DECEMBER • 2021

2021 IRP

INTEGRATED RESOURCE PLAN

A VIEW FROM ABOVE

APPENDIX C: **TECHNICAL REPORT**

SAFE HARBOR STATEMENT

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INTRODUCTION

Appendix C–Technical Appendix contains supporting data and explanatory materials used to develop Idaho Power's *2021 Integrated Resource Plan (IRP)*.

The main document, the 2021 IRP Report, contains a full narrative of Idaho Power's resource planning process. Additional information regarding the 2021 IRP sales and load forecast is contained in *Appendix A–Sales and Load Forecast*, details on Idaho Power's demand-side management efforts are explained in *Appendix B–Demand-Side Management 2020 Annual Report*, and supplemental information on Boardman to Hemingway (B2H) transmission is provided in *Appendix D–B2H Supplement,* anticipated to be filed in first quarter 2022.

For information or questions concerning the resource plan or the resource planning process, contact Idaho Power:

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IRP ADVISORY COUNCIL

Idaho Power has involved representatives of the public in the IRP planning process since the early 1990s. This public forum is known as the IRP Advisory Council (IRPAC). The IRPAC generally meets monthly during the development of the IRP, and the meetings are open to the public. Members of the council include regulatory, political, environmental, and customer representatives, as well as representatives of other public-interest groups.

Idaho Power hosted nine IRPAC meetings for the 2021 IRP, with an additional three workshops that focused on various topics, such as a review of the AURORA modeling software. Idaho Power values these opportunities to convene, and the IRPAC members and the public have made significant contributions to this plan.

Idaho Power the IRP is better because of public involvement and is grateful to the individuals and groups that participated in the process.

Customer Representatives

Adler Industrial	Mike Adler
Agricultural Representative	Sid Erwin
Boise State University	Barry Burbank
Idaho National Laboratory	Kurt Myers
Micron	Jim Swier
Rule Steel	Greg Burkhardt
St. Luke’s Medical	Stephanie Wicks

Public-Interest Representatives

Boise State University Energy Policy Institute	Kathleen Araujo
City of Boise	Steve Burgos
City of Nampa	Mayor Debbie Kling
Idaho Conservation League	Ben Otto
Idaho Legislature	Rep. Laurie Lickley
Idaho Office of Energy and Mineral Resources	John Chatburn
Idaho Sierra Club	Mike Heckler
Idaho Water Resource Board	Roger Chase
Northwest Power and Conservation Council	Ben Kujala
Oil and Gas Industry Advisor	David Hawk
Oregon State University, Malheur Experiment Station Professor Emeritus	Clint Shock

Snake River Alliance	Chad Worth
Sun Valley Institute for Resilience	Herbert Romero

Regulatory Commission Representatives

Idaho Public Utilities Commission	Mike Louis
Public Utility Commission of Oregon	Nadine Hanhan

IRPAC Meeting Schedule and Agenda

Meeting Dates		Agenda Items
2021	Tuesday, January 12	Energy Efficiency Subcommittee Meeting Historical Modeling of Energy Efficiency in the IRP Energy Efficiency Potential Study—Introduction & Overview Energy Efficiency & Load Forecast Discussion
2021	Tuesday, February 9	Introduction from President & CEO Lisa Grow Idaho Power Clean Energy Goal 2019 IRP in Review 2021 IRP Schedule, Process Overview, & Process Road Map 2021 IRP Carbon Outlook Valmy Unit 2 Study Outline
2021	Tuesday, February 23	Load Forecasting Workshop
2021	Thursday, March 11	Industry Topics CSPP Forecast & Assumptions Natural Gas Price Forecast Load Forecast
2021	Thursday, April 8	Operations Hydrology: RMJOC-II Part 2 Climate Change Update Operations Hydrology: Streamflow & Hydrogeneration Development Coal Unit Overview & Inputs Energy Efficiency Potential Study & Bundling Analysis Effective Load Carrying Capability: Solar, Wind & Storage Demand Response Valmy Unit 2 Study Update
2021	Thursday, April 22	AURORA Workshop
2021	Thursday, May 13	Northwest Resource Adequacy Resource Adequacy at Idaho Power Regional Transmission Overview Transmission Projects Update Future Supply-Side Resource Options
2021	Thursday, June 10	Industry Topics Transmission & Distribution Planning Topics Resource Sufficiency (IPC Flexibility & Reserve Requirements) 2020 Variable Energy Resource Integration Study Modeling Regulation Reserve Requirements IRP Modeling Scenarios Natural Gas Price Forecast Follow-Up

Meeting Dates		Agenda Items
2021	Tuesday, July 13	Power System Recent Events: 2021 Pacific Northwest Heatwave Meeting a New Peak Demand IRP Scenarios & Sensitivities Follow-Up Electrification Scenario Analysis Loss of Load Analysis & ELCC Update
2021	Tuesday, August 10	Analysis Workshop IRP Portfolio & Sensitivity Development Methodology Carbon Adder Forecasts Transmission Benefits Stochastic Risk Analysis Ideation Sessions Report-Out Demand Response Update
2021	Thursday, October 21	Analysis Check-in Preliminary Results Bridger Natural Gas Conversion
2021	Thursday, November 18	Aurora Results Update Preliminary Preferred Portfolio Validation & Verification LOLE Analysis Quantitative Risk Assessment IRP Action Plan

SALES AND LOAD FORECAST DATA

50th Percentile Annual Forecast Growth Rates

	2021–2026	2021–2031	2021–2040
Sales			
Residential Sales	0.92%	0.69%	0.77%
Commercial Sales	1.18%	0.91%	0.92%
Irrigation Sales	0.43%	0.45%	0.58%
Industrial Sales	2.82%	1.86%	1.59%
Additional Firm Sales	18.07%	12.37%	6.34%
System Sales	2.68%	2.08%	1.47%
Total Sales	2.68%	2.08%	1.47%
Loads			
Residential Load	0.90%	0.68%	0.76%
Commercial Load	1.16%	0.91%	0.91%
Irrigation Load	0.43%	0.45%	0.56%
Industrial Load	2.79%	1.85%	1.57%
Additional Firm Sales	18.07%	12.37%	6.34%
System Load Losses	1.75%	1.36%	1.11%
System Load	2.59%	2.02%	1.43%
Total Load	2.59%	2.02%	1.43%
Peaks			
System Peak	2.07%	1.69%	1.36%
Total Peak	2.07%	1.69%	1.36%
Winter Peak	2.34%	1.61%	1.23%
Summer Peak	2.07%	1.69%	1.36%
Customers			
Residential Customers	2.56%	2.26%	1.90%
Commercial Customers	2.18%	2.05%	1.84%
Irrigation Customers	1.13%	1.11%	1.07%
Industrial Customers	0.39%	0.51%	0.54%

Expected-Case Load Forecast

2021 Monthly Summary[1]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	830	727	605	521	468	579	724	670	523	530	680	875
Commercial	493	474	442	428	428	464	529	526	478	458	470	502
Irrigation	4	4	11	150	335	557	658	574	315	61	7	4
Industrial	283	290	286	280	284	305	303	309	300	304	302	297
Additional Firm	107	111	110	106	98	101	101	110	112	109	111	115
Loss	146	135	120	124	137	173	203	190	146	121	131	152
System Load	**1,863**	**1,741**	**1,574**	**1,609**	**1,750**	**2,180**	**2,518**	**2,380**	**1,874**	**1,583**	**1,702**	**1,946**
Light Load	1,736	1,613	1,455	1,466	1,586	1,952	2,267	2,103	1,701	1,435	1,575	1,812
Heavy Load	1,972	1,837	1,659	1,713	1,891	2,346	2,716	2,598	2,012	1,699	1,804	2,052
Total Load	**1,863**	**1,741**	**1,574**	**1,609**	**1,750**	**2,180**	**2,518**	**2,380**	**1,874**	**1,583**	**1,702**	**1,946**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,462	2,130	1,930	2,012	2,557	3,624	3,745	3,499	3,027	2,244	2,351	2,584
Total Peak Load	**2,462**	**2,130**	**1,930**	**2,012**	**2,557**	**3,624**	**3,745**	**3,499**	**3,027**	**2,244**	**2,351**	**2,584**

2022 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	848	746	620	532	475	585	725	673	525	532	685	884
Commercial	510	496	452	430	446	470	527	524	479	462	477	508
Irrigation	3	3	9	116	307	587	677	580	319	62	7	4
Industrial	298	294	295	287	292	305	306	310	302	304	303	308
Additional Firm	115	117	113	107	112	107	117	118	121	118	123	127
Loss	151	139	123	122	137	177	205	191	147	122	133	155
System Load	**1,926**	**1,794**	**1,611**	**1,595**	**1,770**	**2,231**	**2,557**	**2,396**	**1,893**	**1,600**	**1,727**	**1,987**
Light Load	1,794	1,662	1,490	1,453	1,604	1,998	2,303	2,118	1,719	1,450	1,598	1,850
Heavy Load	2,038	1,893	1,698	1,698	1,912	2,401	2,777	2,598	2,033	1,717	1,831	2,095
Total Load	**1,926**	**1,794**	**1,611**	**1,595**	**1,770**	**2,231**	**2,557**	**2,396**	**1,893**	**1,600**	**1,727**	**1,987**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,529	2,296	2,086	2,121	2,680	3,654	3,801	3,523	3,054	2,261	2,377	2,609
Total Peak Load	**2,529**	**2,296**	**2,086**	**2,121**	**2,680**	**3,654**	**3,801**	**3,523**	**3,054**	**2,261**	**2,377**	**2,609**

1.The sales and load forecast considers and reflects the impact of existing energy efficiency programs on average load and peak demand. The new energy efficiency programs, proposed as part of the 2019 IRP, are accounted for in the load and resource balance. The peak load forecast does not include the impact of existing or new demand response programs, which are both accounted for in the load and resource balance.

2023 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	859	755	625	537	480	592	735	682	530	536	690	893
Commercial	516	501	457	435	450	475	533	531	484	466	481	515
Irrigation	3	3	9	117	310	592	683	586	322	62	7	4
Industrial	309	305	307	299	305	319	320	322	314	316	315	319
Additional Firm	133	137	131	126	122	113	123	123	120	122	128	134
Loss	154	142	126	125	140	180	209	194	149	123	134	157
System Load	**1,976**	**1,845**	**1,656**	**1,639**	**1,807**	**2,271**	**2,603**	**2,437**	**1,919**	**1,626**	**1,755**	**2,023**
Light Load	1,841	1,709	1,531	1,493	1,638	2,034	2,344	2,154	1,742	1,474	1,624	1,884
Heavy Load	2,092	1,946	1,745	1,755	1,940	2,444	2,826	2,642	2,060	1,746	1,860	2,143
Total Load	**1,976**	**1,845**	**1,656**	**1,639**	**1,807**	**2,271**	**2,603**	**2,437**	**1,919**	**1,626**	**1,755**	**2,023**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,570	2,338	2,119	2,160	2,730	3,804	3,866	3,625	3,104	2,292	2,403	2,679
Total Peak Load	**2,570**	**2,338**	**2,119**	**2,160**	**2,730**	**3,804**	**3,866**	**3,625**	**3,104**	**2,292**	**2,403**	**2,679**

2024 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	871	738	631	542	485	600	746	690	534	539	694	900
Commercial	526	492	464	443	458	482	543	540	492	473	488	520
Irrigation	3	3	9	117	311	595	687	590	324	63	8	4
Industrial	320	305	316	308	314	329	329	332	324	326	324	325
Additional Firm	144	145	144	140	136	128	142	144	144	152	163	176
Loss	157	140	128	127	142	183	212	197	152	126	137	160
System Load	**2,022**	**1,824**	**1,693**	**1,676**	**1,846**	**2,317**	**2,660**	**2,494**	**1,970**	**1,678**	**1,814**	**2,085**
Light Load	1,884	1,689	1,566	1,528	1,673	2,075	2,395	2,204	1,789	1,522	1,679	1,941
Heavy Load	2,131	1,923	1,793	1,785	1,982	2,510	2,869	2,704	2,129	1,792	1,923	2,208
Total Load	**2,022**	**1,824**	**1,693**	**1,676**	**1,846**	**2,317**	**2,660**	**2,494**	**1,970**	**1,678**	**1,814**	**2,085**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,635	2,382	2,166	2,192	2,796	3,844	3,939	3,718	3,178	2,350	2,472	2,731
Total Peak Load	**2,635**	**2,382**	**2,166**	**2,192**	**2,796**	**3,844**	**3,939**	**3,718**	**3,178**	**2,350**	**2,472**	**2,731**

2025 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	878	770	634	543	487	604	752	696	536	539	695	905
Commercial	531	514	467	446	461	486	548	545	495	476	490	523
Irrigation	4	3	9	118	312	597	690	593	325	63	8	4
Industrial	325	322	322	314	319	342	343	345	337	338	337	337
Additional Firm	180	186	187	184	184	179	195	200	201	206	211	222
Loss	160	147	130	129	144	187	216	201	155	129	140	163
System Load	**2,078**	**1,942**	**1,750**	**1,735**	**1,906**	**2,395**	**2,745**	**2,579**	**2,049**	**1,751**	**1,882**	**2,155**
Light Load	1,936	1,799	1,618	1,581	1,728	2,145	2,471	2,280	1,861	1,587	1,741	2,006
Heavy Load	2,189	2,050	1,853	1,847	2,047	2,595	2,960	2,816	2,200	1,869	2,005	2,272
Total Load	**2,078**	**1,942**	**1,750**	**1,735**	**1,906**	**2,395**	**2,745**	**2,579**	**2,049**	**1,751**	**1,882**	**2,155**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,695	2,466	2,224	2,251	2,869	3,951	4,045	3,814	3,280	2,430	2,562	2,803
Total Peak Load	**2,695**	**2,466**	**2,224**	**2,251**	**2,869**	**3,951**	**4,045**	**3,814**	**3,280**	**2,430**	**2,562**	**2,803**

2026 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	887	776	637	545	489	608	758	701	538	539	697	911
Commercial	537	519	471	450	465	490	554	551	499	479	493	525
Irrigation	4	3	9	118	313	600	694	596	327	64	8	4
Industrial	337	335	333	326	330	346	347	349	341	342	341	339
Additional Firm	236	245	238	233	234	231	247	250	250	252	268	279
Loss	164	151	133	132	147	190	220	205	158	131	143	166
System Load	**2,163**	**2,029**	**1,822**	**1,805**	**1,978**	**2,465**	**2,819**	**2,651**	**2,113**	**1,807**	**1,949**	**2,224**
Light Load	2,015	1,879	1,686	1,645	1,793	2,208	2,538	2,343	1,918	1,638	1,804	2,071
Heavy Load	2,279	2,141	1,930	1,922	2,138	2,653	3,041	2,894	2,269	1,929	2,077	2,346
Total Load	**2,163**	**2,029**	**1,822**	**1,805**	**1,978**	**2,465**	**2,819**	**2,651**	**2,113**	**1,807**	**1,949**	**2,224**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,784	2,555	2,298	2,324	2,928	4,036	4,149	3,903	3,360	2,520	2,615	2,901
Total Peak Load	**2,784**	**2,555**	**2,298**	**2,324**	**2,928**	**4,036**	**4,149**	**3,903**	**3,360**	**2,520**	**2,615**	**2,901**

2027 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					Average Load (aMW) 50th Percentile							
Residential	895	782	639	547	491	612	765	706	540	539	698	917
Commercial	539	520	472	451	465	491	556	553	499	479	493	527
Irrigation	4	3	9	118	314	603	698	600	329	64	8	4
Industrial	339	338	336	329	333	349	350	352	344	345	344	342
Additional Firm	295	303	298	294	292	287	299	304	303	311	325	341
Loss	167	154	136	135	150	192	223	208	160	133	145	169
System Load	**2,238**	**2,101**	**1,891**	**1,874**	**2,045**	**2,534**	**2,890**	**2,722**	**2,176**	**1,871**	**2,013**	**2,301**
Light Load	2,086	1,946	1,749	1,708	1,854	2,270	2,602	2,406	1,976	1,697	1,863	2,142
Heavy Load	2,369	2,217	1,993	1,996	2,210	2,727	3,117	2,972	2,337	2,009	2,134	2,426
Total Load	**2,238**	**2,101**	**1,891**	**1,874**	**2,045**	**2,534**	**2,890**	**2,722**	**2,176**	**1,871**	**2,013**	**2,301**
					Peak Load (MW) 90th Percentile							
System Peak Load (1 hour)	2,870	2,614	2,378	2,401	3,028	4,140	4,238	4,031	3,437	2,572	2,689	2,965
Total Peak Load	**2,870**	**2,614**	**2,378**	**2,401**	**3,028**	**4,140**	**4,238**	**4,031**	**3,437**	**2,572**	**2,689**	**2,965**

2028 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					Average Load (aMW) 50th Percentile							
Residential	904	762	642	549	493	616	772	712	542	539	700	923
Commercial	544	506	475	455	468	495	561	558	503	482	495	530
Irrigation	4	3	9	118	315	605	701	603	331	64	8	4
Industrial	343	329	339	331	336	352	352	355	347	348	347	345
Additional Firm	349	351	349	341	335	327	335	334	331	337	347	358
Loss	170	152	139	137	152	195	226	210	162	135	146	171
System Load	**2,313**	**2,103**	**1,953**	**1,932**	**2,099**	**2,589**	**2,947**	**2,772**	**2,216**	**1,905**	**2,043**	**2,332**
Light Load	2,156	1,948	1,807	1,760	1,903	2,319	2,653	2,450	2,012	1,727	1,891	2,171
Heavy Load	2,449	2,218	2,059	2,069	2,254	2,787	3,200	3,005	2,379	2,046	2,166	2,471
Total Load	**2,313**	**2,103**	**1,953**	**1,932**	**2,099**	**2,589**	**2,947**	**2,772**	**2,216**	**1,905**	**2,043**	**2,332**
					Peak Load (MW) 90th Percentile							
System Peak Load (1 hour)	2,955	2,686	2,447	2,462	3,066	4,226	4,318	4,084	3,488	2,612	2,722	2,999
Total Peak Load	**2,955**	**2,686**	**2,447**	**2,462**	**3,066**	**4,226**	**4,318**	**4,084**	**3,488**	**2,612**	**2,722**	**2,999**

2029 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	913	795	645	550	494	620	778	717	543	539	701	928
Commercial	549	529	479	459	472	498	566	563	506	485	498	535
Irrigation	4	3	9	118	315	608	705	607	333	65	8	4
Industrial	345	343	342	334	339	355	356	358	350	351	350	349
Additional Firm	357	364	352	341	336	327	335	335	331	338	348	359
Loss	172	159	139	138	153	196	227	212	163	135	147	172
System Load	**2,341**	**2,193**	**1,966**	**1,941**	**2,109**	**2,604**	**2,967**	**2,790**	**2,227**	**1,912**	**2,052**	**2,347**
Light Load	2,181	2,032	1,819	1,769	1,912	2,332	2,671	2,466	2,022	1,734	1,898	2,185
Heavy Load	2,466	2,314	2,073	2,079	2,264	2,802	3,221	3,025	2,406	2,041	2,175	2,486
Total Load	**2,341**	**2,193**	**1,966**	**1,941**	**2,109**	**2,604**	**2,967**	**2,790**	**2,227**	**1,912**	**2,052**	**2,347**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	2,987	2,708	2,462	2,470	3,078	4,273	4,355	4,130	3,508	2,620	2,730	3,016
Total Peak Load	**2,987**	**2,708**	**2,462**	**2,470**	**3,078**	**4,273**	**4,355**	**4,130**	**3,508**	**2,620**	**2,730**	**3,016**

2030 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	920	800	646	551	495	622	782	720	543	537	701	933
Commercial	556	535	483	464	476	503	573	569	511	489	502	538
Irrigation	4	3	9	118	316	610	708	610	335	65	8	4
Industrial	349	347	346	338	343	359	359	361	354	355	354	352
Additional Firm	360	366	354	343	337	329	337	336	333	340	350	361
Loss	174	160	140	139	154	197	229	213	164	136	148	173
System Load	**2,362**	**2,211**	**1,978**	**1,952**	**2,120**	**2,620**	**2,988**	**2,811**	**2,239**	**1,921**	**2,062**	**2,361**
Light Load	2,201	2,048	1,830	1,779	1,922	2,346	2,690	2,484	2,033	1,742	1,908	2,198
Heavy Load	2,489	2,333	2,095	2,079	2,277	2,838	3,223	3,047	2,420	2,051	2,185	2,502
Total Load	**2,362**	**2,211**	**1,978**	**1,952**	**2,120**	**2,620**	**2,988**	**2,811**	**2,239**	**1,921**	**2,062**	**2,361**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,008	2,724	2,471	2,478	3,092	4,309	4,394	4,172	3,529	2,630	2,741	3,028
Total Peak Load	**3,008**	**2,724**	**2,471**	**2,478**	**3,092**	**4,309**	**4,394**	**4,172**	**3,529**	**2,630**	**2,741**	**3,028**

2031 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	928	806	647	551	495	624	786	724	544	535	701	938
Commercial	560	538	485	467	478	506	577	573	513	491	503	542
Irrigation	4	3	9	118	317	612	712	614	337	65	8	4
Industrial	352	350	349	341	346	362	363	365	357	358	357	356
Additional Firm	360	366	354	343	337	329	337	336	333	340	350	362
Loss	175	161	141	139	154	198	230	215	165	136	148	174
System Load	**2,379**	**2,224**	**1,986**	**1,958**	**2,127**	**2,631**	**3,004**	**2,826**	**2,248**	**1,925**	**2,067**	**2,376**
Light Load	2,217	2,060	1,837	1,785	1,928	2,356	2,705	2,497	2,041	1,745	1,912	2,212
Heavy Load	2,496	2,347	2,103	2,085	2,271	2,850	3,221	3,085	2,399	2,055	2,190	2,494
Total Load	**2,379**	**2,224**	**1,986**	**1,958**	**2,127**	**2,631**	**3,004**	**2,826**	**2,248**	**1,925**	**2,067**	**2,376**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,031	2,739	2,482	2,483	3,101	4,359	4,429	4,217	3,544	2,635	2,746	3,047
Total Peak Load	**3,031**	**2,739**	**2,482**	**2,483**	**3,101**	**4,359**	**4,429**	**4,217**	**3,544**	**2,635**	**2,746**	**3,047**

2032 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	936	782	648	550	494	625	789	726	543	533	700	942
Commercial	567	525	491	472	483	511	584	580	518	496	508	545
Irrigation	4	3	9	119	318	616	716	618	340	66	8	4
Industrial	357	342	353	345	350	366	367	369	361	362	361	360
Additional Firm	360	360	355	343	337	329	337	337	333	340	350	362
Loss	177	157	142	140	155	199	232	216	165	137	148	175
System Load	**2,400**	**2,170**	**1,997**	**1,969**	**2,138**	**2,646**	**3,026**	**2,846**	**2,260**	**1,933**	**2,075**	**2,388**
Light Load	2,237	2,010	1,847	1,794	1,938	2,370	2,724	2,515	2,052	1,752	1,920	2,223
Heavy Load	2,518	2,300	2,104	2,096	2,296	2,848	3,244	3,107	2,412	2,075	2,189	2,507
Total Load	**2,400**	**2,170**	**1,997**	**1,969**	**2,138**	**2,646**	**3,026**	**2,846**	**2,260**	**1,933**	**2,075**	**2,388**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,052	2,753	2,491	2,490	3,115	4,396	4,468	4,259	3,566	2,644	2,755	3,057
Total Peak Load	**3,052**	**2,753**	**2,491**	**2,490**	**3,115**	**4,396**	**4,468**	**4,259**	**3,566**	**2,644**	**2,755**	**3,057**

2033 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						Average Load (aMW) 50th Percentile						
Residential	943	815	648	549	493	625	792	728	542	530	698	946
Commercial	572	547	493	475	486	514	588	584	520	498	509	549
Irrigation	4	3	9	119	320	620	722	622	342	66	8	4
Industrial	360	358	356	348	353	370	371	373	365	366	365	364
Additional Firm	360	367	355	343	337	329	337	337	333	340	350	362
Loss	178	163	142	140	155	200	233	217	166	137	149	176
System Load	**2,416**	**2,253**	**2,003**	**1,975**	**2,146**	**2,659**	**3,043**	**2,861**	**2,268**	**1,936**	**2,080**	**2,401**
Light Load	2,252	2,087	1,853	1,800	1,945	2,381	2,740	2,529	2,059	1,755	1,924	2,236
Heavy Load	2,546	2,377	2,111	2,103	2,304	2,861	3,282	3,101	2,420	2,079	2,193	2,521
Total Load	**2,416**	**2,253**	**2,003**	**1,975**	**2,146**	**2,659**	**3,043**	**2,861**	**2,268**	**1,936**	**2,080**	**2,401**
						Peak Load (MW) 90th Percentile						
System Peak Load (1 hour)	3,073	2,767	2,500	2,495	3,124	4,443	4,503	4,303	3,580	2,648	2,759	3,074
Total Peak Load	**3,073**	**2,767**	**2,500**	**2,495**	**3,124**	**4,443**	**4,503**	**4,303**	**3,580**	**2,648**	**2,759**	**3,074**

2034 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						Average Load (aMW) 50th Percentile						
Residential	951	820	650	550	495	631	801	736	546	533	703	954
Commercial	578	553	497	480	490	519	595	590	525	501	513	552
Irrigation	4	3	9	120	323	625	727	627	345	67	8	4
Industrial	364	362	361	353	358	374	375	377	369	370	369	368
Additional Firm	360	367	355	343	337	329	337	337	333	340	350	362
Loss	180	165	143	141	157	202	236	219	167	138	150	178
System Load	**2,437**	**2,270**	**2,015**	**1,987**	**2,159**	**2,679**	**3,070**	**2,887**	**2,285**	**1,948**	**2,093**	**2,418**
Light Load	2,271	2,103	1,863	1,811	1,957	2,400	2,764	2,551	2,074	1,766	1,936	2,251
Heavy Load	2,568	2,395	2,123	2,128	2,305	2,884	3,312	3,130	2,439	2,092	2,207	2,549
Total Load	**2,437**	**2,270**	**2,015**	**1,987**	**2,159**	**2,679**	**3,070**	**2,887**	**2,285**	**1,948**	**2,093**	**2,418**
						Peak Load (MW) 90th Percentile						
System Peak Load (1 hour)	3,093	2,782	2,509	2,503	3,142	4,486	4,547	4,351	3,610	2,662	2,773	3,088
Total Peak Load	**3,093**	**2,782**	**2,509**	**2,503**	**3,142**	**4,486**	**4,547**	**4,351**	**3,610**	**2,662**	**2,773**	**3,088**

2035 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	961	829	655	555	501	639	813	747	551	535	706	962
Commercial	582	556	500	483	492	522	599	595	527	503	514	555
Irrigation	4	3	9	121	325	629	732	632	347	67	8	4
Industrial	368	366	365	357	362	379	379	382	373	374	374	373
Additional Firm	362	368	356	344	338	330	338	338	334	341	352	363
Loss	181	166	144	142	158	204	238	221	169	138	150	179
System Load	**2,459**	**2,289**	**2,029**	**2,002**	**2,176**	**2,702**	**3,100**	**2,913**	**2,301**	**1,960**	**2,105**	**2,437**
Light Load	2,292	2,121	1,877	1,824	1,972	2,420	2,791	2,575	2,089	1,777	1,947	2,269
Heavy Load	2,580	2,416	2,139	2,144	2,323	2,908	3,343	3,158	2,471	2,092	2,220	2,570
Total Load	**2,459**	**2,289**	**2,029**	**2,002**	**2,176**	**2,702**	**3,100**	**2,913**	**2,301**	**1,960**	**2,105**	**2,437**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,116	2,799	2,521	2,515	3,162	4,531	4,592	4,401	3,639	2,675	2,785	3,104
Total Peak Load	**3,116**	**2,799**	**2,521**	**2,515**	**3,162**	**4,531**	**4,592**	**4,401**	**3,639**	**2,675**	**2,785**	**3,104**

2036 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	973	809	661	560	506	648	826	757	557	538	710	971
Commercial	588	542	504	487	496	526	605	600	531	507	518	560
Irrigation	4	3	9	122	327	634	737	636	350	68	8	4
Industrial	374	358	369	361	366	383	384	387	378	379	378	378
Additional Firm	362	362	356	344	338	330	338	338	334	341	352	363
Loss	183	162	145	144	159	206	241	224	170	139	151	181
System Load	**2,483**	**2,236**	**2,045**	**2,018**	**2,193**	**2,727**	**3,131**	**2,942**	**2,319**	**1,972**	**2,117**	**2,458**
Light Load	2,314	2,072	1,892	1,839	1,988	2,442	2,819	2,600	2,106	1,788	1,959	2,288
Heavy Load	2,605	2,358	2,166	2,149	2,341	2,955	3,357	3,212	2,476	2,105	2,244	2,580
Total Load	**2,483**	**2,236**	**2,045**	**2,018**	**2,193**	**2,727**	**3,131**	**2,942**	**2,319**	**1,972**	**2,117**	**2,458**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,143	2,821	2,536	2,526	3,185	4,585	4,639	4,455	3,672	2,690	2,798	3,125
Total Peak Load	**3,143**	**2,821**	**2,536**	**2,526**	**3,185**	**4,585**	**4,639**	**4,455**	**3,672**	**2,690**	**2,798**	**3,125**

2037 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	985	848	668	566	513	658	840	769	563	542	715	980
Commercial	596	568	509	493	501	531	613	608	536	511	522	566
Irrigation	4	3	9	123	329	638	743	641	352	68	8	4
Industrial	379	376	375	366	372	389	390	392	383	385	384	384
Additional Firm	361	368	355	344	338	330	338	337	333	341	351	363
Loss	185	169	146	145	161	208	243	226	172	140	153	182
System Load	**2,509**	**2,333**	**2,063**	**2,037**	**2,213**	**2,754**	**3,166**	**2,974**	**2,340**	**1,987**	**2,132**	**2,480**
Light Load	2,338	2,161	1,908	1,856	2,006	2,467	2,851	2,628	2,125	1,802	1,973	2,308
Heavy Load	2,633	2,462	2,185	2,169	2,376	2,964	3,394	3,246	2,498	2,121	2,260	2,603
Total Load	**2,509**	**2,333**	**2,063**	**2,037**	**2,213**	**2,754**	**3,166**	**2,974**	**2,340**	**1,987**	**2,132**	**2,480**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,172	2,841	2,553	2,539	3,210	4,643	4,689	4,514	3,709	2,707	2,813	3,148
Total Peak Load	**3,172**	**2,841**	**2,553**	**2,539**	**3,210**	**4,643**	**4,689**	**4,514**	**3,709**	**2,707**	**2,813**	**3,148**

2038 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	996	858	674	572	519	668	854	781	569	545	719	989
Commercial	605	575	515	499	507	538	621	616	543	517	527	572
Irrigation	4	4	10	123	332	643	748	646	355	69	8	4
Industrial	385	382	381	372	377	395	396	398	390	391	390	389
Additional Firm	361	368	356	344	338	330	338	337	334	341	351	363
Loss	188	171	148	147	162	210	246	229	173	142	154	184
System Load	**2,538**	**2,358**	**2,083**	**2,057**	**2,235**	**2,784**	**3,204**	**3,007**	**2,363**	**2,004**	**2,150**	**2,501**
Light Load	2,365	2,185	1,927	1,875	2,026	2,494	2,884	2,658	2,145	1,817	1,989	2,328
Heavy Load	2,675	2,489	2,196	2,191	2,400	2,996	3,434	3,283	2,522	2,152	2,267	2,625
Total Load	**2,538**	**2,358**	**2,083**	**2,057**	**2,235**	**2,784**	**3,204**	**3,007**	**2,363**	**2,004**	**2,150**	**2,501**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,202	2,865	2,570	2,554	3,238	4,698	4,741	4,573	3,750	2,726	2,830	3,168
Total Peak Load	**3,202**	**2,865**	**2,570**	**2,554**	**3,238**	**4,698**	**4,741**	**4,573**	**3,750**	**2,726**	**2,830**	**3,168**

2039 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	1,008	868	681	578	525	678	868	792	575	549	724	998
Commercial	612	581	520	505	512	543	629	623	548	521	531	577
Irrigation	4	4	10	124	334	648	754	651	358	69	8	4
Industrial	389	387	385	377	382	400	401	403	394	396	395	395
Additional Firm	360	367	355	343	337	329	337	337	333	340	350	362
Loss	190	173	149	148	164	212	249	232	175	143	155	186
System Load	**2,564**	**2,380**	**2,100**	**2,075**	**2,254**	**2,811**	**3,238**	**3,038**	**2,383**	**2,017**	**2,163**	**2,522**
Light Load	2,389	2,205	1,942	1,891	2,044	2,517	2,915	2,685	2,163	1,829	2,002	2,348
Heavy Load	2,701	2,511	2,213	2,209	2,421	3,025	3,493	3,294	2,543	2,166	2,282	2,647
Total Load	**2,564**	**2,380**	**2,100**	**2,075**	**2,254**	**2,811**	**3,238**	**3,038**	**2,383**	**2,017**	**2,163**	**2,522**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,230	2,886	2,585	2,566	3,263	4,754	4,790	4,630	3,786	2,742	2,844	3,190
Total Peak Load	**3,230**	**2,886**	**2,585**	**2,566**	**3,263**	**4,754**	**4,790**	**4,630**	**3,786**	**2,742**	**2,844**	**3,190**

2040 Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Load (aMW) 50th Percentile												
Residential	1,020	848	687	584	531	688	882	804	581	552	728	1,007
Commercial	620	568	526	511	517	550	637	632	553	527	536	583
Irrigation	4	3	10	125	337	653	760	656	361	70	8	4
Industrial	396	379	391	382	388	406	407	410	400	402	401	401
Additional Firm	360	360	355	343	337	329	337	337	333	340	350	362
Loss	192	169	151	149	166	215	252	234	177	144	156	187
System Load	**2,593**	**2,329**	**2,120**	**2,095**	**2,276**	**2,841**	**3,276**	**3,073**	**2,405**	**2,034**	**2,180**	**2,544**
Light Load	2,416	2,157	1,961	1,909	2,063	2,544	2,949	2,715	2,184	1,844	2,017	2,369
Heavy Load	2,732	2,456	2,234	2,244	2,430	3,057	3,533	3,331	2,582	2,171	2,299	2,683
Total Load	**2,593**	**2,329**	**2,120**	**2,095**	**2,276**	**2,841**	**3,276**	**3,073**	**2,405**	**2,034**	**2,180**	**2,544**
Peak Load (MW) 90th Percentile												
System Peak Load (1 hour)	3,262	2,910	2,603	2,580	3,291	4,814	4,842	4,692	3,826	2,761	2,860	3,214
Total Peak Load	**3,262**	**2,910**	**2,603**	**2,580**	**3,291**	**4,814**	**4,842**	**4,692**	**3,826**	**2,761**	**2,860**	**3,214**

Annual Summary

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Billed Sales (MWh) 50th Percentile										
Residential	5,635,713	5,710,186	5,772,357	5,834,308	5,864,905	5,898,453	5,931,181	5,967,746	5,999,109	6,018,724
Commercial	4,154,365	4,217,870	4,263,448	4,334,031	4,365,752	4,404,485	4,412,187	4,445,191	4,478,255	4,524,186
Irrigation	1,970,226	1,965,458	1,983,439	1,994,283	2,002,695	2,012,609	2,022,833	2,032,511	2,041,379	2,050,717
Industrial	2,580,373	2,623,201	2,730,455	2,816,579	2,897,217	2,965,928	2,992,099	3,017,063	3,044,712	3,074,987
Additional Firm	942,656	1,018,694	1,104,071	1,288,348	1,705,710	2,163,300	2,667,909	2,996,219	3,009,581	3,025,290
System Load	**15,283,333**	**15,535,409**	**15,853,770**	**16,267,549**	**16,836,279**	**17,444,775**	**18,026,210**	**18,458,730**	**18,573,037**	**18,693,904**
Total Load	**15,283,333**	**15,535,409**	**15,853,770**	**16,267,549**	**16,836,279**	**17,444,775**	**18,026,210**	**18,458,730**	**18,573,037**	**18,693,904**
Generation Month Sales (MWh) 50th Percentile										
Residential	5,643,792	5,715,460	5,777,754	5,837,430	5,868,421	5,902,080	5,935,286	5,971,643	6,002,306	6,022,165
Commercial	4,157,604	4,220,547	4,267,693	4,335,826	4,367,986	4,404,768	4,414,055	4,447,059	4,480,927	4,525,422
Irrigation	1,969,952	1,965,473	1,983,447	1,994,290	2,002,703	2,012,617	2,022,841	2,032,518	2,041,387	2,050,724
Industrial	2,586,804	2,631,598	2,738,356	2,820,809	2,906,038	2,968,139	2,994,178	3,019,425	3,047,267	3,077,338
Additional Firm	942,656	1,018,694	1,104,071	1,288,348	1,705,710	2,163,300	2,667,909	2,996,219	3,009,581	3,025,290
System Sales	**15,300,808**	**15,551,772**	**15,871,321**	**16,276,703**	**16,850,858**	**17,450,904**	**18,034,270**	**18,466,864**	**18,581,468**	**18,700,939**
Total Sales	**15,300,808**	**15,551,772**	**15,871,321**	**16,276,703**	**16,850,858**	**17,450,904**	**18,034,270**	**18,466,864**	**18,581,468**	**18,700,939**
Loss	1,299,774	1,317,582	1,339,261	1,364,116	1,390,580	1,417,751	1,441,898	1,462,314	1,471,333	1,480,536
Required Generation	**16,600,582**	**16,869,354**	**17,210,583**	**17,640,819**	**18,241,438**	**18,868,655**	**19,476,169**	**19,929,178**	**20,052,801**	**20,181,475**
Average Load (aMW) 50th Percentile										
Residential	644	652	660	665	670	674	678	680	685	687
Commercial	475	482	487	494	499	503	504	506	512	517
Irrigation	225	224	226	227	229	230	231	231	233	234
Industrial	295	300	313	321	332	339	342	344	348	351
Additional Firm	108	116	126	147	195	247	305	341	344	345
Loss	148	150	153	155	159	162	165	166	168	169
System Load	**1,895**	**1,926**	**1,965**	**2,008**	**2,082**	**2,154**	**2,223**	**2,269**	**2,289**	**2,304**
Light Load	1,727	1,755	1,790	1,830	1,898	1,963	2,026	2,068	2,086	2,100
Heavy Load	2,027	2,060	2,102	2,148	2,227	2,304	2,378	2,427	2,448	2,463
Total Load	**1,895**	**1,926**	**1,965**	**2,008**	**2,082**	**2,154**	**2,223**	**2,269**	**2,289**	**2,304**
Peak Load (MW) 90th Percentile										
System Peak (1 hour)	3,745	3,801	3,866	3,939	4,045	4,149	4,238	4,318	4,355	4,394
Total Peak Load	**3,745**	**3,801**	**3,866**	**3,939**	**4,045**	**4,149**	**4,238**	**4,318**	**4,355**	**4,394**

	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Billed Sales (MWh) 50th Percentile										
Residential	6,038,740	6,053,331	6,061,524	6,104,752	6,167,697	6,234,707	6,307,610	6,379,036	6,451,389	6,524,479
Commercial	4,547,247	4,597,454	4,623,819	4,666,477	4,691,896	4,730,777	4,781,058	4,840,659	4,891,067	4,946,878
Irrigation	2,059,844	2,072,374	2,087,185	2,102,102	2,117,049	2,132,249	2,148,024	2,163,705	2,180,446	2,197,856
Industrial	3,102,840	3,139,967	3,172,009	3,209,971	3,246,433	3,287,987	3,335,272	3,388,295	3,429,735	3,483,237
Additional Firm	3,026,907	3,032,142	3,027,782	3,028,582	3,039,830	3,043,140	3,034,836	3,036,125	3,028,047	3,032,367
System Load	**18,775,578**	**18,895,269**	**18,972,319**	**19,111,884**	**19,262,906**	**19,428,860**	**19,606,800**	**19,807,820**	**19,980,685**	**20,184,816**
Total Load	**18,775,578**	**18,895,269**	**18,972,319**	**19,111,884**	**19,262,906**	**19,428,860**	**19,606,800**	**19,807,820**	**19,980,685**	**20,184,816**
Generation Month Sales (MWh) 50th Percentile										
Residential	6,038,740	6,053,331	6,061,524	6,104,752	6,167,697	6,234,707	6,307,610	6,379,036	6,451,389	6,524,479
Commercial	4,547,247	4,597,454	4,623,819	4,666,477	4,691,896	4,730,777	4,781,058	4,840,659	4,891,067	4,946,878
Irrigation	2,059,844	2,072,374	2,087,185	2,102,102	2,117,049	2,132,249	2,148,024	2,163,705	2,180,446	2,197,856
Industrial	3,102,840	3,139,967	3,172,009	3,209,971	3,246,433	3,287,987	3,335,272	3,388,295	3,429,735	3,483,237
Additional Firm	3,026,907	3,032,142	3,027,782	3,028,582	3,039,830	3,043,140	3,034,836	3,036,125	3,028,047	3,032,367
System Sales	**18,775,578**	**18,895,269**	**18,972,319**	**19,111,884**	**19,262,906**	**19,428,860**	**19,606,800**	**19,807,820**	**19,980,685**	**20,184,816**
Total Sales	**18,775,578**	**18,895,269**	**18,972,319**	**19,111,884**	**19,262,906**	**19,428,860**	**19,606,800**	**19,807,820**	**19,980,685**	**20,184,816**
Loss	1,487,351	1,496,764	1,503,299	1,515,098	1,527,602	1,541,794	1,557,512	1,574,430	1,589,893	1,607,050
Required Generation	**20,272,221**	**20,399,203**	**20,484,525**	**20,635,958**	**20,801,018**	**20,982,844**	**21,177,403**	**21,393,841**	**21,583,530**	**21,804,967**
Average Load (aMW) 50th Percentile										
Residential	690	689	692	697	705	710	721	729	737	743
Commercial	519	524	528	533	536	539	546	553	559	564
Irrigation	235	236	238	240	242	243	245	247	249	250
Industrial	355	358	362	367	371	375	381	387	392	397
Additional Firm	346	345	346	346	347	346	346	347	346	345
Loss	170	170	172	173	174	176	178	180	181	183
System Load	**2,314**	**2,322**	**2,338**	**2,356**	**2,375**	**2,389**	**2,418**	**2,442**	**2,464**	**2,482**
Light Load	2,109	2,117	2,131	2,147	2,164	2,177	2,203	2,226	2,246	2,262
Heavy Load	2,468	2,477	2,494	2,513	2,532	2,548	2,578	2,605	2,628	2,648
Total Load	**2,314**	**2,322**	**2,338**	**2,356**	**2,375**	**2,389**	**2,418**	**2,442**	**2,464**	**2,482**
Peak Load (MW) 90th Percentile										
System Peak (1 hour)	4,429	4,468	4,503	4,547	4,592	4,639	4,689	4,741	4,790	4,842
Total Peak Load	**4,429**	**4,468**	**4,503**	**4,547**	**4,592**	**4,639**	**4,689**	**4,741**	**4,790**	**4,842**

LOAD AND RESOURCE BALANCE DATA

	1/2021	2/2021	3/2021	4/2021	5/2021	6/2021	7/2021	8/2021	9/2021	10/2021	11/2021	12/2021
Peak-Hour (50th+15.5%) w/EE	(2,693)	(2,339)	(2,172)	(2,064)	(2,757)	(3,938)	(4,161)	(3,899)	(3,259)	(2,453)	(2,525)	(2,733)
Existing Demand Response Capacity	–	–	–	–	–	66	66	58	–	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(2,693)**	**(2,339)**	**(2,172)**	**(2,064)**	**(2,757)**	**(3,873)**	**(4,096)**	**(3,840)**	**(3,259)**	**(2,453)**	**(2,525)**	**(2,733)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	121	121	121	121	121	121	121	121	121	121	121	121
Total Coal	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**
Langley Gulch	288	282	279	279	276	270	270	270	273	276	282	288
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**717**	**708**	**689**	**680**	**672**	**640**	**636**	**637**	**671**	**691**	**706**	**725**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	356	366	285	431	458	434	295	254	244	218	200	378
Total Hydroelectric (50%)	**1,368**	**1,378**	**1,346**	**1,492**	**1,615**	**1,591**	**1,355**	**1,266**	**1,159**	**1,086**	**875**	**1,342**
Solar CSPP (PURPA)	–	–	99	99	99	197	197	197	99	99	99	–
Wind CSPP Capacity	94	94	94	94	94	93	93	93	94	94	94	94
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**125**	**133**	**239**	**276**	**314**	**424**	**420**	**412**	**296**	**260**	**227**	**126**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	–	–	–	–	–	–	–	–	–	–
Clatskanie Exchange	–	–	–	–	–	14	11	2	–	–	–	–
Total PPAs	**50**	**50**	**48**	**46**	**38**	**52**	**42**	**38**	**41**	**46**	**51**	**52**
Available Transmission w/3rd Party Secured	**50**	**50**	**50**	**50**	**150**	**200**	**200**	**200**	**200**	**200**	**150**	**150**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,424**	**3,434**	**3,486**	**3,657**	**3,904**	**4,021**	**3,767**	**3,667**	**3,481**	**3,397**	**3,123**	**3,510**
Monthly Surplus/Deficit	**731**	**1,095**	**1,314**	**1,594**	**1,147**	**148**	**(329)**	**(173)**	**222**	**944**	**598**	**776**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 4 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Storage)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—WY Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—ID Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	–	–	–	–	–	–	–	–	–	–	–	–
New Resource Subtotal	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Surplus/Deficit	731	1,095	1,314	1,594	1,147	148	(329)	(173)	222	944	598	776
Planning Margin	46.8%	69.6%	85.4%	104.7%	63.6%	19.9%	6.4%	10.4%	23.4%	59.9%	42.9%	48.3%

	1/2022	2/2022	3/2022	4/2022	5/2022	6/2022	7/2022	8/2022	9/2022	10/2022	11/2022	12/2022
Peak-Hour (50th+15.5%) w/EE	(2,771)	(2,531)	(2,352)	(2,188)	(2,899)	(3,973)	(4,226)	(3,927)	(3,291)	(2,473)	(2,555)	(2,762)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(2,771)**	**(2,531)**	**(2,352)**	**(2,188)**	**(2,899)**	**(3,798)**	**(4,050)**	**(3,800)**	**(3,188)**	**(2,473)**	**(2,555)**	**(2,762)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	121	121	121	121	121	121	121	121	121	121	121	121
Total Coal	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**
Langley Gulch	288	282	279	279	276	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**717**	**708**	**689**	**680**	**672**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	356	366	286	431	461	437	295	254	244	218	200	379
Total Hydroelectric (50%)	**1,368**	**1,378**	**1,346**	**1,492**	**1,618**	**1,594**	**1,355**	**1,266**	**1,159**	**1,086**	**875**	**1,343**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	94	94	94	94	94	93	93	93	94	94	94	94
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**125**	**133**	**240**	**276**	**316**	**425**	**422**	**414**	**297**	**261**	**228**	**126**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	–	–	–	–	–	–	–	–	–	–
Clatskanie Exchange	–	–	–	–	–	14	11	2	–	–	–	–
Total PPAs	**50**	**50**	**48**	**46**	**38**	**52**	**42**	**38**	**41**	**46**	**51**	**52**
Available Transmission w/3rd Party Secured	**150**	**150**	**150**	**150**	**250**	**300**	**300**	**300**	**300**	**300**	**250**	**209**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,524**	**3,534**	**3,588**	**3,758**	**4,008**	**4,161**	**3,904**	**3,804**	**3,618**	**3,533**	**3,259**	**3,605**
Monthly Surplus/Deficit	**753**	**1,003**	**1,236**	**1,570**	**1,109**	**364**	**(146)**	**4**	**430**	**1,060**	**705**	**843**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 4 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Storage)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—WY Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—ID Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	–	–	–	–	–	–	–	–	–	–	–	–
New Resource Subtotal	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Surplus/Deficit	**753**	**1,003**	**1,236**	**1,570**	**1,109**	**364**	**(146)**	**4**	**430**	**1,060**	**705**	**843**
Planning Margin	**46.9%**	**61.3%**	**76.2%**	**98.4%**	**59.7%**	**26.1%**	**11.5%**	**15.6%**	**30.6%**	**65.0%**	**47.4%**	**50.8%**

	1/2023	2/2023	3/2023	4/2023	5/2023	6/2023	7/2023	8/2023	9/2023	10/2023	11/2023	12/2023
Peak-Hour (50th+15.5%) w/EE	(2,818)	(2,579)	(2,390)	(2,234)	(2,956)	(4,146)	(4,301)	(4,045)	(3,348)	(2,509)	(2,585)	(2,843)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(2,818)**	**(2,579)**	**(2,390)**	**(2,234)**	**(2,956)**	**(3,971)**	**(4,126)**	**(3,917)**	**(3,245)**	**(2,509)**	**(2,585)**	**(2,843)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	121	121	121	121	121	121	121	121	121	121	121	121
Total Coal	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	356	366	287	431	464	443	295	254	244	218	200	381
Total Hydroelectric (50%)	**1,368**	**1,378**	**1,347**	**1,492**	**1,621**	**1,599**	**1,355**	**1,266**	**1,159**	**1,086**	**875**	**1,345**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	94	94	94	94	94	93	93	93	94	94	94	94
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**125**	**133**	**240**	**276**	**316**	**425**	**422**	**414**	**297**	**261**	**228**	**126**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	14	11	2	–	–	–	–
Total PPAs	**50**	**50**	**68**	**66**	**58**	**92**	**82**	**78**	**61**	**66**	**71**	**52**
Available Transmission w/3rd Party Secured	**239**	**295**	**330**	**330**	**271**	**380**	**380**	**380**	**380**	**380**	**275**	**206**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,648**	**3,714**	**3,825**	**3,994**	**4,088**	**4,287**	**4,025**	**3,925**	**3,718**	**3,634**	**3,305**	**3,605**
Monthly Surplus/Deficit	**830**	**1,135**	**1,435**	**1,760**	**1,132**	**316**	**(101)**	**8**	**473**	**1,125**	**720**	**762**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	7	7	5	4	–	–	–
New Resource—Battery: 4 hour	50	50	50	101	101	101	101	101	50	50	50	50
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Storage)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—WY Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—ID Wind	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	–	–	–	–	–	–	–	–	–	–	–	–
New Resource Subtotal	50	50	50	50	101	108	108	106	105	50	50	50
Monthly Surplus/Deficit	**881**	**1,185**	**1,485**	**1,810**	**1,232**	**424**	**7**	**114**	**578**	**1,175**	**770**	**812**
Planning Margin	**51.6%**	**68.6%**	**87.2%**	**109.1%**	**63.6%**	**27.3%**	**15.7%**	**18.7%**	**35.4%**	**69.6%**	**49.9%**	**48.5%**

	1/2024	2/2024	3/2024	4/2024	5/2024	6/2024	7/2024	8/2024	9/2024	10/2024	11/2024	12/2024
Peak-Hour (50th+15.5%) w/EE	(2,893)	(2,630)	(2,444)	(2,271)	(3,033)	(4,192)	(4,385)	(4,152)	(3,433)	(2,576)	(2,664)	(2,902)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(2,893)**	**(2,630)**	**(2,444)**	**(2,271)**	**(3,033)**	**(4,017)**	**(4,210)**	**(4,025)**	**(3,330)**	**(2,576)**	**(2,664)**	**(2,902)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	121	121	121	121	121	121	121	121	121	121	121	121
Total Coal	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	357	366	289	432	466	446	295	253	244	218	200	383
Total Hydroelectric (50%)	**1,369**	**1,379**	**1,349**	**1,492**	**1,623**	**1,603**	**1,355**	**1,266**	**1,159**	**1,085**	**875**	**1,347**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	94	94	94	94	94	93	93	93	94	94	94	94
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**125**	**133**	**240**	**276**	**316**	**425**	**422**	**414**	**297**	**261**	**228**	**126**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	14	11	2	–	–	–	–
Total PPAs	**50**	**50**	**68**	**66**	**58**	**92**	**82**	**78**	**61**	**66**	**71**	**52**
Available Transmission w/3rd Party Secured	**237**	**294**	**330**	**330**	**269**	**380**	**379**	**380**	**380**	**380**	**273**	**205**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,647**	**3,714**	**3,826**	**3,994**	**4,088**	**4,290**	**4,023**	**3,925**	**3,718**	**3,633**	**3,303**	**3,604**
Monthly Surplus/Deficit	**754**	**1,083**	**1,382**	**1,723**	**1,056**	**274**	**(186)**	**(100)**	**388**	**1,058**	**639**	**702**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	7	7	5	4	–	–	–
New Resource—Battery: 4 hour	53	53	53	53	105	105	105	105	105	53	53	53
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Storage)	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar	–	–	–	–	–	–	–	–	–	10	10	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	334	334	334	334	334	334	334
Early Bridger Coal Exits	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)
New Resource Subtotal	(204)	(204)	(204)	(204)	(151)	190	190	188	187	141	141	131
Monthly Surplus/Deficit	**550**	**879**	**1,178**	**1,520**	**904**	**464**	**4**	**88**	**575**	**1,198**	**779**	**833**
Planning Margin	**37.5%**	**54.1%**	**71.2%**	**92.8%**	**49.9%**	**28.3%**	**15.6%**	**18.0%**	**34.8%**	**69.2%**	**49.3%**	**48.6%**

	1/2025	2/2025	3/2025	4/2025	5/2025	6/2025	7/2025	8/2025	9/2025	10/2025	11/2025	12/2025
Peak-Hour (50th+15.5%) w/EE	(2,962)	(2,727)	(2,512)	(2,339)	(3,118)	(4,316)	(4,508)	(4,263)	(3,551)	(2,669)	(2,768)	(2,986)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(2,962)**	**(2,727)**	**(2,512)**	**(2,339)**	**(3,118)**	**(4,140)**	**(4,332)**	**(4,135)**	**(3,448)**	**(2,669)**	**(2,768)**	**(2,986)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	121	121	121	121	121	121	121	121	121	121	121	121
Total Coal	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**	**784**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	356	366	288	431	466	445	295	253	243	218	200	382
Total Hydroelectric (50%)	**1,369**	**1,378**	**1,349**	**1,492**	**1,623**	**1,602**	**1,355**	**1,266**	**1,159**	**1,085**	**875**	**1,346**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	94	94	94	94	94	93	93	93	94	93	93	93
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**125**	**133**	**240**	**276**	**316**	**425**	**422**	**414**	**297**	**259**	**227**	**125**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	14	11	2	–	–	–	–
Total PPAs	**50**	**50**	**68**	**66**	**58**	**92**	**82**	**78**	**61**	**66**	**71**	**52**
Available Transmission w/3rd Party Secured	**235**	**290**	**330**	**330**	**268**	**380**	**377**	**380**	**380**	**379**	**271**	**203**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,645**	**3,710**	**3,826**	**3,994**	**4,086**	**4,289**	**4,021**	**3,925**	**3,718**	**3,631**	**3,300**	**3,601**
Monthly Surplus/Deficit	**683**	**983**	**1,314**	**1,654**	**968**	**149**	**(311)**	**(211)**	**269**	**962**	**531**	**614**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	55	55	55	55	109	109	109	109	109	55	55	55
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	5	5	5	10	10	10	5	5	5	–
New Resource—Solar + Storage 1:1 (Storage)	43	43	43	43	87	87	87	87	87	43	43	43
New Resource—Solar	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)	(334)
New Resource Subtotal	176	176	191	191	290	319	319	315	298	191	191	176
Monthly Surplus/Deficit	**859**	**1,160**	**1,505**	**1,846**	**1,258**	**468**	**8**	**105**	**567**	**1,154**	**723**	**791**
Planning Margin	**49.0%**	**64.6%**	**84.7%**	**106.6%**	**62.1%**	**28.0%**	**15.7%**	**18.3%**	**34.0%**	**65.4%**	**45.7%**	**46.1%**

	1/2026	2/2026	3/2026	4/2026	5/2026	6/2026	7/2026	8/2026	9/2026	10/2026	11/2026	12/2026
Peak-Hour (50th+15.5%) w/EE	(3,065)	(2,829)	(2,598)	(2,423)	(3,186)	(4,415)	(4,620)	(4,358)	(3,636)	(2,765)	(2,822)	(3,092)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,065)**	**(2,829)**	**(2,598)**	**(2,423)**	**(3,186)**	**(4,239)**	**(4,445)**	**(4,231)**	**(3,533)**	**(2,765)**	**(2,822)**	**(3,092)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	356	365	288	431	465	445	294	253	243	218	200	380
Total Hydroelectric (50%)	**1,368**	**1,378**	**1,348**	**1,491**	**1,622**	**1,601**	**1,355**	**1,265**	**1,159**	**1,085**	**875**	**1,344**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	93	93	92	92	92	91	91	91	92	92	92	92
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**124**	**132**	**238**	**274**	**313**	**423**	**420**	**412**	**295**	**258**	**226**	**124**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**50**	**50**	**68**	**66**	**58**	**78**	**71**	**76**	**61**	**66**	**71**	**52**
Available Transmission w/3rd Party Secured	**233**	**289**	**330**	**330**	**266**	**380**	**375**	**380**	**380**	**277**	**170**	**102**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,520**	**3,585**	**3,702**	**3,870**	**3,961**	**4,152**	**3,885**	**3,799**	**3,594**	**3,407**	**3,076**	**3,375**
Monthly Surplus/Deficit	**455**	**756**	**1,105**	**1,447**	**775**	**(88)**	**(560)**	**(432)**	**61**	**642**	**253**	**283**
2021 IRP Resources												
New Transmission—B2H	–	–	–	–	–	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	55	55	55	55	109	109	109	109	109	55	55	55
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	5	5	5	10	10	10	5	5	5	–
New Resource—Solar + Storage 1:1 (Storage)	43	43	43	43	87	87	87	87	87	43	43	43
New Resource—Solar	–	–	21	21	21	42	42	42	21	21	27	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)
New Resource Subtotal	13	13	39	39	138	678	678	674	646	439	445	413
Monthly Surplus/Deficit	**468**	**769**	**1,144**	**1,486**	**912**	**591**	**118**	**242**	**707**	**1,081**	**699**	**696**
Planning Margin	**33.1%**	**46.9%**	**66.4%**	**86.4%**	**48.6%**	**30.9%**	**18.5%**	**21.9%**	**37.9%**	**60.7%**	**44.1%**	**41.5%**

	1/2027	2/2027	3/2027	4/2027	5/2027	6/2027	7/2027	8/2027	9/2027	10/2027	11/2027	12/2027
Peak-Hour (50th+15.5%) w/EE	(3,157)	(2,890)	(2,682)	(2,505)	(3,294)	(4,527)	(4,724)	(4,506)	(3,725)	(2,825)	(2,907)	(3,166)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,157)**	**(2,890)**	**(2,682)**	**(2,505)**	**(3,294)**	**(4,351)**	**(4,548)**	**(4,379)**	**(3,622)**	**(2,825)**	**(2,907)**	**(3,166)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	355	364	287	431	465	443	294	253	243	218	200	377
Total Hydroelectric (50%)	**1,367**	**1,376**	**1,347**	**1,491**	**1,621**	**1,600**	**1,355**	**1,265**	**1,159**	**1,085**	**874**	**1,341**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	92	92	92	92	92	91	91	91	92	92	92	92
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**123**	**131**	**238**	**274**	**313**	**423**	**420**	**412**	**295**	**258**	**226**	**124**
Elkhorn	15	15	15	15	15	15	15	15	15	15	15	15
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**50**	**50**	**68**	**66**	**58**	**78**	**71**	**76**	**61**	**66**	**71**	**52**
Available Transmission w/3rd Party Secured	**132**	**187**	**250**	**258**	**165**	**380**	**374**	**380**	**380**	**276**	**169**	**101**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,416**	**3,481**	**3,621**	**3,798**	**3,858**	**4,150**	**3,883**	**3,799**	**3,594**	**3,406**	**3,074**	**3,371**
Monthly Surplus/Deficit	**259**	**591**	**939**	**1,293**	**565**	**(201)**	**(665)**	**(580)**	**(28)**	**581**	**167**	**205**
2021 IRP Resources												
New Transmission—B2H	400	400	400	699	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	57	57	57	57	114	114	114	114	114	57	57	57
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	5	5	5	10	10	10	5	5	5	–
New Resource—Solar + Storage 1:1 (Storage)	43	43	43	43	87	87	87	87	87	43	43	43
New Resource—Solar	–	–	27	27	27	68	68	68	34	34	34	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)
New Resource Subtotal	415	415	447	746	848	708	708	704	663	454	454	415
Monthly Surplus/Deficit	**675**	**1,006**	**1,386**	**2,039**	**1,413**	**507**	**44**	**124**	**635**	**1,035**	**622**	**621**
Planning Margin	**40.2%**	**55.7%**	**75.2%**	**109.5%**	**65.0%**	**28.4%**	**16.6%**	**18.7%**	**35.2%**	**57.8%**	**40.2%**	**38.1%**

	1/2028	2/2028	3/2028	4/2028	5/2028	6/2028	7/2028	8/2028	9/2028	10/2028	11/2028	12/2028
Peak-Hour (50th+15.5%) w/EE	(3,254)	(2,974)	(2,761)	(2,576)	(3,337)	(4,626)	(4,816)	(4,568)	(3,784)	(2,871)	(2,946)	(3,205)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,254)**	**(2,974)**	**(2,761)**	**(2,576)**	**(3,337)**	**(4,451)**	**(4,640)**	**(4,440)**	**(3,681)**	**(2,871)**	**(2,946)**	**(3,205)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	353	362	285	430	463	442	294	253	243	217	199	374
Total Hydroelectric (50%)	**1,366**	**1,374**	**1,345**	**1,490**	**1,620**	**1,598**	**1,354**	**1,265**	**1,159**	**1,085**	**874**	**1,338**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	92	92	92	92	92	91	91	91	92	92	92	92
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**123**	**131**	**238**	**274**	**313**	**423**	**420**	**412**	**295**	**258**	**226**	**124**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**43**	**63**	**56**	**61**	**46**	**51**	**56**	**37**
Available Transmission w/3rd Party Secured	**131**	**188**	**249**	**258**	**164**	**380**	**373**	**380**	**380**	**276**	**168**	**100**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,399**	**3,465**	**3,603**	**3,782**	**3,841**	**4,134**	**3,867**	**3,784**	**3,579**	**3,390**	**3,059**	**3,353**
Monthly Surplus/Deficit	**145**	**491**	**842**	**1,206**	**504**	**(317)**	**(773)**	**(657)**	**(102)**	**519**	**113**	**148**
2021 IRP Resources												
New Transmission—B2H	400	400	400	695	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	81	81	81	81	162	162	162	162	162	81	81	81
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	5	5	5	10	10	10	5	5	5	–
New Resource—Solar + Storage 1:1 (Storage)	43	43	43	43	87	87	87	87	87	43	43	43
New Resource—Solar	–	–	34	34	34	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)	(497)
New Resource Subtotal	439	439	478	774	903	768	768	764	717	485	485	439
Monthly Surplus/Deficit	**584**	**930**	**1,320**	**1,980**	**1,406**	**451**	**(4)**	**108**	**615**	**1,004**	**597**	**587**
Planning Margin	**36.2%**	**51.6%**	**70.7%**	**104.3%**	**64.2%**	**26.8%**	**15.4%**	**18.2%**	**34.3%**	**55.9%**	**38.9%**	**36.7%**

	1/2029	2/2029	3/2029	4/2029	5/2029	6/2029	7/2029	8/2029	9/2029	10/2029	11/2029	12/2029
Peak-Hour (50th+15.5%) w/EE	(3,292)	(3,000)	(2,779)	(2,584)	(3,352)	(4,681)	(4,859)	(4,621)	(3,807)	(2,881)	(2,956)	(3,225)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,292)**	**(3,000)**	**(2,779)**	**(2,584)**	**(3,352)**	**(4,505)**	**(4,684)**	**(4,493)**	**(3,704)**	**(2,881)**	**(2,956)**	**(3,225)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	352	361	283	429	459	441	294	253	243	217	199	371
Total Hydroelectric (50%)	**1,365**	**1,373**	**1,344**	**1,490**	**1,616**	**1,598**	**1,354**	**1,265**	**1,158**	**1,085**	**874**	**1,335**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	87	87	87	86	86	85	85	85	86	86	86	86
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**118**	**127**	**233**	**268**	**308**	**418**	**414**	**406**	**289**	**252**	**220**	**118**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**43**	**63**	**56**	**61**	**46**	**51**	**56**	**37**
Available Transmission w/3rd Party Secured	**130**	**185**	**249**	**257**	**163**	**380**	**372**	**380**	**380**	**275**	**167**	**99**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,393**	**3,456**	**3,597**	**3,774**	**3,830**	**4,127**	**3,861**	**3,778**	**3,572**	**3,383**	**3,052**	**3,343**
Monthly Surplus/Deficit	**101**	**457**	**818**	**1,190**	**479**	**(378)**	**(823)**	**(716)**	**(131)**	**503**	**96**	**118**
2021 IRP Resources												
New Transmission—B2H	400	400	400	692	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	149	149	149	149	298	298	298	298	298	149	149	149
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—Solar + Storage 1:1 (Storage)	87	87	87	87	174	174	174	174	174	87	87	87
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	385	385	435	727	971	835	835	831	779	435	435	385
Monthly Surplus/Deficit	**486**	**842**	**1,253**	**1,917**	**1,449**	**457**	**12**	**116**	**648**	**938**	**531**	**503**
Planning Margin	**32.6%**	**47.9%**	**67.6%**	**101.2%**	**65.5%**	**26.8%**	**15.8%**	**18.4%**	**35.2%**	**53.1%**	**36.3%**	**33.5%**

	1/2030	2/2030	3/2030	4/2030	5/2030	6/2030	7/2030	8/2030	9/2030	10/2030	11/2030	12/2030
Peak-Hour (50th+15.5%) w/EE	(3,316)	(3,018)	(2,790)	(2,594)	(3,368)	(4,722)	(4,904)	(4,669)	(3,832)	(2,892)	(2,968)	(3,238)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,316)**	**(3,018)**	**(2,790)**	**(2,594)**	**(3,368)**	**(4,546)**	**(4,729)**	**(4,541)**	**(3,729)**	**(2,892)**	**(2,968)**	**(3,238)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	351	359	282	429	458	438	294	252	242	217	199	368
Total Hydroelectric (50%)	**1,364**	**1,371**	**1,342**	**1,489**	**1,615**	**1,594**	**1,354**	**1,265**	**1,158**	**1,085**	**874**	**1,332**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	86	86	86	86	86	81	81	81	82	82	82	82
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**117**	**125**	**232**	**268**	**308**	**414**	**410**	**402**	**285**	**248**	**216**	**114**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**43**	**63**	**56**	**61**	**46**	**51**	**56**	**37**
Available Transmission w/3rd Party Secured	**130**	**185**	**248**	**256**	**162**	**380**	**371**	**380**	**380**	**274**	**166**	**99**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,390**	**3,453**	**3,593**	**3,773**	**3,829**	**4,120**	**3,856**	**3,774**	**3,568**	**3,379**	**3,046**	**3,335**
Monthly Surplus/Deficit	**73**	**435**	**803**	**1,180**	**461**	**(427)**	**(873)**	**(768)**	**(160)**	**486**	**79**	**97**
2021 IRP Resources												
New Transmission—B2H	400	400	400	688	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	173	173	173	173	346	346	346	346	346	173	173	173
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—Solar + Storage 1:1 (Storage)	87	87	87	87	174	174	174	174	174	87	87	87
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	409	409	459	748	1,019	883	883	879	827	459	459	409
Monthly Surplus/Deficit	**482**	**844**	**1,262**	**1,927**	**1,480**	**457**	**10**	**111**	**667**	**945**	**538**	**506**
Planning Margin	**32.3%**	**47.8%**	**67.8%**	**101.3%**	**66.3%**	**26.7%**	**15.7%**	**18.3%**	**35.6%**	**53.2%**	**36.4%**	**33.5%**

	1/2031	2/2031	3/2031	4/2031	5/2031	6/2031	7/2031	8/2031	9/2031	10/2031	11/2031	12/2031
Peak-Hour (50th+15.5%) w/EE	(3,342)	(3,035)	(2,803)	(2,599)	(3,377)	(4,780)	(4,944)	(4,721)	(3,849)	(2,898)	(2,974)	(3,260)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,342)**	**(3,035)**	**(2,803)**	**(2,599)**	**(3,377)**	**(4,604)**	**(4,769)**	**(4,594)**	**(3,746)**	**(2,898)**	**(2,974)**	**(3,260)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	349	360	281	428	457	436	294	252	242	217	199	364
Total Hydroelectric (50%)	**1,362**	**1,372**	**1,342**	**1,489**	**1,614**	**1,592**	**1,354**	**1,265**	**1,158**	**1,084**	**873**	**1,328**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	75	63	63	63	61	60	60	60	61	61	58	58
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**105**	**103**	**210**	**246**	**283**	**393**	**389**	**381**	**264**	**228**	**193**	**90**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**43**	**63**	**56**	**61**	**46**	**51**	**56**	**37**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,376**	**3,430**	**3,569**	**3,750**	**3,802**	**4,097**	**3,833**	**3,753**	**3,547**	**3,357**	**3,022**	**3,307**
Monthly Surplus/Deficit	**34**	**395**	**767**	**1,150**	**425**	**(507)**	**(935)**	**(841)**	**(198)**	**459**	**48**	**47**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	197	197	197	197	394	394	394	394	394	197	197	197
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—Solar + Storage 1:1 (Storage)	87	87	87	87	174	174	174	174	174	87	87	87
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	433	433	483	768	1,067	932	932	928	875	483	483	433
Monthly Surplus/Deficit	**467**	**828**	**1,250**	**1,918**	**1,492**	**425**	**(4)**	**87**	**677**	**942**	**531**	**480**
Planning Margin	**31.6%**	**47.0%**	**67.0%**	**100.7%**	**66.5%**	**25.8%**	**15.4%**	**17.6%**	**35.8%**	**53.1%**	**36.1%**	**32.5%**

	1/2032	2/2032	3/2032	4/2032	5/2032	6/2032	7/2032	8/2032	9/2032	10/2032	11/2032	12/2032
Peak-Hour (50th+15.5%) w/EE	(3,367)	(3,051)	(2,812)	(2,608)	(3,394)	(4,823)	(4,989)	(4,770)	(3,874)	(2,908)	(2,984)	(3,272)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,367)**	**(3,051)**	**(2,812)**	**(2,608)**	**(3,394)**	**(4,647)**	**(4,813)**	**(4,642)**	**(3,771)**	**(2,908)**	**(2,984)**	**(3,272)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	348	358	280	427	456	434	293	252	242	217	198	360
Total Hydroelectric (50%)	**1,360**	**1,370**	**1,341**	**1,488**	**1,613**	**1,590**	**1,354**	**1,264**	**1,158**	**1,084**	**873**	**1,324**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	58	58	58	58	58	57	57	57	58	58	58	58
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**89**	**98**	**204**	**241**	**280**	**390**	**387**	**378**	**261**	**225**	**192**	**90**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	7	8	8	8	9	9	10	10
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**43**	**63**	**56**	**61**	**46**	**51**	**56**	**37**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,358**	**3,423**	**3,563**	**3,743**	**3,798**	**4,092**	**3,830**	**3,750**	**3,544**	**3,354**	**3,021**	**3,303**
Monthly Surplus/Deficit	**(9)**	**372**	**751**	**1,135**	**405**	**(555)**	**(983)**	**(893)**	**(227)**	**446**	**38**	**31**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	221	221	221	221	442	442	442	442	442	221	221	221
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—Solar + Storage 1:1 (Storage)	87	87	87	87	174	174	174	174	174	87	87	87
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	457	457	507	792	1,115	980	980	976	923	507	507	457
Monthly Surplus/Deficit	**448**	**829**	**1,258**	**1,928**	**1,520**	**425**	**(3)**	**83**	**697**	**953**	**545**	**488**
Planning Margin	**30.9%**	**46.9%**	**67.2%**	**100.9%**	**67.2%**	**25.7%**	**15.4%**	**17.5%**	**36.3%**	**53.4%**	**36.6%**	**32.7%**

	1/2033	2/2033	3/2033	4/2033	5/2033	6/2033	7/2033	8/2033	9/2033	10/2033	11/2033	12/2033
Peak-Hour (50th+15.5%) w/EE	(3,391)	(3,067)	(2,823)	(2,613)	(3,405)	(4,877)	(5,029)	(4,820)	(3,890)	(2,912)	(2,989)	(3,291)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,391)**	**(3,067)**	**(2,823)**	**(2,613)**	**(3,405)**	**(4,702)**	**(4,854)**	**(4,693)**	**(3,787)**	**(2,912)**	**(2,989)**	**(3,291)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	347	357	279	427	456	432	293	252	242	216	198	356
Total Hydroelectric (50%)	**1,359**	**1,369**	**1,339**	**1,487**	**1,612**	**1,589**	**1,354**	**1,264**	**1,158**	**1,084**	**873**	**1,320**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	38	38	38	38	38	38	38	38	38	38	38	38
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**69**	**78**	**184**	**221**	**260**	**370**	**367**	**359**	**241**	**205**	**172**	**70**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	10	10	9	10	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**35**	**35**	**53**	**51**	**36**	**55**	**48**	**53**	**37**	**42**	**46**	**27**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,337**	**3,402**	**3,541**	**3,723**	**3,771**	**4,063**	**3,803**	**3,722**	**3,515**	**3,324**	**2,991**	**3,269**
Monthly Surplus/Deficit	**(53)**	**335**	**719**	**1,110**	**366**	**(639)**	**(1,051)**	**(971)**	**(272)**	**412**	**2**	**(22)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	265	265	265	265	529	529	529	529	529	265	265	265
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	10	10	10	20	20	20	10	10	10	–
New Resource—Solar + Storage 1:1 (Storage)	87	87	87	87	174	174	174	174	174	87	87	87
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	501	501	551	836	1,203	1,067	1,067	1,063	1,011	551	551	501
Monthly Surplus/Deficit	**447**	**836**	**1,270**	**1,946**	**1,568**	**428**	**16**	**92**	**739**	**963**	**553**	**479**
Planning Margin	**30.7%**	**47.0%**	**67.4%**	**101.5%**	**68.7%**	**25.6%**	**15.9%**	**17.7%**	**37.4%**	**53.7%**	**36.9%**	**32.3%**

	1/2034	2/2034	3/2034	4/2034	5/2034	6/2034	7/2034	8/2034	9/2034	10/2034	11/2034	12/2034
Peak-Hour (50th+15.5%) w/EE	(3,414)	(3,084)	(2,833)	(2,623)	(3,425)	(4,926)	(5,080)	(4,876)	(3,925)	(2,929)	(3,004)	(3,308)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,414)**	**(3,084)**	**(2,833)**	**(2,623)**	**(3,425)**	**(4,751)**	**(4,905)**	**(4,749)**	**(3,823)**	**(2,929)**	**(3,004)**	**(3,308)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	346	357	277	426	455	431	293	252	242	216	198	352
Total Hydroelectric (50%)	**1,358**	**1,369**	**1,337**	**1,486**	**1,612**	**1,587**	**1,353**	**1,264**	**1,157**	**1,084**	**873**	**1,316**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	38	38	38	38	38	38	38	38	38	38	38	38
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**69**	**78**	**184**	**221**	**260**	**370**	**367**	**359**	**241**	**205**	**172**	**70**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**25**	**25**	**44**	**41**	**36**	**55**	**48**	**53**	**37**	**42**	**46**	**27**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,326**	**3,391**	**3,530**	**3,712**	**3,770**	**4,062**	**3,802**	**3,721**	**3,515**	**3,324**	**2,991**	**3,264**
Monthly Surplus/Deficit	**(88)**	**307**	**697**	**1,089**	**345**	**(689)**	**(1,102)**	**(1,027)**	**(308)**	**395**	**(14)**	**(43)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	287	287	287	287	573	573	573	573	573	287	287	287
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	15	15	15	31	31	31	15	15	15	–
New Resource—Solar + Storage 1:1 (Storage)	130	130	130	130	260	260	260	260	260	130	130	130
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	334	334	334	334	334	334	334	334	334	334	334	334
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	566	566	621	906	1,338	1,208	1,208	1,204	1,147	621	621	566
Monthly Surplus/Deficit	**478**	**873**	**1,319**	**1,995**	**1,683**	**519**	**106**	**177**	**839**	**1,017**	**608**	**523**
Planning Margin	**31.7%**	**48.2%**	**69.3%**	**103.4%**	**72.2%**	**27.7%**	**17.9%**	**19.7%**	**40.2%**	**55.6%**	**38.9%**	**33.8%**

	1/2035	2/2035	3/2035	4/2035	5/2035	6/2035	7/2035	8/2035	9/2035	10/2035	11/2035	12/2035
Peak-Hour (50th+15.5%) w/EE	(3,441)	(3,105)	(2,848)	(2,636)	(3,449)	(4,979)	(5,133)	(4,933)	(3,959)	(2,944)	(3,018)	(3,326)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,441)**	**(3,105)**	**(2,848)**	**(2,636)**	**(3,449)**	**(4,804)**	**(4,957)**	**(4,806)**	**(3,856)**	**(2,944)**	**(3,018)**	**(3,326)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	345	354	275	425	454	431	293	251	242	216	196	348
Total Hydroelectric (50%)	**1,357**	**1,367**	**1,335**	**1,485**	**1,611**	**1,588**	**1,353**	**1,263**	**1,157**	**1,083**	**871**	**1,312**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	38	38	38	38	38	38	38	38	38	38	38	38
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**69**	**78**	**184**	**221**	**260**	**370**	**367**	**359**	**241**	**205**	**172**	**70**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**25**	**25**	**44**	**41**	**36**	**55**	**48**	**53**	**37**	**42**	**46**	**27**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,325**	**3,389**	**3,529**	**3,711**	**3,769**	**4,062**	**3,802**	**3,721**	**3,515**	**3,324**	**2,989**	**3,260**
Monthly Surplus/Deficit	**(116)**	**284**	**681**	**1,075**	**320**	**(742)**	**(1,155)**	**(1,085)**	**(341)**	**379**	**(29)**	**(66)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	376	376	376	376	753	753	753	753	753	376	376	376
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Solar + Storage 1:1 (Solar)	–	–	20	20	20	41	41	41	20	20	20	–
New Resource—Solar + Storage 1:1 (Storage)	174	174	174	174	347	347	347	347	347	174	174	174
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	365	365	425	710	1,275	1,150	1,150	1,146	1,084	425	425	365
Monthly Surplus/Deficit	**249**	**649**	**1,106**	**1,785**	**1,595**	**408**	**(5)**	**61**	**742**	**805**	**396**	**299**
Planning Margin	**23.8%**	**39.7%**	**60.4%**	**93.7%**	**68.9%**	**25.0%**	**15.4%**	**16.9%**	**37.2%**	**47.1%**	**30.7%**	**25.9%**

	1/2036	2/2036	3/2036	4/2036	5/2036	6/2036	7/2036	8/2036	9/2036	10/2036	11/2036	12/2036
Peak-Hour (50th+15.5%) w/EE	(3,472)	(3,129)	(2,865)	(2,649)	(3,474)	(5,041)	(5,187)	(4,996)	(3,996)	(2,961)	(3,033)	(3,350)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,472)**	**(3,129)**	**(2,865)**	**(2,649)**	**(3,474)**	**(4,866)**	**(5,011)**	**(4,869)**	**(3,893)**	**(2,961)**	**(3,033)**	**(3,350)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	344	352	274	424	453	429	292	251	241	216	197	342
Total Hydroelectric (50%)	**1,356**	**1,364**	**1,334**	**1,485**	**1,610**	**1,586**	**1,353**	**1,263**	**1,157**	**1,083**	**871**	**1,306**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	38	38	38	38	38	38	38	38	38	38	38	38
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**69**	**78**	**184**	**221**	**260**	**370**	**367**	**359**	**241**	**205**	**172**	**70**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	27
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**25**	**25**	**44**	**41**	**36**	**55**	**48**	**53**	**37**	**42**	**46**	**27**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,324**	**3,387**	**3,528**	**3,710**	**3,768**	**4,060**	**3,802**	**3,721**	**3,514**	**3,324**	**2,989**	**3,255**
Monthly Surplus/Deficit	**(148)**	**257**	**663**	**1,061**	**293**	**(805)**	**(1,210)**	**(1,148)**	**(379)**	**363**	**(44)**	**(95)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	378	378	378	378	757	757	757	757	757	378	378	378
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	49	49	49	49	49	49	49	49	49	49	49	49
New Resource—Solar + Storage 1:1 (Solar)	–	–	20	20	20	41	41	41	20	20	20	–
New Resource—Solar + Storage 1:1 (Storage)	174	174	174	174	347	347	347	347	347	174	174	174
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	415	415	476	761	1,328	1,203	1,203	1,199	1,136	476	476	415
Monthly Surplus/Deficit	**268**	**673**	**1,139**	**1,822**	**1,621**	**398**	**(7)**	**51**	**757**	**839**	**432**	**321**
Planning Margin	**24.4%**	**40.3%**	**61.4%**	**94.9%**	**69.4%**	**24.6%**	**15.3%**	**16.7%**	**37.4%**	**48.2%**	**32.0%**	**26.6%**

	1/2037	2/2037	3/2037	4/2037	5/2037	6/2037	7/2037	8/2037	9/2037	10/2037	11/2037	12/2037
Peak-Hour (50th+15.5%) w/EE	(3,506)	(3,153)	(2,884)	(2,664)	(3,504)	(5,108)	(5,244)	(5,065)	(4,040)	(2,981)	(3,051)	(3,377)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,506)**	**(3,153)**	**(2,884)**	**(2,664)**	**(3,504)**	**(4,933)**	**(5,069)**	**(4,937)**	**(3,937)**	**(2,981)**	**(3,051)**	**(3,377)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	343	350	272	423	452	426	292	251	241	216	196	338
Total Hydroelectric (50%)	**1,355**	**1,363**	**1,332**	**1,483**	**1,609**	**1,583**	**1,353**	**1,263**	**1,157**	**1,083**	**871**	**1,302**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	29	29	29	24	24	23	23	23	24	24	24	24
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**60**	**69**	**175**	**206**	**245**	**356**	**352**	**344**	**226**	**190**	**158**	**55**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	25	25	24	21	16	15	8	13	17	22	26	–
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**25**	**25**	**44**	**41**	**36**	**55**	**48**	**53**	**37**	**42**	**46**	**0**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,314**	**3,376**	**3,517**	**3,694**	**3,752**	**4,043**	**3,787**	**3,706**	**3,500**	**3,309**	**2,974**	**3,209**
Monthly Surplus/Deficit	**(192)**	**223**	**633**	**1,030**	**248**	**(890)**	**(1,282)**	**(1,231)**	**(437)**	**328**	**(76)**	**(168)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	14	14	10	8	–	–	–
New Resource—Battery: 4 hour	424	424	424	424	849	849	849	849	849	424	424	424
New Resource—Battery: 4 hour - Removals	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—Battery: 8 hour	49	49	49	49	49	49	49	49	49	49	49	49
New Resource—Solar + Storage 1:1 (Solar)	–	–	20	20	20	41	41	41	20	20	20	–
New Resource—Solar + Storage 1:1 (Storage)	174	174	174	174	347	347	347	347	347	174	174	174
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	461	461	522	807	1,420	1,295	1,295	1,291	1,228	522	522	461
Monthly Surplus/Deficit	**270**	**684**	**1,155**	**1,837**	**1,668**	**404**	**13**	**60**	**791**	**850**	**446**	**293**
Planning Margin	**24.4%**	**40.6%**	**61.8%**	**95.1%**	**70.5%**	**24.6%**	**15.8%**	**16.9%**	**38.1%**	**48.4%**	**32.4%**	**25.5%**

	1/2038	2/2038	3/2038	4/2038	5/2038	6/2038	7/2038	8/2038	9/2038	10/2038	11/2038	12/2038
Peak-Hour (50th+15.5%) w/EE	(3,541)	(3,180)	(2,903)	(2,681)	(3,536)	(5,171)	(5,304)	(5,132)	(4,087)	(3,003)	(3,071)	(3,400)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,541)**	**(3,180)**	**(2,903)**	**(2,681)**	**(3,536)**	**(4,996)**	**(5,129)**	**(5,005)**	**(3,984)**	**(3,003)**	**(3,071)**	**(3,400)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	342	351	271	422	451	425	292	251	241	215	197	333
Total Hydroelectric (50%)	**1,354**	**1,363**	**1,331**	**1,483**	**1,607**	**1,582**	**1,352**	**1,263**	**1,157**	**1,083**	**872**	**1,297**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	24	24	24	24	24	23	23	23	24	24	24	24
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**54**	**63**	**170**	**206**	**245**	**356**	**352**	**344**	**226**	**190**	**158**	**55**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**0**	**0**	**20**	**20**	**20**	**40**	**40**	**40**	**20**	**20**	**20**	**0**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,282**	**3,346**	**3,486**	**3,673**	**3,735**	**4,026**	**3,780**	**3,693**	**3,482**	**3,287**	**2,949**	**3,204**
Monthly Surplus/Deficit	**(258)**	**166**	**583**	**991**	**199**	**(970)**	**(1,349)**	**(1,312)**	**(501)**	**283**	**(122)**	**(196)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	–	–	–	–	–	–	–	–	–	–	–	–
New Resource—DR	–	–	–	–	–	22	22	16	13	–	–	–
New Resource—Battery: 4 hour	427	427	427	427	853	853	853	853	853	427	427	427
New Resource—Battery: 4 hour - Removals	(50)	(50)	(50)	(50)	(101)	(101)	(101)	(101)	(101)	(50)	(50)	(50)
New Resource—Battery: 8 hour	97	97	97	97	97	97	97	97	97	97	97	97
New Resource—Solar + Storage 1:1 (Solar)	–	–	26	26	26	51	51	51	26	26	26	–
New Resource—Solar + Storage 1:1 (Storage)	217	217	217	217	434	434	434	434	434	217	217	217
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	505	505	571	856	1,464	1,351	1,351	1,345	1,277	571	571	505
Monthly Surplus/Deficit	**247**	**671**	**1,153**	**1,847**	**1,663**	**382**	**2**	**34**	**775**	**854**	**449**	**309**
Planning Margin	**23.6%**	**39.9%**	**61.4%**	**95.1%**	**69.8%**	**24.0%**	**15.5%**	**16.3%**	**37.4%**	**48.3%**	**32.4%**	**26.0%**

	1/2039	2/2039	3/2039	4/2039	5/2039	6/2039	7/2039	8/2039	9/2039	10/2039	11/2039	12/2039
Peak-Hour (50th+15.5%) w/EE	(3,573)	(3,204)	(2,921)	(2,695)	(3,565)	(5,237)	(5,361)	(5,198)	(4,128)	(3,021)	(3,086)	(3,426)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,573)**	**(3,204)**	**(2,921)**	**(2,695)**	**(3,565)**	**(5,061)**	**(5,185)**	**(5,071)**	**(4,025)**	**(3,021)**	**(3,086)**	**(3,426)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	342	351	271	422	451	425	292	251	241	215	197	333
Total Hydroelectric (50%)	**1,354**	**1,363**	**1,331**	**1,483**	**1,607**	**1,582**	**1,352**	**1,263**	**1,157**	**1,083**	**872**	**1,297**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	24	24	24	24	24	23	23	23	24	24	24	24
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**54**	**63**	**170**	**206**	**245**	**356**	**352**	**344**	**226**	**190**	**158**	**55**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**0**	**0**	**20**	**20**	**20**	**40**	**40**	**40**	**20**	**20**	**20**	**0**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,282**	**3,346**	**3,486**	**3,673**	**3,735**	**4,026**	**3,780**	**3,693**	**3,482**	**3,287**	**2,949**	**3,204**
Monthly Surplus/Deficit	**(290)**	**142**	**565**	**977**	**170**	**(1,035)**	**(1,406)**	**(1,378)**	**(543)**	**266**	**(138)**	**(222)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	2	2	2	2	2	2	2	2	2	2	2	2
New Resource—DR	–	–	–	–	–	29	29	21	17	–	–	–
New Resource—Battery: 4 hour	451	451	451	451	901	901	901	901	901	451	451	451
New Resource—Battery: 4 hour - Removals	(53)	(53)	(53)	(53)	(105)	(105)	(105)	(105)	(105)	(53)	(53)	(53)
New Resource—Battery: 8 hour	97	97	97	97	97	97	97	97	97	97	97	97
New Resource—Solar + Storage 1:1 (Solar)	–	–	26	26	26	51	51	51	26	26	26	–
New Resource—Solar + Storage 1:1 (Storage)	217	217	217	217	434	434	434	434	434	217	217	217
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	529	529	595	880	1,510	1,404	1,404	1,396	1,327	595	595	529
Monthly Surplus/Deficit	**239**	**671**	**1,160**	**1,857**	**1,680**	**370**	**(2)**	**18**	**784**	**860**	**457**	**307**
Planning Margin	**23.2%**	**39.7%**	**61.4%**	**95.1%**	**69.9%**	**23.7%**	**15.5%**	**15.9%**	**37.4%**	**48.4%**	**32.6%**	**25.8%**

	1/2040	2/2040	3/2040	4/2040	5/2040	6/2040	7/2040	8/2040	9/2040	10/2040	11/2040	12/2040
Peak-Hour (50th+15.5%) w/EE	(3,610)	(3,232)	(2,942)	(2,712)	(3,597)	(5,306)	(5,421)	(5,269)	(4,175)	(3,043)	(3,106)	(3,453)
Existing Demand Response Capacity	–	–	–	–	–	176	176	127	103	–	–	–
Peak-Hour (50th+15.5%) w/DR and EE	**(3,610)**	**(3,232)**	**(2,942)**	**(2,712)**	**(3,597)**	**(5,130)**	**(5,246)**	**(5,142)**	**(4,072)**	**(3,043)**	**(3,106)**	**(3,453)**
Existing Resources												
Bridger	663	663	663	663	663	663	663	663	663	663	663	663
Valmy	–	–	–	–	–	–	–	–	–	–	–	–
Total Coal	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**	**663**
Langley Gulch	323	318	315	315	312	306	306	306	309	312	318	323
Total Gas Peakers	429	426	410	400	396	370	365	367	397	415	424	437
Total Gas	**752**	**743**	**725**	**715**	**708**	**675**	**671**	**672**	**706**	**727**	**741**	**761**
Hydro (50%) HCC	1,012	1,012	1,060	1,060	1,157	1,157	1,060	1,012	916	868	675	964
Hydro (50%)—Other	342	351	271	422	451	425	292	251	241	215	197	333
Total Hydroelectric (50%)	**1,354**	**1,363**	**1,331**	**1,483**	**1,607**	**1,582**	**1,352**	**1,263**	**1,157**	**1,083**	**872**	**1,297**
Solar CSPP (PURPA)	–	–	99	99	99	199	199	199	99	99	99	–
Wind CSPP Capacity	24	24	24	24	24	23	23	23	24	24	24	24
Other CSPP	31	39	47	83	122	134	130	122	104	67	35	32
Total CSPP	**54**	**63**	**170**	**206**	**245**	**356**	**352**	**344**	**226**	**190**	**158**	**55**
Elkhorn	–	–	–	–	–	–	–	–	–	–	–	–
Raft River Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Neal Hot Springs Geothermal	–	–	–	–	–	–	–	–	–	–	–	–
Jackpot Solar	–	–	20	20	20	40	40	40	20	20	20	–
Clatskanie Exchange	–	–	–	–	–	–	–	–	–	–	–	–
Total PPAs	**0**	**0**	**20**	**20**	**20**	**40**	**40**	**40**	**20**	**20**	**20**	**0**
Available Transmission w/3rd Party Secured	**129**	**184**	**247**	**256**	**161**	**380**	**370**	**380**	**380**	**274**	**165**	**98**
Emergency Transmission (CBM)	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**	**330**
Existing Resource Subtotal	**3,282**	**3,346**	**3,486**	**3,673**	**3,735**	**4,026**	**3,780**	**3,693**	**3,482**	**3,287**	**2,949**	**3,204**
Monthly Surplus/Deficit	**(328)**	**114**	**545**	**961**	**138**	**(1,104)**	**(1,466)**	**(1,449)**	**(590)**	**244**	**(157)**	**(249)**
2021 IRP Resources												
New Transmission—B2H	400	400	400	685	700	500	500	500	500	400	400	400
New Resource—EE	5	5	5	5	5	5	5	5	5	5	5	5
New Resource—DR	–	–	–	–	–	36	36	26	21	–	–	–
New Resource—Battery: 4 hour	475	475	475	475	949	949	949	949	949	475	475	475
New Resource—Battery: 4 hour - Removals	(55)	(55)	(55)	(55)	(109)	(109)	(109)	(109)	(109)	(55)	(55)	(55)
New Resource—Battery: 8 hour	97	97	97	97	97	97	97	97	97	97	97	97
New Resource—Solar + Storage 1:1 (Solar)	–	–	26	26	26	51	51	51	26	26	26	–
New Resource—Solar + Storage 1:1 (Storage)	217	217	217	217	434	434	434	434	434	217	217	217
New Resource—Solar	–	–	40	40	40	80	80	80	40	40	40	–
New Resource—WY Wind	45	45	45	45	45	45	45	45	45	45	45	45
New Resource—ID Wind	33	33	33	33	33	33	33	33	33	33	33	33
New Resource—Gas Conversion (exit 2034)	–	–	–	–	–	–	–	–	–	–	–	–
Early Bridger Coal Exits	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)	(663)
New Resource Subtotal	554	554	620	905	1,557	1,458	1,458	1,449	1,378	620	620	554
Monthly Surplus/Deficit	**227**	**669**	**1,164**	**1,866**	**1,695**	**355**	**(8)**	**(0)**	**789**	**864**	**463**	**305**
Planning Margin	**22.8%**	**39.4%**	**61.2%**	**95.0%**	**69.9%**	**23.2%**	**15.3%**	**15.5%**	**37.3%**	**48.3%**	**32.7%**	**25.7%**

DEMAND-SIDE RESOURCE DATA

DSM Financial Assumptions

Avoided Levelized Capacity Costs	
Simple Cycle Combustion Turbine (SCCT)	$131.60/kW-year*
Financial Assumptions	
Discount rate (weighted average cost of capital)	7.12%
Financial escalation factor	2.30%
Transmission Losses	
Non-summer secondary losses	9.60%
Summer peak loss	9.70%

*The selection of an SCCT matches the company's filings for approval to modify its demand response programs (IPUC Case No. IPC-E-21-32 and OPUC Tariff Advice No. 21-12). An SCCT is also the resource selected to fulfill unmet LOLE reliability requirements in the 2021 IRP.

Avoided Cost Averages ($/MWh except where noted)

Year	Summer On-Peak	Summer Mid-Peak	Summer Off-Peak	Non-Summer Mid-Peak	Non-Summer Off-Peak	Annual T&D On-Peak EE Deferral Value ($/kW-year)
2021	$32.43	$26.86	$23.33	$26.96	$23.92	$6.33
2022	$32.83	$26.70	$23.62	$26.41	$23.64	$6.42
2023	$47.75	$40.76	$35.04	$36.78	$33.10	$6.42
2024	$49.14	$41.34	$36.00	$36.46	$33.57	$6.77
2025	$49.63	$41.03	$36.28	$34.61	$32.32	$6.35
2026	$50.40	$40.01	$34.38	$35.11	$32.97	$6.39
2027	$50.75	$35.14	$31.16	$30.71	$31.06	$6.35
2028	$54.17	$36.81	$32.71	$31.79	$33.55	$6.53
2029	$53.51	$36.42	$33.44	$33.05	$35.85	$6.64
2030	$51.51	$30.48	$30.30	$30.44	$36.23	$6.44
2031	$54.93	$31.80	$32.57	$31.69	$37.22	$6.35
2032	$55.88	$32.56	$33.72	$33.05	$39.16	$6.33
2033	$55.06	$29.37	$33.17	$31.75	$40.52	$6.52
2034	$57.35	$31.20	$34.77	$32.64	$41.68	$6.29
2035	$57.24	$31.79	$35.03	$34.11	$43.54	$3.89
2036	$58.88	$32.54	$36.79	$36.38	$44.18	$2.53
2037	$56.64	$29.74	$35.62	$30.80	$39.90	$2.54
2038	$58.93	$32.09	$38.00	$32.12	$42.51	$1.53
2039	$61.82	$34.40	$40.23	$32.53	$42.10	$1.65
2040	$62.84	$35.36	$41.54	$32.02	$42.16	$1.72

*Energy efficiency will also receive a capacity value in all Summer On-Peak hours when the company is capacity deficient, and the measure contributes energy savings during those hours.

DSM alternate cost summer pricing periods (June 1–August 31)

Hour End	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Holiday
1	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
2	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
3	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
4	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
5	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
6	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
7	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
8	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
9	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
10	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
11	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP	SOFP
12	SMP	SMP	SMP	SMP	SMP	SMP	SMP	SOFP
13	SMP	SMP	SMP	SMP	SMP	SMP	SMP	SOFP
14	SMP	SMP	SMP	SMP	SMP	SMP	SMP	SOFP
15	SMP	SMP	SMP	SMP	SMP	SMP	SMP	SOFP
16	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
17	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
18	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
19	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
20	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
21	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
22	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
23	SMP	SONP	SONP	SONP	SONP	SONP	SMP	SOFP
24	SMP	SMP	SMP	SMP	SMP	SMP	SMP	SOFP

SOFP—Summer Off-Peak
SMP—Summer Mid-Peak
SONP—Summer On-Peak

DSM alternate cost non-summer pricing periods (September 1–May 31)

Hour End	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Holiday
1	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
2	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
3	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
4	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
5	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
6	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
7	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP
8	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
9	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
10	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
11	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
12	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
13	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
14	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
15	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
16	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
17	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
18	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
19	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
20	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
21	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
22	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
23	NSOFP	NSMP	NSMP	NSMP	NSMP	NSMP	NSMP	NSOFP
24	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP	NSOFP

NSOFP—Non-Summer Off-Peak

NSMP—Non-Summer Mid-Peak

Bundle Amounts

Incremental Achievable Potential (aMW)

Bundle	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Summer Low	3	3	3	3	4	4	4	5	4	4
Summer High	5	8	12	16	20	23	24	26	27	28
Winter Low	6	8	11	15	18	21	21	21	21	19
Winter High	3	3	4	4	5	6	6	7	7	7
Total	**17**	**21**	**30**	**38**	**47**	**53**	**56**	**58**	**59**	**59**

Bundle	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Summer Low	4	4	4	4	3	3	3	3	3	3
Summer High	28	28	28	28	27	25	22	22	20	18
Winter Low	17	14	11	10	8	8	6	6	6	6
Winter High	8	7	7	7	7	6	6	6	6	5
Total	**57**	**54**	**50**	**48**	**45**	**42**	**37**	**37**	**35**	**32**

Bundle Costs

Savings Weighted Levelized Cost of Energy ($/MWh) Real Dollars

Bundle	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Summer Low	$80	$90	$97	$99	$101	$104	$107	$108	$109	$108
Summer High	$1,699	$1,305	$1,040	$861	$789	$721	$654	$606	$570	$544
Winter Low	$70	$70	$69	$69	$69	$69	$68	$67	$66	$66
Winter High	$249	$331	$349	$359	$368	$368	$360	$352	$346	$320
Total	**$552**	**$523**	**$465**	**$416**	**$386**	**$359**	**$330**	**$308**	**$297**	**$287**

Bundle	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Summer Low	$107	$105	$105	$104	$104	$104	$105	$105	$105	$105
Summer High	$527	$515	$506	$497	$494	$476	$461	$458	$460	$463
Winter Low	$66	$66	$65	$65	$65	$64	$60	$60	$59	$60
Winter High	$321	$324	$328	$321	$313	$302	$290	$305	$293	$285
Total	**$291**	**$299**	**$306**	**$308**	**$309**	**$298**	**$288**	**$294**	**$284**	**$276**

SUPPLY-SIDE RESOURCE DATA

Key Financial and Forecast Assumptions

Financing Cap Structure and Cost	
Composition	
Debt	50.10%
Preferred	0.00%
Common	49.90%
Total	**100.00%**
Cost	
Debt	5.73%
Preferred	0.00%
Common	10.00%
Average Weighted Cost	**7.86%**

Financial Assumptions and Factors	
Plant operating (book) life	**Expected Life of the Asset**
Discount rate (weighted average cost of capital[1])	7.12%
Composite tax rate	25.74%
Deferred rate	21.30%
General O&M escalation rate	2.30%
Annual property tax rate (% of investment)	0.47%
B2H annual property tax rate (% of investment)	0.64%
Property tax escalation rate	3.00%
B2H property tax escalation rate	0.68%
Annual insurance premiums (% of investment)	0.049%
B2H annual insurance premiums (% of investment)	0.004%
Insurance escalation rate	3.00%
B2H insurance escalation rate	3.00%
AFUDC rate (annual)	7.45%

[1] Incorporates tax effects.

Cost Inputs and Operating Assumptions (Costs in 2021$)

Supply-Side Resources	Plant Capacity (MW)	Plant Capital[1] ($/kW)	Transmission/Interconnection Capital ($/kW)	Total Capital ($/kW)	Fixed O&M[2] ($/kW-mth)	Variable O&M ($/MWh)	Heat Rate (Btu/kWh)	Economic Life[3] (years)
Aeroderivative (45 MW)	45	$1,500	$166	$1,666	$1.42	$4.92	8,533	40
Biomass (35 MW)	35	$4,176	$128	$4,304	$3.54	$4.71	0	30
Boardman to Hemingway (500 MW Summer/200 MW Winter)		$0	$647	$647	$0.03	$0.00	0	55
CCCT (1x1) F Class (300 MW)	300	$1,656	$25	$1,681	$1.49	$1.11	6,708	30
Danskin 1 Retrofit (90 MW)	90	$2,350	$41	$2,391	$1.49	$1.11	6,909	30
Geothermal (30 MW)	30	$4,500	$149	$4,649	$11.99	$0.00	0	30
Reciprocating Gas Engine (55.5 MW)	56	$1,560	$67	$1,627	$3.07	$5.95	8,300	40
SCCT—Frame F Class (170 MW)	170	$900	$22	$922	$1.02	$4.82	9,720	35
Small Modular Nuclear (77 MW)	77	$4,250	$144	$4,394	$10.62	$2.48	11,500	60
Solar PV—Utility Scale 1-Axis Tracking (100 MW)	100	$1,000	$50	$1050	$0.81	$0.00	0	30
Solar PV—Utility Scale 1-Axis Tracking (100 MW) w/ 4-hr Battery (100 MW)	100	$2,150	$50	$2,200	$3.30	$0.00	0	30[3]
Storage—4-Hour Li Battery (50 MW)	50	$1,150	$77	$1,227	$2.49	$0.00	0	15
Storage—4-Hour Li Battery for Grid Benefits (5 MW)	5	$863	$77	$940	$2.49	$0.00	0	15
Storage—8-Hour Li Battery (50 MW)	50	$2,100	$77	$2,177	$2.49	$0.00	0	15
Storage—Compressed Air Energy Storage (150 MW)	150	$2,200	$77	$2,277	$1.08	$6.65	0	50
Storage—Pumped-Hydro (250 MW)	250	$2,100	$227	$2,327	$0.38	$0.00	0	75
SWIP North (100 MW Summer/200 MW Winter)		$0	$798	$798	$0.04	$0.00	0	55
Wind ID (100 MW)	100	$1,300	$50	$1,350	$2.11	$0.00	0	25
Wind WY (100 MW)	100	$1,300	$50	$1,350	$2.11	$0.00	0	25

[1] Plant costs include engineering development costs, generating and ancillary equipment purchase, and installation costs, as well as balance of plant construction.
[2] Fixed O&M excludes property taxes and insurance (separately calculated within the levelized resource cost analysis)
[3] Economic life assumed for the solar component is 30 years and is 15 years for the storage component

Supply-Side Resource Escalation Factors[1] (2022–2030)

Supply-Side Resources	2022	2023	2024	2025	2026	2027	2028	2029	2030
Aeroderivative (45 MW)	1.81%	1.12%	0.46%	1.06%	1.55%	1.48%	1.76%	1.93%	1.79%
Biomass (35 MW)	2.17%	2.17%	2.17%	1.93%	2.12%	2.06%	2.10%	2.08%	1.98%
CCCT (1x1) F Class (300 MW)	1.21%	1.20%	0.89%	1.28%	1.69%	1.63%	1.85%	1.97%	1.83%
Danskin 1 Retrofit (90 MW)	1.21%	1.20%	0.89%	1.28%	1.69%	1.63%	1.85%	1.97%	1.83%
Geothermal (30 MW)	0.14%	0.09%	0.04%	-0.01%	-0.06%	-0.12%	-0.17%	-0.24%	-0.29%
Reciprocating Gas Engine (55.5 MW)	1.81%	1.12%	0.46%	1.06%	1.55%	1.48%	1.76%	1.93%	1.79%
SCCT—Frame F Class (170 MW)	1.81%	1.12%	0.46%	1.06%	1.55%	1.48%	1.76%	1.93%	1.79%
Small Modular Nuclear (77 MW)	-2.15%	-2.15%	-2.15%	-2.15%	-2.15%	-2.15%	-2.15%	-2.15%	-2.15%
Solar PV—Utility Scale 1-Axis Tracking (100 MW)	-1.76%	-1.93%	-2.11%	-2.31%	-2.53%	-2.77%	-3.04%	-3.33%	-3.66%
Solar PV—Utility Scale 1-Axis Tracking (100 MW) w/ 4-hr Battery (100 MW)	-3.60%	-4.01%	-4.47%	-5.02%	-2.90%	-3.18%	-3.49%	-3.84%	-4.23%
Storage—4-Hour Li Battery (50 MW)	-5.45%	-6.08%	-6.83%	-7.72%	-3.26%	-3.58%	-3.94%	-4.35%	-4.81%
Storage—4-Hour Li Battery for Grid Benefits (5 MW)	-5.45%	-6.08%	-6.83%	-7.72%	-3.26%	-3.58%	-3.94%	-4.35%	-4.81%
Storage—8-Hour Li Battery (50 MW)	-5.45%	-6.08%	-6.83%	-7.72%	-3.26%	-3.58%	-3.94%	-4.35%	-4.81%
Storage—Compressed Air Energy Storage (150 MW)	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Storage—Pumped-Hydro (250 MW)	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Wind ID (100 MW)	0.22%	0.14%	0.06%	-0.03%	-0.12%	-0.21%	-0.32%	-0.43%	-0.54%
Wind WY (100 MW)	0.38%	0.27%	0.15%	0.02%	-0.11%	-0.25%	-0.40%	-0.56%	-0.73%

[1] Factors include the 2021 IRP general O&M escalation rate assumption of 2.3%.

Supply-Side Resource Escalation Factors[1] (2031–2040)

Supply-Side Resources	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Aeroderivative (45 MW)	1.86%	1.83%	1.76%	1.91%	2.02%	1.91%	2.06%	2.02%	1.94%	1.92%
Biomass (35 MW)	2.01%	1.98%	1.96%	2.06%	2.03%	1.90%	2.04%	2.00%	1.93%	1.91%
CCCT (1x1) F Class (300 MW)	1.89%	1.86%	1.80%	1.94%	2.01%	1.90%	2.05%	2.01%	1.93%	1.91%
Danskin 1 Retrofit (90 MW)	1.89%	1.86%	1.80%	1.94%	2.01%	1.90%	2.05%	2.01%	1.93%	1.91%
Geothermal (30 MW)	1.79%	1.79%	1.79%	1.79%	1.79%	1.79%	1.79%	1.79%	1.79%	1.79%
Reciprocating Gas Engine (55.5 MW)	1.86%	1.83%	1.76%	1.91%	2.02%	1.91%	2.06%	2.02%	1.94%	1.92%
SCCT—Frame F Class (170 MW)	1.86%	1.83%	1.76%	1.91%	2.02%	1.91%	2.06%	2.02%	1.94%	1.92%
Small Modular Nuclear (77 MW)	1.62%	1.58%	1.56%	1.67%	1.63%	1.49%	1.63%	1.59%	1.50%	1.48%
Solar PV—Utility Scale 1-Axis Tracking (100 MW)	1.39%	1.38%	1.37%	1.37%	1.36%	1.35%	1.34%	1.33%	1.32%	1.31%
Solar PV—Utility Scale 1-Axis Tracking (100 MW) w/ 4-hr Battery (100 MW)	0.84%	0.82%	0.80%	0.77%	0.74%	0.72%	0.69%	0.66%	0.62%	0.59%
Storage—4-Hour Li Battery (50 MW)	0.30%	0.26%	0.22%	0.17%	0.13%	0.08%	0.03%	-0.02%	-0.07%	-0.13%
Storage—4-Hour Li Battery for Grid Benefits (5 MW)	0.30%	0.26%	0.22%	0.17%	0.13%	0.08%	0.03%	-0.02%	-0.07%	-0.13%
Storage—8-Hour Li Battery (50 MW)	0.30%	0.26%	0.22%	0.17%	0.13%	0.08%	0.03%	-0.02%	-0.07%	-0.13%
Storage—Compressed Air Energy Storage (150 MW)	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Storage—Pumped-Hydro (250 MW)	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Wind ID (100 MW)	1.26%	1.25%	1.24%	1.22%	1.21%	1.19%	1.18%	1.16%	1.15%	1.13%
Wind WY (100 MW)	1.51%	1.50%	1.49%	1.48%	1.47%	1.45%	1.44%	1.43%	1.41%	1.40%

[1] Factors include the 2021 IRP general O&M escalation rate assumption of 2.3%.

Levelized Cost of Energy (costs in 2021$, $/MWh) at stated capacity factors

Supply-Side Resources	Cost of Capital[1]	Non-Fuel O&M[2]	Fuel[3]	Total Cost per MWh[4,5]	Capacity Factor[6]
Aeroderivative (45 MW)	$145	$42	$36	$223	12%
Biomass (35 MW)	$91	$23	$0	$114	61%
Boardman to Hemingway (500 MW Summer/200 MW Winter)	$19	$4	$0	$23	33%
CCCT (1x1) F Class (300 MW)	$38	$9	$26	$73	55%
Danskin 1 Retrofit (90 MW)	$52	$10	$27	$89	55%
Geothermal (30 MW)	$59	$28	$0	$87	95%
Reciprocating Gas Engine (55.5 MW)	$147	$69	$35	$251	12%
SCCT—Frame F Class (170 MW)	$91	$29	$40	$160	12%
Small Modular Nuclear (77 MW)	$62	$32	$9	$103	93%
Solar PV—Utility Scale 1-Axis Tracking (100 MW), 26% ITC	$27	$8	$0	$35	29%
Solar PV—Utility Scale 1-Axis Tracking (100 MW), 10% ITC	$33	$8	$0	$41	29%
Solar PV—Utility Scale 1-Axis Tracking (100 MW) + 4-hr Battery (100 MW), 26% ITC	$65	$23	$0	$88	30%
Solar PV—Utility Scale 1-Axis Tracking (100 MW) + 4-hr Battery (100 MW), 10% ITC	$80	$23	$0	$103	30%
Storage—4-Hour Li Battery (50 MW)	$100	$30	$0	$130	17%
Storage—4-Hour Li Battery for Locational Grid Benefits (5 MW)	$77	$28	$0	$105	17%
Storage—8-Hour Li Battery (50 MW)	$90	$17	$0	$107	33%
Storage—Compressed Air Energy Storage (150 MW)	$73	$23	$0	$96	33%
Storage—Pumped-Hydro (250 MW)	$82	$10	$0	$92	33%
SWIP North (100 MW Summer/200 MW Winter)	$18	$2	$0	$20	33%
Wind ID (100 MW), PTC	$29	$14	$0	$43	35%
Wind ID (100 MW)	$42	$14	$0	$56	35%
Wind WY (100 MW), PTC	$21	$10	$0	$31	48%
Wind WY (100 MW)	$31	$10	$0	$41	48%

[1] Cost of Capital includes tax credit benefits (ITC/PTC).
[2] Non-Fuel O&M includes fixed and variable costs and property taxes.
[3] Fuel costs are not included for biomass resource.
[4] Storage resources will have a cost or benefit associated with the price difference between the energy price to charge the storage and the energy price during the time of discharge (less losses). Arbitrage is not included in the LCOE calculation in the table. As noted in IRP, levelized cost for storage resources is driven by fixed costs.
[5] Transmission resource costs do not include potential benefits of additional short-term and non-firm third-party wheeling usage. The LCOE does not include a price for market purchases, therefore, the LCOE in this table can be viewed as a cost above the market purchase price for the energy assuming the associated capacity factor.
[6] Capacity factor for 4-hour storage resources assume one discharge cycle per day; 8-hour storage resources and above assume eight hours of discharge per day.

Levelized Capacity (fixed) Cost per kW/Month (costs in 2021$)

Supply-Side Resources	Cost of Capital[1]	Non-Fuel O&M[2]	Total Cost per kW
Aeroderivative (45 MW)	$13	$3	$16
Biomass (35 MW)	$40	$8	$48
Boardman to Hemingway (500 MW Summer/200 MW Winter)	$5	$1	$6
CCCT (1x1) F Class (300 MW)	$15	$3	$18
Danskin 1 Retrofit (90 MW)	$21	$3	$24
Geothermal (30 MW)	$41	$19	$60
Reciprocating Gas Engine (55.5 MW)	$13	$5	$18
SCCT—Frame F Class (170 MW)	$8	$2	$10
Small Modular Nuclear (77 MW)	$40	$19	$59
Solar PV—Utility Scale 1-Axis Tracking (100 MW), 26% ITC	$5	$2	$7
Solar PV—Utility Scale 1-Axis Tracking (100 MW), 10% ITC	$7	$2	$9
Solar PV—Utility Scale 1-Axis Tracking (100 MW) + 4-hr Battery (100 MW), 26% ITC	$14	$5	$19
Solar PV—Utility Scale 1-Axis Tracking (100 MW) + 4-hr Battery (100 MW), 10% ITC	$18	$5	$23
Storage—4-Hour Li Battery (50 MW)	$12	$4	$16
Storage—4-Hour Li Battery for Locational Grid Benefits (5 MW)	$9	$4	$13
Storage—8-Hour Li Battery (50 MW)	$22	$4	$26
Storage—Compressed Air Energy Storage (150 MW)	$18	$3	$21
Storage—Pumped-Hydro (250 MW)	$20	$2	$22
SWIP North (100 MW Summer/200 MW Winter)	$4	$1	$5
Wind ID (100 MW), PTC	$8	$4	$12
Wind ID (100 MW)	$10	$4	$14
Wind WY (100 MW), PTC	$7	$4	$11
Wind WY (100 MW)	$10	$4	$14

[1] Cost of Capital includes tax credit benefits (ITC/PTC).

[2] Non-Fuel O&M includes fixed and variable costs, property taxes.

Renewable Energy Certificate Forecast

Year	Nominal ($/MWh)
2021	7.94
2022	7.82
2023	7.70
2024	7.54
2025	7.37
2026	7.42
2027	7.58
2028	7.58
2029	7.64
2030	7.82
2031	7.85
2032	7.96
2033	8.14
2034	8.20
2035	8.21
2036	8.45
2037	8.46
2038	8.57
2039	8.76
2040	8.87

EXISTING RESOURCE DATA

Qualifying Facility Data (PURPA)

Cogeneration & Small Power Production Projects
Status as of December 31, 2020

Hydro Projects

		Contract				Contract	
Project	MW	On-line Date	End Date	Project	MW	On-line Date	End Date
Arena Drop	0.45	Sep-2010	Sep-2030	Littlewood/Arkoosh	0.87	Aug-1986	Aug-2021
Baker City Hydro	0.24	Sep-2015	Sep-2030	Low Line Canal	8.20	May-2020	May-2040
Barber Dam	3.70	Apr-1989	Apr-2024	Low Line Midway Hydro	2.50	Aug-2007	Aug-2027
Birch Creek	0.07	Nov-1984	Nov-2039	Lowline #2	2.79	Apr-1988	Apr-2023
Black Canyon #3	0.13	Apr-2019	Apr-2039	Magic Reservoir	9.07	Jun-1989	Jun-2024
Black Canyon Bliss Hydro	0.03	Nov-2014	Oct-2035	Malad River	1.17	May-2019	May-2039
Blind Canyon	1.63	Dec-2014	Dec-2034	Marco Ranches	1.20	Aug-2020	Aug-2040
Box Canyon	0.30	Feb-2019	Feb-2039	MC6 Hydro	2.10	Apr-2021	Estimated
Briggs Creek	0.60	Oct-2020	Oct-2040	Mile 28	1.50	Jun-1994	Jun-2029
Bypass	9.96	Jun-1988	Jun-2023	Mitchell Butte	2.09	May-1989	Dec-2033
Canyon Springs	0.11	Jan-2019	Jan-2039	Mora Drop Small Hydro	1.85	Sep-2006	Sep-2026
Cedar Draw	1.55	Jun-1984	Jun-2039	Mud Creek/S&S	0.52	Feb-2017	Feb-2037
Clear Springs Trout	0.56	Nov-2018	Nov-2038	Mud Creek/White	0.21	Jan-1986	Jan-2021
Coleman Hydro	0.80	Jun-2021	Estimated	North Gooding Main	1.30	Oct-2016	Oct-2036
Crystal Springs	2.44	Apr-1986	Apr-2021	Owyhee Dam CSPP	5.00	Aug-1985	May-2033
Curry Cattle Company	0.25	Jun-2018	Jun-2033	Pigeon Cove	1.75	Oct-1984	Nov-2039
Dietrich Drop	4.50	Aug-1988	Aug-2023	Pristine Springs #1	0.13	May-2020	May-2040
Eightmile Hydro Project	0.36	Oct-2014	Oct-2034	Pristine Springs #3	0.20	May-2020	May-2040
Elk Creek	2.00	May-1986	May-2021	Reynolds Irrigation	0.26	May-1986	May-2021
Fall River	9.10	Aug-1993	Aug-2028	Rock Creek #1	2.17	Jan-2018	Jan-2038
Fargo Drop Hydroelectric	1.27	Apr-2013	Apr-2033	Rock Creek #2	1.90	Apr-1989	Apr-2024
Faulkner Ranch	0.87	Aug-1987	Aug-2022	Sagebrush	0.58	Jun-2021	Jun-2040
Fisheries Dev.	0.26	Jul-1990	Jul-2040	Sahko Hydro	0.50	Feb-2011	Feb-2021
Geo-Bon #2	0.93	Nov-1986	Nov-2021	Schaffner	0.53	Aug-1986	Aug-2021
Hailey CSPP	0.04	Jun-2020	Jun-2025	Shingle Creek	0.22	Aug-2017	Aug-2022
Hazelton A	8.10	Mar-2011	Mar-2026	Shoshone #2	0.58	May-1996	May-2031
Hazelton B	7.60	May-1993	May-2028	Shoshone CSPP	0.36	Feb-2017	Feb-2037
Head of U Canal Project	1.28	May-2015	Jun-2035	Snake River Pottery	0.09	Nov-1984	Dec-2027
Horseshoe Bend Hydro	9.50	Sep-1995	Sep-2030	Snedigar	0.50	Jan-2020	Jan-2040
Jim Knight	0.48	Jun-2021	Estimated	Tiber Dam	7.50	Jun-2004	Jun-2024
Koyle Small Hydro	1.25	Apr-2019	Apr-2039	Trout-Co	0.24	Dec-1986	Dec-2021
Lateral # 10	2.06	May-2020	May-2040	Tunnel #1	7.00	Jun-1993	Feb-2035
Lemoyne	0.08	Jun-2020	Jun-2030	White Water Ranch	0.16	Aug2020	Aug-2040
Little Wood River Ranch II	1.25	Jun-2015	Oct-2035	Wilson Lake Hydro	8.40	May-1993	May-2028
Little Wood River Res	2.85	Mar-2020	Mar-2040				

Total Hydro Nameplate Rating 150.94 MW

Cogeneration/Thermal Projects

Project	MW	Contract On-line Date	Contract End Date
Pico Energy, LLC	2.13	Aug-2020	Aug-2030
Simplot Pocatello Cogen	15.90	Mar-2019	Mar-2022
TASCO—Nampa Natural Gas	2	Sep-2003	Sept-2040
TASCO—Twin Falls Natural Gas	3	Aug-2001	Jan-2040
Total Thermal Nameplate Rating 23.03 MW			

Biomass Projects

Project	MW	Contract On-line Date	Contract End Date	Project	MW	Contract On-line Date	Contract End Date
Bannock County Landfill	3.20	May-2014	May-2034	Pocatello Waste	0.46	Dec-1985	Dec-2020
Fighting Creek Landfill	3.06	Apr-2014	Apr-2029	SISW LFGE	5.00	Sept-2018	Sept-2038
Hidden Hollow Landfill Gas	3.20	Jan-2007	Jan-2027	Tamarack CSPP	6.25	Jun-2018	Jun-2038
Total Biomass Nameplate Rating 21.17 MW							

Solar Projects

Project	MW	Contract On-line Date	Contract End Date	Project	MW	Contract On-line Date	Contract End Date
American Falls Solar II, LLC	20.00	Mar-2017	Mar-2037	Mt. Home Solar 1, LLC	20.00	Mar-2017	Mar-2037
American Falls Solar, LLC	20.00	Mar-2017	Mar-2037	Murphy Flat Power, LLC	20.00	Mar-2017	Mar-2037
Baker Solar Center	15.00	Feb-2020	Feb-2040	Ontario Solar Center	3.00	Mar-2020	Mar-2040
Brush Solar	2.75	Oct-2019	Dec-2039	Open Range Solar Center, LLC	10.00	Mar-2017	Mar-2037
Durkee Solar	3.00	Mar-2022	Estimated	Orchard Ranch Solar, LLC	20.00	Oct-2016	Oct-2036
Grand View PV Solar Two	80.00	Dec-2016	Dec-2036	Railroad Solar Center, LLC	4.50	Dec-2016	Dec-2036
Grove Solar Center, LLC	6.00	Oct-2016	Oct-2036	Simcoe Solar, LLC	20.00	Mar-2017	Mar-2037
Hyline Solar Center, LLC	9.00	Nov-2016	Nov-2036	Thunderegg Solar Center, LLC	10.00	Nov-2016	Nov-2036
ID Solar 1	40.00	Aug-2016	Jan-2036	Vale Air Solar Center, LLC	10.00	Nov-2016	Nov-2036
Morgan Solar	3.00	Apr-2020	Apr-2040	Vale 1 Solar	3.00	Jul-2020	Jul-2040
Total Solar Nameplate Rating 319.25 MW							

Wind Projects

Project	MW	Contract On-line Date	Contract End Date	Project	MW	Contract On-line Date	Contract End Date
Bennett Creek Wind Farm	21.00	Dec-2008	Dec-2028	Mainline Windfarm	23.00	Dec-2012	Dec-2032
Benson Creek Windfarm	10.00	Mar-2017	Mar-2037	Milner Dam Wind	19.92	Feb-2011	Feb-2031
Burley Butte Wind Park	21.30	Feb-2011	Feb-2031	Oregon Trail Wind Park	13.50	Jan-2011	Jan-2031
Camp Reed Wind Park	22.50	Dec-2010	Dec-2030	Payne's Ferry Wind Park	21.00	Dec-2010	Dec-2030
Cassia Wind Farm LLC	10.50	Mar-2009	Mar-2029	Pilgrim Stage Station Wind Park	10.50	Jan-2011	Jan-2031
Cold Springs Windfarm	23.00	Dec-2012	Dec-2032	Prospector Windfarm	10.00	Mar-2017	Mar-2037
Desert Meadow Windfarm	23.00	Dec-2012	Dec-2032	Rockland Wind Farm	80.00	Dec-2011	Dec-2036
Durbin Creek Windfarm	10.00	Mar-2017	Mar-2037	Ryegrass Windfarm	23.00	Dec-2012	Dec-2032
Fossil Gulch Wind	10.50	Sep-2005	Sep-2025	Salmon Falls Wind	22.00	Apr-2011	Apr-2031
Golden Valley Wind Park	12.00	Feb-2011	Feb-2031	Sawtooth Wind Project	22.00	Nov-2011	Nov-2031
Hammett Hill Windfarm	23.00	Dec-2012	Dec-2032	Thousand Springs Wind Park	12.00	Jan-2011	Jan-2031
High Mesa Wind Project	40.00	Dec-2012	Dec-2032	Tuana Gulch Wind Park	10.50	Jan-2011	Jan-2031
Horseshoe Bend Wind	9.00	Feb-2006	Feb-2026	Tuana Springs Expansion	35.70	May-2010	May-2030
Hot Springs Wind Farm	21.00	Dec-2008	Dec-2028	Two Ponds Windfarm	23.00	Dec-2012	Dec-2032
Jett Creek Windfarm	10.00	Mar-2017	Mar-2037	Willow Spring Windfarm	10.00	Mar-2017	Mar-2037
Lime Wind Energy	3.00	Dec-2011	Dec-2031	Yahoo Creek Wind Park	21.00	Dec-2010	Dec-2030
Total Wind Nameplate Rating 626.92 MW							
Total Nameplate Rating 1,141.31 MW							

The above is a summary of the Nameplate rating for the CSPP projects under contract with Idaho Power as of December 31, 2020. In the case of CSPP projects, Nameplate rating of the actual generation units is not an accurate or reasonable estimate of the actual energy these projects will deliver to Idaho Power. Historical generation information, resource specific industry standard capacity factors, and other known and measurable operating characteristics are accounted for in determining a reasonable estimate of the energy these projects will produce.

Power Purchase Agreement Data

Project	MW	On-Line Date	Contract End Date
Wind Projects			
Elkhorn Wind Project	101	Dec-2007	Dec-2027
Total Wind Nameplate Rating	**101**		
Geothermal Projects			
Raft River Unit 1	13	Apr-2008	Apr-2033
Neal Hot Springs	22	Nov-2012	Nov-2037
Total Geothermal Nameplate Rating	**35**		
Solar Projects			
Jackpot Solar Facility	120	Dec-2022	Dec-2042
Total Solar Nameplate Rating	**120**		
Total Nameplate Rating	**256**		

The above is a summary of the Nameplate rating for the CSPP projects under contract with Idaho Power as of December 31, 2020. In the case of CSPP projects, Nameplate rating of the actual generation units is not an accurate or reasonable estimate of the actual energy these projects will deliver to Idaho Power. Historical generation information, resource specific industry standard capacity factors, and other known and measurable operating characteristics are accounted for in determining a reasonable estimate of the energy these projects will produce.

Hydro Flow Modeling

Hydro Models

Idaho Power uses two modeling methods (planning models) for the development of future hydro flow scenarios for the IRP. The first method accounts for surface water regulation in the system, this consists of two models built in the CADSWES RiverWare modeling framework. The first of these models covers the spatial extent of the Snake River basin from the headwaters to Brownlee inflow. The second model takes the results of the first and regulates the flows through the Hells Canyon Complex (HCC). The second modeling method uses the Enhanced Snake Plain Aquifer Model (ESPAM) to model aquifer management practices implemented on the Eastern Snake Plain Aquifer (ESPA). The planning models have been updated to include hydrologic conditions for water years 1951 through 2018. ESPAM was updated with the release of ESPAM 2.1 in late 2012.

Hydro Model Inputs

The inputs for the 2021 IRP were derived, in part, from management practices outlined in an agreement between the Surface Water Coalition (SWC) and Idaho Groundwater Appropriators (IGWA). The agreement set out specific targets for several management practices that include aquifer recharge, system conversions, and a total reduction in ground water diversions of 240,000 acre-feet. The modeling also included inputs from other entities diverting ground water on the ESPA who have separate mitigation agreements with the SWC. Model inputs also included a long-term analysis of trends in reach gains to the Snake River from Palisades Dam to King Hill. Weather modification activities conducted by Idaho Power and other participating entities were included in the modeling effort. The modeling also included aquifer recharge efforts by the Idaho Water Resource Board who is targeting an average annual natural flow recharge of 250,000 acre-ft per year.

Recharge capacity modeled for the 2021 IRP included diversions with the capability of diverting all available water at the Snake River below Milner Dam during the winter months under typical release conditions. These diversions can have a significant impact to flows downstream of Milner Dam. Total recharge diversions, including private and state sponsored programs, are modeled at approximately 407,000 acre-ft per year of the IRP. In IRP year 2025, approximately 195,000 acre-feet (acre-ft) of recharge diversions occur above American Falls Reservoir and 212,000 acre-ft is diverted at Milner Dam. The 2021 IRP included approximately 55,000 acre-feet of additional annual recharge not included in the 2019 IRP. This increase in projected recharge activity is based upon recharge activity observed from spring 2016 through spring 2020. The additional annual recharge volume can be attributed to the development of private aquifer recharge and state sponsored storage water recharge demonstrating a higher level of recharge capacity than anticipated in the 2019 IRP.

System conversion projects involve the conversion of ground water supplied irrigated land to surface water supplied irrigated land. The number of acres modeled and potential water savings was based on data provided by the Idaho Department of Water Resources (IDWR) and local ground water districts. The current model assumes approximately 57,000 acres of converted land on the ESPA. Water savings for conversion projects are calculated at a rate of 2.0 acre-ft/converted acre. Diversions for conversion projects are modeled at approximately 114,000 acre-ft and are held essentially constant through all years of the IRP. The model accounted for approximately 140,000 acre-ft decrease in ground water pumping from the ESPA.

The decrease was spread evenly over ground water irrigated lands subject to the agreement between the SWC and the IGWA. The SWC agreement requires a total reduction of 240,000 acre-ft per year (acre-ft/year), but the agreement allows for a portion to be offset by aquifer recharge activities. Based on recent management activity, approximately 100,000 acre-ft/year reduction is accomplished through other forms of mitigation, such as private aquifer recharge.

The 2021 IRP modeling also recognized ongoing declines in specific reaches. Future reach declines were determined using several statistical analyses. Trend data indicate reach gains from Blackfoot to Neely and from Lower Salmon Falls Dam to King Hill demonstrated a statistically significant decline from 1990 to 2019. The long-term declines are still present, but they have improved since the 2019 IRP. Reach gains to the Snake River increased since 2017. The increases in reach gains may be due to recent high runoff events, good supply of irrigation water, and aquifer recharge activities. This results in additional water in the Snake River throughout the planning period. Weather modification was added to the model at various levels of development. For IRP years 2021 through 2026, weather modification reflects the current 2020 level of program development in Eastern Idaho and the Wood River, Boise, and Payette basins. Beyond IRP year 2026, weather modification levels in Eastern Idaho and the Wood River and Boise basins were increased due to an anticipation of expanding the cloud seeding program. The level of weather modification was held constant at the current level in the Payette River Basin throughout the IRP planning period. The modeling also accounts for changes in reach gains from observed water management activities on the ESPA since 2014. Reach gain calculations include management activities since 2014. Idaho Power used data from IDWR and other sources to determine the magnitude of the management activities and the ESPAM was used to model the projected reach gains. The impact of those management activities can have impacts on reach gains for up to 30 years.

Hydro Model Results

The modeling methods implemented by Idaho Power allows for the inclusion of all future management activities, and the resulting reach gains from those management activities into Idaho Power's 2021 IRP. Management activities, such as recharge and system conversions, do not significantly change the total annual volume of water expected to flow through the HCC, but instead change the timing and location of reach gains within the system. Other future management activities, such as weather modification and a decrease in ground water pumping, directly impact the annual volume of water expected through the HCC as well as the timing and location of gains within the system.

Overall inflow to Brownlee Reservoir increases from IRP modeled year 2021 through 2026. Flows peak in 2026 with the 50% exceedance water year annual inflow to Brownlee Reservoir at just over 12.86 million acre-ft/year. In 2040, those flows declined to approximately 12.59 million acre-ft/year.

The Brownlee inflow volumes for the 2021 IRP are higher than those reported in the 2019 IRP. There are several factors leading to the increase in modeled flows. The change in reach declines had a significant impact on inflows to Brownlee Reservoir. For example, in model year 2038 the increase in Brownlee inflow volume attributable to changes in reach declines between the 2021 and 2019 IRPs is approximately 380,000 acre-feet. Weather modification volume increased by approximately 10,000 acre-ft/year in the 2021 IRP as compared to the 2019 IRP. The other notable change is the observed recharge conducted in 2018 through 2020 exceeded recharge volume assumptions made during the 2019 IRP. Over 1,000,000 acre-ft water were recharged to the ESPA during 2018 through 2020. While outside the modeling period of 2021 to 2040, the reach gains resulting from this recharge are modeled and significantly increase reach gains for the modeling period. The modeled reach gains from this recharge increased reach gains in the Snake River and inflows to Brownlee Reservoir particularly during the first five years of the modeling period.

2021 Hydro Model Parameters (acre-feet/year)

	Managed Recharge						Reach Declines	
Year	Above American Falls	Below American Falls	Total	Weather Modification	System Conversions	Ground Water Pumping Declines	American Falls Inflows	Below Milner Inflows
2021	194,877	212,336	407,213	1,005,582	114,236	140,047	17,807	19,724
2022	194,877	212,336	407,213	1,005,582	114,236	140,047	29,341	32,500
2023	194,877	212,336	407,213	1,005,582	114,236	140,047	40,876	45,276
2024	194,877	212,336	407,213	1,005,582	114,236	140,047	52,542	58,197
2025	194,877	212,336	407,213	1,005,582	114,236	140,047	63,944	70,827
2026	194,877	212,336	407,213	1,279,757	114,236	140,047	75,478	83,603
2027	194,877	212,336	407,213	1,279,757	114,236	140,047	87,013	96,379
2028	194,877	212,336	407,213	1,279,757	114,236	140,047	98,805	109,441
2029	194,877	212,336	407,213	1,279,757	114,236	140,047	110,081	121,931
2030	194,877	212,336	407,213	1,279,757	114,236	140,047	121,615	134,707
2031	194,877	212,336	407,213	1,279,757	114,236	140,047	133,150	147,483
2032	194,877	212,336	407,213	1,279,757	114,236	140,047	145,069	160,684
2033	194,877	212,336	407,213	1,279,757	114,236	140,047	156,218	173,034
2034	194,877	212,336	407,213	1,279,757	114,236	140,047	167,753	185,810
2035	194,877	212,336	407,213	1,279,757	114,236	140,047	179,287	198,586
2036	194,877	212,336	407,213	1,279,757	114,236	140,047	191,332	211,928
2037	194,877	212,336	407,213	1,279,757	114,236	140,047	202,355	224,138
2038	194,877	212,336	407,213	1,279,757	114,236	140,047	213,890	236,914
2039	194,877	212,336	407,213	1,279,757	114,236	140,047	225,424	249,690
2040	194,877	212,336	407,213	1,279,757	114,236	140,047	237,596	263,171

Hydro Modeling Results (aMW)

		50th Percentile (planning case)			Climate Change Modeling		
Year	Month	HCC*	ROR**	Total	HCC	ROR	Total
2021	Jan	765	312	1,077	1198	558	1,757
	Feb	960	337	1,297	1189	510	1,699
	Mar	865	389	1,253	1160	562	1,722
	Apr	1073	411	1,484	1198	595	1,794
	May	941	365	1,306	1208	596	1,804
	June	902	403	1,305	1267	524	1,792
	July	621	389	1,011	899	426	1,325
	Aug	512	298	810	627	414	1,041
	Sept	637	250	887	750	257	1,007
	Oct	423	226	650	473	240	713
	Nov	340	219	559	331	237	567
	Dec	514	219	733	602	358	959
Annual aMW		**713**	**318**	**1,031**	**909**	**440**	**1,348**
2022	Jan	763	311	1,074	1218	544	1,762
	Feb	958	337	1,295	1187	502	1,689
	Mar	863	388	1,251	1139	580	1,719
	Apr	1071	410	1,481	1126	583	1,708
	May	940	365	1,305	1094	582	1,676
	June	901	403	1,303	1306	582	1,888
	July	620	389	1,009	817	395	1,212
	Aug	511	297	808	652	436	1,088
	Sept	635	250	885	687	260	947
	Oct	423	226	649	430	239	670
	Nov	340	219	559	330	219	549
	Dec	514	218	732	591	362	953
Annual aMW		**712**	**318**	**1,029**	**881**	**440**	**1,322**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2023	Jan	762	311	1,072	1154	545	1,699
	Feb	957	336	1,293	1126	497	1,623
	Mar	863	387	1,249	1113	444	1,557
	Apr	1072	409	1,481	1185	462	1,647
	May	940	365	1,305	923	517	1,439
	June	900	402	1,302	893	422	1,315
	July	620	389	1,009	615	405	1,019
	Aug	511	297	808	462	281	743
	Sept	634	250	884	630	241	871
	Oct	422	226	648	397	234	631
	Nov	340	219	559	335	221	556
	Dec	513	218	732	451	194	645
Annual aMW		**711**	**317**	**1,028**	**774**	**372**	**1,145**
2024	Jan	761	310	1,071	561	282	843
	Feb	956	336	1,292	620	284	903
	Mar	862	386	1,248	529	281	810
	Apr	1071	408	1,480	537	218	755
	May	940	364	1,304	546	234	780
	June	899	402	1,301	501	338	839
	July	619	389	1,008	462	264	726
	Aug	510	297	807	399	201	599
	Sept	633	249	882	421	201	622
	Oct	422	226	647	353	197	550
	Nov	340	219	559	340	194	534
	Dec	513	218	731	434	187	621
Annual aMW		**710**	**317**	**1,027**	**475**	**240**	**715**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2025	Jan	760	309	1,069	564	197	762
	Feb	955	334	1,289	594	186	781
	Mar	860	385	1,246	619	205	824
	Apr	1071	408	1,479	879	202	1,081
	May	939	364	1,303	667	291	957
	June	899	402	1,300	750	261	1,012
	July	619	388	1,007	490	251	741
	Aug	510	297	806	421	194	614
	Sept	631	249	881	389	198	587
	Oct	421	225	647	361	197	558
	Nov	340	219	559	346	189	535
	Dec	513	218	730	430	185	616
Annual aMW		**710**	**317**	**1,026**	**543**	**213**	**756**
2026	Jan	783	324	1,107	619	220	838
	Feb	975	351	1,327	703	222	925
	Mar	884	399	1,282	507	189	696
	Apr	1089	441	1,530	675	191	866
	May	940	379	1,319	950	238	1,188
	June	914	412	1,326	816	252	1,068
	July	621	396	1,017	533	286	820
	Aug	511	302	813	425	217	642
	Sept	633	250	882	373	206	579
	Oct	422	226	647	362	193	554
	Nov	340	219	559	350	185	535
	Dec	513	218	732	424	188	612
Annual aMW		**719**	**326**	**1,045**	**561**	**216**	**777**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2027	Jan	780	323	1,103	533	185	719
	Feb	974	350	1,325	688	205	893
	Mar	882	397	1,280	669	194	863
	Apr	1089	440	1,529	670	191	861
	May	939	378	1,318	719	268	987
	June	913	412	1,324	662	244	906
	July	620	396	1,016	502	260	763
	Aug	510	302	812	437	211	648
	Sept	631	250	881	463	202	665
	Oct	421	225	647	377	189	566
	Nov	340	219	559	332	183	516
	Dec	513	218	731	453	185	637
Annual aMW		**718**	**326**	**1,044**	**542**	**210**	**752**
2028	Jan	778	322	1,100	538	246	784
	Feb	973	349	1,322	550	226	776
	Mar	881	396	1,277	416	213	629
	Apr	1089	440	1,529	562	222	784
	May	939	376	1,315	903	265	1,167
	June	912	411	1,323	655	249	905
	July	620	395	1,015	582	371	953
	Aug	510	301	810	451	268	719
	Sept	630	249	879	462	219	682
	Oct	421	225	646	370	201	571
	Nov	340	219	559	348	189	537
	Dec	513	218	730	645	178	823
Annual aMW		**717**	**325**	**1,042**	**540**	**237**	**777**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2029	Jan	775	321	1,095	1119	282	1,400
	Feb	972	348	1,320	1142	217	1,359
	Mar	880	395	1,275	1148	285	1,433
	Apr	1089	439	1,528	1193	537	1,730
	May	939	375	1,314	1218	509	1,728
	June	912	410	1,322	1101	472	1,573
	July	619	395	1,014	631	416	1,047
	Aug	509	300	809	492	285	777
	Sept	628	249	878	566	237	803
	Oct	420	225	645	391	209	601
	Nov	340	219	559	338	190	528
	Dec	512	218	730	495	197	692
Annual aMW		**716**	**325**	**1,041**	**820**	**320**	**1,139**
2030	Jan	773	319	1,092	605	321	926
	Feb	970	347	1,317	724	347	1,071
	Mar	879	394	1,273	627	379	1,007
	Apr	1089	438	1,527	638	309	947
	May	938	376	1,314	675	235	910
	June	911	410	1,321	542	347	889
	July	618	395	1,013	475	270	745
	Aug	508	300	809	405	222	627
	Sept	627	249	876	511	215	725
	Oct	419	225	644	368	198	566
	Nov	340	219	559	336	187	522
	Dec	511	217	729	426	187	612
Annual aMW		**715**	**324**	**1,039**	**528**	**268**	**796**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2031	Jan	771	318	1,089	541	217	758
	Feb	969	345	1,314	641	225	866
	Mar	877	393	1,270	665	228	893
	Apr	1088	437	1,525	799	332	1,131
	May	938	375	1,313	934	243	1,178
	June	909	410	1,319	945	258	1,203
	July	618	394	1,012	596	324	920
	Aug	508	300	808	484	325	809
	Sept	625	249	874	482	223	705
	Oct	419	225	644	392	203	595
	Nov	340	218	558	342	187	528
	Dec	511	217	728	421	184	604
Annual aMW		**714**	**323**	**1,038**	**603**	**246**	**849**
2032	Jan	768	317	1,085	602	300	902
	Feb	967	344	1,310	690	285	975
	Mar	877	392	1,269	767	418	1,185
	Apr	1087	436	1,523	1118	551	1,668
	May	940	378	1,319	1032	442	1,474
	June	908	410	1,318	1118	528	1,646
	July	617	394	1,011	627	389	1,016
	Aug	507	300	807	514	351	865
	Sept	624	248	872	482	234	716
	Oct	418	224	643	389	215	604
	Nov	340	218	558	346	190	536
	Dec	510	217	728	438	188	626
Annual aMW		**714**	**323**	**1,037**	**677**	**341**	**1,018**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2033	Jan	765	315	1,080	651	332	983
	Feb	965	342	1,307	732	330	1,061
	Mar	876	391	1,266	646	321	967
	Apr	1086	435	1,521	757	273	1,030
	May	940	378	1,318	840	315	1,155
	June	907	409	1,316	1129	307	1,435
	July	616	394	1,010	515	293	807
	Aug	506	299	806	442	240	682
	Sept	622	248	870	503	228	730
	Oct	418	224	642	394	215	609
	Nov	340	218	558	340	196	535
	Dec	510	217	727	522	182	704
Annual aMW		**713**	**322**	**1,035**	**622**	**269**	**892**
2034	Jan	762	313	1,075	873	296	1,170
	Feb	963	341	1,304	1083	301	1,384
	Mar	873	389	1,263	1120	532	1,653
	Apr	1086	435	1,521	1113	513	1,626
	May	939	377	1,317	1067	499	1,566
	June	906	408	1,315	1293	583	1,875
	July	615	393	1,009	1092	546	1,638
	Aug	506	299	805	691	437	1,127
	Sept	621	248	868	649	252	901
	Oct	417	224	641	422	222	644
	Nov	340	218	558	341	194	535
	Dec	509	217	726	634	454	1,088
Annual aMW		**712**	**322**	**1,033**	**865**	**402**	**1,267**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2035	Jan	760	312	1,071	1103	536	1,640
	Feb	961	339	1,301	1152	476	1,628
	Mar	872	388	1,260	1097	486	1,583
	Apr	1085	434	1,519	1108	495	1,603
	May	939	376	1,315	725	391	1,116
	June	905	408	1,313	538	337	875
	July	615	393	1,008	617	405	1,022
	Aug	505	299	804	457	277	734
	Sept	619	247	867	589	229	818
	Oct	417	224	640	381	210	591
	Nov	340	218	558	329	192	521
	Dec	509	216	725	438	199	637
Annual aMW		**711**	**321**	**1,032**	**711**	**353**	**1,064**
2036	Jan	757	310	1,067	505	223	728
	Feb	960	338	1,298	641	260	901
	Mar	870	386	1,257	460	234	693
	Apr	1084	433	1,517	487	190	677
	May	939	376	1,314	532	233	766
	June	904	407	1,311	532	337	868
	July	614	393	1,006	427	271	698
	Aug	505	299	803	370	203	573
	Sept	618	247	865	436	203	639
	Oct	416	223	640	382	193	575
	Nov	340	218	558	344	185	529
	Dec	508	216	724	411	178	589
Annual aMW		**710**	**320**	**1,030**	**461**	**226**	**686**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2037	Jan	755	308	1,063	452	174	626
	Feb	958	336	1,294	616	196	812
	Mar	868	384	1,252	756	216	972
	Apr	1082	432	1,514	781	388	1,169
	May	938	376	1,314	695	255	949
	June	903	407	1,310	619	237	856
	July	613	392	1,005	506	372	878
	Aug	504	298	802	442	272	714
	Sept	616	247	863	441	218	659
	Oct	416	223	639	376	209	585
	Nov	340	217	558	339	184	524
	Dec	508	216	724	504	191	695
Annual aMW		**708**	**320**	**1,028**	**544**	**243**	**787**
2038	Jan	752	306	1,059	675	344	1,019
	Feb	956	334	1,290	945	372	1,318
	Mar	866	382	1,248	605	339	944
	Apr	1083	431	1,514	545	315	860
	May	938	375	1,313	473	262	736
	June	902	406	1,308	462	310	772
	July	612	391	1,003	487	367	854
	Aug	504	298	802	361	245	606
	Sept	614	246	861	387	224	611
	Oct	415	223	638	362	199	561
	Nov	340	217	557	342	186	528
	Dec	507	216	723	477	171	648
Annual aMW		**707**	**319**	**1,026**	**510**	**278**	**788**

*HCC=Hells Canyon Complex, **ROR=Run of River

Year	Month	50th Percentile (planning case) HCC	ROR	Total	Climate Change Modeling HCC	ROR	Total
2039	Jan	750	305	1,054	579	240	819
	Feb	954	333	1,287	741	255	996
	Mar	864	381	1,245	777	218	995
	Apr	1082	430	1,512	922	210	1,132
	May	937	373	1,310	830	243	1,072
	June	900	406	1,306	568	247	815
	July	612	391	1,002	499	348	847
	Aug	503	298	801	395	233	629
	Sept	613	246	859	440	211	650
	Oct	415	223	637	373	187	560
	Nov	340	217	557	343	165	509
	Dec	507	215	722	448	173	621
Annual aMW		**707**	**318**	**1,024**	**576**	**228**	**804**
2040	Jan	748	302	1,050	819	318	1,137
	Feb	952	331	1,283	1179	463	1,642
	Mar	863	379	1,242	1129	580	1,709
	Apr	1081	429	1,510	1144	584	1,728
	May	937	372	1,309	1181	583	1,765
	June	899	405	1,304	1243	506	1,749
	July	611	392	1,003	642	359	1,001
	Aug	503	297	800	548	363	911
	Sept	611	246	857	636	236	872
	Oct	414	222	637	410	212	623
	Nov	340	217	557	329	207	537
	Dec	506	215	722	462	184	646
Annual aMW		**706**	**317**	**1,023**	**810**	**383**	**1,193**

*HCC=Hells Canyon Complex, **ROR=Run of River

LONG-TERM CAPACITY EXPANSION RESULTS (MW)

Preferred Portfolio—Base with B2H

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	105	0	20	-308	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	55	0	0	-175	27	0
2029	0	0	100	255	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	700	1,405	1,685	500	400	-841	428	12
Total	**4,289**								

Base with B2H—High Gas High Carbon Test (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	105	0	20	-308	27	0
2026	0	0	515	0	500	0	0	28	0
2027	0	0	250	0	0	0	0	27	0
2028	0	400	320	0	GW1	0	-175	27	0
2029	0	100	100	200	0	0	0	26	0
2030	0	100	0	55	GW2	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	0	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	357	1,300	1,805	1,570	500	400	-841	428	12
Total	**5,531**								

Base with B2H—PAC Bridger Alignment (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	0	0	20	0	25	0
2025	0	0	300	105	0	0	-134	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	0	0	0	0	27	0
2028	0	0	120	0	0	0	0	27	0
2029	0	0	0	5	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	5	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	105	0	0	0	22	0
2034	-357	0	100	305	0	0	-349	21	0
2035	0	0	200	505	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	100	105	0	0	0	14	0
2038	0	0	0	155	0	0	0	12	0
2039	0	100	0	55	GW1	0	0	11	0
2040	0	100	0	55	0	0	0	10	0
Subtotal	0	900	1,405	1,680	500	340	-841	428	0
Total	**4,412**								

Base without B2H (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	900	0	0	0	0	0	25	0
2025	0	0	400	205	0	0	-308	27	0
2026	0	0	515	305	GW1	0	0	28	0
2027	0	0	250	105	0	0	-175	27	0
2028	0	200	320	205	GW2	20	0	27	0
2029	0	100	0	50	0	0	0	26	0
2030	0	100	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	105	0	0	0	22	0
2034	-357	0	100	155	0	0	0	21	0
2035	0	0	100	300	0	0	0	20	0
2036	0	0	0	55	0	20	0	16	0
2037	0	0	0	100	0	0	0	14	6
2038	0	0	0	150	0	20	0	12	6
2039	0	0	0	50	0	40	0	11	3
2040	0	0	0	50	0	20	0	10	9
Subtotal	0	1,300	1,805	2,115	0	440	-841	428	23
Total	**5,271**								

Base without B2H, without Gateway West (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	130	0	20	-357	24	0
2024	357	400	0	20	0	20	0	25	0
2025	0	0	200	120	0	0	-134	27	0
2026	0	0	215	270	0	0	0	28	0
2027	0	0	250	70	0	20	0	27	0
2028	0	0	120	120	0	0	-175	27	0
2029	0	200	0	220	0	0	0	26	0
2030	0	200	0	20	0	0	0	24	0
2031	0	0	0	70	0	0	0	24	0
2032	0	0	0	60	0	0	-174	23	0
2033	0	0	0	265	0	0	0	22	0
2034	-357	0	0	265	0	0	0	21	0
2035	0	0	0	205	0	20	0	20	8
2036	0	0	0	60	0	0	0	16	11
2037	0	0	0	120	0	0	0	14	6
2038	0	0	0	170	0	0	0	12	6
2039	0	0	0	70	0	20	0	11	6
2040	0	0	0	170	0	20	0	10	3
Subtotal	0	800	905	2,425	0	420	-841	428	40
Total	**4,177**								

Base without B2H—PAC Bridger Alignment (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	800	0	0	0	0	0	25	0
2025	0	0	400	205	0	0	-134	27	0
2026	0	0	215	155	0	0	0	28	0
2027	0	200	250	55	GW1	0	0	27	0
2028	0	0	120	105	0	0	0	27	0
2029	0	100	0	50	0	0	0	26	0
2030	0	100	100	100	0	0	0	24	0
2031	0	0	0	0	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	100	100	GW2	0	0	22	0
2034	-357	0	100	305	0	0	-349	21	0
2035	0	0	300	505	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	100	100	0	0	0	14	0
2038	0	0	100	150	0	0	0	12	6
2039	0	0	0	55	0	0	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	1,200	1,905	2,165	0	340	-841	428	18
Total	**5,215**								

Rapid Electrification (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	14
2024	357	800	0	5	0	0	0	25	0
2025	0	0	300	105	0	0	-308	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	105	0	0	0	27	0
2029	0	100	0	55	0	0	-175	26	0
2030	0	300	0	205	GW1	0	0	24	0
2031	0	0	100	105	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	55	0	0	0	22	0
2034	-357	0	100	105	0	0	0	21	0
2035	0	0	100	405	0	20	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	6
2038	0	0	100	205	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	0
2040	0	200	100	5	GW2	40	0	10	0
Subtotal	0	1,400	1,505	1,745	500	420	-841	428	20
Total	**5,178**								

Climate Change (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	215	0	20	-357	24	30
2024	357	900	400	5	0	20	0	25	0
2025	0	0	400	105	0	0	-308	27	0
2026	0	0	215	5	500	0	0	28	0
2027	0	0	250	5	GW1	0	0	27	0
2028	0	300	120	5	0	0	-175	27	0
2029	0	0	200	255	GW2	0	0	26	0
2030	0	100	100	5	0	0	0	24	0
2031	0	0	100	105	0	0	0	24	0
2032	0	0	0	5	0	0	0	23	0
2033	0	0	100	150	0	0	0	22	0
2034	-357	0	100	105	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	100	105	0	0	0	14	0
2038	0	0	100	255	0	0	0	12	6
2039	0	0	0	55	0	0	0	11	6
2040	0	0	100	55	0	0	0	10	9
Subtotal	0	1,300	2,505	1,795	500	340	-841	428	50
Total	**6,078**								

100% Clean by 2035 (MW)

Year	Gas	Wind	Solar	Storage	Nuclear	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	0	20	-357	24	0
2024	357	900	0	0	0	0	0	0	25	0
2025	0	0	400	205	0	0	0	-308	27	0
2026	0	0	515	305	0	500	0	0	28	0
2027	0	0	250	105	0	GW1	0	-175	27	0
2028	0	200	320	205	0	0	20	0	27	0
2029	0	100	0	50	0	0	0	0	26	0
2030	-45	100	0	55	0	GW2	0	0	24	0
2031	-45	0	0	55	77	0	0	0	24	0
2032	-164	0	0	55	0	0	0	0	23	0
2033	-171	0	0	105	154	0	0	0	22	0
2034	-693	0	100	155	154	0	0	0	21	0
2035	0	0	100	300	308	0	0	0	20	0
2036	0	0	0	55	0	0	20	0	16	0
2037	0	0	0	100	0	0	0	0	14	6
2038	0	0	0	150	0	0	20	0	12	6
2039	0	0	0	50	0	0	40	0	11	3
2040	0	0	0	50	0	0	20	0	10	9
Subtotal	-762	1,300	1,805	2,115	693	500	440	-841	428	23
Total	**5,702**									

100% Clean by 2045 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	-134	25	0
2025	0	0	900	200	0	0	-174	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	GW1	0	-175	27	0
2028	0	0	220	105	0	0	0	27	0
2029	0	0	0	55	0	0	0	26	0
2030	0	0	100	105	0	0	0	24	0
2031	0	0	0	5	0	0	0	24	0
2032	0	0	0	55	0	20	0	23	0
2033	0	0	0	55	0	20	0	22	0
2034	-357	0	0	155	0	20	0	21	0
2035	0	0	100	305	0	20	0	20	0
2036	0	0	0	55	0	20	0	16	0
2037	0	0	0	105	0	20	0	14	0
2038	0	0	0	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	9
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	700	1,905	1,590	500	500	-841	428	18
Total	**4,800**								

SWIP North (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	800	0	0	0	0	0	25	0
2025	0	0	200	0	100[1]	0	-308	27	0
2026	0	0	215	5	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	55	0	0	-175	27	0
2029	0	300	0	205	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	100	100	GW1	0	0	24	0
2032	0	100	0	5	0	0	0	23	0
2033	0	0	100	105	0	0	0	22	0
2034	-357	0	0	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	8
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	150	0	20	0	12	6
2039	0	0	0	50	0	20	0	11	0
2040	0	100	0	55	0	0	0	10	0
Subtotal	0	1,300	1,305	1,520	600	360	-841	428	13
Total	**4,686**								

1. SWIP North Capacity

CSPP Wind Renewal Low (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	100	0	20	-308	27	0
2026	0	0	215	5	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	55	0	0	-175	27	0
2029	0	0	100	250	0	0	0	26	0
2030	0	0	0	50	0	0	0	24	0
2031	0	0	100	105	0	0	0	24	0
2032	0	100	0	5	0	0	0	23	0
2033	0	0	0	105	0	0	0	22	0
2034	-357	0	0	155	0	0	0	21	0
2035	0	0	100	305	0	20	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	GW1	0	0	12	9
2039	0	100	0	55	0	0	0	11	0
2040	0	100	0	50	0	0	0	10	6
Subtotal	0	1,000	1,405	1,680	500	360	-841	428	15
Total	**4,547**								

CSPP Wind Renewal High (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	0	0	20	0	25	0
2025	0	0	300	105	0	0	-308	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	0	0	0	0	27	0
2028	0	0	120	100	0	0	-175	27	0
2029	0	0	0	200	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	100	0	50	0	0	0	24	0
2032	0	0	0	50	0	0	0	23	0
2033	0	0	0	50	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	100	100	300	0	0	0	20	0
2036	0	0	0	55	0	20	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	150	GW1	0	0	12	0
2039	0	0	0	50	0	0	0	11	0
2040	0	200	300	5	0	20	0	10	0
Subtotal	0	1,100	1,605	1,540	500	380	-841	428	0
Total	**4,712**								

Validation Test: Natural Gas in 2028 Rather Than Solar and Storage (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	105	0	20	-308	27	0
2026	0	0	215	5	500	0	0	28	0
2027	0	0	250	5	0	0	-175	27	0
2028	170	0	120	55	0	0	0	27	0
2029	0	0	0	55	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	105	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	55	0	0	0	22	0
2034	-357	0	0	55	0	0	0	21	0
2035	0	0	100	405	0	20	0	20	0
2036	0	0	0	100	0	0	0	16	0
2037	0	0	0	50	0	0	0	14	3
2038	0	0	100	205	0	0	0	12	6
2039	0	0	0	55	0	0	0	11	0
2040	0	300	0	5	GW1	20	0	10	6
Subtotal	170	1,000	1,205	1,490	500	380	-841	428	15
Total	**4,347**								

Validation Test: Bridger Exit Units 1 and 2 at the End of 2023 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	0	400	400	400	0	0	0	25	0
2025	0	0	300	100	0	0	-308	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	55	0	0	-175	27	0
2029	0	0	100	250	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	100	100	0	0	0	23	0
2033	0	100	0	0	0	20	0	22	0
2034	0	0	0	55	0	0	0	21	10
2035	0	100	0	55	GW1	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	100	0	155	0	0	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	100	0	55	0	0	0	10	0
Subtotal	0	800	1,605	1,670	500	360	-841	428	13
Total	**4,535**								

Validation Test: Bridger Exit Unit 2 at the End of 2026 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-177	24	0
2024	177	800	0	0	0	0	0	25	0
2025	0	0	300	105	0	0	-308	27	0
2026	0	0	215	0	500	0	-180	28	0
2027	0	0	250	150	0	0	0	27	0
2028	0	0	120	105	0	0	-175	27	0
2029	0	0	200	250	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	100	0	55	0	0	0	22	0
2034	-177	100	0	55	GW1	0	0	21	0
2035	0	0	100	255	0	0	0	20	0
2036	0	0	0	105	0	0	0	16	8
2037	0	0	0	0	0	20	0	14	6
2038	0	100	100	155	0	20	0	12	6
2039	0	0	0	55	0	20	0	11	6
2040	0	0	0	55	0	40	0	10	6
Subtotal	0	1,100	1,405	1,625	500	420	-841	428	31
Total	**4,669**								

Validation Test: Bridger Exit Units 3 and 4 in 2028 and 2030 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	100	0	20	-134	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	5	0	0	-174	27	0
2029	0	0	0	105	0	20	0	26	0
2030	0	0	0	55	0	0	-175	24	0
2031	0	0	0	255	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	200	0	0	0	21	0
2035	0	100	100	250	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	100	100	0	0	0	14	0
2038	0	0	100	155	GW1	20	0	12	6
2039	0	0	0	50	0	20	0	11	0
2040	0	0	0	50	0	20	0	10	9
Subtotal	0	800	1,405	1,660	500	420	-841	428	15
Total	**4,387**								

Validation Test: Valmy Unit 2 Exit in 2023 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-491	24	0
2024	357	600	100	150	0	0	0	25	0
2025	0	0	300	105	0	0	-174	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	0	0	0	-175	27	0
2028	0	0	220	105	0	0	0	27	0
2029	0	0	0	55	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	100	0	100	0	0	0	24	0
2032	0	100	0	5	0	0	0	23	0
2033	0	0	0	105	0	0	0	22	0
2034	-357	0	0	205	0	0	0	21	0
2035	0	0	100	255	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	GW1	0	0	12	0
2039	0	100	0	105	0	0	0	11	0
2040	0	0	0	55	0	20	0	10	0
Subtotal	0	900	1,405	1,730	500	340	-841	428	0
Total	**4,462**								

Validation Test: Valmy Unit 2 Exit in 2024 (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	-134	25	0
2025	0	0	400	250	0	0	-174	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	-175	27	0
2028	0	0	120	105	0	0	0	27	0
2029	0	0	0	55	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	100	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	105	0	0	0	22	0
2034	-357	0	100	155	0	0	0	21	0
2035	0	0	100	300	0	0	0	20	0
2036	0	0	0	50	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	100	0	155	GW1	0	0	12	0
2039	0	0	0	55	0	20	0	11	0
2040	0	0	100	105	0	0	0	10	0
Subtotal	0	900	1,405	1,730	500	340	-841	428	0
Total	**4,462**								

Validation Test: Biomass (MW)

Year	Gas	Wind	Solar	Storage	Biomass	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	0	20	-357	24	0
2024	357	700	0	5	0	0	0	0	25	0
2025	0	0	300	105	0	0	20	-308	27	0
2026	0	0	215	0	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	0	27	0
2028	0	0	120	5	50	0	0	-175	27	0
2029	0	0	100	255	0	0	0	0	26	0
2030	0	0	0	55	0	0	0	0	24	0
2031	0	0	0	55	0	0	0	0	24	0
2032	0	0	0	55	0	0	0	0	23	0
2033	0	0	0	100	0	0	0	0	22	0
2034	-357	0	100	150	0	0	0	0	21	0
2035	0	0	100	305	0	0	0	0	20	0
2036	0	0	0	55	0	0	0	0	16	0
2037	0	0	0	105	0	0	0	0	14	0
2038	0	0	100	155	0	0	20	0	12	0
2039	0	0	0	55	0	0	20	0	11	3
2040	0	0	0	55	0	0	20	0	10	9
Subtotal	0	700	1,405	1,635	50	500	400	-841	428	12
Total	**4,289**									

Validation Test: Geothermal (MW)

Year	Gas	Wind	Solar	Storage	Geothermal	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	0	20	-357	24	0
2024	357	700	0	5	0	0	0	0	25	0
2025	0	0	300	105	0	0	20	-308	27	0
2026	0	0	215	0	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	0	27	0
2028	0	0	120	5	50	0	0	-175	27	0
2029	0	0	100	255	0	0	0	0	26	0
2030	0	0	0	55	0	0	0	0	24	0
2031	0	0	0	55	0	0	0	0	24	0
2032	0	0	0	55	0	0	0	0	23	0
2033	0	0	0	100	0	0	0	0	22	0
2034	-357	0	100	150	0	0	0	0	21	0
2035	0	0	100	305	0	0	0	0	20	0
2036	0	0	0	55	0	0	0	0	16	0
2037	0	0	0	105	0	0	0	0	14	0
2038	0	0	100	155	0	0	20	0	12	0
2039	0	0	0	55	0	0	20	0	11	3
2040	0	0	0	55	0	0	20	0	10	9
Subtotal	0	700	1,405	1,635	50	500	400	-841	428	12
Total	**4,289**									

Validation Test: Demand Response (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	0	0	20	0	25	0
2025	0	0	300	100	0	20	-308	27	0
2026	0	0	215	0	500	20	0	28	0
2027	0	0	250	0	0	20	0	27	0
2028	0	0	120	50	0	0	-175	27	0
2029	0	0	100	255	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	700	1,405	1,665	500	460	-841	428	12
Total	**4,329**								

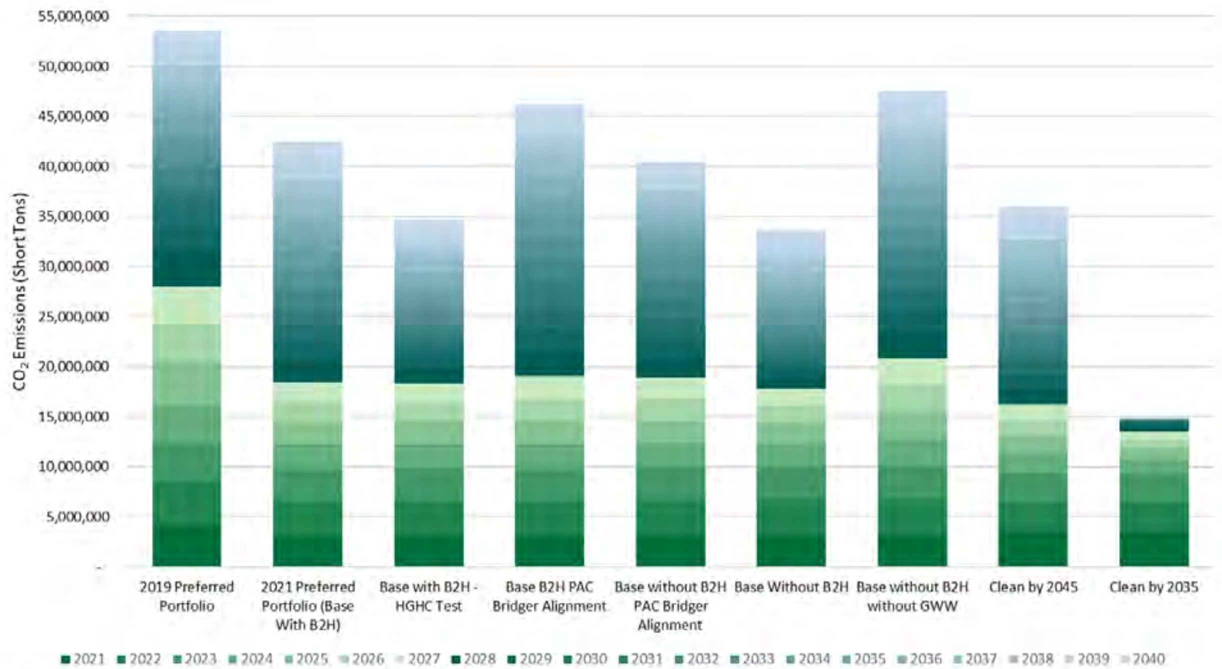
Validation Test: Energy Efficiency (MW)

Year	Gas	Wind	Solar	Storage	Transmission	Demand Response	Coal Exit	Energy Efficiency Forecast	Energy Efficiency Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	110	0	20	-357	24	14
2024	357	700	0	0	0	0	0	25	18
2025	0	0	300	100	0	20	-308	27	22
2026	0	0	215	0	500	0	0	28	25
2027	0	0	250	0	0	0	0	27	26
2028	0	0	120	40	0	0	-175	27	0
2029	0	0	100	255	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	700	1,405	1,650	500	400	-841	428	117
Total	**4,359**								

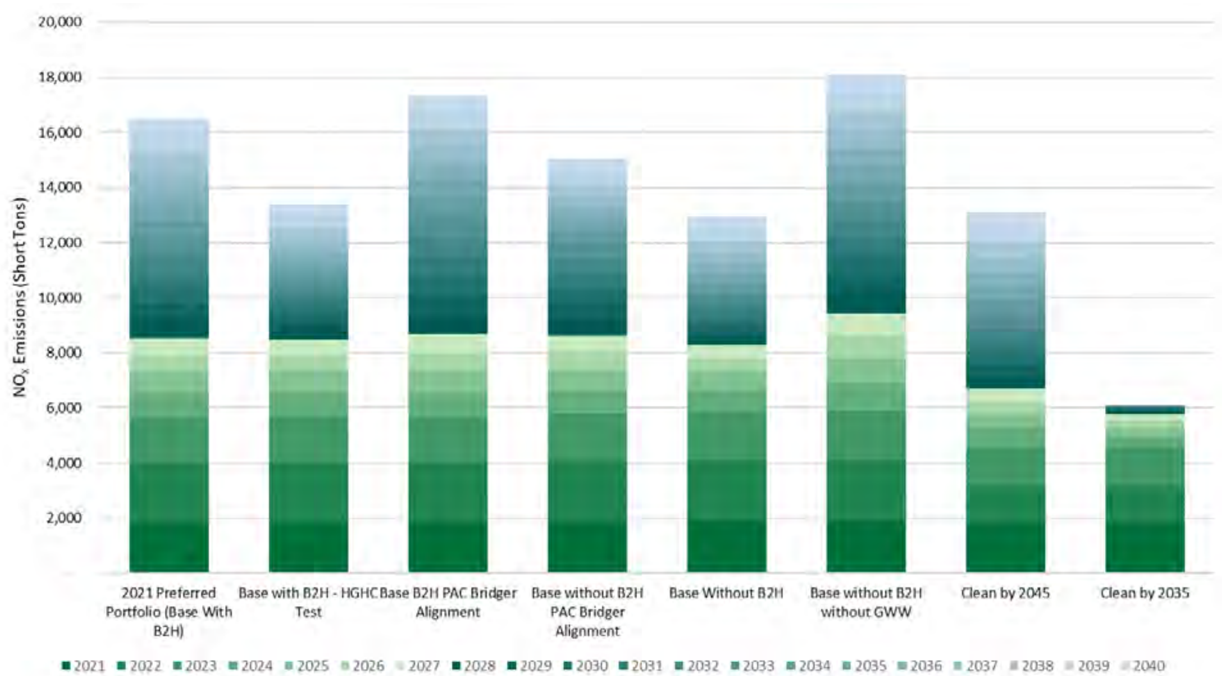
PORTFOLIO EMISSIONS FORECAST

Total emissions forecasts (CO_2, NO_x, and SO_2) for Idaho Power's resources are outputs of the AURORA model and are presented below.

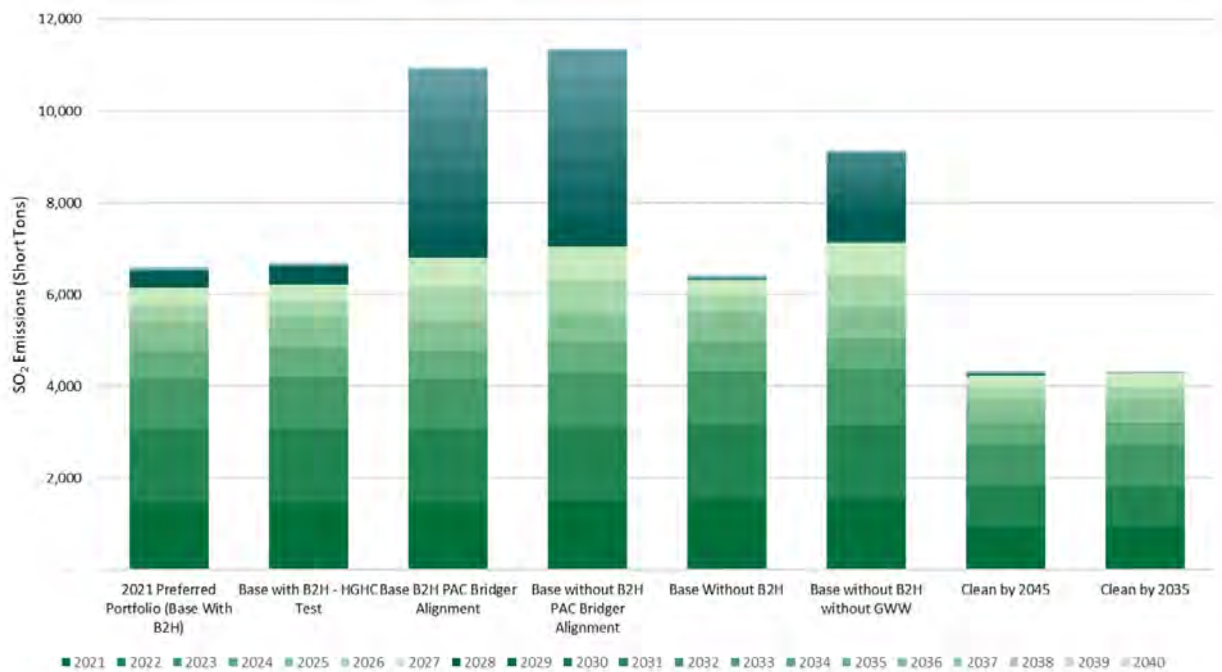
CO_2 Tons



NOx Tons



SO_2 Tons



12,000
10,000
8,000
6,000
4,000
2,000
SO_2 Emissions (Short Tons)
2021 Preferred Portfolio (Base With B2H)
Base with B2H - HGHC Test
Base B2H PAC Bridger Alignment
Base without B2H PAC Bridger Alignment
Base Without B2H
Base without B2H without GWW
Clean by 2045
Clean by 2035
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

Preferred Portfolio (Base with B2H) Emissions

Year	CO_2 (short tons)	NOx (short tons)	SO_2 (short tons)
2021	3,146,734	1,825	1,459
2022	3,464,248	2,175	1,588
2023	3,133,471	1,656	1,119
2024	2,428,049	857	639
2025	2,304,014	801	649
2026	2,014,136	604	348
2027	2,025,337	611	339
2028	2,111,398	652	348
2029	1,748,562	558	9
2030	1,725,706	555	9
2031	1,787,393	590	9
2032	1,831,248	608	10
2033	1,905,600	633	10
2034	1,889,374	631	10
2035	1,783,130	606	9
2036	1,787,069	611	9
2037	1,809,568	617	9
2038	1,839,524	627	9
2039	1,869,889	642	9
2040	1,861,797	642	9

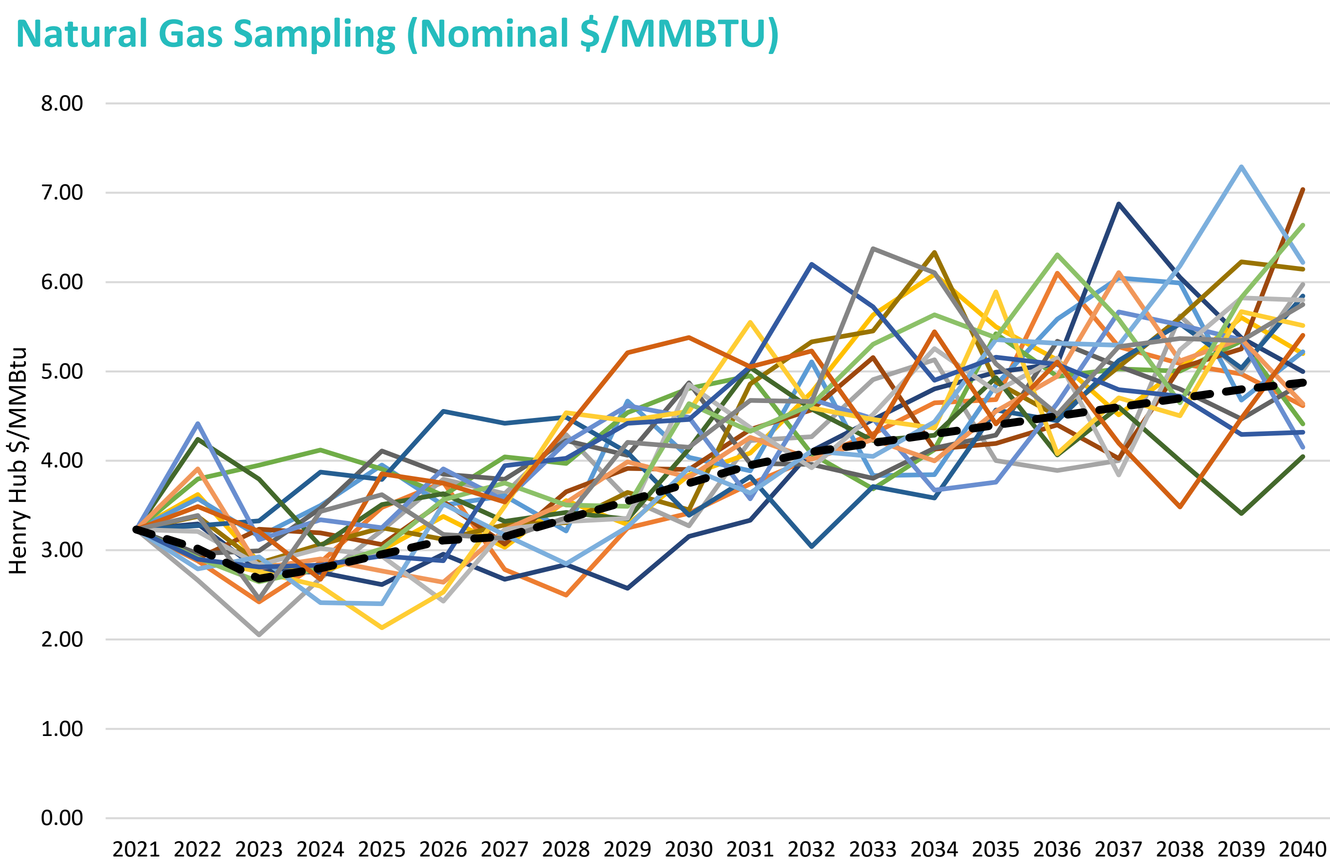
STOCHASTIC RISK ANALYSIS

The stochastic analysis assesses the effect on portfolio costs when select variables take on values different from their planning-case levels. Stochastic variables are selected based on the degree to which there is uncertainty regarding their forecasts and the degree to which they can affect the analysis results (i.e., portfolio costs).

The purpose of the analysis is to understand the range of portfolio costs across the full extent of stochastic shocks (i.e., across the full set of stochastic iterations) and how the ranges for portfolios differ.

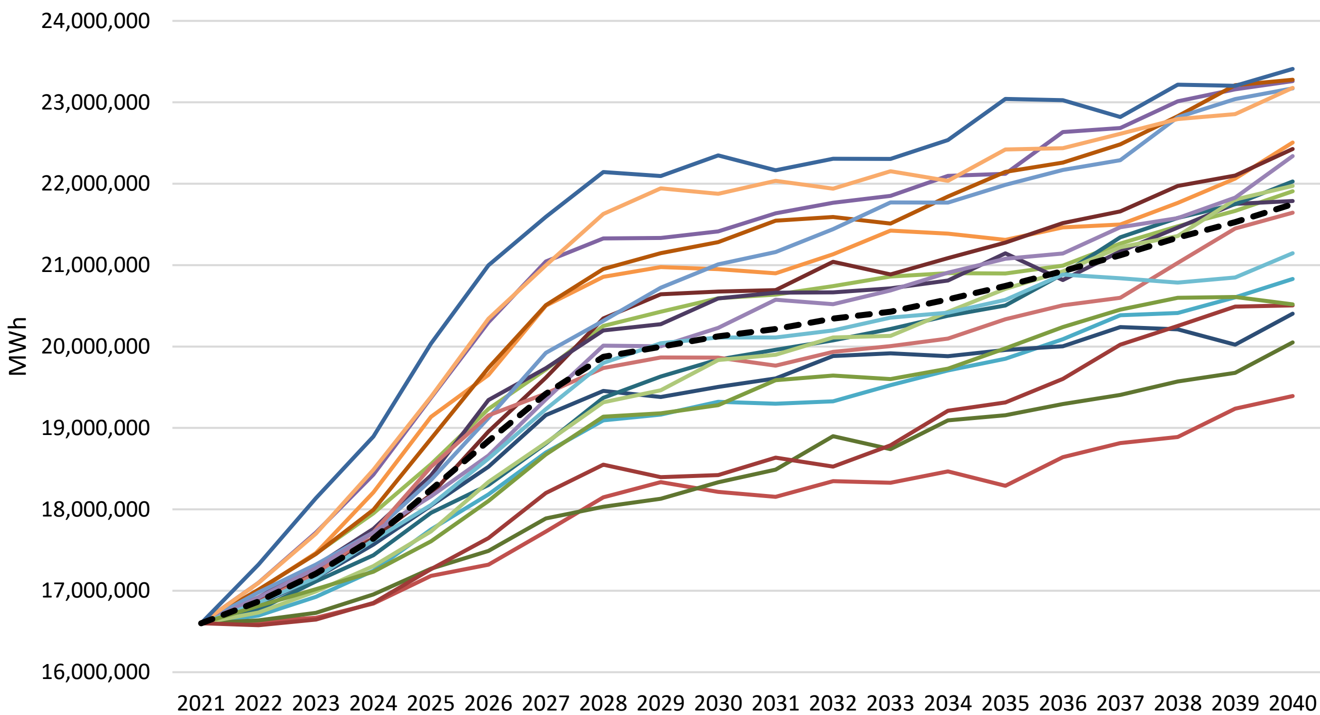
Idaho Power identified the following three variables for the stochastic analysis:

1. *Natural gas price*—Based on the historical Henry Hub natural gas price data for the 1997 to 2020 period, it was determined that natural gas price variance around the trend approximates a log-normal distribution with a year-to-year correlation factor of 0.55. The graph below shows planning case average annual price in the black dashed line and the remaining-colored lines show the 20 different stochastic iterations for Henry Hub gas prices.



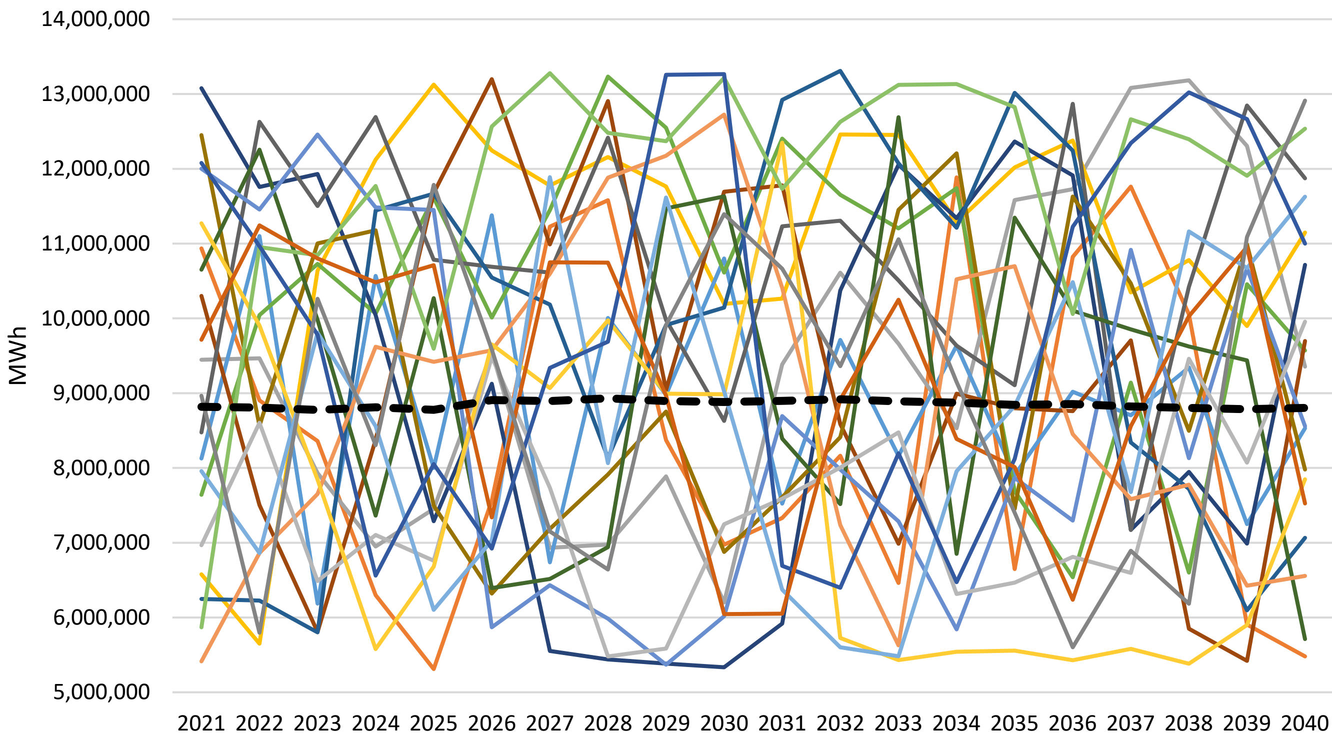
2. *Customer load*—Customer load follows a normal distribution and is adjusted around the planning case load forecast, which is shown as the dashed line in the figure below. To assess the reasonableness of the stochastic error bounds as they relate to customer load, the upper and lower bounds were compared to the load forecast 90/10 error bounds. For both the upper and lower bound, the stochastic values were found to fall slightly outside of the 90/10 bounds which is to be expected. The stochastic process produces 20 scenarios which could be expected to test a larger bound of 95/5.

Customer Load Sampling (Annual MWh)



3. *Hydroelectric variability*—Hydroelectric generation variability was found to approximate a uniform distribution based on the historical generation from the 1951 to 2017 period. Although an unexpected result based on the non-uniform distribution of rainfall across the Snake River Basin, the regulation of streamflow likely explains the difference between rainfall and generation distributions. In addition to the distribution, the historical data also shows a correlation between years of 0.55.

Hydro Generation Sampling (Annual MWh)

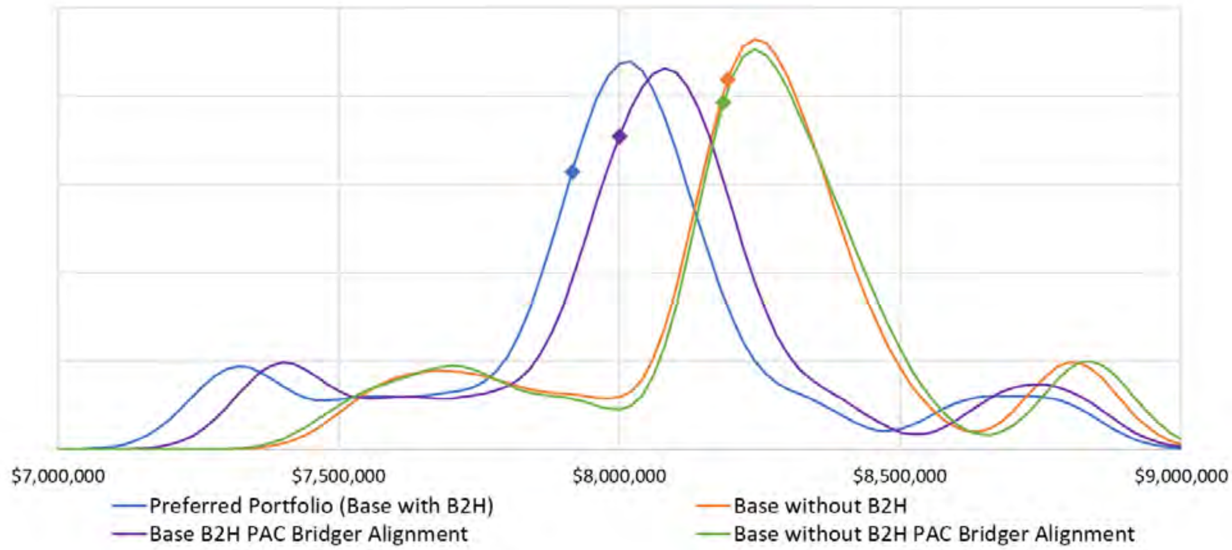


The three selected stochastic variables are key drivers of variability in year-to-year power-supply costs and therefore provide suitable stochastic shocks to allow differentiated results for analysis.

Due to the significant time required to perform the stochastic risk analysis, Idaho Power was limited to performing a maximum of 20 risk iterations. Based on the sample size, the choice was made to use the Latin Hypercube sampling technique over a pure Monte Carlo method. The Latin Hypercube design samples the distribution range with a relatively smaller sample size, allowing a reduction in simulation run times. The Latin Hypercube method does this by sampling at regular intervals across the distribution spectrum. Contrast this to Monte Carlo methods where samples are taken randomly from the distribution range. The random Monte Carlo draw requires far more than 20 iterations to ensure a good distribution of draws. Once the stochastic elements are drawn, Idaho Power then calculated the 20-year NPV portfolio cost for each of the 20 iterations for all evaluated portfolios. The distribution of 20-year NPV portfolio costs for the portfolios are shown in the graph below.

Portfolio Stochastic Analysis, Total Portfolio Cost

NPV Years 2021–2040 ($ x 1,000)



In the figure above, each line represents the likelihood of occurrence by NPV with the diamonds showing the planning conditions NPV. Higher values on the line represent a higher probability of occurrence with values near the horizontal axis representing improbable events. Values that occur toward the left have lower cost while values toward the right have higher cost. As indicated by the peak of the graph being furthest left, the results of the stochastic analysis show that the Preferred Portfolio (Base with B2H) is likely to have the lowest cost given a range of natural gas prices, load forecasts, and hydroelectric generation levels. Next lowest is the Base B2H PAC Bridger Alignment portfolio indicated by the middle peak. Nearly tied as the most expensive options analyzed using stochastic elements are both Base without B2H portfolios regardless of PAC Bridger alignment.

LOSS OF LOAD EXPECTATION

As utilities continue to add more renewable energy to the electric grid, it is becoming more critical to analyze the effect variable energy resources have on system reliability. For the 2021 IRP, Idaho Power utilized the risk-based equations and methodologies described in this section to calculate the contribution to peak of different variable energy resources for the AURORA model and quantitatively analyze the risk associated with the portfolios. The company chose to conduct this study because of the recognition that the output of variable energy resources such as wind and solar change with time (with their hourly output being dependent on a multitude of factors like weather and environmental conditions) and that it is essential to capture and value that variability. Another key factor for conducting this study is that the industry is also attempting to establish a generally accepted method to calculate the contribution to peak of variable energy resources, so it is essential for Idaho Power to adopt and apply these best practices.

Methodology Components

The Loss of Load Probability (LOLP) is the likelihood of the system load exceeding the available generating capacity during a given time period (typically an hour). The LOLP can be calculated by determining the probability that the available generation at any given hour is able to meet the net load during that same hour. The LOLP can be defined as:

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

where P_i is the cumulative probability of the available generation required to meet the system demand at hour i, G_i is the available generation required to meet the system demand at hour i, and L_i is the system demand at hour i.

The Loss of Load Expectation (LOLE) is 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. The LOLE can be calculated by adding the maximum LOLP from each day for a time period (typically over the course of a year). LOLE can be defined as:

$$LOLE = \sum_{d=1}^{D} max[_{i=1}^{H} (LOLP_i)]$$

where $LOLP_i$ is the LOLP at hour i.

The Effective Load Carrying Capability (ELCC) is a reliability-based metric used to assess the contribution to peak of any given generation unit or power plant. ELCC decomposes an individual generator's contribution to the overall system reliability and is primarily driven by the timing of high LOLP hours. These calculated values were assigned to existing and selectable resources when modeling the different portfolios. To calculate the ELCC of a resource, there are two definitions that should first be stated:

EFOR:	the Equivalent Forced Outage Rate (EFOR) represents the number of hours a generation unit is forced off-line compared to the number of hours the unit runs; for example, an EFOR of three percent means a generator is forced off three percent of its running time.
Perfect Generator:	a generation unit whose EFOR value is zero percent, meaning that it is always available and never forced off-line.

The ELCC of a resource is determined by first calculating the perfect generation required to achieve an LOLE of 0.05 days per year with all market purchases set equal to zero. Then, the resource being evaluated is added to the system and the perfect generation required is calculated once again. The ELCC of a given resource will be equal to the difference in the size of the perfect generators from the two runs divided by the resource's nameplate:

$$ELCC = \frac{PG_1 - PG_2}{Resource_{NM}}$$

where PG_1 is the perfect generation required to achieve an LOLE of 0.05 days per year without including the evaluated resource, PG_2 is the perfect generation required to achieve an LOLE of 0.05 days per year with the evaluated resource included, and $Resource_{NM}$ is the nameplate of the evaluated resource.

Modeling Idaho Power's System

Idaho Power created a tool to implement the LOLE methodology and maximize computational efficiency for modeling Idaho Power's existing and potential resource stack. Within this tool, the company's resources were split into three primary categories: dispatchable resources, intermittent resources, and energy limited resources (demand response and storage).

Dispatchable resources were modeled using a monthly outage table that was calculated using their monthly capacity and EFOR. The outage table is comprised of the following four components:

Capacity In:	capacity available to serve load (MW)
Capacity Out:	forced outage capacity (MW)
Individual Probability:	probability that a specific event will occur
Cumulative Probability:	cumulative distribution of the individual probabilities

Dispatchable resources include the Hells Canyon Complex, natural gas plants, Bridger and Valmy coal and various transmission assets with access to the market.

Variable resources (such as wind and solar) were modeled by using four years of historical hourly output data to maintain the relationship between load and renewable generation. Other resources for which Idaho Power does not have direct control over (in reference to their dispatch) were also modeled using four years of historical hourly output data. Examples of these resources include dairy digestors, non-wind and non-solar PURPA projects, run of river hydroelectric plants and geothermal generation. In the model, these variable resources are subtracted from the system adjusted load to produce a net load that is then used in the LOLE calculations.

Because resources such as storage and demand response are dispatched based on the daily peak load shape, Idaho Power devised a separate way to model energy limited resources. The tool begins by sorting the days in a year from high to low based on their net load peak. Starting on the day with the highest net load, a target for each day was set based on the net load peak and the size of the demand response group or storage selection. After verifying that the operating parameters of the demand response portfolio or storage resource are met on that day, the algorithm iterates over each hour of the day and compares the net load with the target. If the net load is above the target, the function will dispatch the MW assigned for that hour. The algorithm will then move to the next day and perform all the checks before it iterates over all the hours again; this is done for every day in each year.

This customization functionality of the LOLE tool allows for a detailed approach to modeling Idaho Power's system. As system needs continue to change, new analysis such as this LOLE tool will be essential in best evaluating the company's highest risk hours (which is of key importance since they will no longer necessarily align with the peak load hour).

ELCC Results

The ELCC of future variable energy resources are dependent upon the order of the resources built before them, making the ELCC calculation of future resources challenging. For the 2021 IRP, Idaho Power adopted the concept of "last-in ELCC" where from the future resources being modeled, only one resource is added at a time. For example, to calculate the ELCC of future solar PV, all the existing resources are modeled and only solar is included in the LOLE tool. This approach will result in an accurate baseline for AURAORA to build the portfolios.

The average ELCC values used in AURORA for future solar PV, wind, demand response, 4-hour storage, 8-hour storage and solar PV plus storage were fed into the model. The table below shows the ELCC for existing and future resources that were used in the AURORA model.

ELCC of Existing Resources		ELCC of Future Resources	
Resource	Average	Resource	Average
PURPA Solar	62.3%	Solar PV	10.2%
Oregon Solar	62.3%	Jackpot Solar	34.0%
PUPRA Wind	15.0%	Wind	11.2%
Elkhorn Wind	15.0%	4-Hour Storage	87.5%
Current Demand Response	17.3%	8-Hour Storage	97.0%
		Solar PV + 4-Hour Storage	97.0%
		Proposed Demand Response	58.5%
		Incremental Demand Response	36.0%

LOLE of Portfolios

To quantitively analyze portfolio reliability, Idaho Power fed portfolio results into the company's LOLE tool, as described in Chapter 10 of the 2021 IRP. Idaho Power utilized a reliability threshold (LOLE) of 0.1 days per year in the 2019 IRP. For the 2021 IRP, Idaho Power is adopting a reliability threshold of 0.05 days per year. The 0.05 (1-in-20) reliability threshold was chosen to 1) account for the extreme weather events that are becoming more frequent in the Northwest, and 2) factor in water availability uncertainty year to year. A poor water year, resulting in reduced hydro generation, can look equivalent to a season-long resource outage. This 0.05 days per year threshold aligns with the reliability threshold used by the Northwest Power & Conservation Council (NWPCC).

The LOLE tool was used to evaluate various portfolios created by AURORA using the four test years, producing an average LOLE for each year of the planning horizon for each of the selected portfolios. A generator with an EFOR of 5% was added to the LOLE tool when the LOLE of a particular year was above the preestablished threshold.

The portfolio reliability results table below shows the portfolio LOLE per year and the additional generation (when needed) that was added to each of the selected portfolios.

Portfolio Reliability Results

	Preferred Portfolio (Base with B2H)		Base without B2H		Base B2H PAC Bridger Alignment		Base without B2H PAC Bridger Alignment		SWIP-North	
Year	**LOLE (d/yr)**	**Additional Gen. (MW)**	**LOLE (d/yr)**	**Additional Gen. (MW)**	**LOLE (d/yr)**	**Additional Gen. (MW)**	**LOLE (d/yr)**	**Additional Gen. (MW)**	**LOLE (d/yr)**	**Additional Gen. (MW)**
2021	0.1050	0	0.1050	0	0.1050	0	0.1050	0	0.1050	0
2022	0.0594	0	0.0594	0	0.0594	0	0.0594	0	0.0594	0
2023	0.0259	0	0.0259	0	0.0259	0	0.0259	0	0.0259	0
2024	0.0161	0	0.0147	0	0.0149	0	0.0157	0	0.0157	0
2025	0.0072	0	0.0032	0	0.0074	0	0.0034	0	0.0067	0
2026	0.0016	0	0.0075	0	0.0003	0	0.0071	0	0.0013	0
2027	0.0024	0	0.0087	0	0.0006	0	0.0079	0	0.0024	0
2028	0.0025	0	0.0164	0	0.0009	0	0.0066	0	0.0024	0
2029	0.0035	0	0.0188	0	0.0014	0	0.0076	0	0.0034	0
2030	0.0039	0	0.0199	0	0.0014	0	0.0055	0	0.0038	0
2031	0.0056	0	0.0282	0	0.0025	0	0.0103	0	0.0033	0
2032	0.0064	0	0.0324	0	0.0027	0	0.0120	0	0.0046	0
2033	0.0073	0	0.0389	0	0.0026	0	0.0123	0	0.0043	0
2034	0.0049	0	0.0280	0	0.0007	0	0.0042	0	0.0032	0
2035	0.0354	0	0.0494	185	0.0276	0	0.0493	200	0.0190	0
2036	0.0392	0	0.0491	20	0.0361	0	0.0442	45	0.0220	0
2037	0.0495	7	0.0477	40	0.0402	0	0.0506	15	0.0293	0
2038	0.0445	3	0.0386	0	0.0473	0	0.0509	20	0.0293	0
2039	0.0487	15	0.0499	5	0.0492	16	0.0498	20	0.0315	0
2040	0.0496	16	0.0498	10	0.0480	24	0.0511	5	0.0400	0
Total		**41**		**260**		**40**		**305**		**0**

COMPLIANCE WITH STATE OF OREGON IRP GUIDELINES

Guideline 1: Substantive Requirements

a. All resources must be evaluated on a consistent and comparable basis.
   - All known resources for meeting the utility's load should be considered, including supply-side options which focus on the generation, purchase and transmission of power or gas purchases, transportation, and storage and demand side options which focus on conservation and demand response.
   - Utilities should compare different resource fuel types, technologies, lead times, in-service dates, durations and locations in portfolio risk modeling.
   - Consistent assumptions and methods should be used for evaluation of all resources.
   - The after-tax marginal weighted-average cost of capital (WACC) should be used to discount all future resource costs.

Idaho Power response:

Idaho Power considered a range of resource types including renewables (e.g., wind and storage), demand-side management, transmission, market purchases, thermal resources, and energy storage. Each of these resources was included as options in the AURORA capacity expansion modeling.

Supply-side and purchased resources for meeting the utility's load are discussed in *Chapter 4. Idaho Power Today;* demand-side options are discussed in *Chapter 6. Demand-Side Resources*; and transmission resources are discussed in *Chapter 7. Transmission Planning*.

New resource options including fuel types, technologies, lead times, in-service dates, durations, and locations are described in *Chapter 5. Future Supply-side Generation and Storage Resources*, *Chapter 6. Demand-Side resources*, *Chapter 7. Transmission Planning*, and *Chapter 8. Planning Period Forecasts*.

The consistent modeling method for evaluating new resource options is described in *Chapter 8. Planning Period Forecasts* and *Chapter 10. Modeling Analysis and Results*.

The WACC rate used to discount all future resource costs is discussed in the Technical Appendix *Supply Side Resource Data – Key Financial and Forecast Assumptions*.

b. Risk and uncertainty must be considered.
   - At a minimum, utilities should address the following sources of risk and uncertainty:
     1. Electric utilities: load requirements, hydroelectric generation, plant forced outages, fuel prices, electricity prices, and costs to comply with any regulation of greenhouse gas emissions.
     2. Natural gas utilities: demand (peak, swing, and baseload), commodity supply and price, transportation availability and price, and costs to comply with any regulation of greenhouse gas emissions.
   - Utilities should identify in their plans any additional sources of risk and uncertainty.

Idaho Power response:

Electric utility risk and uncertainty factors (load, natural gas, and hydroelectric generation) for resource portfolios are considered in *Chapter 10. Modeling Analysis and Results*. Plant forced outages are modeled in AURORA on a unit basis and are discussed in *Chapter 9 Portfolios*. Risk and uncertainty associated with high natural gas and high carbon cost are discussed in *Chapter 9 Portfolios.*

Additional sources of risk and uncertainty including regional resource adequacy and qualitative risks are discussed in *Chapter 10. Modeling Analysis and Results*.

c. The primary goal must be the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers.
   - The planning horizon for analyzing resource choices should be at least 20 years and account for end effects. Utilities should consider all costs with a reasonable likelihood of being included in rates over the long term, which extends beyond the planning horizon and the life of the resource.
   - Utilities should use present value of revenue requirement (PVRR) as the key cost metric. The plan should include analysis of current and estimated future costs for all long-lived resources such as power plants, gas storage facilities, and pipelines, as well as all short-lived resources such as gas supply and short-term power purchases.
   - To address risk, the plan should include, at a minimum:
     a. Two measures of PVRR risk: one that measures the variability of costs and one that measures the severity of bad outcomes.
     b. Discussion of the proposed use and impact on costs and risks of physical and financial hedging.
   - The utility should explain in its plan how its resource choices appropriately balance cost and risk.

Idaho Power response:

The IRP methodology and the planning horizon of 20 years are discussed in *Chapter 1. Background*.

Modeling analysis of current and estimated future costs for all long-lived resources such as power plants, gas storage facilities, and pipelines, as well as all short-lived resources such as gas supply and short-term power purchases is discussed in *Chapter 10. Modeling Analysis and Results*.

The discussion of cost variability and extreme outcomes, including bad outcomes is discussed in *Chapter 10. Modeling Analysis and Results*.

Idaho Power's Risk Management Policy regarding physical and financial hedging is discussed in *Chapter 1. Background*. Idaho Power's Energy Risk Management Program is designed to systematically identify, quantify, and manage the exposure of the company and its customers to the uncertainties related to the energy markets in which the Company is an active participant. The company's Risk Management Standards limit term purchases to the prompt 18 months of the forward curve.

Idaho Power's plan and how the resource choices appropriately balance cost and risk is presented in *Chapter 11. Preferred Portfolio and Action Plan.*

d. The plan must be consistent with the long-run public interest as expressed in Oregon and federal energy policies.

Idaho Power response:
Long-run public interest issues are discussed in *Chapter 2. Political, Regulatory, and Operational Issues* and *Chapter 3. Climate Change*. The company also evaluated four future scenarios, including rapid electrification, climate change, 100% clean by 2035, and 100% clean by 2045. These are discussed in *Chapter 9. Portfolios*.

Guideline 2: Procedural Requirements

a. The public, which includes other utilities, should be allowed significant involvement in the preparation of the IRP. Involvement includes opportunities to contribute information and ideas, as well as to receive information. Parties must have an opportunity to make relevant inquiries of the utility formulating the plan. Disputes about whether information requests are relevant or unreasonably burdensome, or whether a utility is being properly responsive, may be submitted to the Commission for resolution.

Idaho Power response:
The IRPAC meetings are open to the public. A roster of the IRPAC members along with meeting schedules and agendas is provided in the Technical Appendix, *IRP Advisory Council*.

b. While confidential information must be protected, the utility should make public, in its plan, any non-confidential information that is relevant to its resource evaluation and action plan. Confidential information may be protected through use of a protective order, through aggregation or shielding of data, or through any other mechanism approved by the Commission.

Idaho Power response:
Idaho Power makes public extensive information relevant to its resource evaluation and action plan. This information is discussed in IRPAC meetings and found throughout the 2021 IRP, the 2021 Load and Sales Forecast and in the 2021 Technical Appendix.

c. The utility must provide a draft IRP for public review and comment prior to filing a final plan with the Commission.

Idaho Power response:

Idaho Power posted online a draft 2021 IRP for public review on December 20, 2021. The company requested comments to be provided no later than December 27, 2021.

Guideline 3: Plan Filing, Review, and Updates

a. A utility must file an IRP within two years of its previous IRP acknowledgment order. If the utility does not intend to take any significant resource action for at least two years after its next IRP is due, the utility may request an extension of its filing date from the Commission.

Idaho Power response:

The OPUC acknowledged Idaho Power's 2019 IRP on June 4, 2021 in Order 21-184. The company received an extension on its 2021 IRP and it was filed in December 2021.

b. The utility must present the results of its filed plan to the Commission at a public meeting prior to the deadline for written public comment.

Idaho Power response:

Idaho Power will schedule a public meeting at the OPUC following the December 30, 2021 filing of the 2021 IRP.

c. Commission staff and parties should complete their comments and recommendations within six months of IRP filing.

Idaho Power response:

This will be conducted following the filing of this IRP.

d. The Commission will consider comments and recommendations on a utility's plan at a public meeting before issuing an order on acknowledgment. The Commission may provide the utility an opportunity to revise the plan before issuing an acknowledgment order.

Idaho Power response:

This will be conducted following the filing of this IRP.

e. The Commission may provide direction to a utility regarding any additional analyses or actions that the utility should undertake in its next IRP.

Idaho Power response:

No response needed.

f. Each utility must submit an annual update on its most recently acknowledged plan. The update is due on or before the acknowledgment order anniversary date. Once a utility anticipates a significant deviation from its acknowledged IRP, it must file an update with the Commission, unless the utility is within six months of filing its next IRP. The utility must summarize the update at a Commission public meeting. The utility may request acknowledgment of changes in proposed actions identified in an update.

Idaho Power response:

Idaho Power requested and received a waiver of the 2019 IRP update in Order No. 21-184. This activity for the 2021 IRP will occur following the filing of this IRP.

g. Unless the utility requests acknowledgement of changes in proposed actions, the annual update is an informational filing that:
- Describes what actions the utility has taken to implement the plan;
- Provides an assessment of what has changed since the acknowledgment order that affects the action plan, including changes in such factors as load, expiration of resource contracts, supply-side and demand-side resource acquisitions, resource costs, and transmission availability; and
- Justifies any deviations from the acknowledged action plan.

Idaho Power response:

Not applicable to this filling; this activity will be conducted at a later time.

Guideline 4: Plan Components

At a minimum, the plan must include the following elements:

a. An explanation of how the utility met each of the substantive and procedural requirements;

Idaho Power response:

The information in this section is intended to show how the company complied with this guideline.

b. Analysis of high and low load growth scenarios in addition to stochastic load risk analysis with an explanation of major assumptions;

Idaho Power response:

High-growth scenarios are tested using the Rapid Electrification case as discussed in *Chapter 9. Portfolios*. Stochastic analysis was performed on load (which creates high and low load conditions) and the details of that analysis are contained in the Technical Appendix.

c. For electric utilities, a determination of the levels of peaking capacity and energy capability expected for each year of the plan, given existing resources; identification of capacity and energy needed to bridge the gap between expected loads and resources; modeling of all existing transmission rights, as well as future transmission additions associated with the resource portfolios tested;

Idaho Power response:

Peaking capacity and energy capability for each year of the plan for existing resources is discussed in *Chapter 8. Planning Period Forecasts*. Detailed forecasts are provided in the Technical Appendix, *Load and Resource Balance, Sales and Load Forecast Data* and *Existing Resource Data*. Identification of capacity and energy needed to bridge the gap between expected loads and resources is discussed in *Chapter 9. Portfolios*.

d. For natural gas utilities, a determination of the peaking, swing and base-load gas supply and associated transportation and storage expected for each year of the plan, given existing resources; and identification of gas supplies (peak, swing and base-load), transportation and storage needed to bridge the gap between expected loads and resources;

Idaho Power response:

Not applicable.

e. Identification and estimated costs of all supply-side and demand-side resource options, taking into account anticipated advances in technology;

Idaho Power response:

Supply-side resources are discussed in *Chapter 5. Future Supply-Side Generation and Storage Resources*.

Demand-side resources are discussed in *Chapter 6. Demand-Side Resources*.

Resource costs are discussed in *Chapter 8. Planning Period Forecasts* and presented in the Technical Appendix, *Supply-Side Resource Data Levelized Cost of Energy*.

f. Analysis of measures the utility intends to take to provide reliable service, including cost-risk tradeoffs;

Idaho Power response:

Resource reliability and cost-risk tradeoffs are covered in *Chapter 10. Modeling Analysis and Results*

g. Identification of key assumptions about the future (e.g., fuel prices and environmental compliance costs) and alternative scenarios considered;

Idaho Power response:

Key Assumptions including the natural gas price forecast are discussed in *Chapter 8. Planning Period Forecasts* and in the Technical Appendix, *Key Financial and Forecast Assumptions*. Environmental compliance costs are addressed in *Chapter 10. Modeling Analysis and Results*.

h. Construction of a representative set of resource portfolios to test various operating characteristics, resource types, fuels and sources, technologies, lead times, in-service dates, durations, and general locations – system-wide or delivered to a specific portion of the system;

Idaho Power response:

Resource portfolios considered for the 2021 IRP are described in *Chapter 9. Portfolios*.

i. Evaluation of the performance of the candidate portfolios over the range of identified risks and uncertainties;

Idaho Power response:

Evaluation of the portfolios over a range of risks and uncertainties is discussed in *Chapter 10. Modeling Analysis and Results*.

j. Results of testing and rank ordering of the portfolios by cost and risk metric, and interpretation of those results;

Idaho Power response:

Portfolio cost, risk results, interpretations and the selection of the preferred portfolio are provided in *Chapter 10. Modeling Analysis and Results*.

k. Analysis of the uncertainties associated with each portfolio evaluated;

Idaho Power response:

The quantitative and qualitative uncertainties associated with each portfolio are evaluated in *Chapter 10. Modeling Analysis and Results*.

l. Selection of a portfolio that represents the best combination of cost and risk for the utility and its customers

Idaho Power response:

The preferred resource portfolio is identified in *Chapter 11. Preferred Portfolio and Action Plan*.

m. Identification and explanation of any inconsistencies of the selected portfolio with any state and federal energy policies that may affect a utility's plan and any barriers to implementation; and

Idaho Power response:
Risk associated with the preferred portfolio including coal-unit exits is discussed in *Chapter 11. Preferred Portfolio and Action Plan*.

n. An action plan with resource activities the utility intends to undertake over the next two to four years to acquire the identified resources, regardless of whether the activity was acknowledged in a previous IRP, with the key attributes of each resource specified as in portfolio testing.

Idaho Power response:
An action plan is provided in the *Executive Summary* and in *Chapter 11. Preferred Portfolio and Action Plan.*

Guideline 5: Transmission

Portfolio analysis should include costs to the utility for the fuel transportation and electric transmission required for each resource being considered. In addition, utilities should consider fuel transportation and electric transmission facilities as resource options, taking into account their value for making additional purchases and sales, accessing less costly resources in remote locations, acquiring alternative fuel supplies, and improving reliability.

Idaho Power response:
The fuel costs (including transportation) for each resource being considered is presented in the Technical Appendix, *Cost Inputs and Operating Assumptions*. Transmission assumptions for supply-side resources considered are included in *Chapter 7. Transmission Planning*. Transportation for natural gas is discussed in *Chapter 8. Planning Period Forecasts*.

Guideline 6: Conservation

a. Each utility should ensure that a conservation potential study is conducted periodically for its entire service territory.

Idaho Power response:
The contractor-provided conservation potential study for the 2021 IRP and is described in *Chapter 6. Demand-Side Resources*.

b. To the extent that a utility controls the level of funding for conservation programs in its service territory, the utility should include in its action plan all best cost/risk portfolio conservation resources for meeting projected resource needs, specifying annual savings targets.

Idaho Power response:

A forecast for energy efficiency effects is provided in Cha*pter 6. Demand-Side Resources*. The load forecast into AURORA includes the reduction to customer sales of all future achievable economic energy efficiency potential. In addition to the baseline energy efficiency potential, the company modeled extra bundles of achievable technical energy efficiency and their costs in the AURORA model.

c. To the extent that an outside party administers conservation programs in a utility's service territory at a level of funding that is beyond the utility's control, the utility should:
    - Determine the amount of conservation resources in the best cost/risk portfolio without regard to any limits on funding of conservation programs; and
    - Identify the preferred portfolio and action plan consistent with the outside party's projection of conservation acquisition.

Idaho Power response:

Idaho Power administers all its conservation programs except market transformation. Treatment of third-party market transformation savings was provided by the Northwest Energy Efficiency Alliance (NEEA) and is discussed in *Appendix B: Idaho Power's Demand-Side Management 2020 Annual Report.* NEEA savings are included as savings to meet targets because of the overlap of NEEA initiatives and IPC's most recent potential study.

Guideline 7: Demand Response

Plans should evaluate demand response resources, including voluntary rate programs, on par with other options for meeting energy, capacity, and transmission needs (for electric utilities) or gas supply and transportation needs (for natural gas utilities).

Idaho Power response:

Demand response resources are evaluated in *Chapter 6. Demand-Side Resources.*

As part of the 2021 IRP's rigorous examination of the potential for expanded demand response, Idaho Power utilized a Northwest Power and Conservation Council (NWPCC) assessment of DR potential for the Northwest region to determine the DR potential that may be available in Idaho Power's service area. Based on this assessment, Idaho Power estimated 584 MW of DR potential in its service area and concluded that any needed capacity from DR would be shifted to later hours of the day than what the current DR programs were designed for. Efforts to redesign each of Idaho Power's current programs to better align with system needs took place over the summer and early fall of 2021. Based on the results of the analysis, Idaho Power submitted filings with both the IPUC and OPUC to modify the program parameters.

Guideline 8: Environmental Costs

a. Base case and other compliance scenarios: The utility should construct a base-case scenario to reflect what it considers to be the most likely regulatory compliance future for carbon dioxide (CO_2), nitrogen oxides, sulfur oxides, and mercury emissions.

The utility should develop several compliance scenarios ranging from the present CO_2 regulatory level to the upper reaches of credible proposals by governing entities. Each compliance scenario should include a time profile of CO_2 compliance requirements. The utility should identify whether the basis of those requirements, or "costs," would be CO_2 taxes, a ban on certain types of resources, or CO_2 caps (with or without flexibility mechanisms such as an allowance for credit trading as a safety valve). The analysis should recognize significant and important upstream emissions that would likely have a significant impact on resource decisions. Each compliance scenario should maintain logical consistency, to the extent practicable, between the CO_2 regulatory requirements and other key inputs.

Idaho Power response:

The carbon price forecasts used in the 2021 IRP are found in *Chapter 9. Portfolios*. Compliance with existing environmental regulation and emissions for each portfolio are discussed in *Chapter 10. Modeling Analysis and Results*. Emissions for each portfolio are shown in the Technical Appendix.

b. Testing alternative portfolios against the compliance scenarios: The utility should estimate, under each of the compliance scenarios, the present value revenue requirement (PVRR) costs and risk measures, over at least 20 years, for a set of reasonable alternative portfolios from which the preferred portfolio is selected. The utility should incorporate end-effect considerations in the analyses to allow for comparisons of portfolios containing resources with economic or physical lives that extend beyond the planning period. The utility should also modify projected lifetimes as necessary to be consistent with the compliance scenario under analysis. In addition, the utility should include, if material, sensitivity analyses on a range of reasonably possible regulatory futures for nitrogen oxides, sulfur oxides, and mercury to further inform the preferred portfolio selection.

Idaho Power response:

See *Chapter 9. Portfolios* and *Chapter 10. Modeling Analysis and Results* for discussion on the various scenarios and comparative analysis of the scenarios. The company also evaluated coal unit conversions to natural gas fuel as a compliance alternative in the portfolios.

c. Trigger point analysis: The utility should identify at least one CO2 compliance "turning point" scenario, which, if anticipated now, would lead to, or "trigger" the selection of a portfolio of resources that is substantially different from the preferred portfolio. The utility should develop a substitute portfolio appropriate for this trigger-point scenario and compare the substitute portfolio's expected cost and risk performance to that of the preferred portfolio – under the base case and each of the above CO2 compliance scenarios. The utility should provide its assessment of whether a CO2 regulatory future that is equally or more stringent that the identified trigger point will be mandated.

Idaho Power response:

See *Chapter 9. Portfolios* and *Chapter 10. Modeling Analysis and Results* for discussion on the various scenarios and comparative analysis of the scenarios.

d. Oregon compliance portfolio: If none of the above portfolios is consistent with Oregon energy policies (including state goals for reducing greenhouse gas emissions) as those policies are applied to the utility, the utility should construct the best cost/risk portfolio that achieves that consistency, present its cost and risk parameters, and compare it to those in the preferred and alternative portfolios.

Idaho Power response:

The company evaluated "100% Clean by 2035" and "100% Clean by 2045" scenarios. The results of the portfolios are presented in the Technical Appendix.

Guideline 9: Direct Access Loads

An electric utility's load-resource balance should exclude customer loads that are effectively committed to service by an alternative electricity supplier.

Idaho Power response:

Idaho Power does not have any customers served by alternative electricity suppliers and Idaho Power has no direct access loads.

Guideline 10: Multi-state Utilities

Multi-state utilities should plan their generation and transmission systems, or gas supply and delivery, on an integrated-system basis that achieves a best cost/risk portfolio for all their retail customers.

Idaho Power response:

Idaho Power's analysis was performed on an integrated-system basis discussed in *Chapter 10. Modeling Analysis and Results*. Idaho Power will file the 2021 IRP in both the Idaho and Oregon jurisdictions.

Guideline 11: Reliability

Electric utilities should analyze reliability within the risk modeling of the actual portfolios being considered. Loss of load probability, expected planning reserve margin, and expected and worst-case unserved energy should be determined by year for top-performing portfolios. Natural gas utilities should analyze, on an integrated basis, gas supply, transportation, and storage, along with demand-side resources, to reliably meet peak, swing, and base-load system requirements. Electric and natural gas utility plans should demonstrate that the utility's chosen portfolio achieves its stated reliability, cost, and risk objectives.

Idaho Power response:

The capacity planning margin and regulating reserves are discussed in Chapter 9. Portfolios. A loss of load expectation analysis and regional resource adequacy are discussed in *Chapter 10. Modeling Analysis and Results.*

Guideline 12: Distributed Generation

Electric utilities should evaluate distributed generation technologies on par with other supply-side resources and should consider, and quantify where possible, the additional benefits of distributed generation.

Idaho Power response:

Distributed generation technologies were evaluated in *Chapter 5. Future Supply-Side Generation and Storage Resources* and in *Chapter 8. Planning Period Forecasts*.

Guideline 13: Resource Acquisition

a. An electric utility should, in its IRP:
    - Identify its proposed acquisition strategy for each resource in its action plan.
    - Assess the advantages and disadvantages of owning a resource instead of purchasing power from another party.
    - Identify any Benchmark Resources it plans to consider in competitive bidding.

Idaho Power response:

Idaho Power identifies its proposed acquisition strategy in *Chapter 11. Preferred Portfolio and Action Plan.* Idaho Power's near-term resource procurement strategy is discussed in *Chapter 11. Preferred Portfolio and Action Plan.*

b. Natural gas utilities should either describe in the IRP their bidding practices for gas supply and transportation, or provide a description of those practices following IRP acknowledgment.

Idaho Power response:

Not applicable.

COMPLIANCE WITH EV GUIDELINES

Guideline 1: Forecast the Demand for Flexible Capacity

Forecast the Demand for Flexible Capacity: The electric utilities shall forecast the balancing reserves needed at different time intervals (e.g., ramping needed within 5 minutes) to respond to variation in load and intermittent renewable generation over the 20-year planning period;

Idaho Power response:

A discussion of the 2021 IRP's analysis for the flexibility guideline is provided in *Chapter 9. Portfolios.*

Guideline 2: Forecast the Supply for Flexible Capacity

Forecast the Supply of Flexible Capacity: The electric utilities shall forecast the balancing reserves available at different time intervals (e.g., ramping available within 5 minutes) from existing generating resources over the 20-year planning period;

Idaho Power response:

A discussion of the planning margin and regulating reserves is found at *Chapter 9. Portfolios.*

Guideline 3: Evaluate Flexible Resources on a Consistent and Comparable Basis

In planning to fill any gap between the demand and supply of flexible capacity, the electric utilities shall evaluate all resource options, including the use of EVs, on a consistent and comparable basis.

Idaho Power response:

Future supply side resource options are discussed in *Chapter 5. Future Supply Side Generation and Storage Resources*. Future demand-side resource options are discussed in *Chapter 6. Demand-Side Resources*. The adoption rate of EVs is discussed in Appendix A Sales and Load Forecast.

STATE OF OREGON ACTION ITEMS REGARDING IDAHO POWER'S 2019 IRP

Action Item 1: Jim Bridger Units 1 and 2

Plan and coordinate with PacifiCorp and regulators for early exits from Jim Bridger units. Target dates for early exits are one unit during 2022 and a second unit during 2026. Timing of exit from second unit coincides with the need for a resource addition.

Idaho Power response:

The 2021 IRP evaluates early exit dates of Units 1 and 2 compared to conversion to natural gas operations. The company will continue to work with its partner PacifiCorp to develop the terms necessary to allow for early exit or conversion to a non-coal fuel source.

Action Item 2: Solar Hosting Capacity

Incorporate solar hosting capacity into the customer-owned generation forecasts for the 2021 IRP

Idaho Power response:

Solar-hosting capacity was assessed as a driver of the customer-owned generation forecast and was determined to not materially impact the customer-owned generation forecast. The company will continue to assess the impact of solar hosting capacity in future iterations of the IRP.

Action Item 3: B2H

Conduct ongoing B2H permitting activities. Negotiate and execute B2H partner construction agreement(s)

Idaho Power response:

Idaho Power continues to include B2H in the preferred portfolio and action items include permitting, negotiation and execution of partner construction agreements, preliminary construction activities, acquisition of long-lead materials, and construction of B2H. Discussion and analysis of the completed planning studies and permitting and regulatory filing is found in *Chapter 7. Transmission Planning*. Modeling design and analysis testing B2H in the 2021 IRP is found in *Chapter 9. Portfolios* and *Chapter 10. Modeling Analysis and Results*. Further details will be provided in Appendix D-Transmission Supplement which is anticipated to be filled in the first quarter of 2022.

Action Item 4: B2H

Conduct preliminary construction activities, acquire long-lead materials, and construct the B2H project.

Idaho Power response:

Idaho Power continues to include B2H in the preferred portfolio and action items include permitting, negotiation and execution of partner construction agreements, preliminary construction activities, acquisition of long-lead materials, and construction of B2H. Discussion and analysis of the completed planning studies and permitting and regulatory filing is found in *Chapter 7. Transmission Planning*. Modeling design and analysis testing B2H in the 2021 IRP is found in *Chapter 9. Portfolios* and *Chapter 10. Modeling Analysis and Results*. Further details will be provided in Appendix D-Transmission Supplement which is anticipated to be filled in the first quarter of 2022.

Action Item 5: VER variability and system reliability

Monitor VER variability and system reliability needs, and study projected effects of additions of 120 MW of PV solar (Jackpot Solar) and early exit of Bridger units.

Idaho Power response:

The 2020 VER Study was completed, and the results of the study were included in the Regulating Reserve calculations discussed in *Chapter 9. Portfolios.*

Action Item 6: Boardman

Exit Boardman December 31, 2020.

Idaho Power response:

The Boardman power plant ceased operation in October 2020.

Action Item 7: Jim Bridger Units 1 and 2

Bridger Unit 1 and Unit 2 Regional Haze Reassessment finalized.

Idaho Power response:

The negotiation between the Environmental Protection Agency (EPA), state of Wyoming, and PacifiCorp to resolve Jim Bridger units 1 and 2 compliance with the Federal Clean Air Act Regional Haze (RH) rules is ongoing. On November 15, 2021 Wyoming Governor Gordon issued a notice of intent to sue alleging that EPA failed to perform a nondiscretionary duty under the Clean Air Act when it failed to approve or disapprove Wyoming's RH State Implementation Plan revision for Bridger within the time prescribed by law. On November 16, 2021 the Wyoming Public Service Commission initiated an investigation to determine the effects on rates, generation adequacy, system reliability, and other aspects of operations by the potential discontinuation of operations at Jim Bridger Unit 2 due to the EPA's inaction on the Wyoming Regional Haze State Implementation Plan.

Action Item 8: VER Integration

Conduct a VER Integration Study.

Idaho Power response:

Idaho Power worked in conjunction with a Technical Review Committee (TRC) for the development of the 2020 VER Study and retained E3 to conduct the study. The study was filed with the OPUC in docket UM 1730(6).

Action Item 9: North Valmy Unit 2

Conduct focused economic and system reliability analysis on timing of exit from Valmy Unit 2

Idaho Power response:

Idaho Power conducted a system reliability analysis to evaluate the timing of exit from Valmy Unit 2. The results of the analysis were filed in IPUC docket IPC-E-21-12 and in OPUC docket LC 74. Additionally, in the 2021 IRP early exit of Unit 2 was evaluated as part of the AURORA capacity expansion modeling, but the AURORA model did not select Unit 2 for exit earlier than 2025, see *Executive Summary. Action Plan* and *Chapter 8. Planning Period Forecasts*.

Action Item 10: Jim Bridger Units 1 and 2

Continue to evaluate and coordinate with PacifiCorp for timing of exit/closure of remaining Jim Bridger units.

Idaho Power response:

The 2021 IRP evaluates early exit dates compared to conversion of Units 1 and 2 to natural gas. The company will continue to work with its partner PacifiCorp to develop the terms necessary to allow for early exit or conversion to a non-coal fuel source.

Action Item 11: Jim Bridger Units 1 or 2

Subject to coordination with PacifiCorp, exit Jim Bridger unit (as yet undesignated) by December 31, 2022

Idaho Power response:

In the 2021 IRP analysis, Jim Bridger units 1 and 2 have been identified for conversion to natural gas operations, with a 2034 exit date.

Action Item 12: Jackpot Solar

Jackpot Solar 120 MW on-line December 2022.

Idaho Power response:

Late in the 2021 IRP development process, the project developer informed Idaho Power they may not be able to meet the in-service date specified in the contract. For IRP purposes, all cases assumed Jackpot Solar was in-service per the terms of the contract; however, if Jackpot Solar is not online in 2023, the company will have additional load and resource balance deficits in 2023. Given the near-term nature of this possible deficit, the company's operations teams are evaluating options.

Action Item 13: North Valmy Unit 2

Exit Valmy Unit 2 by December 31, 2022.

Further analysis will be conducted to evaluate the optimal exit date of Valmy Unit 2, weighing exit economics and system reliability concerns.

Idaho Power response:

Idaho Power conducted a system reliability analysis to evaluate the timing of exit from Valmy Unit 2. The results of the analysis were filed in IPUC docket IPC-E-21-12 and in OPUC docket LC 74. Additionally, in the 2021 IRP early exit of Unit 2 was evaluated as part of the AURORA capacity expansion modeling, but the AURORA model did not select Unit 2 for exit earlier than 2025, see *Chapter 8. Planning Period Forecasts*.

Action Item 14: Jim Bridger Units 1 or 2

Subject to coordination with PacifiCorp, exit Jim Bridger unit (as yet undesignated) by December 31, 2026. Timing of the exit from the second Jim Bridger unit is tied to the need for a resource addition (B2H).

Idaho Power response:

In the 2021 IRP analysis**,** Jim Bridger units 1 and 2 have been identified for conversion to natural gas operations, with a 2034 exit date.