

# Portfolio Reliability Analysis

## *Reliability & Capacity Assessment Tool*

Shelby McNeilly  
Resource Planning Engineer

# Helpful Acronyms

Acronym	Meaning
<b>BESS</b>	Battery Energy Storage System
<b>EFORD</b>	Equivalent Forced Outage Rate During Demand
<b>ELCC</b>	Effective Load Carrying Capability
<b>ELR</b>	Energy Limited Resource
<b>IRP</b>	Integrated Resource Plan
<b>LOLE</b>	Loss of Load Expectation
<b>LOLP</b>	Loss of Load Probability

Acronym	Meaning
<b>LTCE</b>	Long-Term Capacity Expansion
<b>L&amp;R</b>	Load & Resource
<b>MW</b>	Megawatt
<b>PRM</b>	Planning Reserve Margin
<b>RCAT</b>	Reliability & Capacity Assessment Tool
<b>VER</b>	Variable Energy Resource
<b>WRAP</b>	Western Resource Adequacy Program

# IRP Educational Resources



Home > Energy and the Environment > Energy > Planning and Electrical Projects > Our 20-Year Plan > Educational Resources

IRP Questions and Responses

**Educational Resources**

Transmission and Resource

Idaho Power has compiled these resources to help those participating in our *Integrated Resource Plan* process or anyone who wants to know more about how their energy is generated and delivered. We will add links, presentations and videos as they become available.

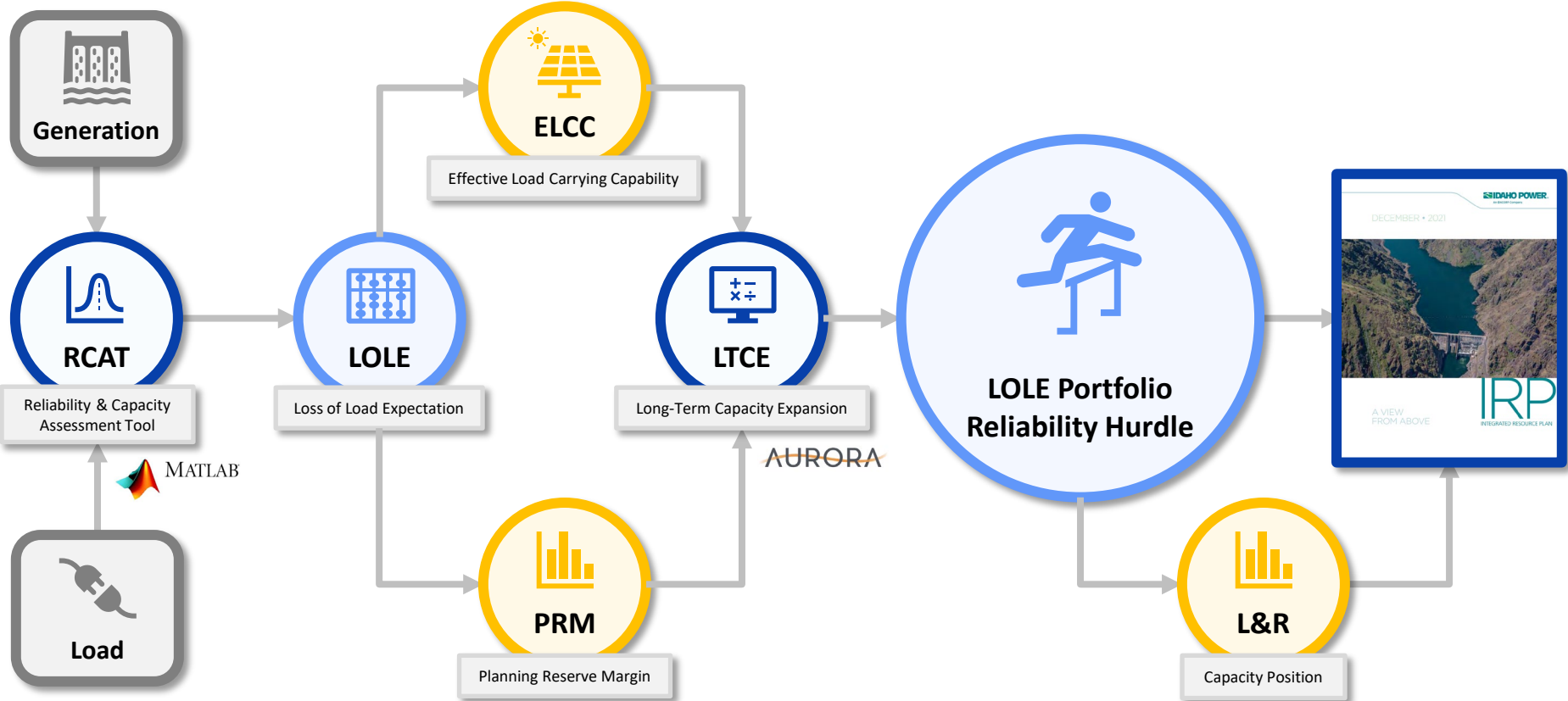
146 Views!



***A Deep Dive into How Idaho Power Assesses Reliability & Capacity in the IRP***

[Educational Resources - Idaho Power](#)

# IRP Relevance



# Reliability Definitions

## Loss of Load Probability

**LOLP**: the probability of system peak or hourly demand exceeding the available generating capacity during a given period

$$LOLP = P(G_i - L_i)$$

*Generation available  
at hour "i"*

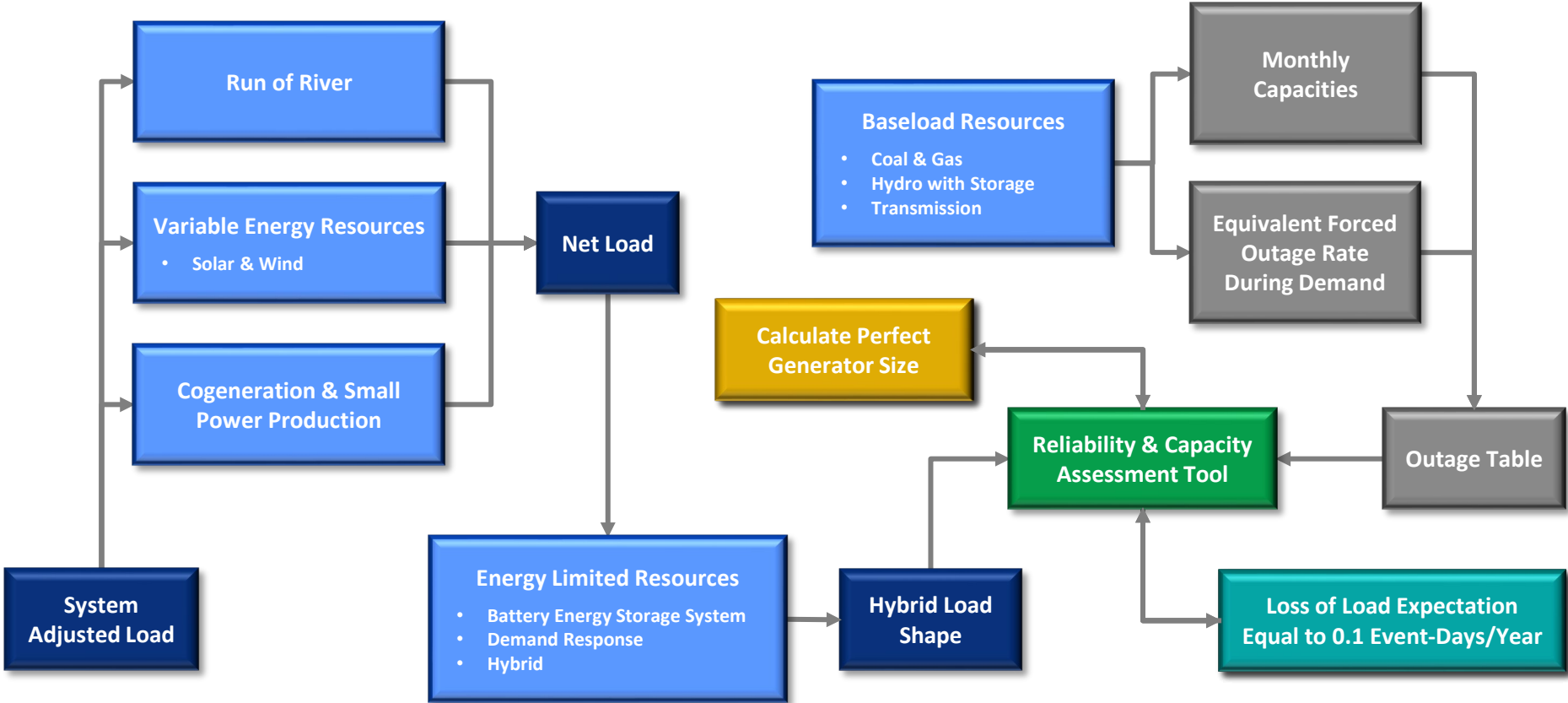
*Net load  
at hour "i"*

## Loss of Load Expectation

**LOLE**: the expected number of days per time period for which the available generation capacity is insufficient to serve the demand at least once per day

$$LOLE = \sum_{d=1}^D \max_{i=1}^H (LOLP_i)$$

# RCAT Modeling Flowchart



# Pre-Portfolio Modeling Inputs

Variable & Energy Limited Resources	Project Nameplate (MW)			
	Existing	2023	2024	2025
Solar	436	-	-	200
Wind	725	-	-	-
Demand Response	320	-	-	-
Run of River Hydro	539	-	-	-
Cogeneration	151	-	-	-
Stand-Alone 4-Hour BESS	-	91	36	227
Solar + 4-Hour BESS 1:1	-	40	-	-
Solar + 4-Hour BESS 1:0.6	-	-	100	-

# Pre-Portfolio Modeling Inputs

Flexible Resources	Project Nameplate (MW)					
	Existing	2023	2024	2025	2026	2027
Hells Canyon	392	-	-	-	-	-
Oxbow	190	-	-	-	-	-
Brownlee	675	-	-	-	-	-
Langley Gulch	319	-	-	-	-	-
Bennett Mountain	164	-	-	-	-	-
Danskin	261	-	-	-	-	-
Bridger	707	-	*-	-	-	-
Valmy	134	-	-	-	(134)	-
WRAP	-	-	-	-	-	14
Firm Transmission	380	-	-	-	500	-

\*2 Units of Bridger Convert to Gas in 2024



# Pre-Portfolio Capacity Positions

Year	Annual Capacity Position (MW) <i>with Existing/Contracted Resources &amp; Retirement Assumptions</i>	
2024	11	Length
2025	3	Length
2026	(22)	Shortfall
2027	(44)	Shortfall
2028	(182)	Shortfall
2029	(324)	Shortfall
2030	(693)	Shortfall
2031	(767)	Shortfall
2032	(796)	Shortfall
2033	(869)	Shortfall
2034	(891)	Shortfall
2035	(913)	Shortfall
2036	(938)	Shortfall
2037	(1,006)	Shortfall
2038	(1,317)	Shortfall
2039	(1,347)	Shortfall
2040	(1,377)	Shortfall
2041	(1,415)	Shortfall
2042	(1,456)	Shortfall
2043	(1,568)	Shortfall

- Table Shows the Annual Capacity Positions to Meet a 0.1 Event-Days/Year LOLE Threshold as Calculated by the R-CAT
- Modeling Details
  - Includes Only Existing & Contracted Resources
  - Valmy Unit 2 Exit EOY 2025
  - B2H Energized July 2026
    - \* *In a B2H Energized November 2026 Scenario, the Pre-Portfolio Capacity Position Decreases to (356) MW Shortfall*
  - WRAP Binding 2027
  - Bridger Units 3 & 4 Exit EOY 2029
  - Bridger Units 1 & 2 Exit EOY 2037

# Post-Portfolio Capacity Positions

Year	Annual Capacity Position (MW) <i>July 2026 B2H &amp; Valmy 1 &amp; 2 Conversion</i>	
2024	11	Length
2025	3	Length
2026	224	Length
2027	285	Length
2028	212	Length
2029	137	Length
2030	155	Length
2031	152	Length
2032	184	Length
2033	164	Length
2034	152	Length
2035	143	Length
2036	134	Length
2037	138	Length
2038	45	Length
2039	54	Length
2040	62	Length
2041	56	Length
2042	49	Length
2043	57	Length

Year	Coal Exit	Gas Exit	Gas Con	Gas New	H2	Wind	Solar	4 Hour	8 Hour	100 Hour	Geo	DR	EE
2024	0	0	357	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	(134)	0	261	0	0	0	100	0	0	0	0	0	0
2027	0	0	0	0	0	400	0	5	0	0	0	0	0
2028	0	0	0	0	0	400	0	5	0	0	0	0	0
2029	0	0	0	0	0	400	0	5	0	0	0	20	0
2030	(350)	0	350	0	0	100	500	155	0	0	30	0	0
2031	0	0	0	0	0	400	400	5	0	0	0	0	0
2032	0	0	0	0	0	100	100	205	0	0	0	0	0
2033	0	0	0	0	0	0	0	105	0	0	0	20	0
2034	0	0	0	0	0	0	0	5	0	0	0	40	0
2035	0	0	0	0	0	0	0	5	0	0	0	40	0
2036	0	0	0	0	0	0	0	5	0	0	0	40	0
2037	0	0	0	0	0	0	0	55	50	0	0	0	0
2038	0	(706)	0	0	340	0	0	155	50	200	0	0	0
2039	0	0	0	0	0	0	0	5	50	0	0	0	0
2040	0	0	0	0	0	0	400	5	0	0	0	0	0
2041	0	0	0	0	0	0	200	5	0	0	0	0	0
2042	0	0	0	0	0	0	200	55	0	0	0	0	0
2043	0	0	0	0	0	0	600	5	0	0	0	0	0
<b>Total</b>	<b>(484)</b>	<b>(706)</b>	<b>967</b>	<b>0</b>	<b>340</b>	<b>1800</b>	<b>2500</b>	<b>780</b>	<b>150</b>	<b>200</b>	<b>30</b>	<b>160</b>	<b>0</b>