



# Monthly Generation Performance Report

April 2024

# Introduction

As part of the Transmission and Distribution System Operation and Maintenance Agreement (OMA), LUMA serves as both the operator of the electric grid and as the island's System Operator.

As the Operator of the electric grid, LUMA oversees and maintains the transmission and distribution system that is critical to delivering energy to over 1.5 million Puerto Rican customers.

As the System Operator, LUMA monitors the performance of GeneraPR and other private generators' generation units, implements dispatch of available units, and plans and maintains adequate generation reserve levels to meet customer's energy demands.

While LUMA does not generate energy, LUMA's responsibility as the System Operator includes measuring the performance of the island's generation fleet. This report summarizes generation performance, identifies trends, compares facility performance, and provides a high-level picture of the entire generation portfolio.



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# Executive Summary – April Performance

## Overview

The maximum peak demand for April 2024 was approximately 2700 MW.

San Juan 6 (220 MW) and 7 (100 MW) are out of service. Their return dates are May 20 and June 1, respectively. Aguirre 2 (450 MW) is expected to come back on May 2. Palo Seco 3 (216 MW) is expected to be returning on June 6 while Palo Seco 4 (216 MW) does not have an expected return yet. Costa Sur 6 (410 MW) estimated time of return is May 3. AES 2 (227 MW) is out of service under annual maintenance and is expected to come back on May 4.

## Major Events

In April, the electric system experienced 5 generation events that resulted in load shed to prevent a frequency decay.

## System Reserves

In April, the hourly reserve levels averaged 696 MW, with 381 hours during the month having less than 750 MW in reserves (equal to 53% of the time.)

The forecast for May 2024 shows lower reserve levels to the same month last year (May 2023), with 269 MW average reserves forecasted versus 640 MW seen for the same month last year.

The System Availability for the month of April was 45%.

- Genera – 35%
- AES – 80%
- Ecoeléctrica – 100%



# System Reserves

System Reserves is the amount of generating capacity available to meet peak or abnormally high demands for power and to generate power during scheduled or unscheduled outages.

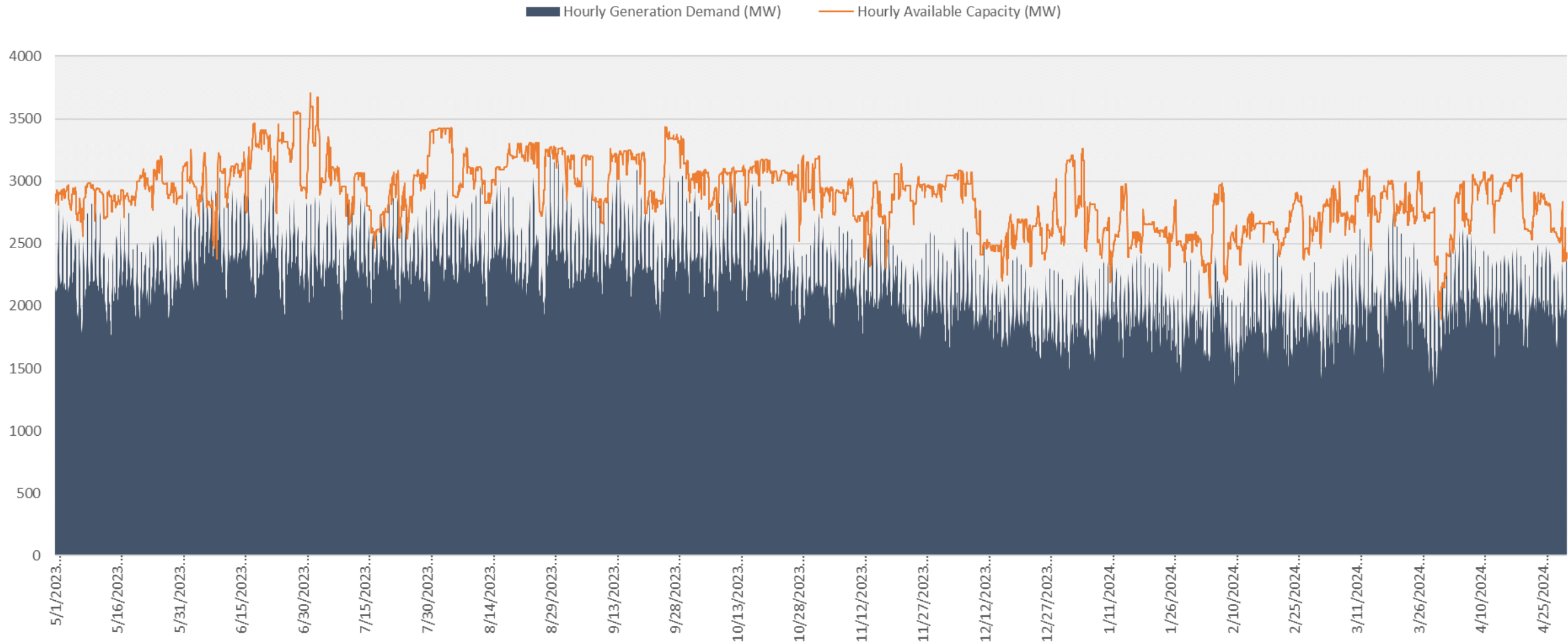
Target: ▲ Reserves >750MW per the System Operation Principles



\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# System Availability

The System Availability is the maximum expected output that generating units can supply to system load, adjusted for scheduled or unscheduled outages. In this graph, the availability is being compared with the total generation required to meet demand to visualize the gap between the two lines (the gap represents the reserves level).



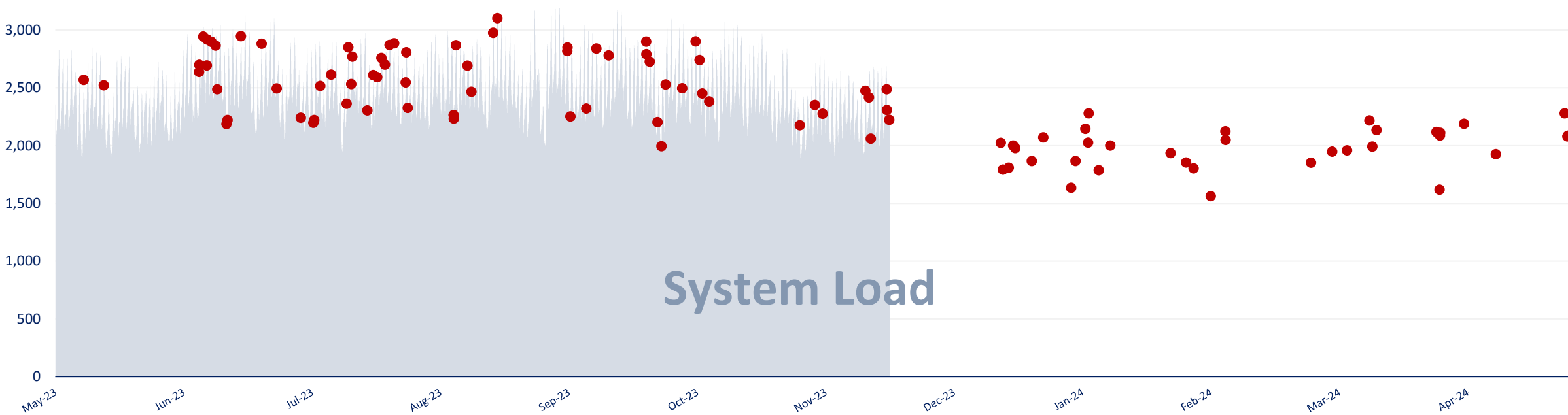
\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Load Shed Events

Load shed events can occur due to unexpected generation unit losses (Unit Performance Load Shed Events). Also, when the demand for electricity exceeds available supply levels, LUMA, as the system operator and in compliance with its responsibilities under the T&D OMA, implements load shedding to stabilize the electric system and prevent larger and longer outages (Generation Shortfall Events).

## Hourly System Load (MW)

Rolling 12 Months Load Shed Events: 111



MTD (April 1, 2024 - April 30, 2024)	Total Events	Average Customers Affected	Average Duration (min)	Rolling 12 Months (May 1, 2023 - April 30, 2024)	Total Events	Average Customers Affected	Average Duration (min)
Generation Shortfall Events	0	0	0	Generation Shortfall Events	27	95,138	152
Unit Performance Load Shed Events	5	140,053	21	Unit Performance Load Shed Events	84	91,641	15

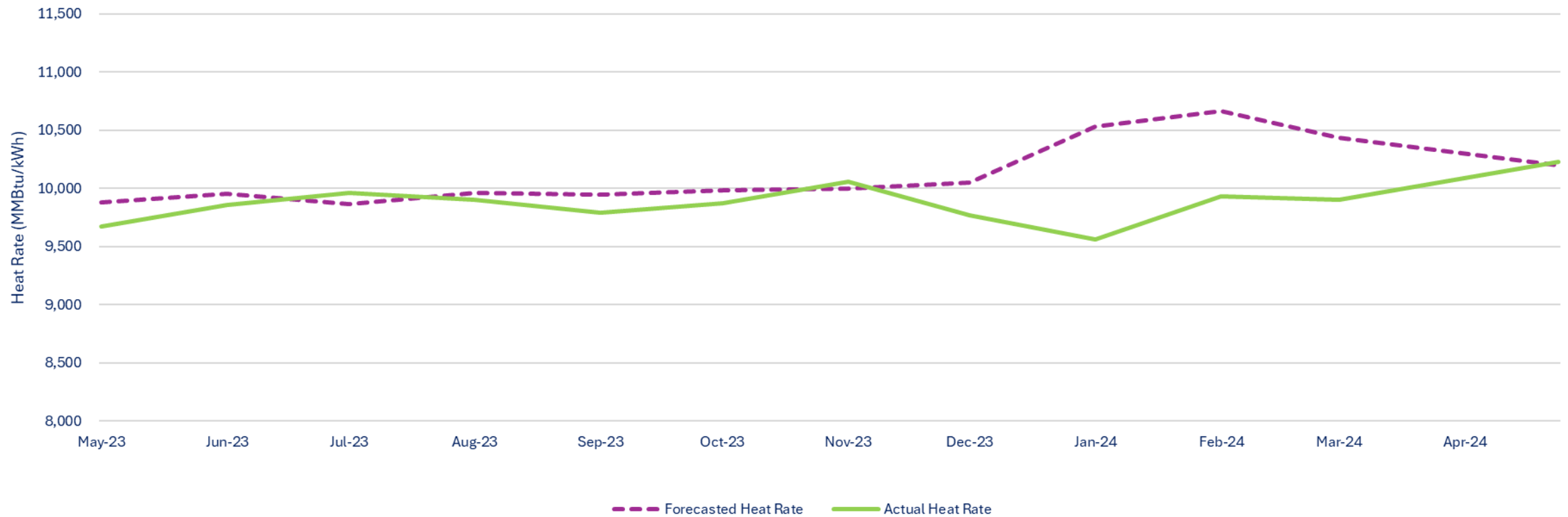
\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# System Heat Rate

The System Heat Rate measures the efficiency of the system to convert fuel into electricity. System Heat Rate will vary depending on the available generation units and required resources to satisfy electrical demand. It is calculated as energy consumed (MMBtu) / energy produced (MWh). The forecasted Heat Rate is determined by the last forecast calculated for the Fuel Clause Adjustment Factor.

Target: ▼ Lower heat rates represent higher efficiency.

Forecasted vs Actual Heat Rate









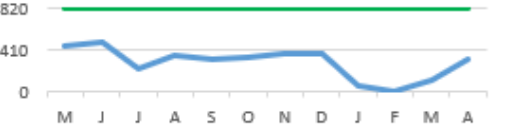





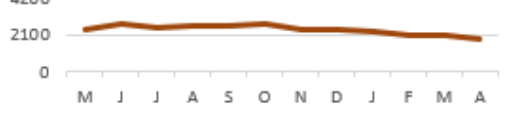

\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.



# Available Capacity – Baseload Units

Available Capacity is the maximum output that a unit can generate at any given time. The Availability Rate indicates the percent of available capacity out of the total nameplate capacity. Variables in the chart below are shown in MW (gross) representing an average over the month.

Target: ▲ A higher availability indicates the plant is able to produce power closer to its nameplate capacity.

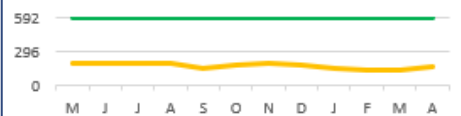



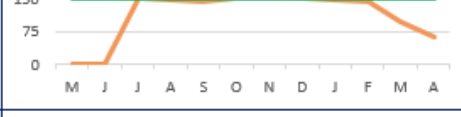


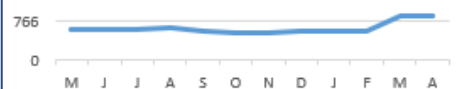
Available Capacity (MW) and Availability Rate (AR)		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
<b>AES</b>		MW	424	437	290	449	448	243	249	263	370	330	463	406
Nameplate Cap: 508		AR	83%	86%	57%	88%	88%	48%	49%	52%	73%	65%	91%	80%
<b>EcoElectrica</b>		MW	550	545	552	531	549	550	531	550	550	547	550	550
Nameplate Cap: 550		AR	100%	99%	100%	97%	100%	100%	97%	100%	100%	99%	100%	100%
<b>Genera Aguirre</b>		MW	91	310	277	344	316	373	257	152	210	368	341	303
Nameplate Cap: 900		AR	10%	34%	31%	38%	35%	41%	29%	17%	23%	41%	38%	34%
<b>Genera Costa Sur</b>		MW	437	480	224	347	313	333	363	366	48	3	105	316
Nameplate Cap: 820		AR	53%	59%	27%	42%	38%	41%	44%	45%	6%	0%	13%	39%
<b>Genera Palo Seco</b>		MW	337	235	291	153	168	171	121	0	0	0	0	0
Nameplate Cap: 602		AR	56%	39%	48%	25%	28%	28%	20%	0%	0%	0%	0%	0%
<b>Genera San Juan</b>		MW	570	641	700	661	690	679	510	652	723	478	585	250
Nameplate Cap: 840		AR	68%	76%	83%	79%	82%	81%	61%	78%	86%	57%	70%	30%
<b>Total Baseload</b>		MW	2410	2648	2484	2631	2626	2697	2384	2329	2249	2070	2043	1826
Nameplate Cap: 4220		AR	57%	63%	57%	60%	60%	59%	52%	51%	49%	45%	48%	43%

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# Available Capacity – Peaker Units

Available Capacity is the maximum output that a unit can generate at any given time. The Availability Rate indicates the percent of available capacity out of the total nameplate capacity. Variables in the chart below are shown in MW representing an average over the month.

Target: ▲ A higher availability indicates the plant is able to produce power closer to its nameplate capacity.

Available Capacity (MW) and Availability Rate (AR)		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
<b>Genera Aguirre Combined Cycle</b> Nameplate Cap: 592		MW	190	193	191	199	148	172	191	185	150	138	127	170
		AR	32%	33%	32%	34%	25%	29%	32%	31%	25%	23%	21%	29%
<b>Genera Cambalache</b> Nameplate Cap: 248		MW	155	146	152	142	144	74	76	104	152	156	153	155
		AR	63%	59%	61%	58%	58%	30%	31%	42%	62%	63%	62%	63%
<b>Genera Mayaguez</b> Nameplate Cap: 220		MW	37	35	28	29	20	32	19	26	24	33	50	37
		AR	17%	16%	13%	13%	9%	14%	9%	12%	11%	15%	23%	17%
<b>Genera Palo Seco (Inc. Mobile Pack)</b> Nameplate Cap: 207		MW	165	161	176	192	178	188	186	182	183	182	176	151
		AR	80%	78%	85%	93%	86%	91%	90%	88%	89%	88%	85%	73%
<b>Palo Seco TM</b> Nameplate Cap: 150		MW	0	0	149	145	142	148	151	150	147	143	96	62
		AR	0%	0%	99%	97%	95%	99%	100%	100%	98%	95%	107%	69%
<b>San Juan TM</b> Nameplate Cap: 200		MW	0	0	0	0	0	199	202	196	201	200	205	245
		AR	0%	0%	0%	0%	0%	100%	101%	98%	101%	100%	82%	98%
<b>Other Peakers</b> Nameplate Cap: 264		MW	57	56	71	69	69	59	62	61	71	68	71	71
		AR	22%	21%	27%	26%	26%	22%	24%	23%	27%	26%	27%	27%
<b>Total Peakers</b> Nameplate Cap: 1531		MW	604	591	618	631	560	524	535	557	581	577	879	891
		AR	39%	39%	40%	41%	37%	34%	35%	36%	38%	38%	47%	48%










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# Heat Rate – Baseload Units

Heat Rate measures the efficiency of a power plant to convert fuel into electricity. It is calculated as energy consumed (MMBtu) / energy produced (MWh).

Target: ▼ Lower heat rates represent higher efficiency.

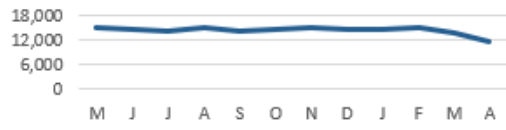





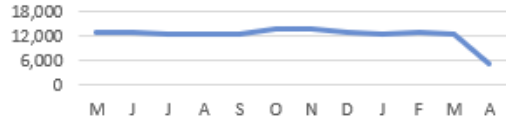
Heat Rate (MMBtu/MWh)		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
<b>AES</b>		9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800	10,620	10,620
<b>EcoElectrica</b>		7,945	7,945	7,945	7,945	7,945	7,945	7,945	7,945	7,957	7,957	7,957	7,957
<b>Genera Aguirre</b>		10,937	10,741	11,082	10,687	10,644	10,734	11,008	11,034	11,207	11,397	11,268	11,117
<b>Genera Costa Sur</b>		11,053	10,733	11,835	10,616	10,788	10,887	10,857	10,838	11,323	40,045	11,913	10,397
<b>Genera Palo Seco</b>		10,270	10,224	10,168	10,379	9,813	10,463	10,254	-	-	-	-	-
<b>Genera San Juan</b>		8,059	8,248	8,458	8,476	8,477	8,574	9,317	8,956	8,973	9,432	8,714	8,882
<b>Total Baseload</b>		9,356	9,336	9,343	9,278	9,215	9,365	9,477	9,267	8,968	9,381	9,510	9,564

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# Heat Rate – Peaker Units

Heat Rate measures the efficiency of a power plant to convert fuel into electricity. It is calculated as energy consumed (MMBtu) / energy produced (MWh).

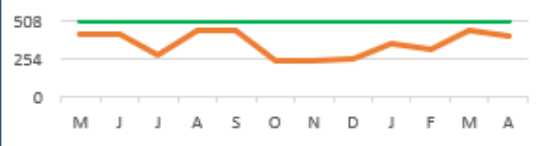
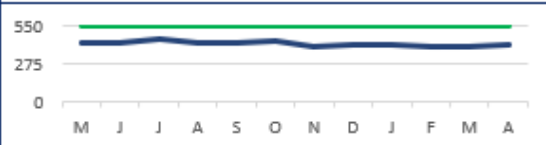


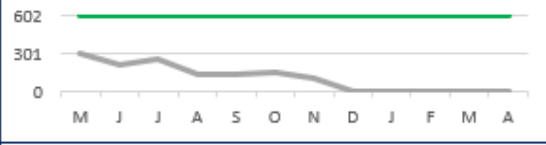
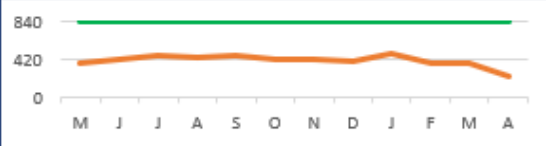

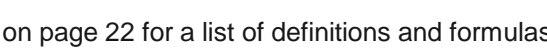
Target: ▼ Lower heat rates represent higher efficiency.

Heat Rate (MMBtu/MWh)		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
<b>Genera Aguirre Combined Cycle</b>		14,945	14,766	14,365	14,969	14,444	14,811	14,969	14,921	14,671	14,989	13,867	11,936
<b>Genera Cambalache</b>		12,535	12,595	12,355	12,573	12,492	12,341	12,435	13,231	12,834	12,785	12,872	12,640
<b>Genera Mayaguez</b>		10,726	10,764	10,716	10,840	10,824	10,942	10,801	11,013	10,882	10,945	11,029	11,107
<b>Genera Palo Seco (Inc. Mobile Pack)</b>		11,320	11,517	11,324	11,454	11,572	15,072	15,981	14,925	15,146	16,487	15,205	14,397
<b>Palo Seco TM &amp; San Juan TM</b>		-	-	-	-	-	-	-	-	-	-	-	11,076
<b>Other Peakers</b>		14,056	13,343	13,677	14,906	14,631	15,086	14,893	14,771	15,064	15,462	14,062	12,730
<b>Total Peakers</b>		13,005	12,819	12,501	12,697	12,578	13,731	13,962	13,195	12,755	12,951	12,710	5,416

# Generation and Capacity Factor – Baseload Units

Generation indicates the average amount of energy each plant produced per month, in MW (gross). The Capacity Factor measures what percentage of the nameplate capacity was used to produce energy during that time period.

Target: ▲ Higher Capacity Factor, and a Generation closer to the nameplate capacity will represent a better utilization of the units.

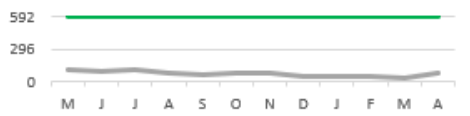
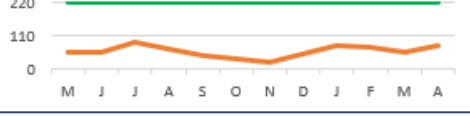
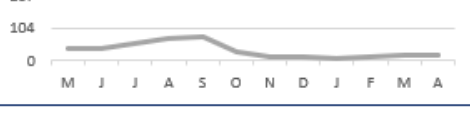


Average Generation (MW) and Capacity Factor		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
<b>AES</b>		MW	426	425	281	449	447	242	248	253	355	320	452	412
Nameplate Cap: 508		CF	84%	84%	55%	88%	88%	48%	49%	50%	70%	63%	89%	81%
<b>EcoElectrica</b>		MW	421	430	449	426	434	435	403	410	412	405	398	412
Nameplate Cap: 550		CF	77%	78%	82%	78%	79%	79%	73%	75%	75%	74%	72%	75%
<b>Genera Aguirre</b>		MW	74	245	231	258	249	289	190	156	134	284	243	221
Nameplate Cap: 900		CF	8%	27%	26%	29%	28%	32%	21%	17%	15%	32%	27%	25%
<b>Genera Costa Sur</b>		MW	431	437	214	324	281	314	304	291	37	1	101	270
Nameplate Cap: 820		CF	53%	53%	26%	39%	34%	38%	37%	35%	5%	0%	12%	33%
<b>Genera Palo Seco</b>		MW	295	207	259	130	141	147	105	0	0	0	0	0
Nameplate Cap: 602		CF	49%	34%	43%	22%	23%	24%	18%	0%	0%	0%	0%	0%
<b>Genera San Juan</b>		MW	371	417	470	446	462	425	417	397	473	380	380	227
Nameplate Cap: 840		CF	44%	50%	56%	53%	55%	51%	50%	47%	56%	45%	45%	27%
<b>Total Baseload</b>		MW	2019	2161	2053	2178	2161	2204	2024	1858	1763	1735	1573	1542
Nameplate Cap: 4370		CF	48%	51%	47%	50%	49%	48%	44%	41%	39%	38%	37%	37%

\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Generation and Capacity Factor – Peaker Units

Generation indicates the average amount of energy each plant produced per month (MW). The Capacity Factor measures what percentage of the nameplate capacity was used to produce energy during that time period.

Target: ▲ Higher Capacity Factor, and a Generation closer to the nameplate capacity will represent a better utilization of the units.

Average Generation (MW) and Capacity Factor		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
<b>Genera Aguirre Combined Cycle</b> Nameplate Cap: 592		MW	103	89	112	83	60	74	75	47	49	42	31	79
	CF	17%	15%	19%	14%	10%	13%	13%	8%	8%	7%	5%	13%	
<b>Genera Cambalache</b> Nameplate Cap: 247.5		MW	44	44	83	69	84	32	30	18	31	35	24	57
	CF	18%	18%	33%	28%	34%	13%	12%	7%	13%	14%	10%	23%	
<b>Genera Mayaguez</b> Nameplate Cap: 220		MW	55	56	88	64	44	32	23	50	77	72	56	79
	CF	25%	26%	40%	29%	20%	14%	10%	23%	35%	33%	25%	36%	
<b>Genera Palo Seco (Inc. Mobile-Pack)</b> Nameplate Cap: 207		MW	37	40	55	70	74	26	9	10	9	13	15	14
	CF	18%	19%	26%	34%	36%	13%	5%	5%	4%	6%	7%	7%	
<b>Palo Seco TM</b> Nameplate Cap: 150		MW	0	0	149	146	146	150	154	154	151	143	96	66
	CF	0%	0%	99%	97%	98%	100%	103%	103%	101%	95%	106%	74%	
<b>San Juan TM</b> Nameplate Cap: 200		MW	0	0	0	0	0	201	202	196	201	201	189	241
	CF	0%	0%	0%	0%	0%	100%	101%	98%	101%	101%	76%	96%	
<b>Other Peakers (Genera)</b> Nameplate Cap: 264		MW	10	11	22	13	24	15	23	7	12	9	7	16
	CF	4%	4%	8%	5%	9%	6%	9%	3%	5%	3%	3%	6%	
<b>Total Peakers</b> Nameplate Cap: 1530.5		MW	248	241	359	299	286	180	161	131	178	171	418	552
	CF	16%	16%	23%	20%	19%	12%	11%	9%	12%	11%	22%	30%	



\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Planned Outage Hours – Baseload Units

Planned Outage Hours represents the shutdown of a generating unit or facility for inspection or maintenance, in accordance with an advance schedule; represented in hours. This scoreboard compares the scheduled outage hours with the actual duration of the outage.

Target: ▼ A smaller gap between actuals and planned hours represents a more accurate planification.

	Planned Outage Hours (MAY 2023 - APR 2024)	Planned Outage Hours	Completed Outage Hours	Notes for In-Progress Planned Outages	Expected Return-to- Service Date
AES		1080	670		
EcoElectrica		432	0		
Genera Aguirre		3000	0		
Genera Costa Sur		6432	0		
Genera Palo Seco		8784	552		
Genera San Juan		3312	1578		
Total Baseload		23040	3719		

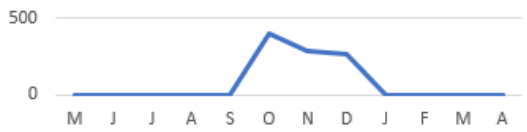




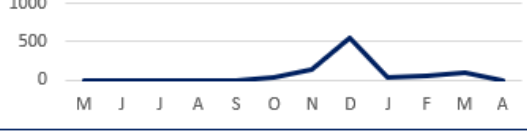

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# Maintenance Outage Hours – Baseload Units

Maintenance Outage Hours represent the shutdown of a generating unit or facility for nonemergency reasons or conditions which need repair outside of the advance schedule; represented in hours per unit.

Target: ▼ Less maintenance hours represents more available capacity in the system to meet demand.

Maintenance Outage Hours		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
<b>AES</b>		0	0	0	0	0	398	288	264	0	0	0	0
<b>EcoElectrica</b>		0	0	0	0	0	0	0	0	0	0	0	0
<b>Genera Aguirre</b>		0	0	0	0	0	0	0	0	0	0	0	0
<b>Genera Costa Sur</b>		0	35	0	0	0	10	0	0	0	0	0	56
<b>Genera Palo Seco</b>		0	0	0	0	0	0	0	0	0	0	24	0
<b>Genera San Juan</b>		0	0	0	0	0	37	136	551	34	48	105	0
<b>Total Baseload</b>		0	35	11	29	0	717	707	954	118	101	129	56


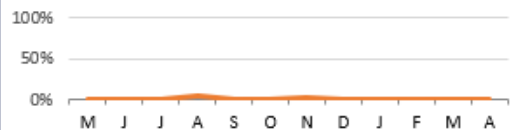
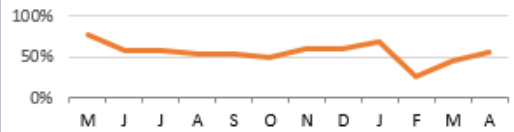
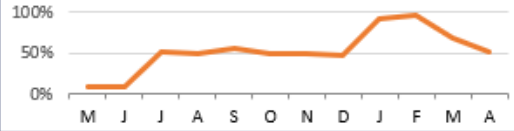
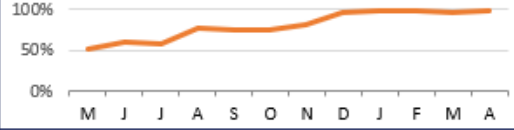
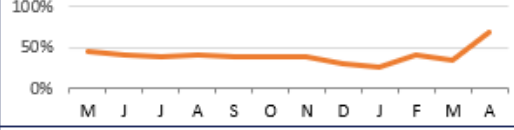
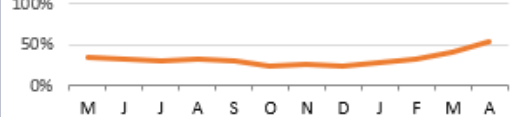
\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.



# Forced Outage Hours and Rate – Baseload Units

Forced Outage Hours represent the shutdown of a generating unit or facility for emergency reasons or a condition in which the generating equipment is unavailable for load due to an unanticipated breakdown; represented in hours per unit. The Forced Outage Rate represents the percentage of time the unit was in a Forced Outage condition out of the total time the unit was expected to be available.

Target: ▼ Less forced outage hours and a smaller outage rate represents more available capacity in the system to meet demand.

Forced Outage Hours and Outage Rate		May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
AES		Hrs	0	25	505	0	0	48	24	218	265	432	0	92
	%	0%	2%	34%	0%	0%	5%	3%	19%	18%	31%	0%	6%	
EcoElectrica		Hrs	0	13	0	72	4	0	35	0	0	7	0	0
	%	0%	1%	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	
Genera Aguirre		Hrs	1166	823	855	800	770	743	862	898	1014	370	686	799
	%	78%	57%	57%	54%	53%	50%	60%	60%	68%	27%	46%	56%	
Genera Costa Sur		Hrs	139	116	771	743	795	743	720	720	1391	1356	1021	720
	%	9%	8%	52%	50%	55%	50%	50%	48%	93%	97%	69%	52%	
Genera Palo Seco		Hrs	1525	1747	1704	2293	2151	2241	2278	2854	2854	2662	2806	2782
	%	51%	61%	57%	77%	76%	75%	82%	97%	100%	100%	97%	100%	
Genera San Juan		Hrs	2421	2196	2328	2489	2180	2281	2193	1589	1521	2198	1964	3897
	%	45%	40%	39%	42%	38%	39%	39%	30%	26%	41%	35%	68%	
Total Baseload		Hrs	5251	4919	6240	6784	6140	6620	6587	6594	7776	8170	6477	8290
	%	34%	33%	30%	33%	31%	24%	25%	25%	28%	32%	41%	55%	

\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Renewables Capacity Factor - Solar

The Capacity Factor measures the actual production of electricity over the theoretical maximum output (nameplate capacity). For Renewable projects, the Capacity Factor is expected to be lower due to the solar and wind cycles.

Target: ▲ A higher Capacity Factor represents a better utilization of the maximum capacity the project is able to produce.






Average Production (MW) and Capacity Factor			May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
<b>AES Ilumina</b> Nameplate Cap: 20		MW	4	4	4	4	4	3	3	3	4	3	4	4
		CF	21%	21%	20%	20%	21%	17%	17%	17%	19%	17%	21%	20%
<b>Windmar Cantera Martínó</b> Nameplate Cap: 2.1		MW	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
		CF	24%	21%	23%	22%	21%	19%	19%	21%	21%	18%	25%	22%
<b>San Fermín</b> Nameplate Cap: 20		MW	3	3	3	3	3	2	2	2	2	2	2	2
		CF	13%	14%	13%	13%	13%	11%	10%	10%	10%	9%	12%	10%
<b>Horizon Energy</b> Nameplate Cap: 10		MW	3	3	3	2	2	2	2	2	2	2	3	3
		CF	28%	26%	27%	23%	23%	24%	24%	24%	25%	22%	27%	26%
<b>Oriana Energy</b> Nameplate Cap: 45		MW	11	11	11	10	11	10	9	9	10	10	10	11
		CF	25%	24%	24%	21%	25%	21%	20%	20%	22%	21%	23%	24%
<b>Windmar Coto Laurel</b> Nameplate Cap: 10		MW	2	2	2	2	2	2	2	2	2	2	2	2
		CF	21%	21%	23%	22%	22%	18%	17%	17%	16%	16%	19%	19%
<b>Fonroche Humacao</b> Nameplate Cap: 40		MW	8	9	8	8	8	6	6	6	7	7	9	8
		CF	21%	22%	21%	19%	20%	16%	15%	16%	16%	17%	21%	19%
<b>Total Solar</b> Nameplate Cap: 147		MW	32	32	31	29	31	26	25	25	27	26	31	29
		CF	22%	22%	21%	20%	21%	18%	17%	17%	18%	17%	21%	20%

\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Renewables Capacity Factor – Wind and Landfill

The Capacity Factor measures the actual production of electricity over the theoretical maximum output (nameplate capacity). For Renewable projects, the Capacity Factor is expected to be lower due to the solar and wind cycles.

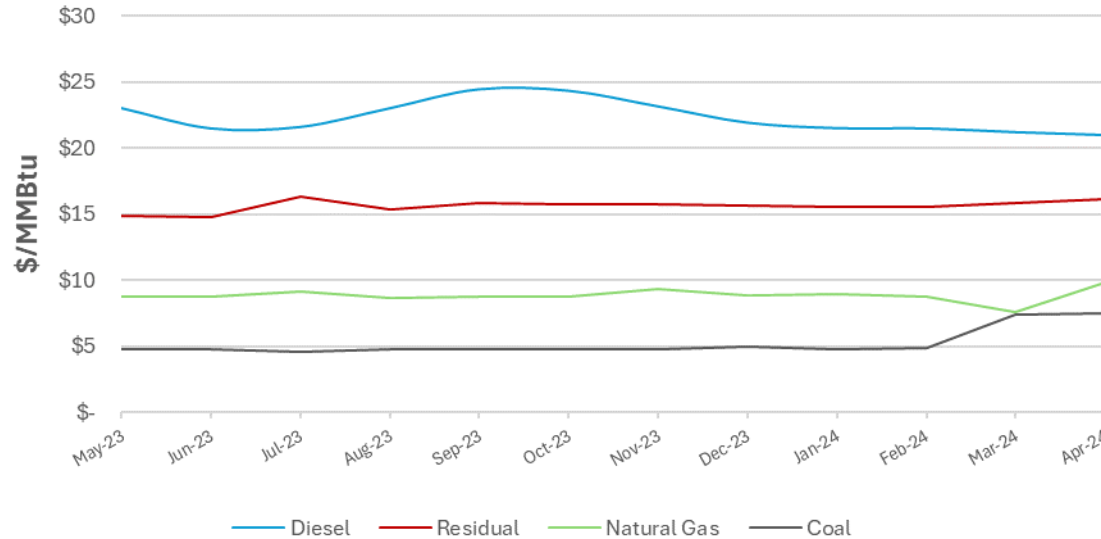
Target: ▲ A higher Capacity Factor represents a better utilization of the maximum capacity the project is able to produce.

Average Production (MW) and Capacity Factor			May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Pattern Santa Isabel		MW	11	12	20	14	6	5	12	12	17	10	13	12
Nameplate Cap: 75	M J J A S O N D J F M A	CF	15%	15%	27%	19%	9%	6%	17%	15%	22%	13%	14%	13%
Punta Lima		MW	0	0	0	0	0	1	3	4	6	4	5	6
Nameplate Cap: 26	M J J A S O N D J F M A	CF	0%	0%	0%	0%	0%	4%	11%	17%	25%	14%	20%	25%
Landfill Gas Fajardo		MW	0.7	0.5	0.5	0.4	0.3	0.6	0.3	0.5	0.2	0.0	0.0	0.1
Nameplate Cap: 2.4	M J J A S O N D J F M A	CF	28%	22%	21%	16%	14%	24%	11%	22%	10%	0%	0%	5%
Landfill Gas Toa Baja		MW	0.6	0.9	1.3	0.9	1.1	1.3	1.2	1.1	1.0	1.0	1.0	1.1
Nameplate Cap: 2.4	M J J A S O N D J F M A	CF	24%	39%	55%	36%	45%	55%	49%	46%	42%	43%	41%	47%
Total Wind and Landfill		MW	12	13	22	16	8	8	17	17	24	14	20	20
Nameplate Cap: 80	M J J A S O N D J F M A	CF	12%	12%	21%	15%	7%	7%	16%	17%	23%	14%	16%	16%

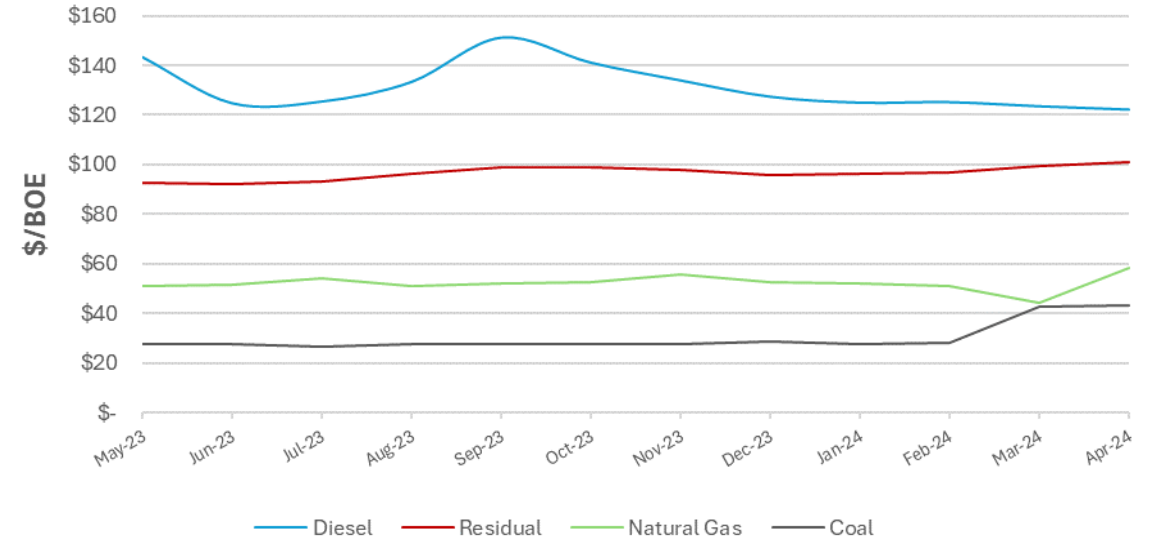
# Fuel Prices

Fuel Price shows the prices paid for fuel used by PREPA and private generators, both in terms of MMBtus and Barrel of Oil Equivalent (BOE). The Fuel Price is divided by Fuel Type to better illustrate the contribution to the total Fuel Price for the month.

## Historical Fuel Price (\$/MMBtu)



## Historical Fuel Price (\$/BOE)

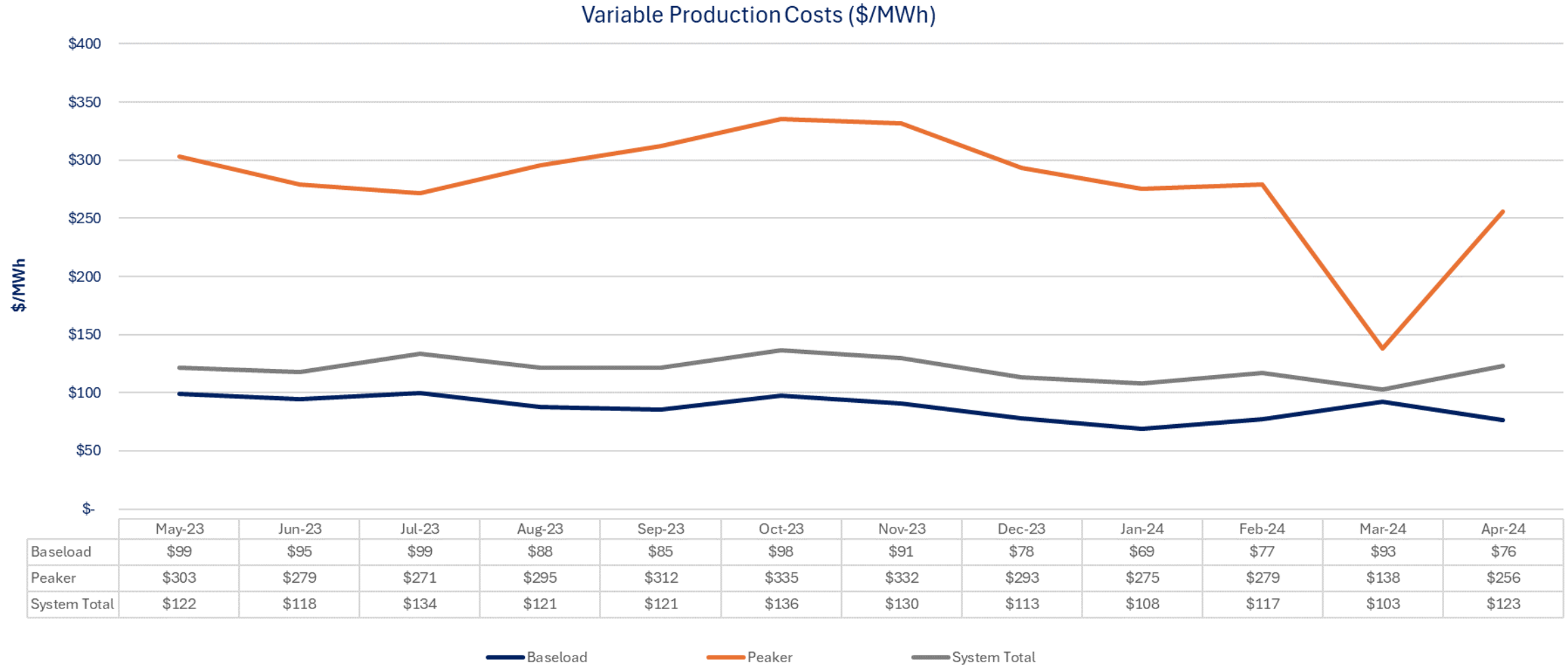


	May-23	Jun-23	Jul-23	Aug-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
<b>\$/MMBtu</b>													
Diesel	23.02	23.88	21.61	23.01	23.01	24.43	24.33	23.15	21.93	21.52	21.50	21.22	21.00
Residual	14.86	14.75	16.29	15.37	15.37	15.83	15.77	15.70	15.66	15.57	15.52	15.88	16.18
Natural Gas	8.77	8.73	9.18	8.62	8.62	8.72	8.77	9.30	8.87	8.91	8.77	7.59	9.79
Coal	4.80	4.80	4.60	4.79	4.79	4.79	4.80	4.80	4.95	4.80	4.85	7.35	7.48
<b>\$/BOE</b>													
Diesel	143.30	124.61	125.28	133.24	133.24	151.21	141.06	133.88	127.24	124.84	125.03	123.35	122.01
Residual	92.75	92.01	93.14	96.34	96.34	98.81	98.75	98.09	95.89	96.38	96.71	99.35	101.02
Natural Gas	51.27	51.62	54.32	51.23	51.23	51.93	52.63	55.73	52.63	51.96	50.94	44.49	58.08
Coal	27.86	27.86	26.68	27.78	27.78	27.78	27.86	27.86	28.69	27.85	28.16	42.66	43.41

\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Variable Production Costs

Variable Production Costs are predominantly fuel costs and reflect the cost to produce one MWh of energy. In the graph, the cost is shown separately for Baseload units and Peaker units. The weighted average cost indicates the cost per MWh of energy produced for the System Portfolio.



\*Refer to Glossary of Terms on page 22 for a list of definitions and formulas.

# Glossary of Terms

Term	Definition	Formula
Heat Rate	Measures the efficiency of a power plant to convert fuel into electricity. It is the amount of energy used by a power plant to generate one kilowatt-hour (kWh) of electricity. The more efficient the generator is, the lower the heat rate.	MMBtu consumption by all units in the station during a specific period / MWh produced by the same units in the same period
Reserves	Amount of generating capacity available to meet peak or abnormally high demands for power and to generate power during scheduled or unscheduled outages.	Available Capacity (MW) during the reported period minus the Actual Generation (MW) during the same period
Available Capacity	The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, adjusted for scheduled or unscheduled outages.	N/A – value is provided for each unit
Availability Rate	The ratio of the maximum output that can be supplied to system load for the period of time considered to the nameplate capacity.	Average available capacity for a specific period (MW) / nameplate capacity
Production	The amount of electric energy produced.	N/A – value is provided for each unit
Capacity Factor	The ratio of the electrical energy produced by a generating unit for the period of time considered to the nameplate capacity.	The average energy produced by all units in the plant during a specific period (MWh) / Nameplate capacity for the plant
Planned Outage Hours	The shutdown of a generating unit or facility for inspection or maintenance, in accordance with an advance schedule; represented in hours per unit (Equivalent Planned Outage Hours). Planned Hours – hours provided in the Generation Outage Schedule for the following 90-day outlook. Actual Hours – number of hours a unit was out of service due to a planned outage.	N/A – values is provided for each unit
Maintenance Outage Hours	The shutdown of a generating unit or facility for nonemergency reasons or conditions which need repair outside of the advance schedule; represented in hours per unit.	N/A – value is provided for each unit
Forced Outage Hours	The shutdown of a generating unit or facility for emergency reasons or a condition in which the generating equipment is unavailable for load due to unanticipated breakdown; represented in hours per unit.	N/A – value is provided for each unit
Forced Outage Rate	The ratio of the forced outages hours to the hours the unit was anticipated to be available for the reporting period.	Forced Outage Hours / Period Hours (excluding planned and unplanned outage hours)
Nameplate Capacity	The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer.	N/A – value is provided for each unit
Generation Shortfall Events	An event in which customer demand for electricity is unable to be met due to lack of Available Capacity, leading to customers being manually disconnected from the grid.	N/A – Value is all events which occur in a specified time frame
Unit Performance Load Shed Events	An event in which a generating unit has an unanticipated breakdown and causes customers to be automatically disconnected from the grid to prevent potential damage to the system.	N/A – Value is all events which occur in a specified time frame

# Plant and Unit List – Baseload and Peaker Units

## BASELOAD UNITS

Plant	Units	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
San Juan	CT 5	X	X	X	X		
	STM 5	X	X	X	X		
	CT 6	X	X	X	X		
	STM 6	X	X	X	X		
	7	X	X	X	X		
	8	X	X	X	X		
	9	X	X	X	X		
	10	X	X	X	X		
Costa Sur	5	X	X	X	X		
	6	X	X	X	X		
Aguirre	1	X	X	X	X		
	2	X	X	X	X		
Palo Seco	1	X	X	X	X		
	2	X	X	X	X		
	3	X	X	X	X		
	4	X	X	X	X		
AES	AES 1	X	X	X	X		
	AES 2	X	X	X	X		
EcoEléctrica	ECO 1	X	X	X	X		
	ECO 2	X	X	X	X		
	STM 1	X	X	X	X		

## PEAKER UNITS

FEMA Palo Seco	GT 1	X	X			X	
	GT 2	X	X			X	
	GT 4	X	X			X	
	GT 5	X	X			X	
	GT 6	X	X			X	
	GT 7	X	X			X	

## PEAKER UNITS

Plant	Units	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
FEMA San Juan	GT 1	X	X			X	
	GT 2	X	X			X	
	GT 3	X	X			X	
	GT 4	X	X			X	
	GT 5	X	X			X	
	GT 6	X	X			X	
	GT 7	X	X			X	
	GT 8	X	X			X	
	GT 9	X	X			X	
	GT 10	X	X			X	
Palo Seco (Inc. Mobile-Pack)	1-1	X	X	X		X	
	1-2	X	X	X		X	
	2-1	X	X	X		X	
	2-2	X	X	X		X	
	3-1	X	X	X		X	
	3-2	X	X	X		X	
	MP 1	X	X	X		X	
	MP 2	X	X	X		X	
	MP 3	X	X	X		X	
	I-1	X	X	X		X	
	I-2	X	X	X		X	
	I-3	X	X	X		X	
	I-4	X	X	X		X	
Aguirre CC	ST-1	X	X	X		X	
	II-1	X	X	X		X	
	II-2	X	X	X		X	
	II-3	X	X	X		X	
	II-4	X	X	X		X	
	ST-2	X	X	X		X	

## PEAKER UNITS

Plant	Units	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
Other Peakers	Daguao 1-1	X	X	X		X	
	Daguao 1-2	X	X	X		X	
	Aguirre 2-1	X	X	X		X	
	Aguirre 2-2	X	X	X		X	
	Costa Sur 1-1	X	X	X		X	
	Costa Sur 1-2	X	X	X		X	
	Jobos 1-1	X	X	X		X	
	Jobos 1-2	X	X	X		X	
	Yabucoa 1-1	X	X	X		X	
	Yabucoa 1-2	X	X	X		X	
	Vega Baja 1-1	X	X	X		X	
	Vega Baja 1-2	X	X	X		X	
	Vieques 1	X	X	X		X	
	Vieques 2	X	X	X		X	
	Culebra 1	X	X	X		X	
	Culebra 2	X	X	X		X	
	Culebra 3	X	X	X		X	
Cambalache	1	X	X	X		X	
	2	X	X	X		X	
	3	X	X	X		X	
Mayaguez	1A	X	X	X		X	
	1B	X	X	X		X	
	2A	X	X	X		X	
	2B	X	X	X		X	
	3A	X	X	X		X	
	3B	X	X	X		X	
	4A	X	X	X		X	
	4B	X	X	X		X	

# Plant and Unit List – Renewable Projects

## SOLAR PROJECTS

Projects	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
AES Ilumina						X
Cantera Martínó						X
San Fermín						X
Horizon Energy						X
Oriana Energy						X
Coto Laurel						X
Humacao						X

## WIND AND LANDFILL PROJECTS

Projects	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
Pattern Santa Isabel						X
Punta Lima						X
Landfill Gas Fajardo						X
Landfill Gas Toa Baja						X

## HYDRO PLANTS

Projects	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
Caonillas 1-1						
Caonillas 1-2						
Caonillas 2-1						
Dos Bocas 1						
Dos Bocas 2						
Dos Bocas 3						
Garzas 1-1						
Garzas 1-2						
Garzas 2-1						
Patillas 1-1						
Patillas 1-2						
Rio Blanco 1-1						
Rio Blanco 1-2						
Toro Negro 1-1						
Toro Negro 1-2						
Toro Negro 1-3						
Toro Negro 1-4						
Toro Negro 2-1						
Yauco 1-1						
Yauco 2-1						
Yauco 2-2						