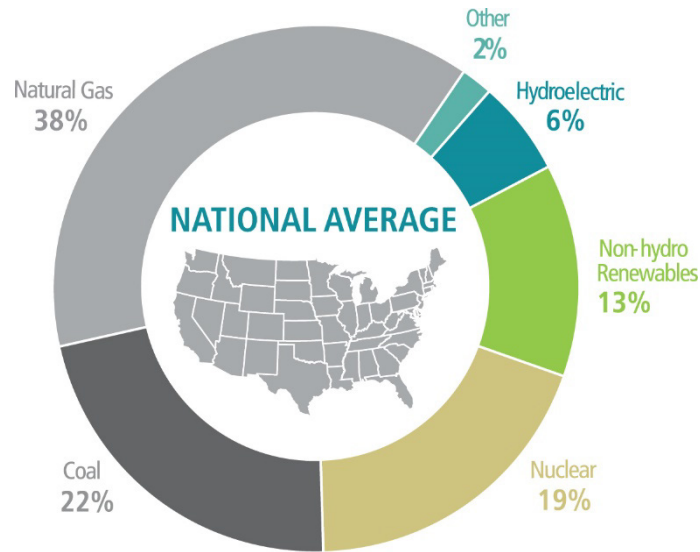
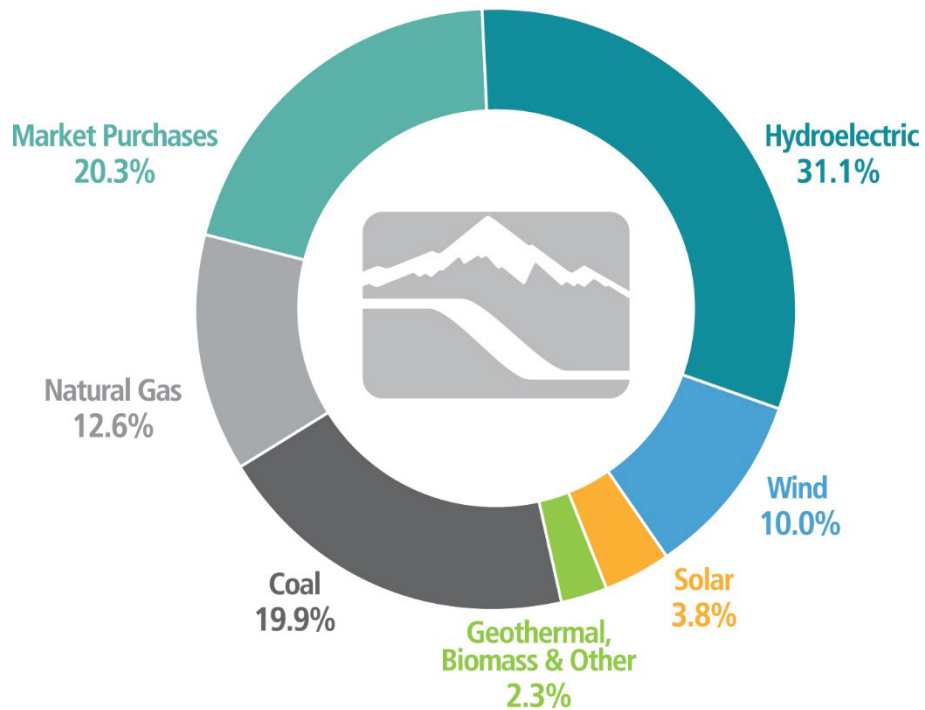
As Idaho Power continues serving customers and communities with **reliable, affordable** energy, we do so with an exciting goal:

Providing  
**100% clean energy by 2045.**

Clean today. **Cleaner tomorrow.**<sup>®</sup>

# Clean Energy

## 2022 Energy Mix





# New Future Demand

Meta Announces Kuna as Location of New Data Center

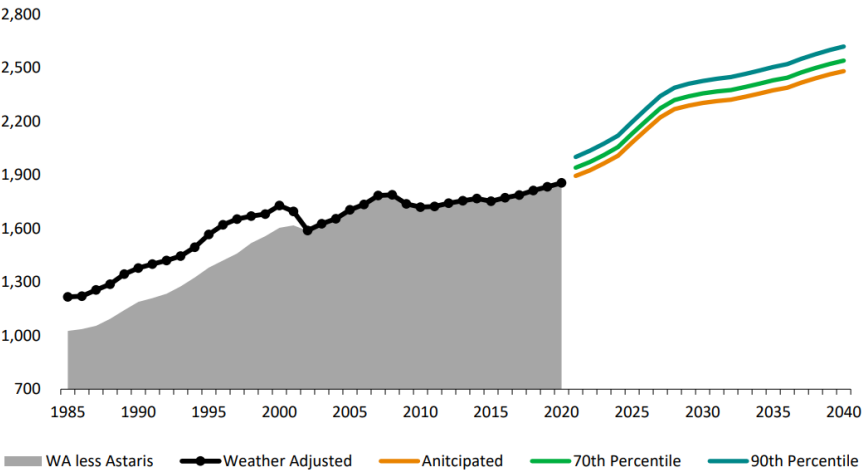


**Micron to Invest 15 Billion in New Idaho Fab, Bringing Leading-Edge Memory Manufacturing to the US**

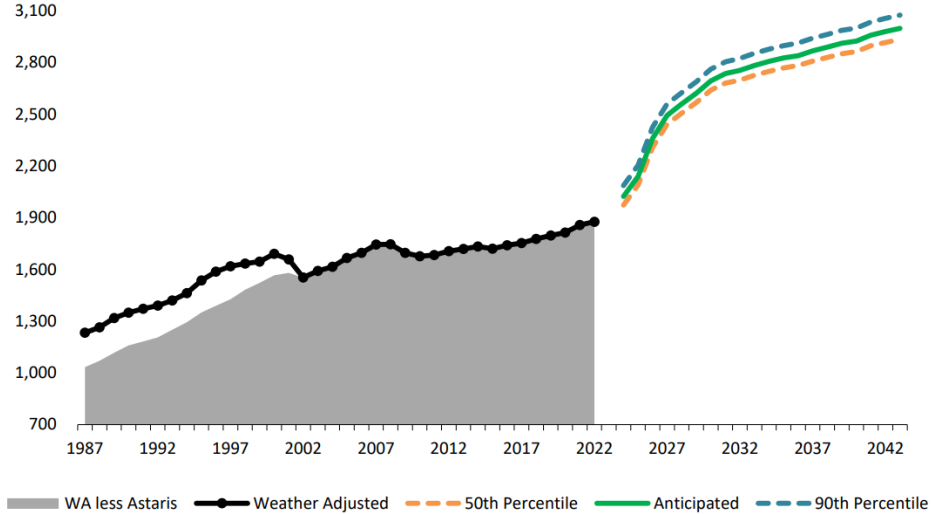


# Load Forecast

Then: 2021 IRP



Now: 2023 IRP

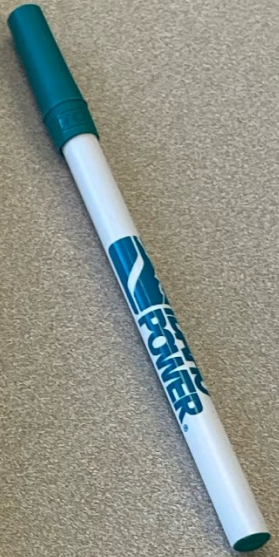




2023 IRP:  
Filed Sept. 29

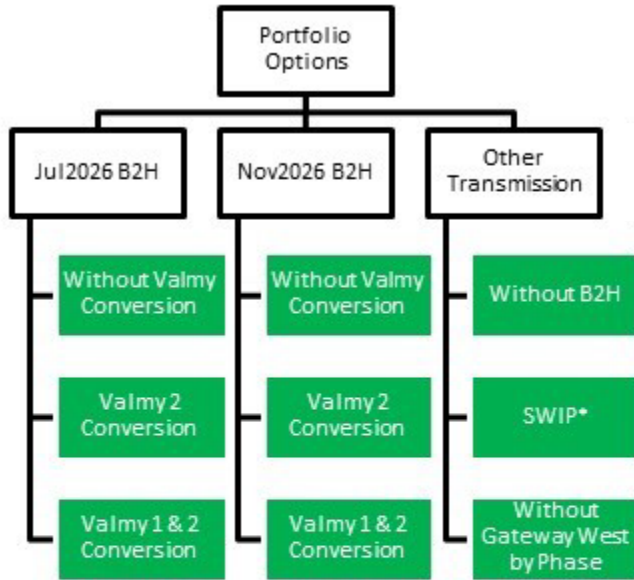


Next Up:  
2025 IRP  
June 2025





# 2023 IRP Analysis



## 2023 IRP Key Decisions

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

\*Information to be shared in a future proceeding

# LTCE Scenarios and Sensitivities

## Scenarios & Sensitivities

Preferred Portfolio Contenders

Informational

Base  
Assumptions

Increased  
Southern  
Transmission

High Carbon  
and High Gas  
Prices

Zero Carbon  
and Low Gas  
Prices

Constrained  
Transmission

Constrained  
Storage

Clean by  
2045

Clean by  
2035

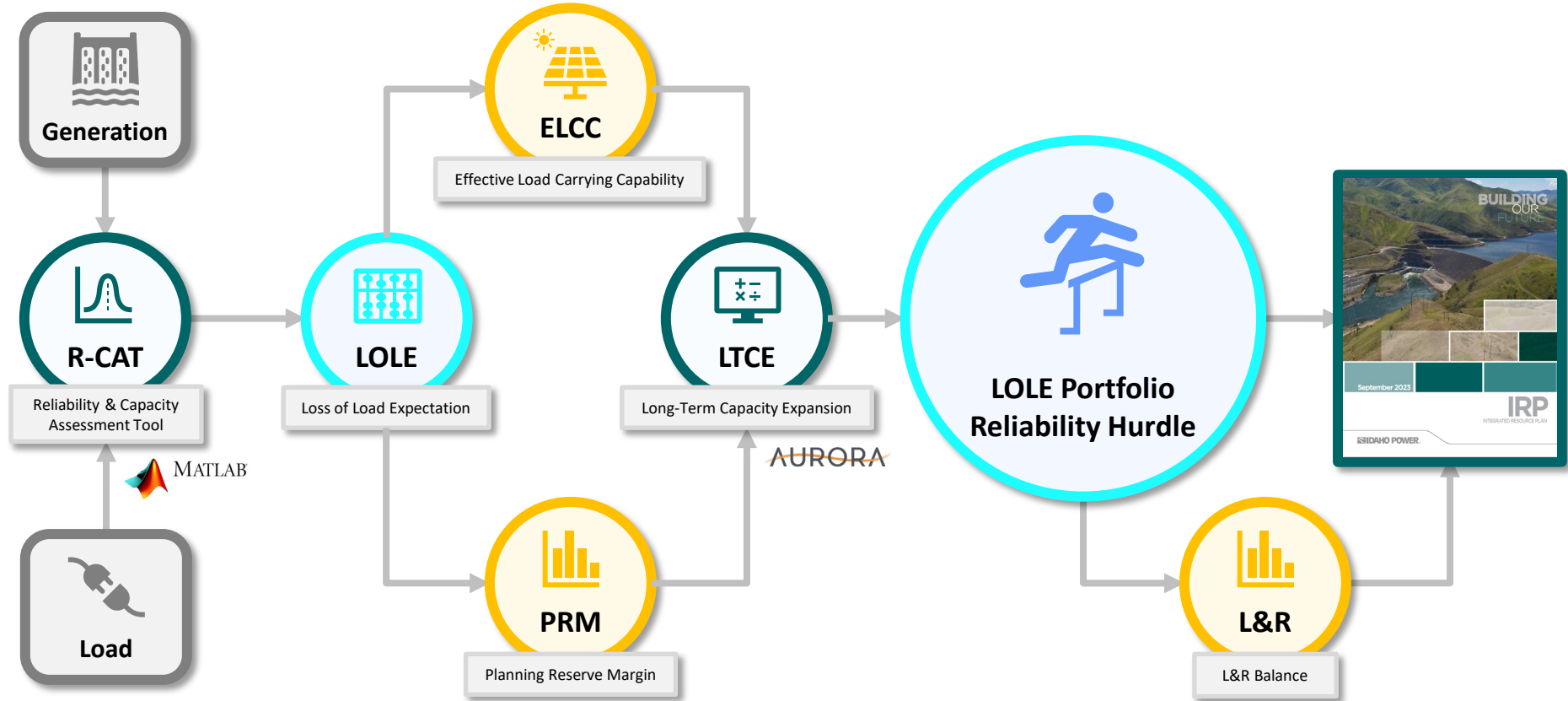
Forecasted  
PURPA  
Projects

Extreme  
Weather

Faster  
Electrification

Load  
Flattening

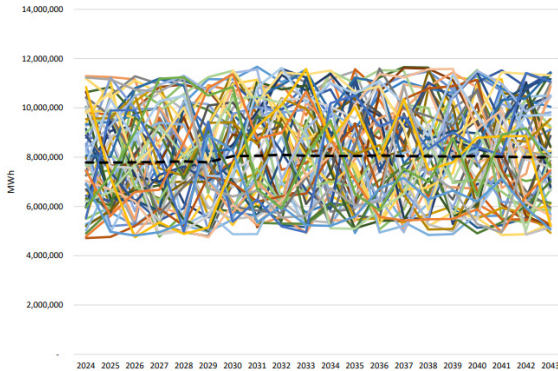
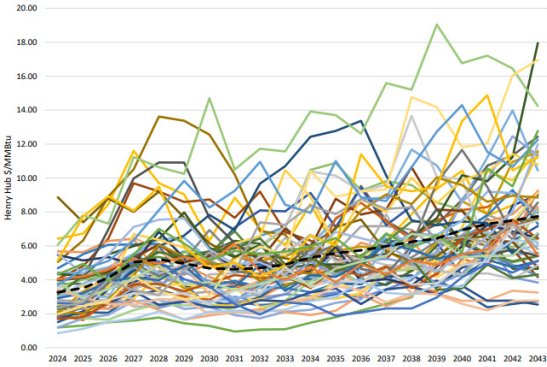
# 2023 IRP Introduces New Methods





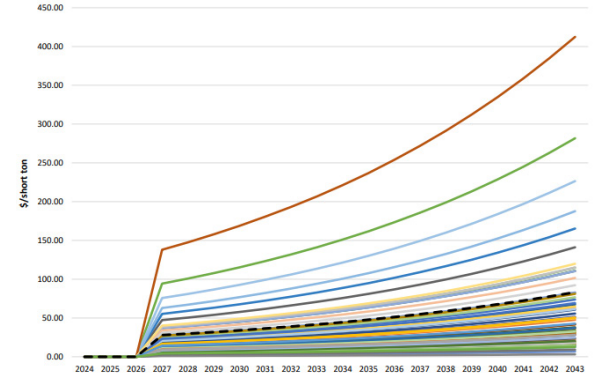
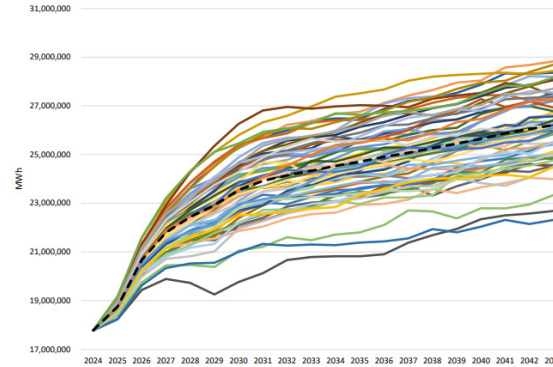
# Stochastic Variables

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



## Hydro Generation Sampling (Annual MWh)

## Customer Load Sampling (Annual MWh)



## Carbon Price Sampling (Annual 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

# How Will We Do It?

Flexible Resources

Coal Conversions

Hydrogen

Geothermal

Variable Resources

Wind

Solar

Storage



# 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

# 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.

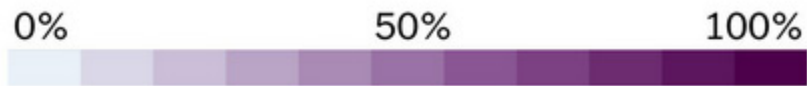
Two hydrogen peaking units are selected in 2038 to replace the Bridger natural gas converted units.



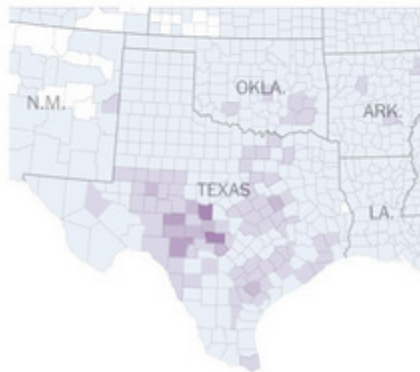
# Texas 2021 Winter Storm



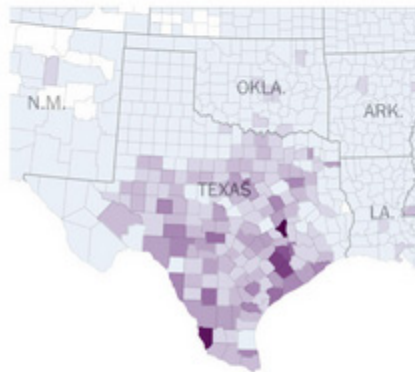
# Percentage of customers without power



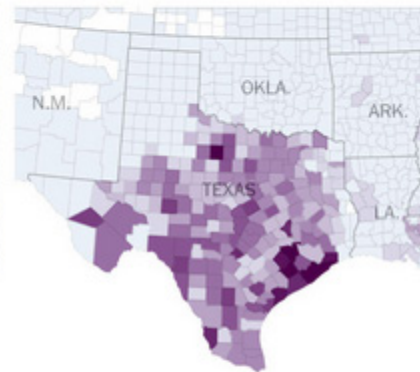
**Sunday, 7 p.m.**



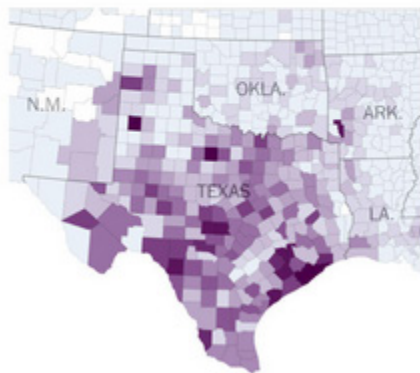
**Monday, 3 a.m.**



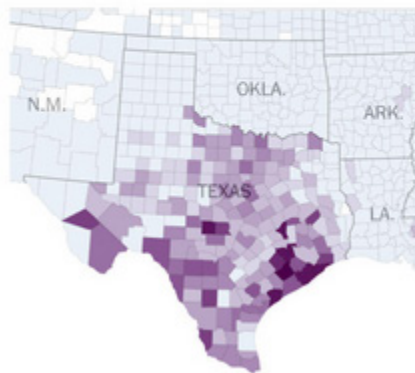
**Monday, 10 p.m.**



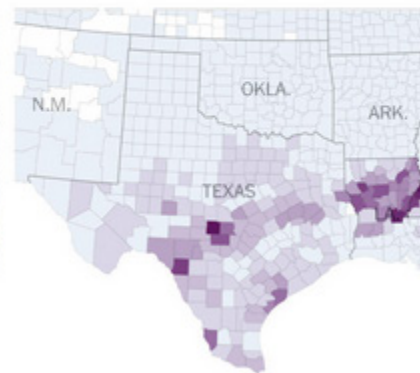
**Tuesday, 12:15 p.m.**



**Wednesday, 11:30 a.m.**



**Thursday, 10:30 a.m.**



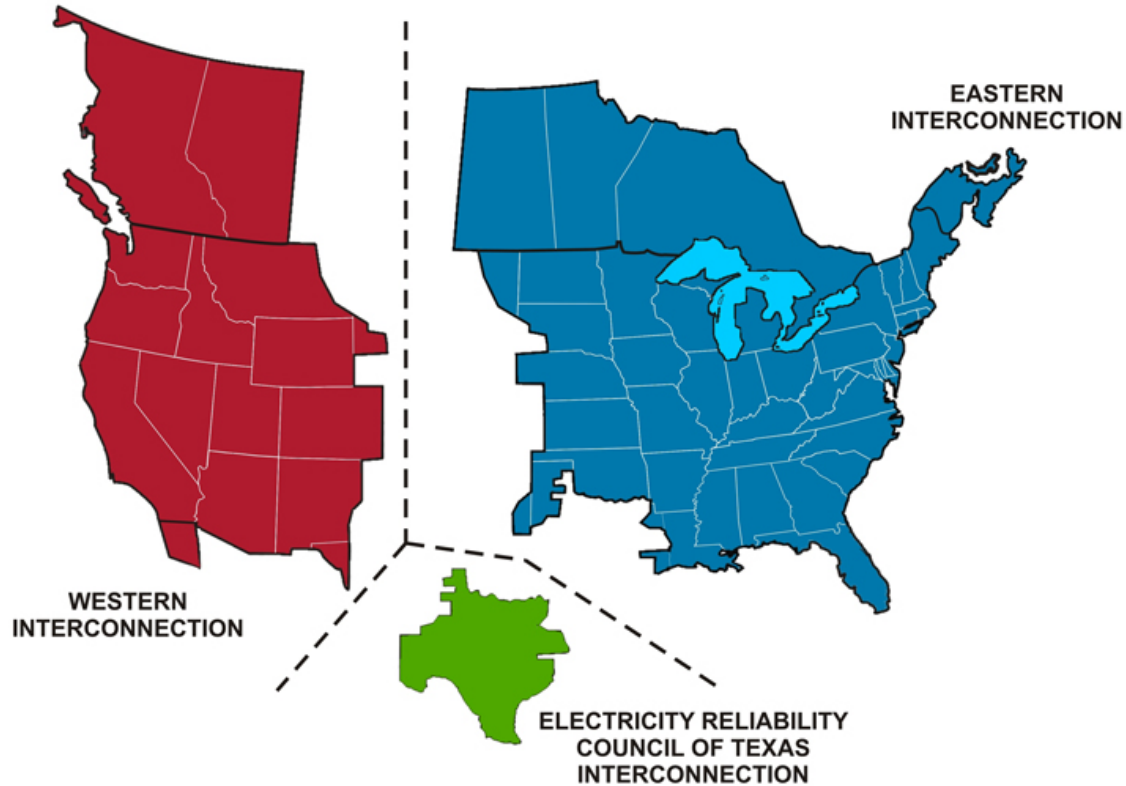


# Texas Frozen Resources

---

# Isolation

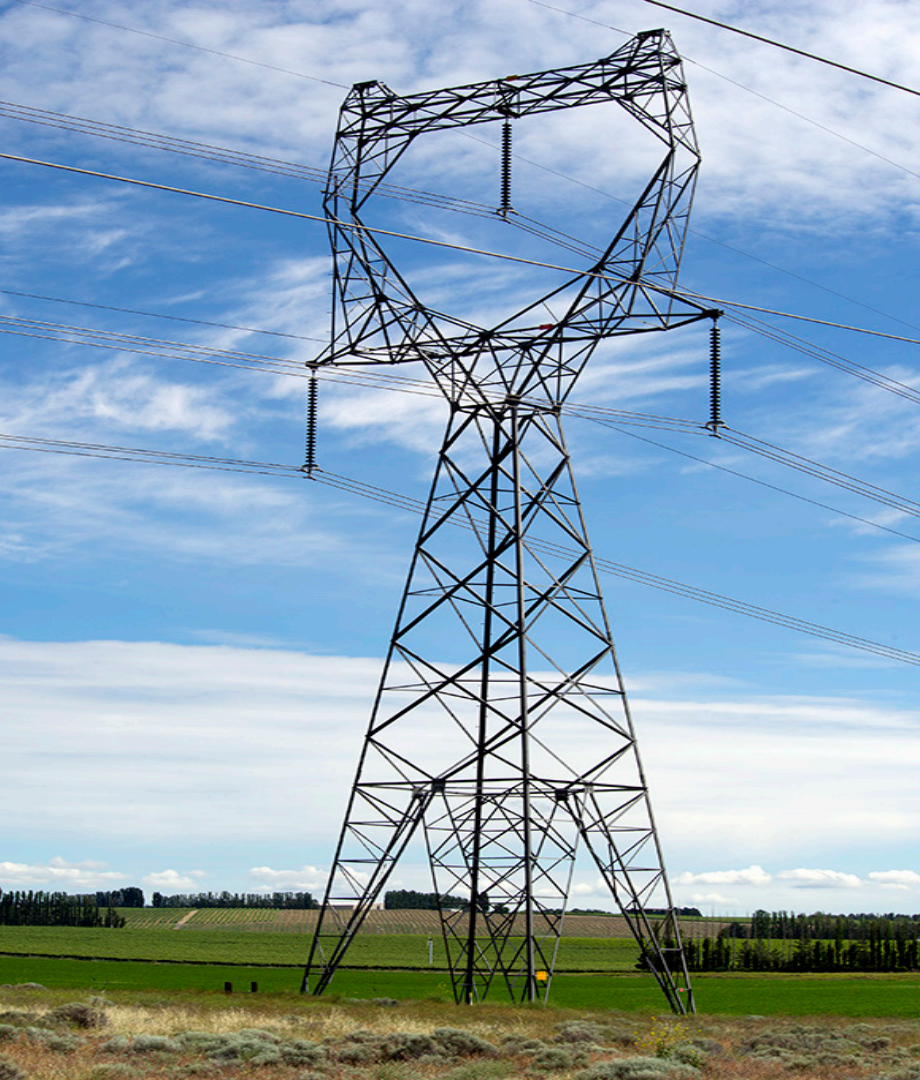
## North American Electric Reliability Corporation Interconnections



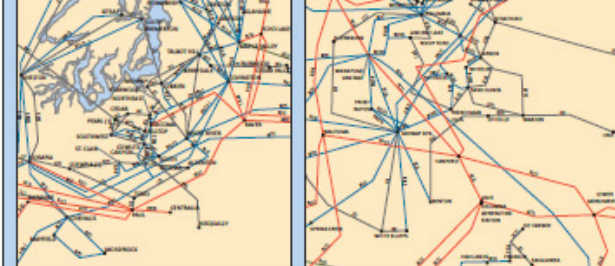












4. SAN FRANCISCO AREA DETAIL



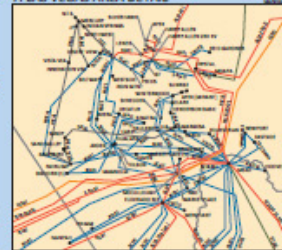
5. PORTLAND AREA DETAIL



6. LOS ANGELES AREA DETAIL



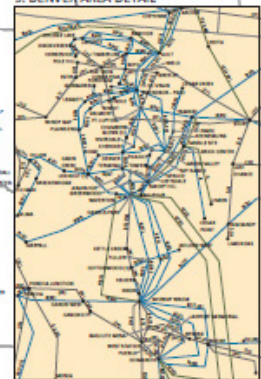
7. LAS VEGAS AREA DETAIL



- 41 San Diego Gas & Electric Company
- 42 Interoceanic Hydro and Power Authority
- 43 Pacific
- 44 Northwestern Energy
- 45 Idaho Power Company
- 46 Western Area Power Administration - Upper Great Plains Region
- 47 Western Area Power Administration - Rocky Mountain Region
- 48 Southern California Power Agency
- 49 Western Area Power Administration - Desert Southwest Region
- 50 Arizona Public Service Company
- 51 Salt River Project
- 52 Turlock Irrigation District
- 54 Modesto Irrigation District
- 56 San Francisco Electric Light & Power
- 55 Coast Community Electric Cooperative
- 56 City of Wilson
- 57 Utah Municipal Power Agency
- 58 ATCO Electric Ltd.
- 59 City and County of San Francisco - West Beach Water and Power
- 60 Tech Metals Ltd.
- 61 Glacier Electric Cooperative Inc.
- 62 Western Interconnect Transmission Project

Note: Not all substations are geographically accurate. To improve readability of map not all transmission lines are annotated with line operators.

9. DENVER AREA DETAIL

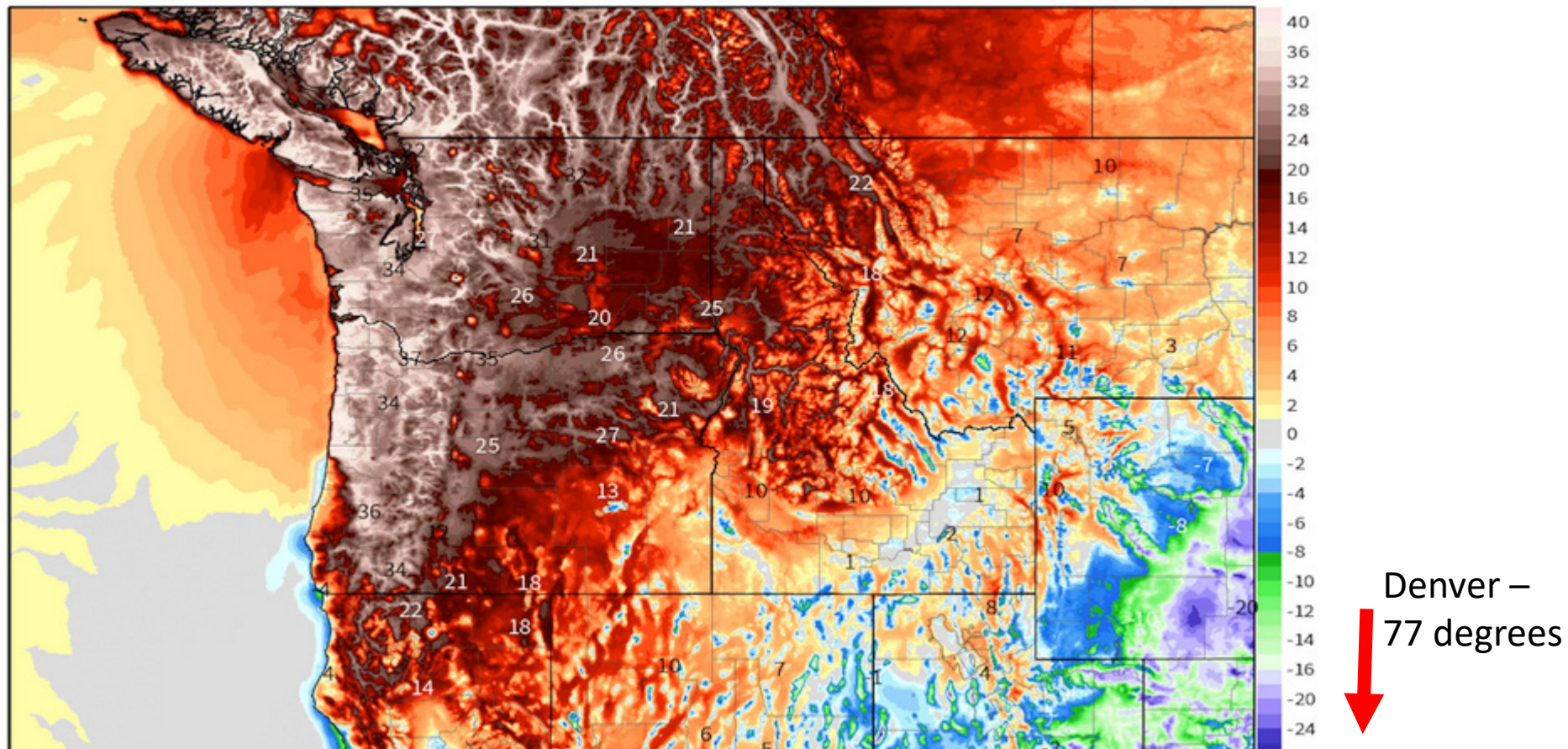


8. PHOENIX AREA DETAIL





# 2021 Pacific Northwest Heat Dome



# Boardman to Hemingway

A Clean-Energy Pipeline

300  
MILE  
500-kV

TRANSMISSION LINE



# B2H Ownership Following 2023 Agreements



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

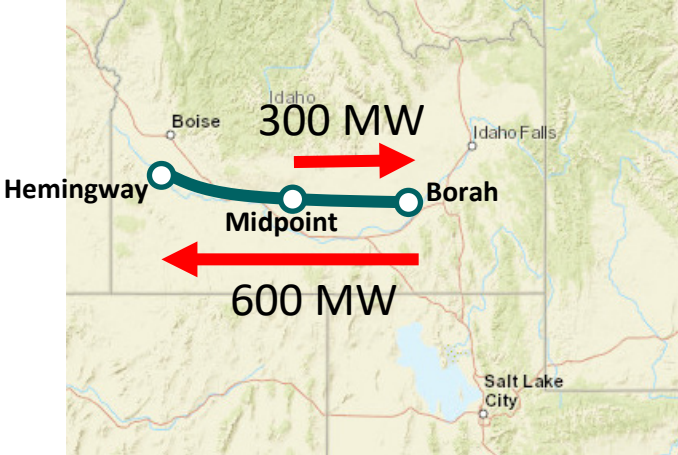


(55%)	300 MW	820 MW
-------	--------	--------

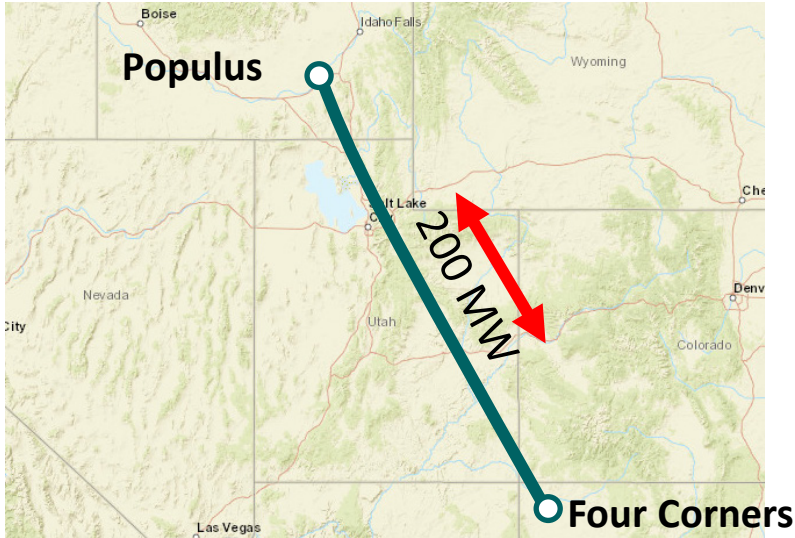
# Idaho Power — PacifiCorp

## Transaction Joint Purchase and Sale Agreement

Idaho Power to PacifiCorp (Assets)



PacifiCorp to Idaho Power (Assets)





# Gateway West Evaluation

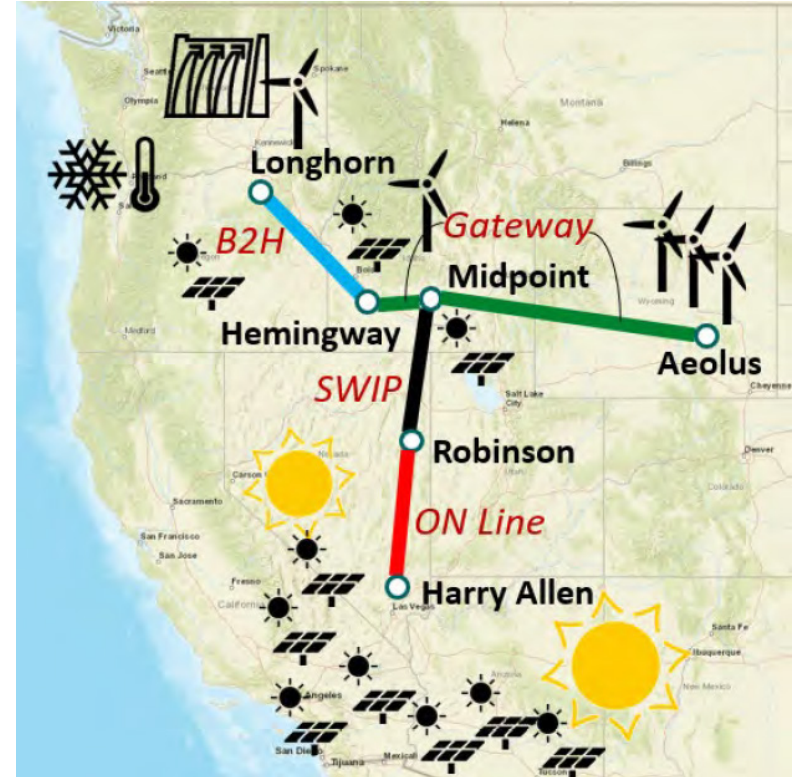


Gateway West  
Phase 1

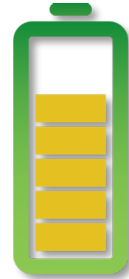
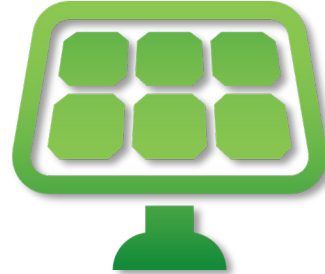
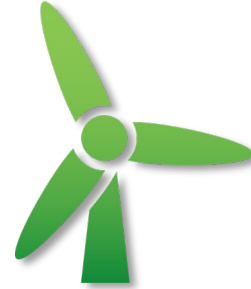
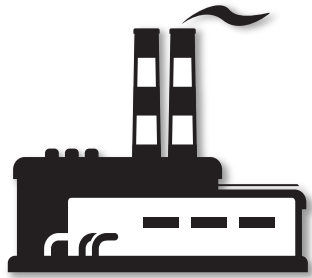
Gateway West  
Phase 2

# Interregional Connectivity

- Interregional Connectivity
- Geographical Diversity
  - Demand Diversity
  - Resource Diversity
- Partnerships to Meet Clean Energy Goals

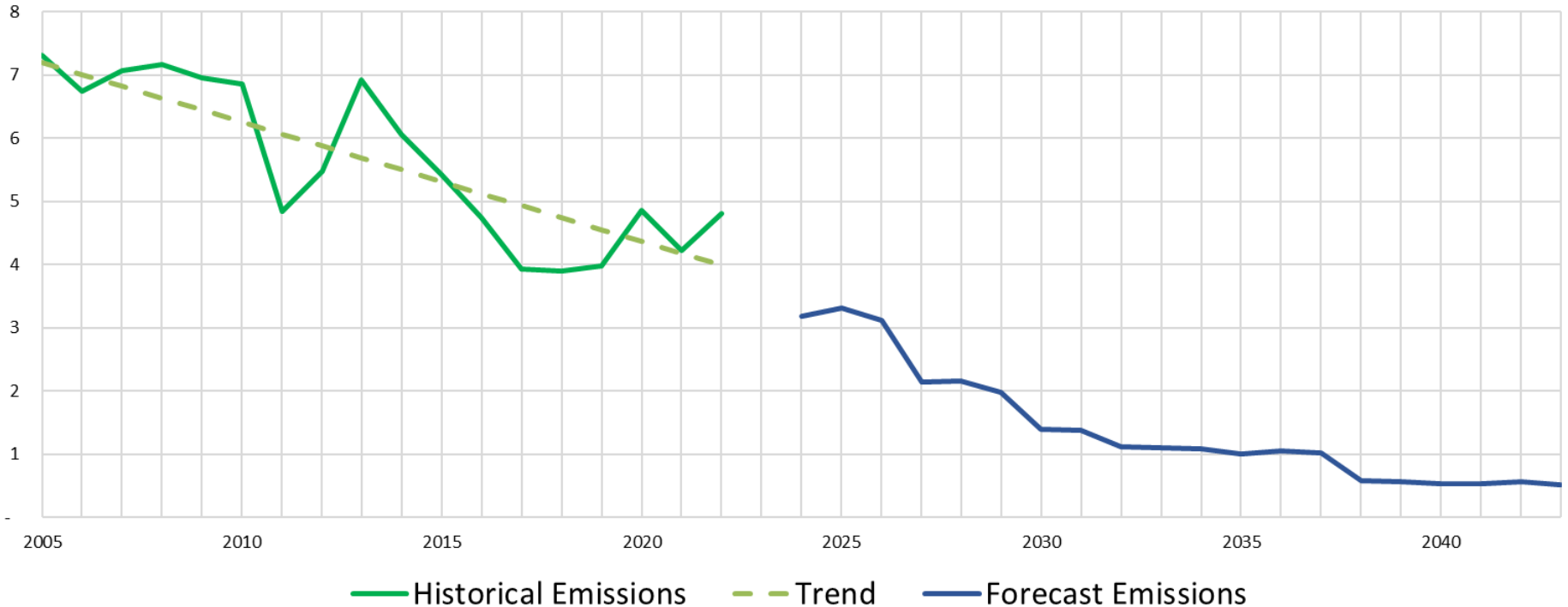


# Shifting Economic Resources



# Forecast Carbon Emissions

Generation CO2 Emissions (Million Metric Tons)



# 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)



# Near Term Resource Acquisition

	Project A	Project B	Project C
2023	Hemingway 80MW BESS*	Black Mesa 40MW solar + 40MW BESS*	11MW Distributed BESS*
2024	Franklin 100MW Solar + 60MW BESS*	Hemingway 36MW BESS*	
2025	Kuna 150MW BESS*	Happy Valley 77MW BESS*	Pleasant Valley 1 200MW Solar
2026	Convert Valmy Coal Units 1 & 2 to Natural Gas	B2H Transmission	More TBD from 2026 AS RFP

\*All batteries are 4-hr Li-Ion