



# Idaho Power 2017 Integrated Resource Plan

Public Utility Commission of Oregon  
Public Meeting  
September 26, 2017

# 2017 IRP

- Goals
  - Identify sufficient resources to reliably serve the growing demand for energy within Idaho Power's service area throughout the 20-year planning period
  - Ensure the selected resource portfolio balances cost, risk, and environmental concerns
  - Give equal and balanced treatment to supply-side resources, demand-side resources, and transmission resources
  - Involve the public in the planning process in a meaningful way
- Planning period → 2017-2036

# 2017 IRP

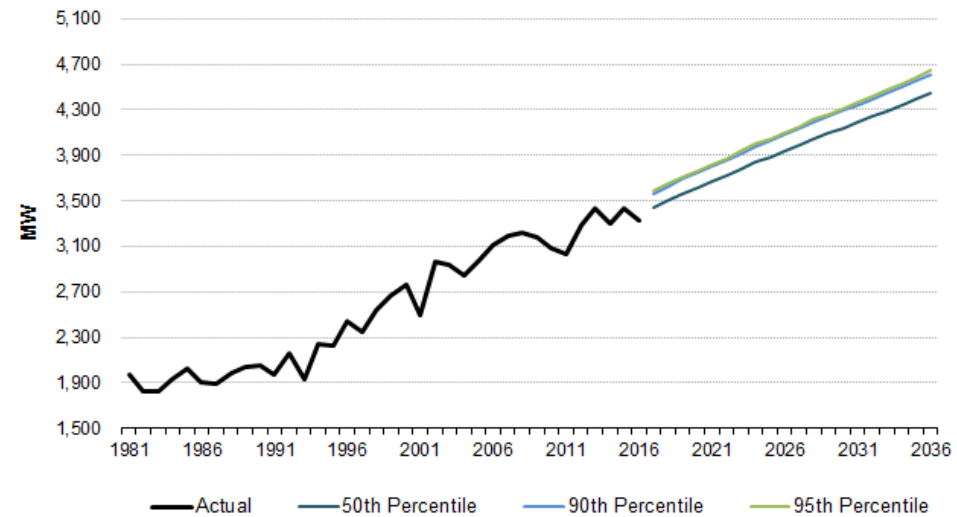
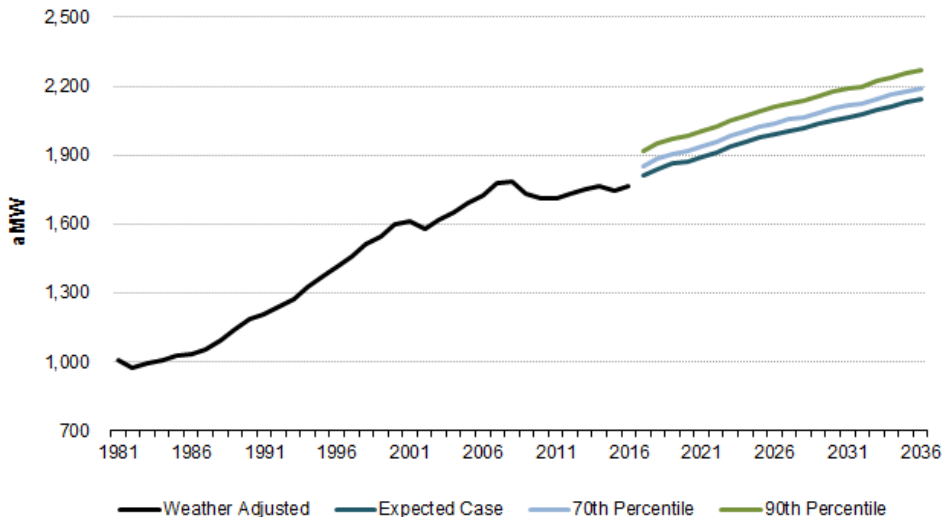
- Boardman to Hemingway (B2H) transmission line
- Jim Bridger units 1 and 2
- North Valmy

# Load and Resource Balance

- Resources
  - Idaho Power generation
    - Hydro – 1,709 MW capacity nameplate
    - Natural gas – 762 MW capacity nameplate
    - Coal – 1,118 MW capacity nameplate
  - Transmission (off-system purchases)
  - Energy contracts
    - PURPA – 1,135 MW capacity nameplate
    - PPA – 150 MW capacity nameplate
  - Demand-side resources
    - Energy efficiency – 209 aMW in 2016
    - Demand response – 390 MW capacity
- Load

# 2017 IRP – Load Forecast

- Growth rates
  - Average energy → 0.9% per year
  - Peak-hour → 1.4% per year
- Add ≈220k customers 2017-2036



# 2017 IRP – Resource Options

- Demand-side
  - Energy efficiency
  - Demand response
- Transmission
  - Boardman to Hemingway
- Natural gas
  - CCCT
  - SCCT
  - Reciprocating engines
- Solar PV
  - Utility-scale single-axis tracking
  - Rooftop residential
  - Rooftop C&I
- Storage
  - Pumped hydro
  - Li battery residential
  - Ice thermal storage
  - Zn battery
  - Vanadium flow battery
- Nuclear
  - Small modular reactor
- Wind
- CHP
- Geothermal
- Canal drop hydro
- Biomass – anaerobic digester

# 2017 IRP – Key Considerations

- Jim Bridger units 1 and 2
  - Environmental retrofit investments vs. early retirement alternatives
- Boardman-to-Hemingway (B2H) transmission line
  - B2H vs. alternative resources
- Portfolio design

Treatment of Jim Bridger Units 1 and 2	Primary Portfolio Element(s)		
	B2H	Solar PV/Natural Gas	Natural Gas
Invest in SCR	P1	P2	P3
Retire Unit 1 in 2028 and Unit 2 in 2024	P4	P5	P6
Retire Unit 1 in 2032 and Unit 2 in 2028	P7	P8	P9
Retire Unit 1 in 2022 and Unit 2 in 2021	P10	P11	P12

# 2017 IRP – Portfolio Analysis

2017 IRP portfolios, NPV years 2017-2036 (\$000s)

Treatment of Jim Bridger Units 1 and 2	Primary Portfolio Element(s)			Average	Rank
	B2H	Solar PV/ Natural Gas	Natural Gas		
Invest in SCR	\$6,400,696	\$6,497,505	\$6,530,856	\$6,476,352	3
Retire Unit 1 in 2028 and Unit 2 in 2024	\$6,338,683	\$6,566,567	\$6,508,242	\$6,471,164	2
Retire Unit 1 in 2032 and Unit 2 in 2028	\$6,335,771	\$6,503,524	\$6,483,000	\$6,440,765	1
Retire Unit 1 in 2022 and Unit 2 in 2021	\$6,400,507	\$6,579,769	\$6,671,510	\$6,550,595	4
<b>Average</b>	\$6,368,915	\$6,536,842	\$6,548,402		
<b>Rank</b>	1	2	3		

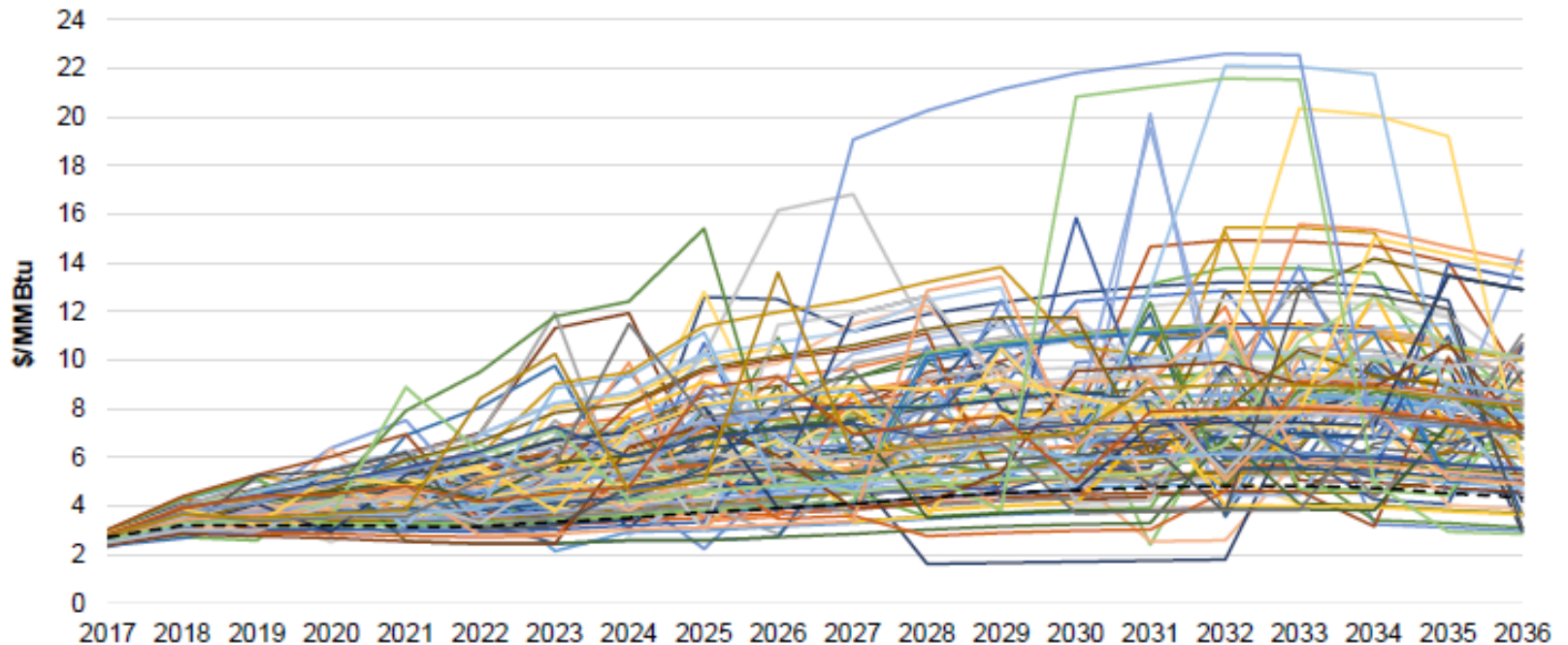
## P7 timeline

Date	Resource	Installed Capacity (MW)	Peak-Hour Capacity (MW)
2026	B2H	500, 200 (Apr–Sep, Oct–Mar transfer capacity)	500
2031	Reciprocating engines	36	36
2032	Reciprocating engines	36	36
2033	CCCT (1x1)	300	300
2035	Reciprocating engines	54	54
2036	Reciprocating engines	54	54
<b>Total</b>		<b>980</b>	<b>980</b>



# Portfolio Analysis and Uncertainty

- Risk analysis
  - Customer load
  - Hydro production
  - Natural gas price



# Portfolio Analysis and Uncertainty

- Qualitative risk

## Qualitative risk analysis

Risk	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Hydro—Water Supply Risk	=	=	=	=	=	=		=	=	=	=	=
Relicensing Risk	=	=	=	=	=	=		=	=	=	=	=
Regulatory Risk	=	=	=	=	=	=		=	=	=	=	=
NOx Compliance Alternatives Risk	<	<	<	=	=	=		=	=	<	<	<
Permitting/Siting Risk	=	=	=	=	=	=		=	=	=	=	=
Regional Resource Adequacy	=	<	<	=	<	<		<	<	=	<	<
DSM Implementation	=	=	=	=	=	=		=	=	=	=	=
Technological Obsolescence	=	>	>	=	>	>		>	>	=	>	>

< Less risk  
> More risk  
= Equal risk

## Qualitative benefit analysis

Benefit	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Regional Resource Diversity	=	<	<	=	<	<		<	<	=	<	<
Regional Transmission Initiatives	=	<	<	=	<	<		<	<	=	<	<
Transmission Tariff Revenue	=	<	<	=	<	<		<	<	=	<	<
Local Economic Effects	=	=	=	=	=	=		=	=	=	=	=

< Less benefit  
= Equal benefit

# 2017 IRP – Action Plan (2017-2021)

- EIM
- North Valmy Unit 1
- Jim Bridger units 1 and 2
- B2H
- Boardman
- Gateway West
- Energy efficiency
- Carbon emission regulations
- North Valmy Unit 2