



Monthly Generation Performance Report

March 2023

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 the Puerto Rico Electric Power Authority (PREPA) 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.



Table of Contents

Executive Summary

Operations

- System Level Performance
 - System Reserve Status
 - System Heat Rate
 - System Availability
- Plant/Unit Level Performance
 - Available Capacity
 - Heat Rate
 - Generation and Capacity Factor
 - Planned Outage Hours
 - Maintenance Outage Hours
 - Forced Outage Hours
 - Renewables Capacity Factor

Economics

- Fuel Prices
- Fuel Production Costs

About This Report

- Glossary of Terms
- Plant and Unit List



Executive Summary – March Performance

Overview

EcoEléctrica is scheduled to complete their annual maintenance on Unit 2 and the LNG terminal on April 10. San Juan 9 has not completed the environmental maintenance on March 26 and there are no ETR provided other than later in April.

The demand is expected to start increasing after the first week of April and reach 2500 MW at peak hours.

Major Events

During March, the electric system experienced 5 generation events that caused underfrequency load shed to prevent a frequency decay.

System Reserves

In March, the hourly reserve levels averaged 951 MW, with 154 hours during the month having less than 750 MW in reserves (equal to 21% of the time.)

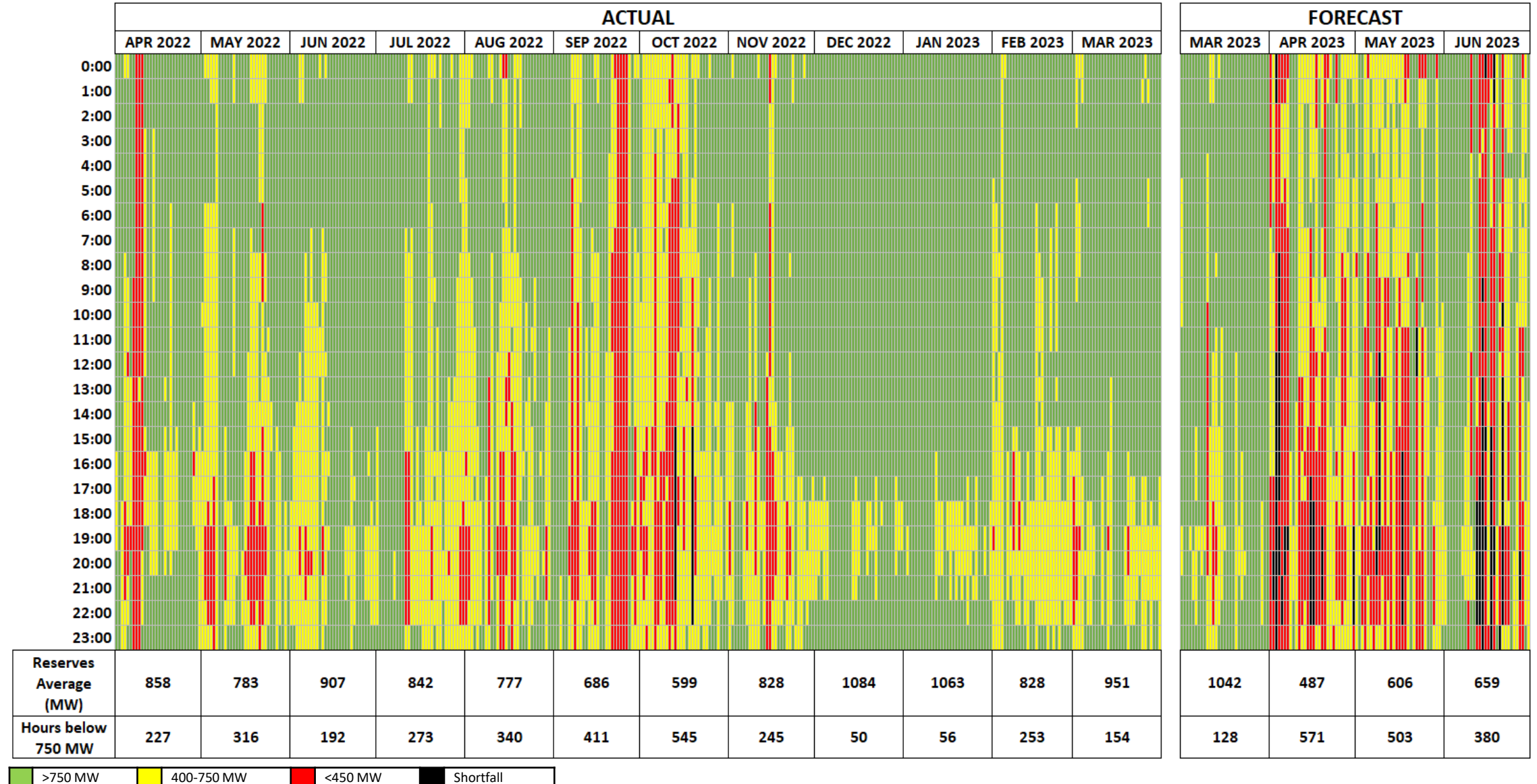
The forecast for April 2023 shows lower reserve levels to the same month last year (April 2022), with 487 MW average reserves forecasted versus 858 MW seen for the same month last year.

The System Availability for the month of March was 52%.

- PREPA – 50%
- AES – 66%
- EcoEléctrica – 57%

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.

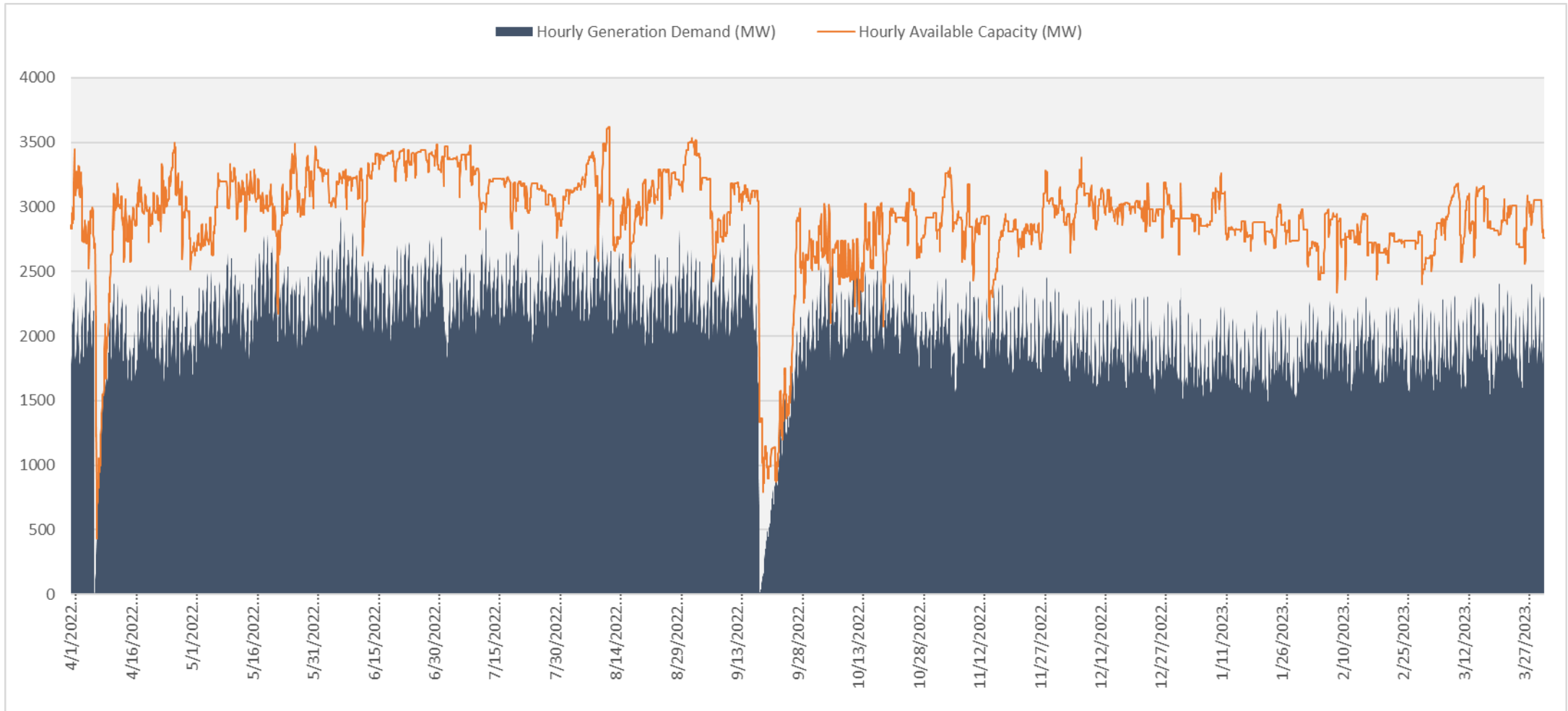


*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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).

Target: ▲ A bigger gap between availability and generation demand means a better chance of recovery in emergency events due to adequate reserves.



- The dip in availability and generation in April is due to the April blackout event.
- The dip in availability and generation in September is due to the passing of Hurricane Fiona.



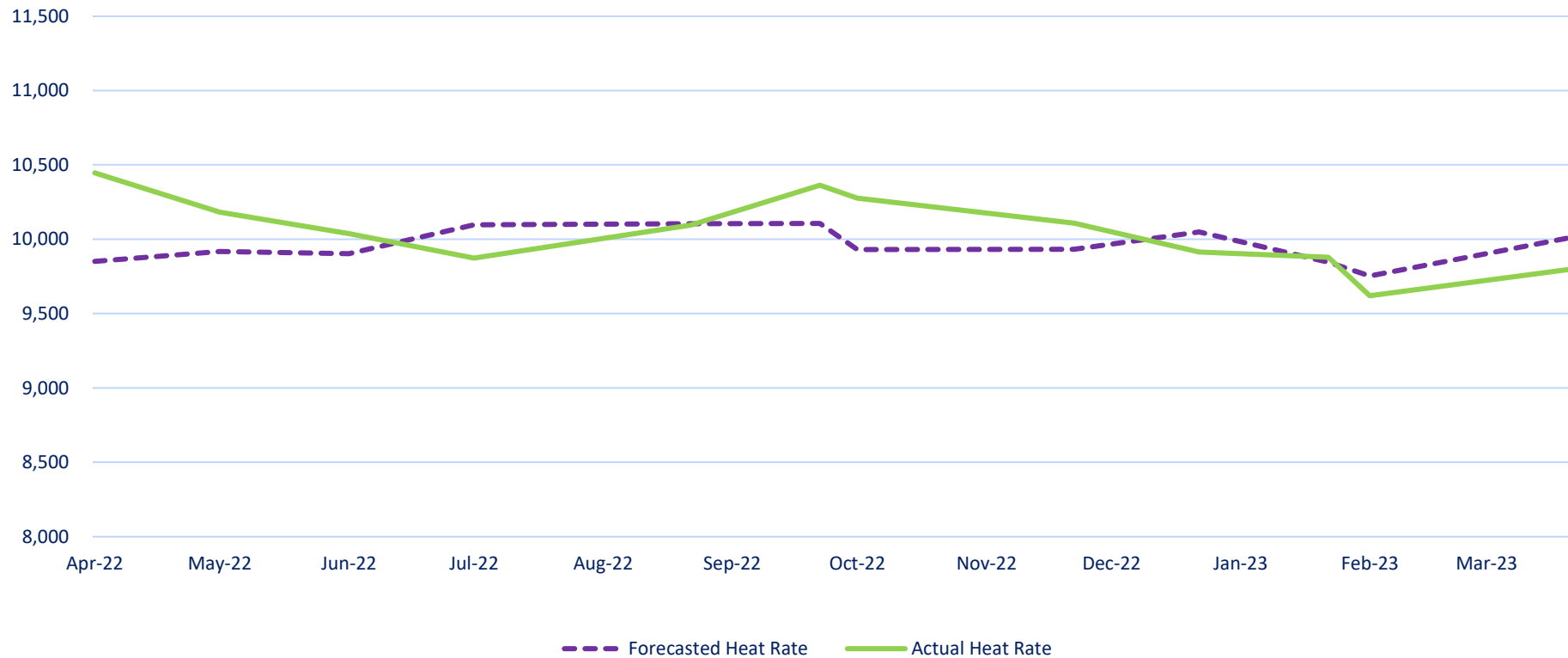
*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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.



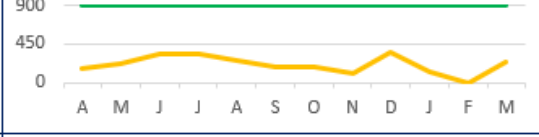
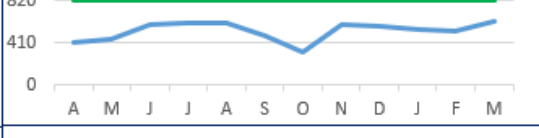
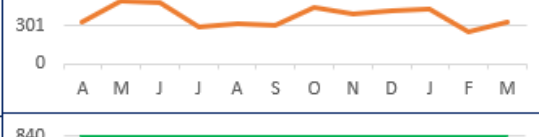

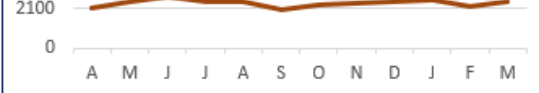
Forecasted vs Actual Heat Rate



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.

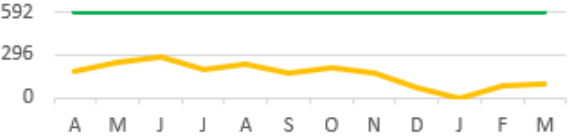
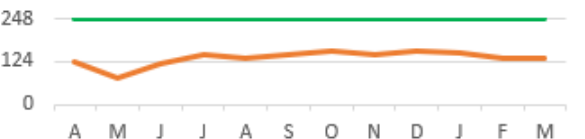


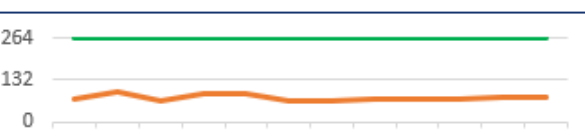
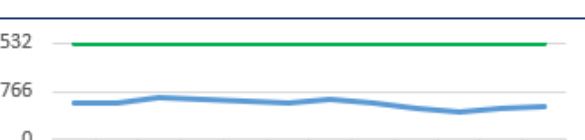
Available Capacity (MW) and Availability Rate (AR)		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	
AES Nameplate Cap: 508		MW	443	505	490	298	321	302	452	391	426	438	256	333
	AR	87%	99%	97%	59%	63%	59%	89%	77%	84%	86%	50%	66%	
EcoElectrica Nameplate Cap: 550		MW	486	546	550	550	547	395	452	550	550	550	550	315
	AR	88%	99%	100%	100%	99%	72%	82%	100%	100%	100%	100%	57%	
PREPA Aguirre Nameplate Cap: 900		MW	170	225	328	327	249	175	180	107	350	128	0	243
	AR	19%	25%	36%	36%	28%	19%	20%	12%	39%	14%	0%	27%	
PREPA Costa Sur Nameplate Cap: 820		MW	408	443	587	599	598	477	324	586	568	532	524	616
	AR	50%	54%	72%	73%	73%	58%	40%	71%	69%	65%	64%	75%	
PREPA Palo Seco Nameplate Cap: 602		MW	329	505	490	298	321	302	452	391	426	438	256	333
	AR	55%	84%	81%	50%	53%	50%	75%	65%	71%	73%	43%	55%	
PREPA San Juan Nameplate Cap: 840		MW	312	255	283	394	454	403	427	385	167	445	662	614
	AR	37%	30%	34%	47%	54%	48%	51%	46%	20%	53%	79%	73%	
Total Baseload Nameplate Cap: 4220		MW	2148	2479	2728	2467	2490	2054	2287	2410	2488	2531	2249	2455
	AR	51%	59%	65%	58%	59%	49%	54%	57%	59%	60%	53%	58%	

*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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.

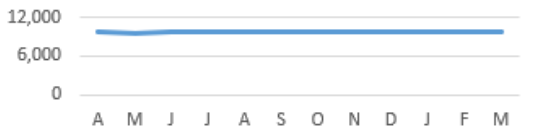
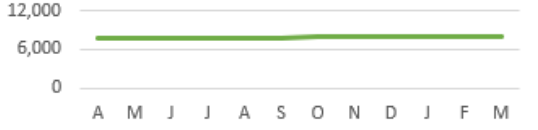
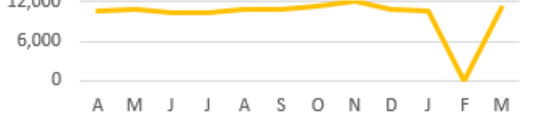

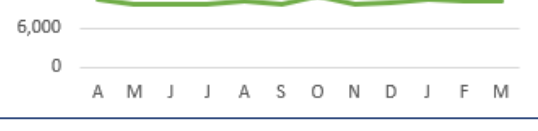


Available Capacity (MW) and Availability Rate (AR)		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	
PREPA Aguirre Combined Cycle Nameplate Cap: 592		MW	184	246	278	201	236	171	202	166	65	0	81	95
	AR	31%	42%	47%	34%	40%	29%	34%	28%	11%	0%	14%	16%	
PREPA Cambalache Nameplate Cap: 248		MW	125	77	118	143	134	146	152	146	156	151	136	136
	AR	50%	31%	48%	58%	54%	59%	62%	59%	63%	61%	55%	55%	
PREPA Mayaguez Nameplate Cap: 220		MW	41	30	40	38	38	37	37	29	37	38	38	33
	AR	18%	14%	18%	17%	17%	17%	17%	13%	17%	17%	17%	15%	
PREPA Palo Seco (Inc. Mobile-Pack) Nameplate Cap: 207		MW	155	146	155	153	122	148	175	177	170	177	177	178
	AR	75%	70%	75%	74%	59%	71%	84%	85%	82%	85%	86%	86%	
Other Peakers Nameplate Cap: 264		MW	71	94	67	91	89	68	68	71	73	69	76	78
	AR	27%	36%	25%	34%	34%	26%	26%	27%	28%	26%	29%	30%	
Total Peakers Nameplate Cap: 1531		MW	575	593	658	626	618	569	634	589	501	435	508	520
	AR	38%	39%	43%	41%	40%	37%	41%	38%	33%	28%	33%	34%	

*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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.

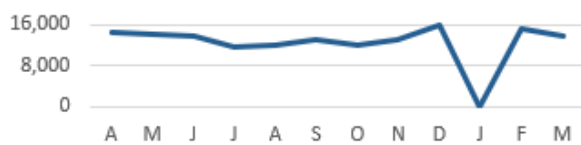
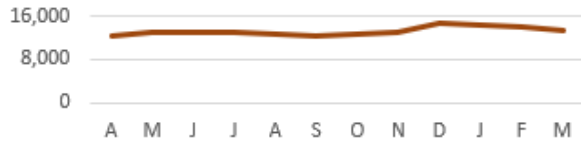
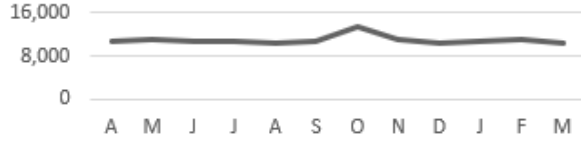
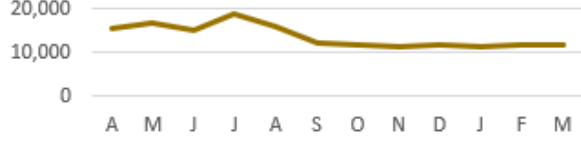

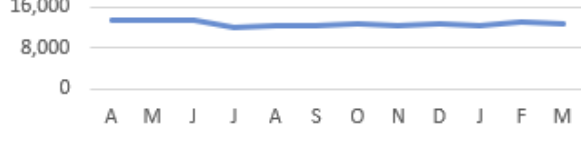
Heat Rate (MMBtu/MWh)		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
AES		9,726	9,694	9,766	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800
EcoElectrica		7,718	7,739	7,692	7,683	7,683	7,683	7,932	7,932	7,932	7,932	7,945	7,945
PREPA Aguirre		10,610	10,767	10,362	10,366	10,847	10,935	11,486	12,016	10,957	10,699	-	11,230
PREPA Costa Sur		10,899	10,791	10,362	10,447	10,620	10,749	10,724	10,736	10,845	10,909	11,408	10,995
PREPA Palo Seco		10,403	9,840	9,839	9,738	10,249	9,865	10,960	9,876	10,131	10,483	10,363	10,223
PREPA San Juan		9,369	10,872	10,768	10,102	9,662	10,271	11,417	11,404	11,603	10,559	9,869	8,345
Total Baseload		9,597	9,769	9,705	9,633	9,712	9,846	10,156	10,049	9,982	9,931	9,866	9,761

*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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)		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
PREPA Aguirre Combined Cycle		14,686	14,316	13,796	11,602	12,169	13,170	12,150	13,145	15,978	-	15,272	13,680
PREPA Cambalache		12,450	13,005	13,117	13,001	12,530	12,481	12,646	13,185	14,794	14,509	13,971	13,264
PREPA Mayaguez		10,626	10,878	10,557	10,552	10,406	10,728	13,418	10,919	10,413	10,816	10,934	10,355
PREPA Palo Seco (Inc. Mobile Pack)		15,556	16,687	15,226	19,157	15,922	12,234	11,818	11,481	11,719	11,341	11,719	11,964
Other Peakers		15,082	14,951	15,888	13,496	15,487	14,860	15,750	14,053	15,681	16,101	17,324	15,391
Total Peakers		13,394	13,501	13,306	11,936	12,319	12,421	12,587	12,438	12,628	12,332	13,085	12,746

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.

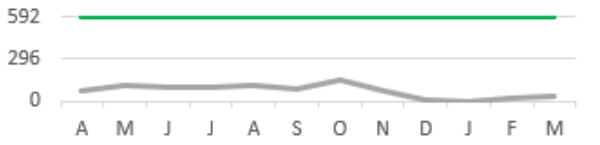
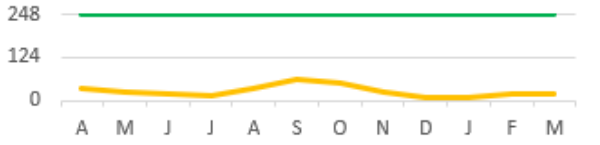
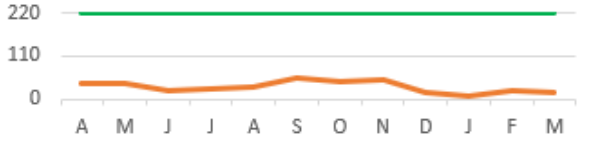
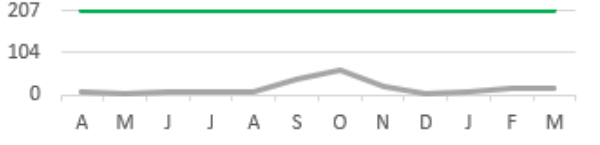

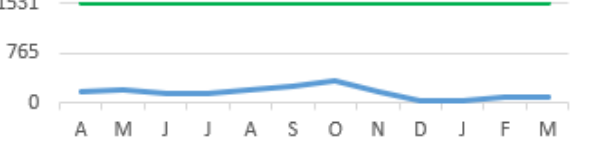
Average Generation (MW) and Capacity Factor		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	
AES Nameplate Cap: 508		MW	435	504	488	296	318	266	452	390	414	414	253	314
	CF	86%	99%	96%	58%	63%	52%	89%	77%	82%	82%	50%	62%	
EcoElectrica Nameplate Cap: 550		MW	372	409	428	433	428	309	373	416	411	380	404	261
	CF	68%	74%	78%	79%	78%	56%	68%	76%	75%	69%	73%	47%	
PREPA Aguirre Nameplate Cap: 900		MW	146	194	287	281	231	155	145	83	250	87	0	191
	CF	16%	22%	32%	31%	26%	17%	16%	9%	28%	10%	0%	21%	
PREPA Costa Sur Nameplate Cap: 820		MW	262	377	495	473	498	400	299	503	471	441	429	473
	CF	32%	46%	60%	58%	61%	49%	37%	61%	57%	54%	52%	58%	
PREPA Palo Seco Nameplate Cap: 602		MW	270	326	305	277	275	114	149	152	258	239	261	241
	CF	45%	54%	51%	46%	46%	19%	25%	25%	43%	40%	43%	40%	
PREPA San Juan Nameplate Cap: 840		MW	285	242	262	374	419	353	404	365	141	293	432	363
	CF	34%	29%	31%	45%	50%	42%	48%	43%	17%	35%	51%	43%	
Total Baseload Nameplate Cap: 4220		MW	1771	2054	2265	2134	2169	1597	1822	1910	1945	1854	1778	1842
	CF	42%	49%	54%	51%	51%	38%	43%	45%	46%	44%	42%	44%	

*Refer to Glossary of Terms on page 21 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			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
PREPA Aguirre Combined Cycle Nameplate Cap: 592		MW	76	114	92	100	113	80	149	76	5	0	23	28
		CF	13%	19%	15%	17%	19%	14%	25%	13%	1%	0%	4%	5%
PREPA Cambalache Nameplate Cap: 247.5		MW	33	25	17	16	35	63	53	22	10	7	18	21
		CF	13%	10%	7%	6%	14%	25%	21%	9%	4%	3%	7%	8%
PREPA Mayaguez Nameplate Cap: 220		MW	38	42	22	26	29	53	46	51	18	8	23	17
		CF	17%	19%	10%	12%	13%	24%	21%	23%	8%	4%	10%	8%
PREPA Palo Seco (Inc. Mobile-Pack) Nameplate Cap: 207		MW	9	2	5	7	7	39	62	21	4	8	17	17
		CF	4%	1%	2%	3%	3%	19%	30%	10%	2%	4%	8%	8%
Other Peakers (PREPA) Nameplate Cap: 264		MW	12	15	4	3	12	14	23	16	2	1	2	7
		CF	4%	6%	2%	1%	5%	5%	9%	6%	1%	0%	1%	3%
Total Peakers Nameplate Cap: 1530.5		MW	167	198	140	151	196	249	332	186	39	24	83	90
		CF	11%	13%	9%	10%	13%	16%	22%	12%	3%	2%	5%	6%

*Refer to Glossary of Terms on page 21 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 (APR 2022 - MAR 2023)	Planned Outage Hours	Completed Outage Hours	Notes for In-Progress Planned Outages	Expected Return-to- Service Date
AES		1872	1323	AES 1 - Out since 2/1/23 (Environmental Maintenance)	AES 1 - 3/7/23
EcoElectrica		1080	718	EcoElectrica 1 - Out since 3/18/23 (Annual Outage) EcoElectrica 2 - Out since 3/11/23 (Annual Outage) EcoElectrica STM - Out since 3/17/23 (Annual Outage)	EcoElectrica 1 - 3/21/23 EcoElectrica 2 - 4/18/23 EcoElectrica STM - 3/21/23
PREPA Aguirre		2640	4696	Aguirre 2 - Out since 1/12/23 (Environmental Maintenance)	Aguirre 2 - 3/5/23
PREPA Costa Sur		0	327		
PREPA Palo Seco		0	72		
PREPA San Juan		4824	6850	San Juan 9 - Out since 2/19/23 (Environmental Maintenance)	San Juan 9 - 4/30/23
Total Baseload		10416	13986		

*Refer to Glossary of Terms on page 21 for a list of definitions and formulas.

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.

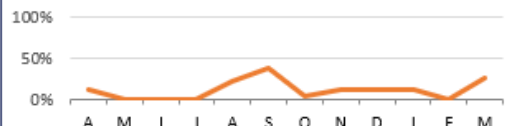



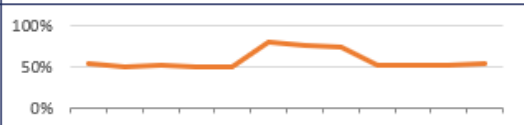
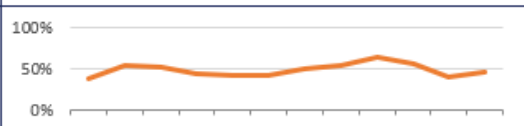
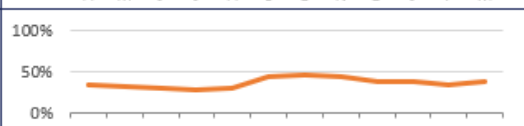
Maintenance Outage Hours		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
AES		0	0	0	0	0	0	0	0	0	0	24	0
EcoElectrica		0	0	0	0	0	0	3	0	0	0	0	24
PREPA Aguirre		0	0	0	0	43	0	0	0	0	0	0	44
PREPA Costa Sur		0	48	3	0	37	0	0	0	90	0	0	0
PREPA Palo Seco		0	57	0	21	9	71	18	0	0	0	0	0
PREPA San Juan		41	0	0	98	15	0	19	137	421	0	2	39
Total Baseload		41	105	3	119	104	71	40	137	511	0	26	107

*Refer to Glossary of Terms on page 21 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		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	
AES		Hrs	161	0	0	0	281	543	36	175	178	173	0	384
	%	11%	0%	0%	0%	21%	38%	2%	12%	12%	12%	12%	0%	27%
EcoElectrica		Hrs	256	16	0	0	7	118	211	0	4	0	0	30
	%	12%	1%	0%	0%	0%	5%	10%	0%	0%	0%	0%	0%	2%
PREPA Aguirre		Hrs	320	213	0	0	130	899	1055	1180	720	815	720	768
	%	43%	29%	0%	0%	16%	67%	71%	82%	48%	75%	94%	56%	
PREPA Costa Sur		Hrs	475	19	14	0	2	268	553	46	0	0	153	0
	%	35%	2%	1%	0%	0%	19%	37%	3%	0%	0%	11%	0%	
PREPA Palo Seco		Hrs	1543	1487	1482	1492	1507	2198	2250	2120	1572	1537	1395	1598
	%	54%	51%	51%	50%	51%	80%	77%	74%	53%	52%	52%	54%	
PREPA San Juan		Hrs	1634	2230	2196	2574	2530	2432	3000	3071	2930	3174	2063	2449
	%	39%	54%	53%	44%	43%	42%	51%	55%	64%	55%	40%	46%	
Total Baseload		Hrs	4390	3965	3691	4066	4455	6458	7105	6592	5405	5699	4330	5228
	%	34%	31%	29%	29%	30%	43%	46%	44%	38%	38%	34%	37%	

*Refer to Glossary of Terms on page 21 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			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
AES Ilumina		MW	4	4	4	4	4	3	4	4	3	4	4	4
		CF	22%	21%	22%	21%	21%	16%	19%	18%	17%	19%	21%	22%
Windmar Cantera Martínó		MW	0.6	0.5	0.6	0.4	0.4	0.3	0.5	0.4	0.5	0.5	0.5	0.6
		CF	27%	25%	27%	20%	17%	15%	22%	21%	23%	22%	26%	29%
San Fermín		MW	3	3	3	1	2	1	2	2	2	2	3	3
		CF	17%	17%	17%	7%	10%	6%	8%	10%	12%	11%	13%	14%
Horizon Energy		MW	1	2	3	2	3	2	2	2	2	2	2	3
		CF	14%	20%	27%	25%	27%	17%	23%	22%	23%	24%	25%	28%
Oriana Energy		MW	10	10	11	10	10	8	9	9	9	10	11	10
		CF	21%	23%	24%	23%	23%	17%	19%	20%	20%	21%	24%	23%
Windmar Coto Laurel		MW	2	2	2	2	2	1	2	2	2	2	2	2
		CF	23%	22%	23%	21%	21%	14%	21%	20%	22%	20%	22%	22%
Fonroche Humacao		MW	9	8	8	7	8	5	7	7	7	7	8	8
		CF	22%	19%	20%	19%	20%	14%	18%	17%	18%	18%	21%	19%
Total Solar		MW	30	31	32	28	30	21	26	26	27	28	31	31
		CF	20%	21%	22%	19%	20%	14%	18%	18%	18%	19%	21%	21%

*Refer to Glossary of Terms on page 21 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.

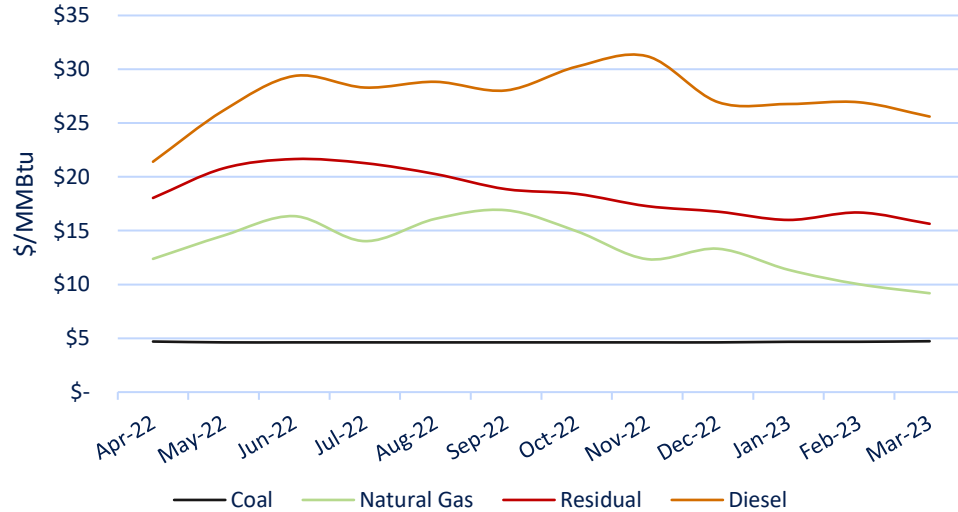
Target: ▲ A higher Capacity Factor represents a better utilization of the maximum capacity the project is able to produce.

Average Production (MW) and Capacity Factor			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
Pattern Santa Isabel Nameplate Cap: 75		MW	24	24	24	26	18	7	10	10	11	14	18	14
		CF	33%	32%	32%	35%	25%	9%	13%	13%	14%	19%	24%	19%
Landfill Gas Fajardo Nameplate Cap: 2.4		MW	0.4	0.6	0.8	0.3	0.6	0.4	0.1	0.2	0.4	0.3	0.5	0.5
		CF	18%	24%	33%	14%	25%	16%	6%	9%	18%	12%	20%	22%
Landfill Gas Toa Baja Nameplate Cap: 2.4		MW	1.1	1.5	1.6	0.8	1.5	0.7	0.9	0.6	0.5	0.6	0.8	0.6
		CF	44%	64%	65%	33%	62%	31%	36%	26%	21%	24%	32%	27%
Total Wind and Landfill Nameplate Cap: 80		MW	26	26	26	27	20	8	11	11	12	15	19	15
		CF	32%	32%	33%	34%	26%	10%	14%	14%	14%	19%	24%	19%

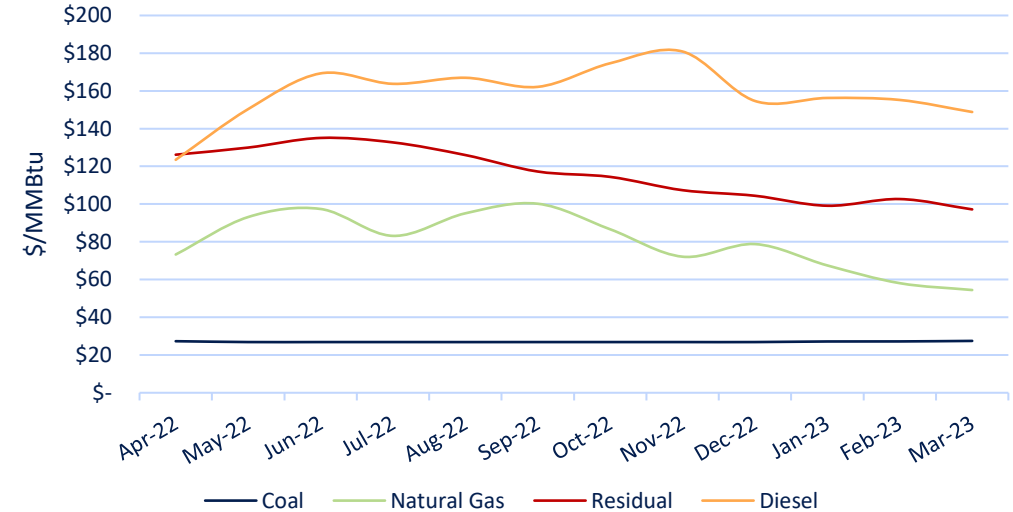
Fuel Prices

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)



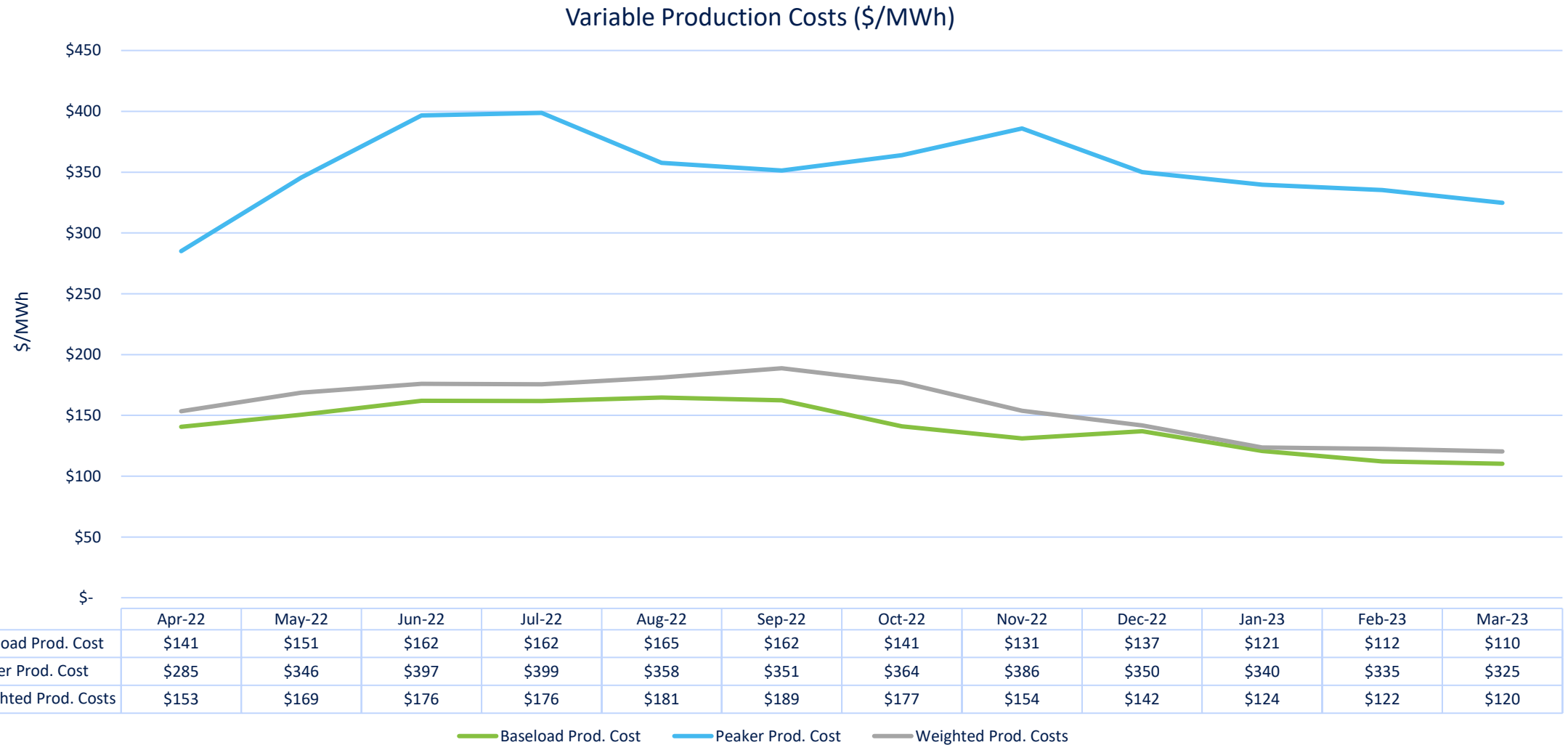
Historical Fuel Price (\$/BOE)



	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
\$/MMBtu												
Diesel	21.41	26.17	29.37	28.30	28.83	28.03	30.23	31.20	26.95	26.77	26.93	25.60
Residual	18.03	20.78	21.64	21.27	20.25	18.84	18.41	17.26	16.75	15.98	16.67	15.62
Natural Gas	12.38	14.54	16.35	14.02	16.10	16.90	14.94	12.35	13.32	11.36	10.02	9.19
Coal	4.70	4.63	4.63	4.62	4.62	4.63	4.63	4.63	4.62	4.68	4.68	4.73
\$/BOE												
Diesel	123.56	150.39	169.30	163.78	167.00	162.18	174.68	180.89	154.70	156.31	155.24	148.87
Residual	126.14	129.91	135.01	132.64	125.96	117.24	114.41	107.37	104.42	99.14	102.69	97.22
Natural Gas	73.28	93.17	97.47	83.18	95.16	100.24	86.67	72.11	78.82	67.47	58.05	54.41
Coal	27.28	26.83	26.83	26.83	26.81	26.83	26.83	26.83	26.83	27.14	27.16	27.43

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 21 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

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

Plant	Units	System Reserves	System Availability	System Heat Rate	All Metrics for Baseload Units	All Metrics for Peaker Units	Renewables Capacity Factor
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	
	1-1	X	X	X		X	
	1-2	X	X	X		X	
Palo Seco (Inc. Mobile-Pack)	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	
Aguirre CC	I-3	X	X	X		X	
	I-4	X	X	X		X	
	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	

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 Martinó						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
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						