

WEM Quarterly Market Review

Q4 2024

Introduction

What is this report and where did all the data come from?

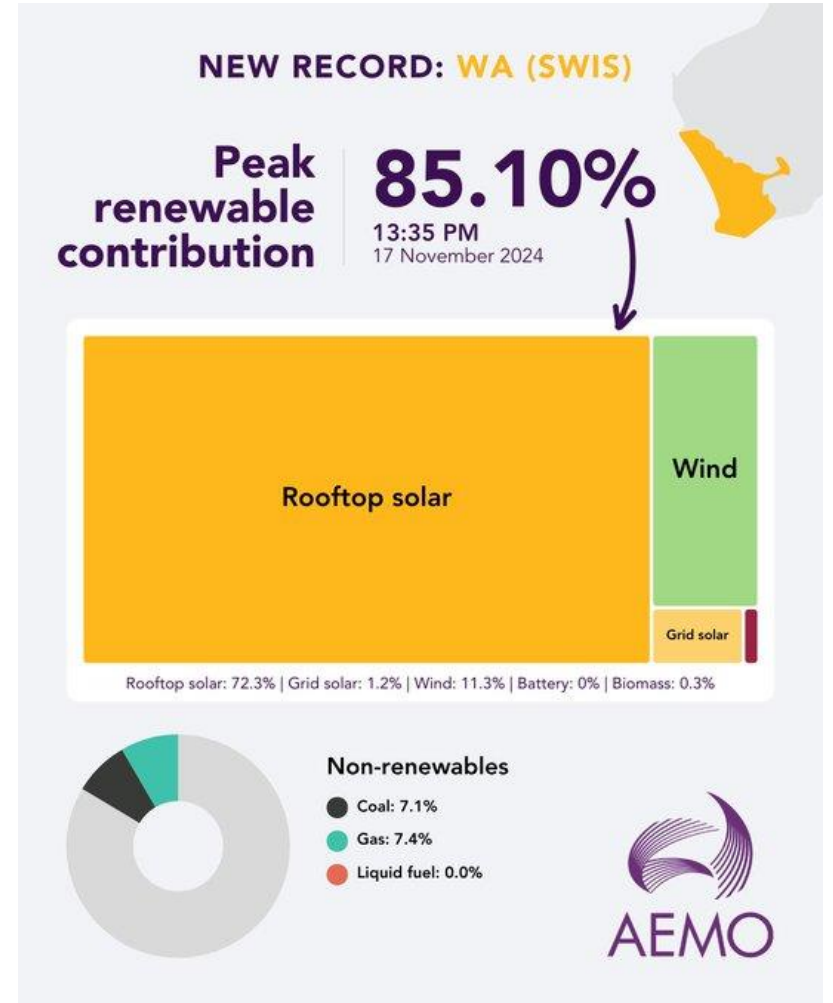
- This report presents an independent review of Wholesale Electricity Market (WEM) outcomes in Q4 2024 from a neutral perspective (*).
- The material in this report is intended to complement the data and insights published by AEMO and other WEM stakeholders.
- Please note that there is no proprietary data used in this report and all the information is derived from the following publicly available data sources:

Data Source	Link
AEMO WA market data	http://data.wa.aemo.com.au/
WEM market fees	https://aemo.com.au/-/media/files/about_aemo/energy_market_budget_and_fees/2023/wa-budget-and-fees-2023-24.pdf?la=en
LGC spot prices (Demand Manager)	https://www.demandmanager.com.au/certificate-prices/
Perth daily temperatures (Bureau of Meteorology)	http://www.bom.gov.au/climate/dwo/IDCJDW6111.latest.shtml

Highlights from Q4 2024

Records, almost records and new facilities being commissioned

- There was a new **minimum operational demand record** of 523 MW at 1:30pm on Sunday 10 November 2024, breaking the previous record of 595 MW set in September 2023.
- A **peak renewable contribution record** was also set of 85.1% on 17 November 2024, breaking the previous record of 84% set in December 2022.
- There was a near record **peak operational demand** of 4,193.7 MW at 6:30pm on 11 December, occurring in the evening of a 40°C day.
 - This peak operational demand was just 30 MW shy of the all-time record demand of 4,233 MW set earlier in the year on 18 February 2024.
- The following new facilities underwent commissioning in Q4 2024:
 - Collie BESS (COLLIE_ESR1) and Kwinana BESS 2 (KWINANA_ESR2) have completed commissioning and are now operational.
 - Cunderdin Hybrid Solar / BESS (SBSOLAR1_CUNDERDIN_PV1) commissioning tests are still progressing (up to 50 MW).



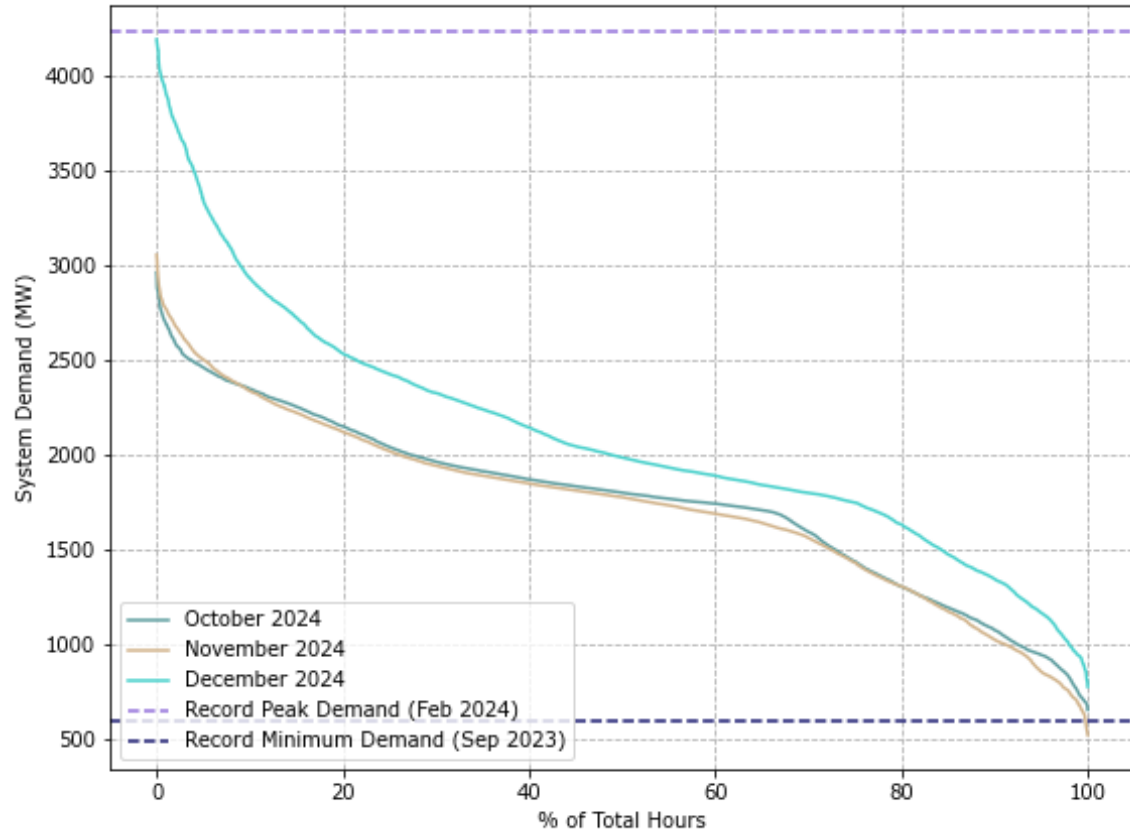
.01 System

Aggregate system level outcomes

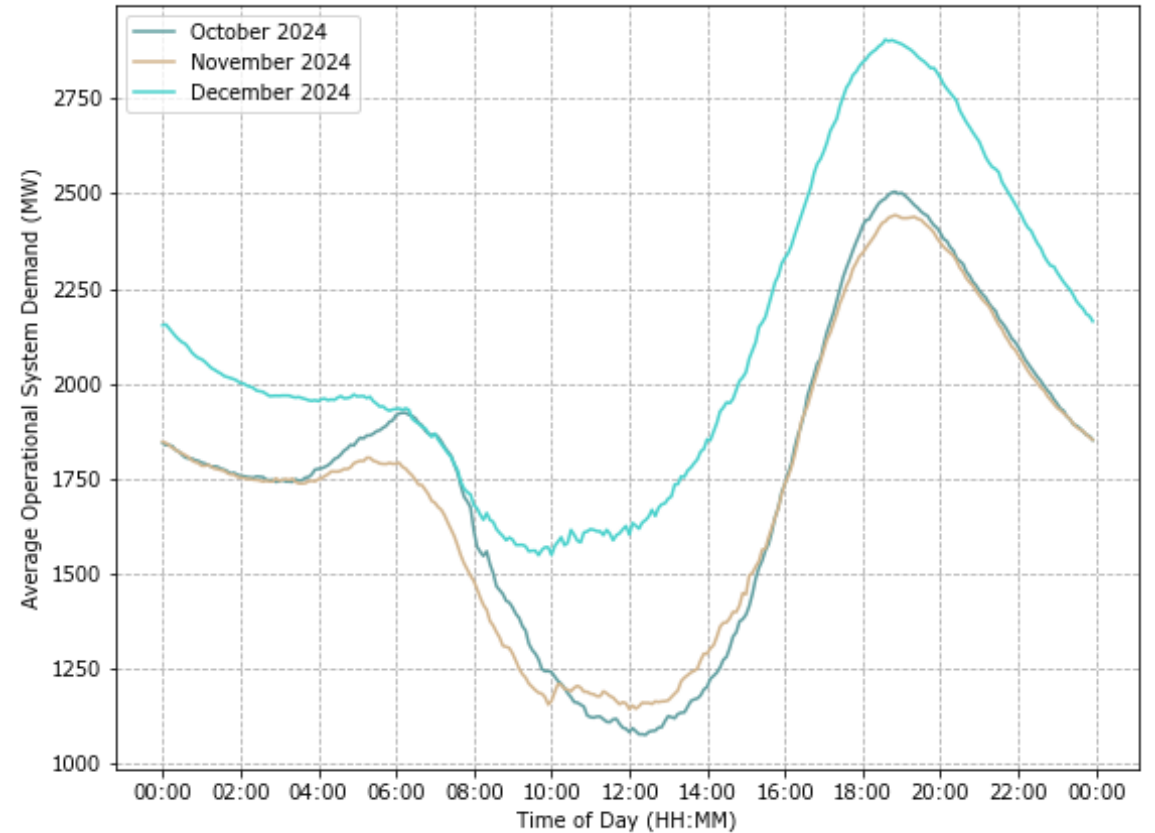
System Operational Demand

System operational demand duration curves and time-of-day averages

Demand Duration Curves



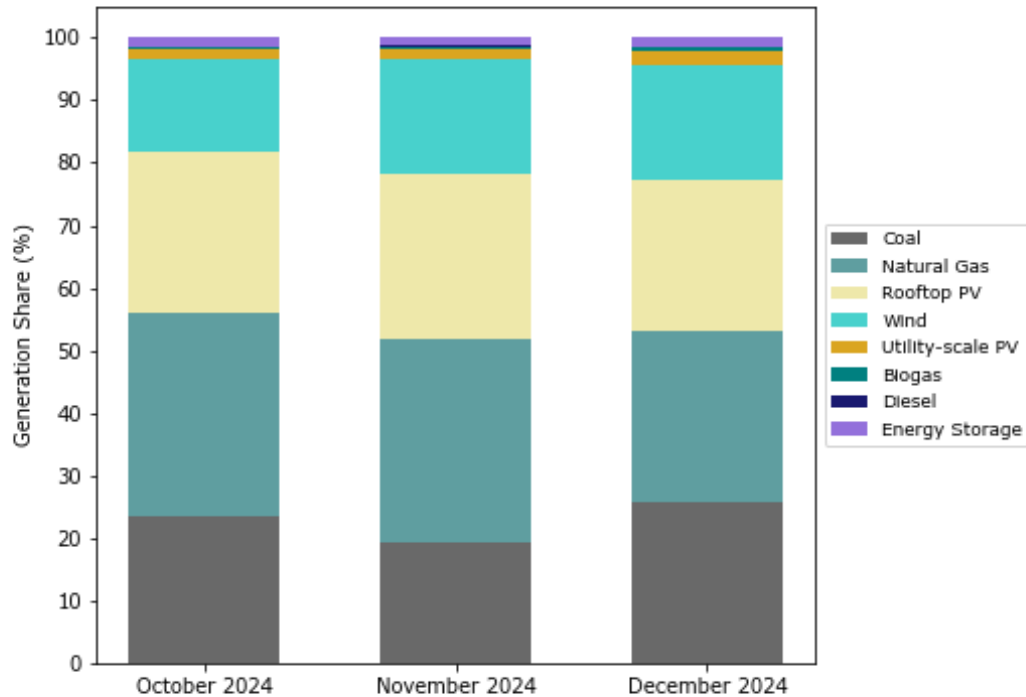
Average Time-of-Day Demand



Generation Mix

Categorised by fuel / technology type

Q4 2024 Generation Mix



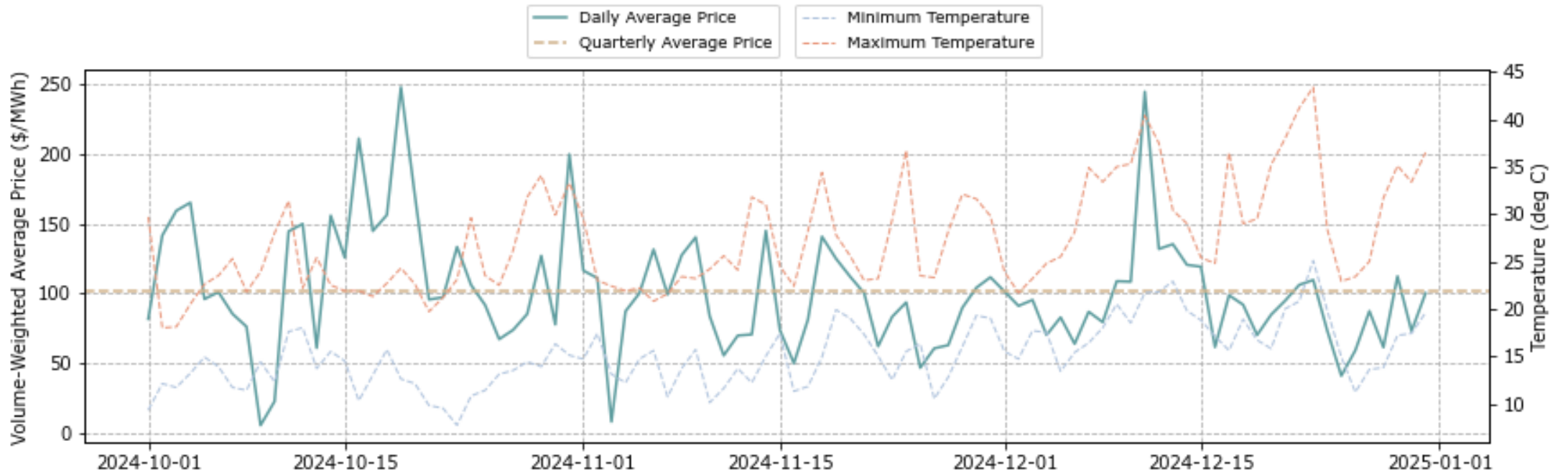
Generation Mix Breakdown

Category	Oct 2024	Nov 2024	Dec 2024
Coal	415 GWh (23.6%)	325 GWh (19.2%)	526 GWh (25.7%)
Natural Gas	571 GWh (32.4%)	551 GWh (32.6%)	565 GWh (27.5%)
Rooftop PV	457 GWh (25.9%)	448 GWh (26.5%)	491 GWh (24%)
Wind	260 GWh (14.7%)	312 GWh (18.4%)	376 GWh (18.3%)
Utility PV	27 GWh (1.6%)	26 GWh (1.5%)	52 GWh (2.5%)
Biogas	6 GWh (0.3%)	6 GWh (0.3%)	7 GWh (0.3%)
Diesel	1 GWh (0.1%)	1 GWh (0.1%)	1 GWh (0.1%)
Storage (*)	24 GWh (1.4%)	22 GWh (1.3%)	32 GWh (1.6%)
TOTAL	1,761 GWh	1,691 GWh	2,050 GWh

(*) Energy storage is only counted when discharging.

Energy Prices

Daily volume-weighted energy prices and daily min/max Perth temperatures (*)

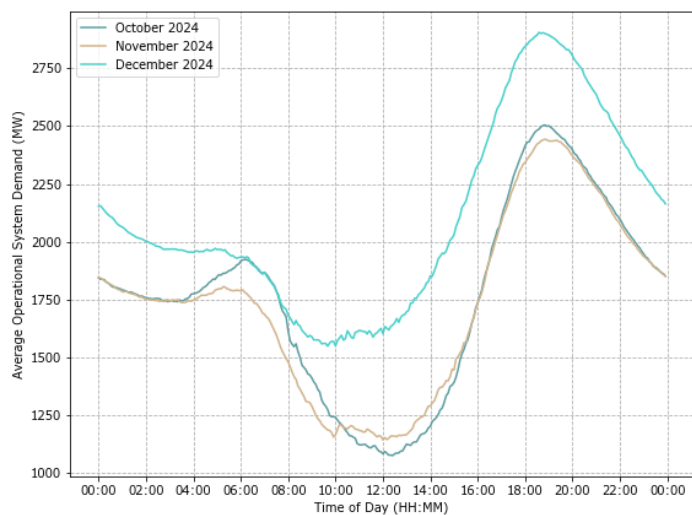
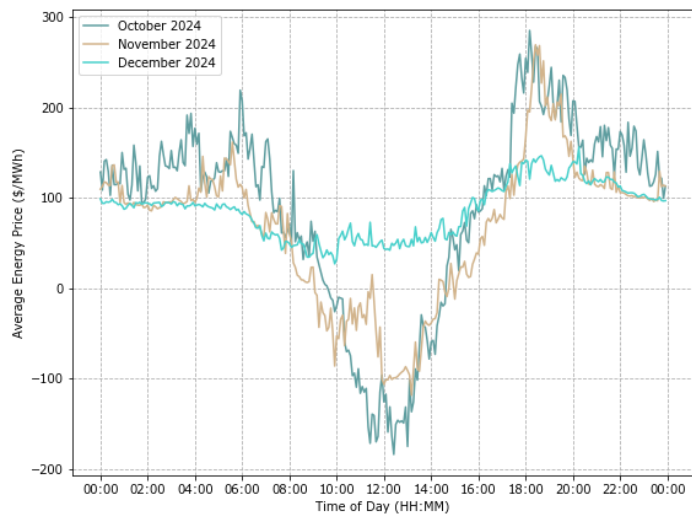


(*) Daily temperatures are based on BOM observations at the [Perth Metro site](#).

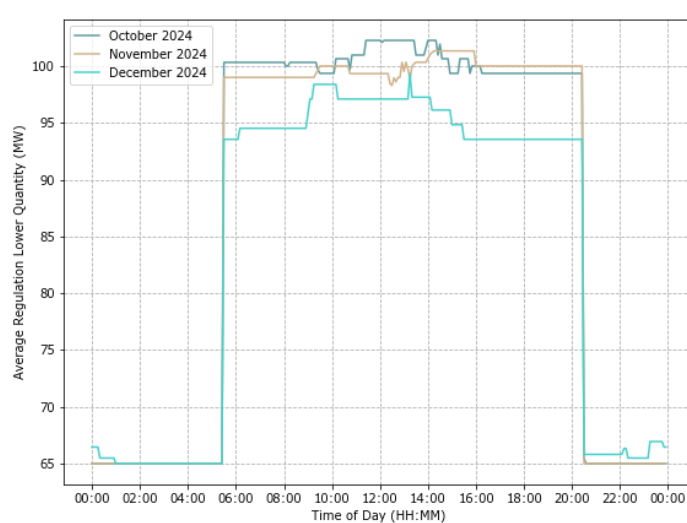
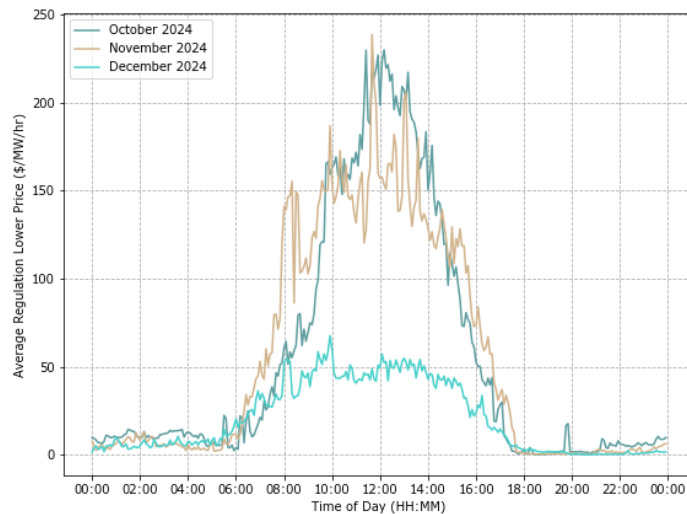
Average time-of-day clearing prices and quantities (1)

Energy, Regulation Lower and Regulation Raise ESS

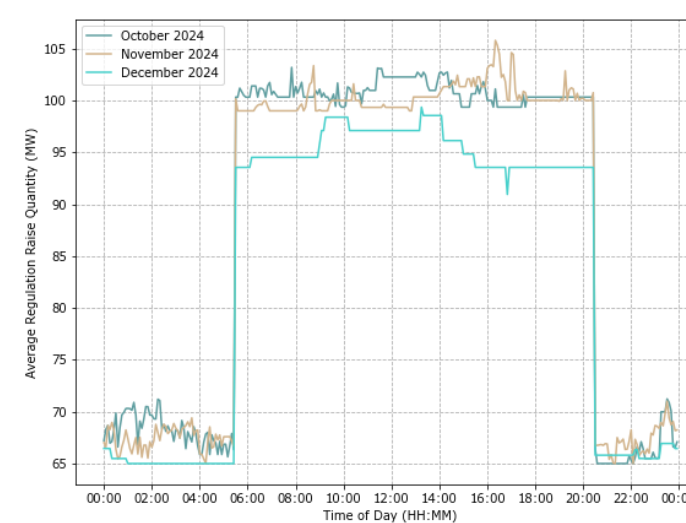
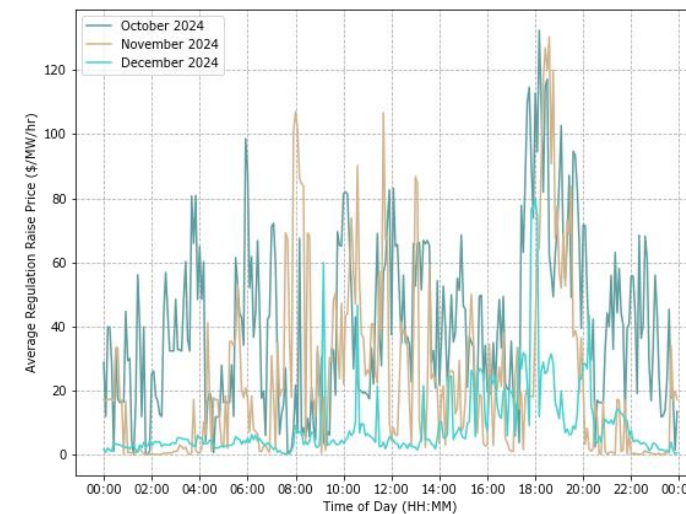
Energy



Regulation Lower (*)



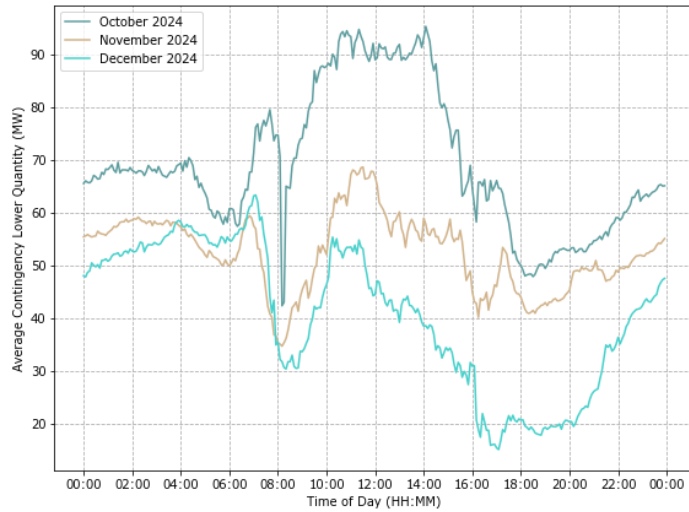
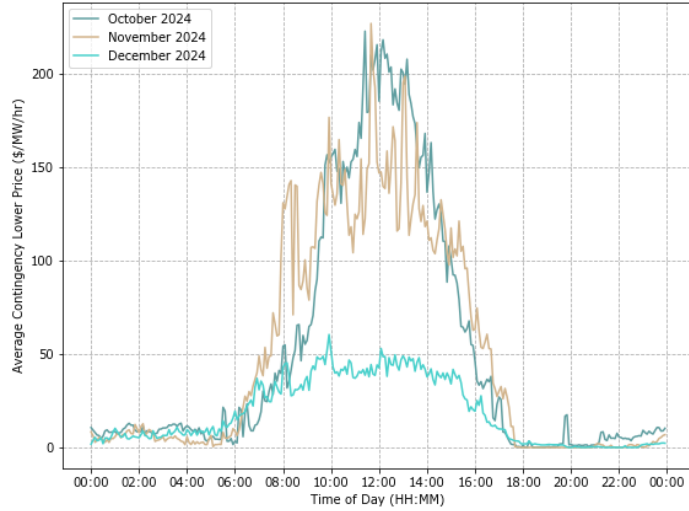
Regulation Raise (*)



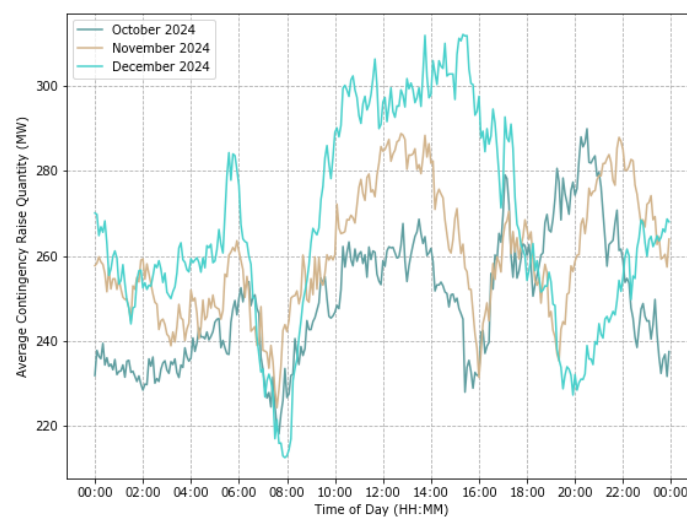
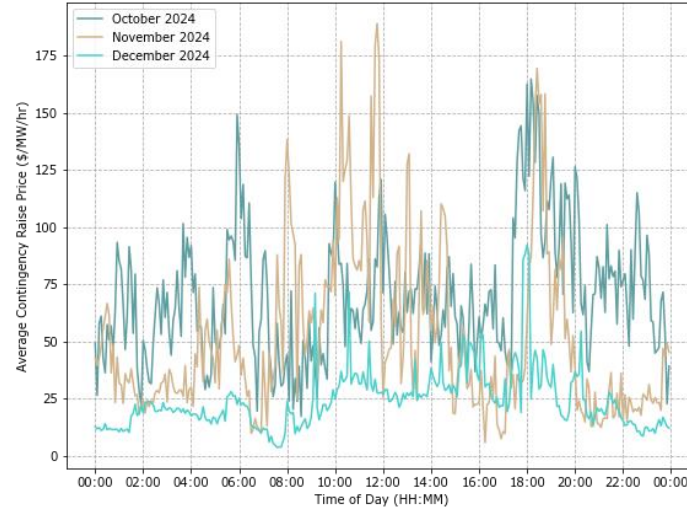
Average time-of-day clearing prices and quantities (2)

Contingency Lower, Contingency Raise and RoCoF Control ESS

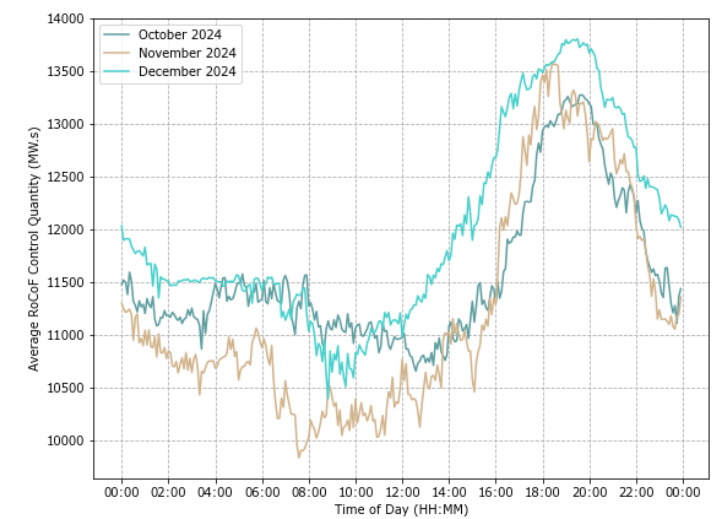
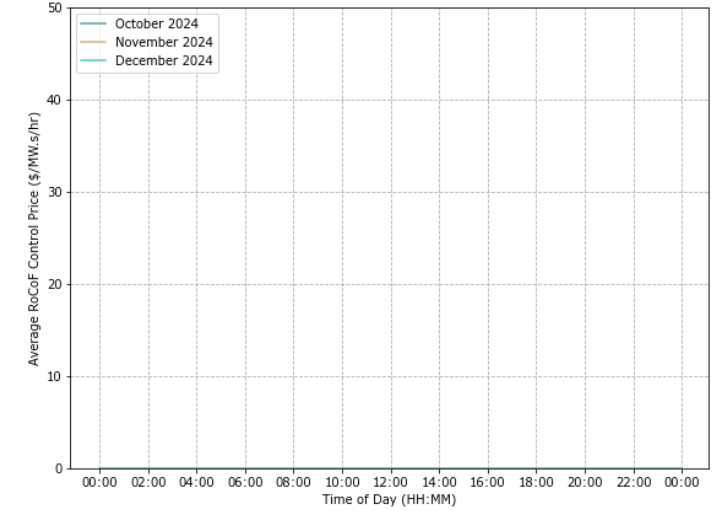
Contingency Lower (*)



Contingency Raise (*)



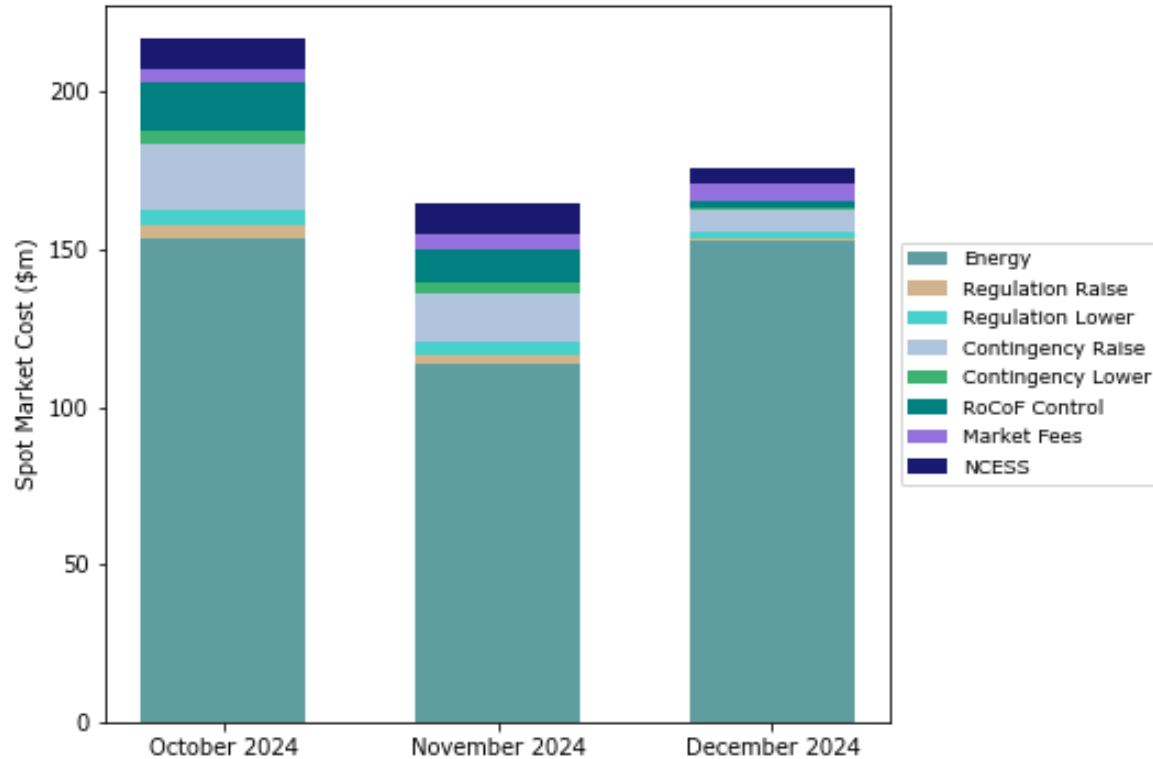
RoCoF Control (*)



WEM Total Spot Market Costs

Total mark-to-market cost of the WEM (excluding Reserve Capacity)

Q4 2024 Market Costs



Market Cost Breakdown (\$m AUD)

Category	Oct 2024	Nov 2024	Dec 2024
Energy	\$153.42m	\$113.57m	\$152.61m
Regulation Raise (*)	\$4.42m	\$2.88m	\$1.06m
Regulation Lower (*)	\$4.58m	\$4.45m	\$1.88m
Contingency Raise (*)	\$20.74m	\$15.09m	\$6.68m
Contingency Lower (*)	\$4.78m	\$3.30m	\$1.04m
RoCoF Control (*)	\$14.96m	\$10.99m	\$2.23m
Market Fees	\$4.64m	\$4.43m	\$5.52m
NCESS	\$9.16m	\$9.63m	\$4.87m
TOTAL	\$216.69m	\$164.35m	\$175.90m
\$ / MWh	\$169.21	\$134.40	\$115.39

(*) Includes estimated FCESS Uplift Payments

.02

Facilities

Selected facility level outcomes

Facility-Level Metrics

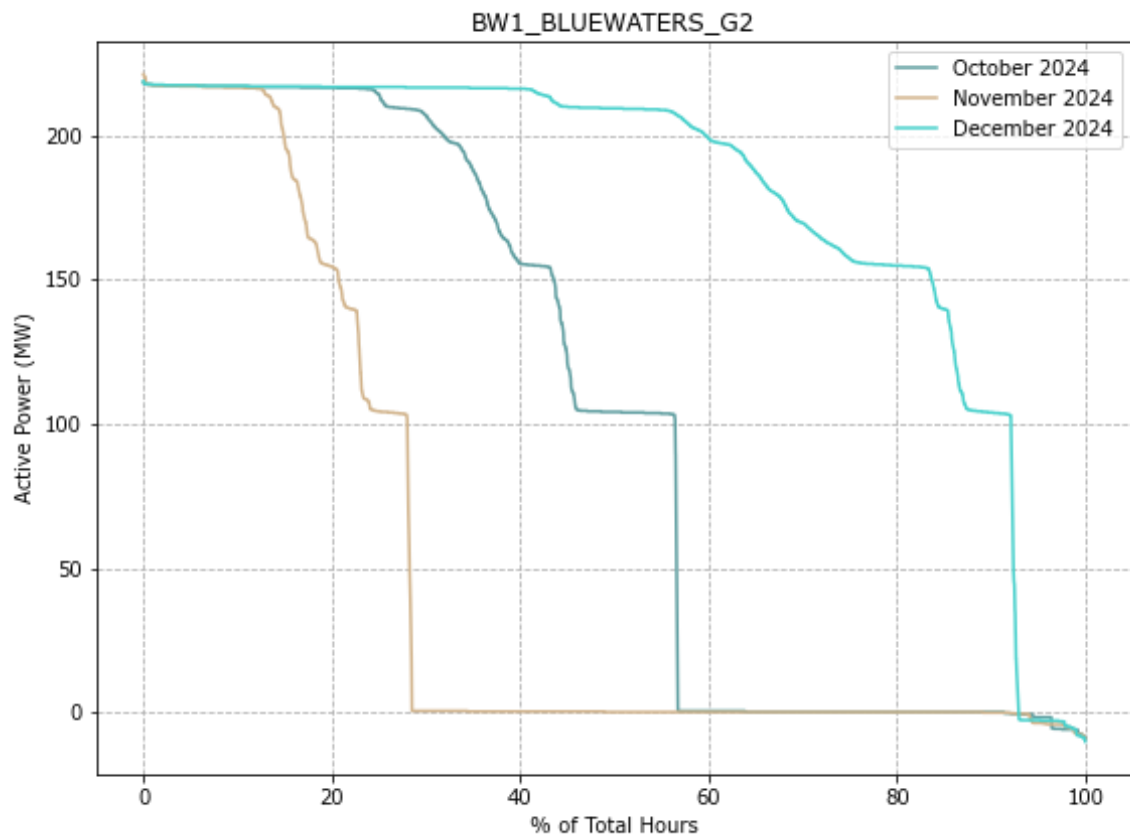
Definitions for the facility-level metrics reported in this section

Facility Metric	Description
Monthly Generation Duration Curve	Curve showing the proportion of time in a month that a facility is operating above a specific output.
Average Time of Day Output	Curve showing the mean output from a facility over a month at a 5-min resolution (with no adjustments for a facility being offline).
Facility Merchant Spot Revenue	The implied monthly revenue that a facility would have received from all energy and ESS markets if it were a merchant facility. Where a facility receives Large Generation Certificate (LGC), this revenue is estimated based on publicly available LGC spot prices published on Demand Manager .
Facility Capacity Factor	Daily average capacity factors based on the daily energy generated and the registered facility size . Note that for energy storage facilities, the net energy throughput is used.
Average Energy Capture Price	Daily average volume weighted energy price that the facility receives based on the following calculation: $\text{Average Energy Capture Price} = \frac{\sum \text{Energy Revenue}}{\sum \text{Energy Generated or Consumed} }$

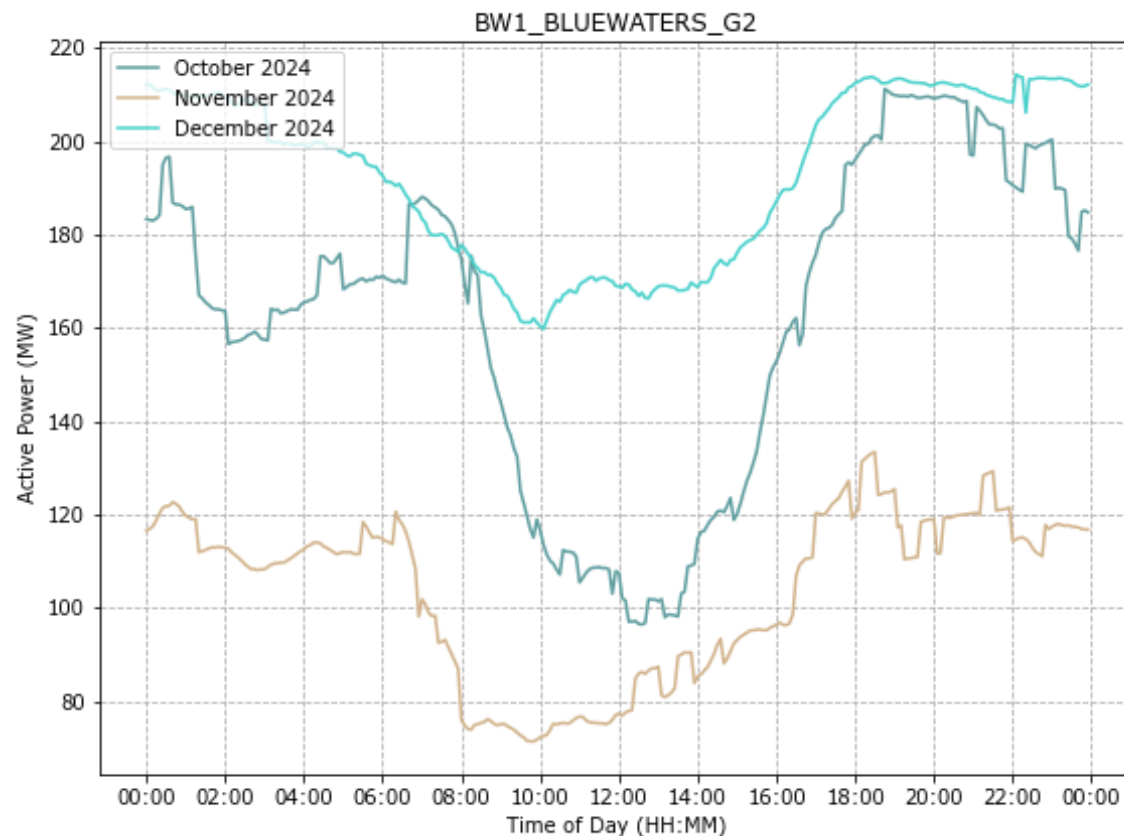
Bluewaters Power Station BW1-G2

Coal-fired Scheduled Facility, 217 MW, Summit Southern Cross Power

Generation Duration Curves



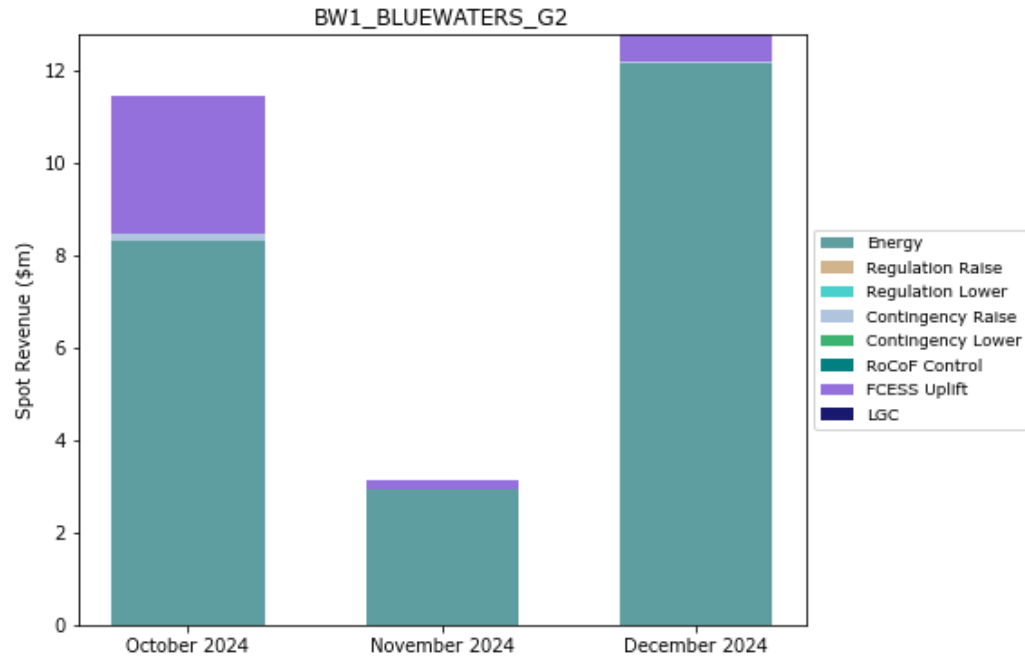
Average Time-of-Day Output



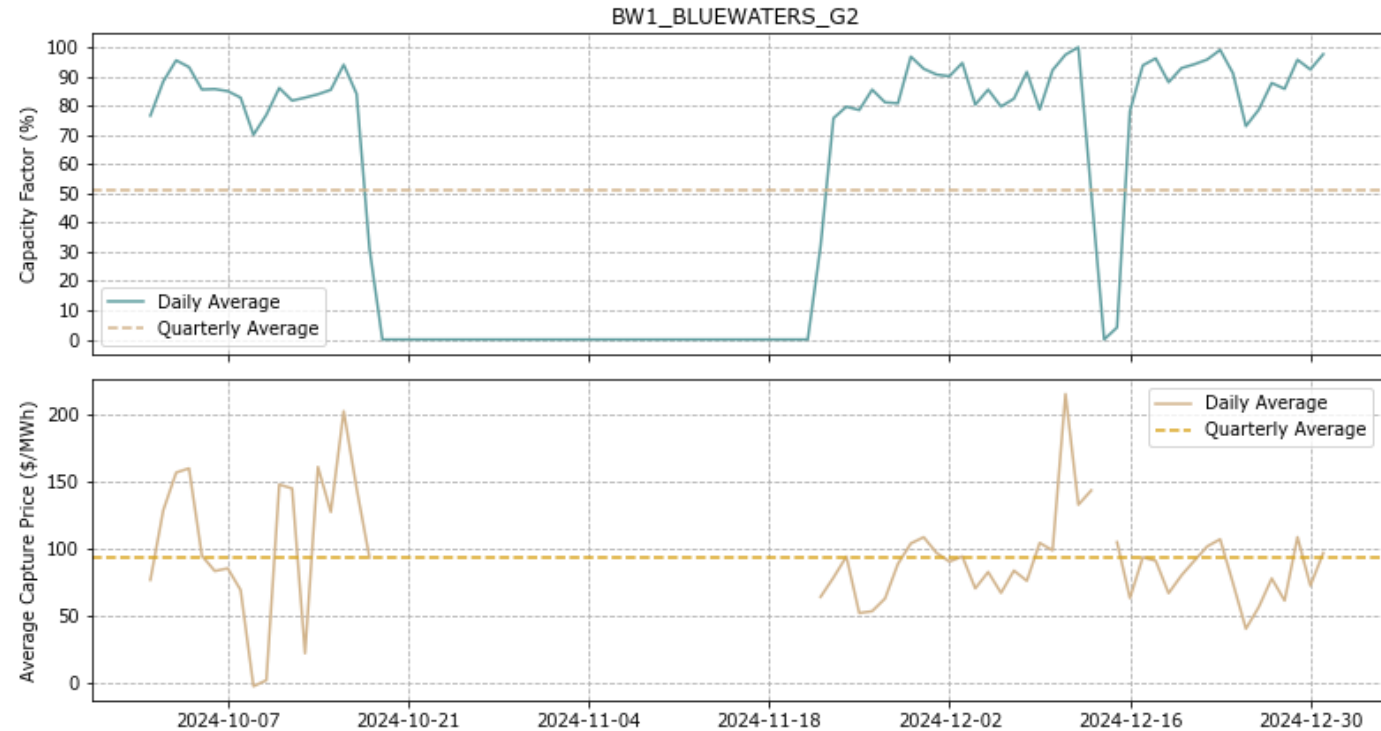
Bluewaters Power Station BW1-G2

Coal-fired Scheduled Facility, 217 MW, Summit Southern Cross Power

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

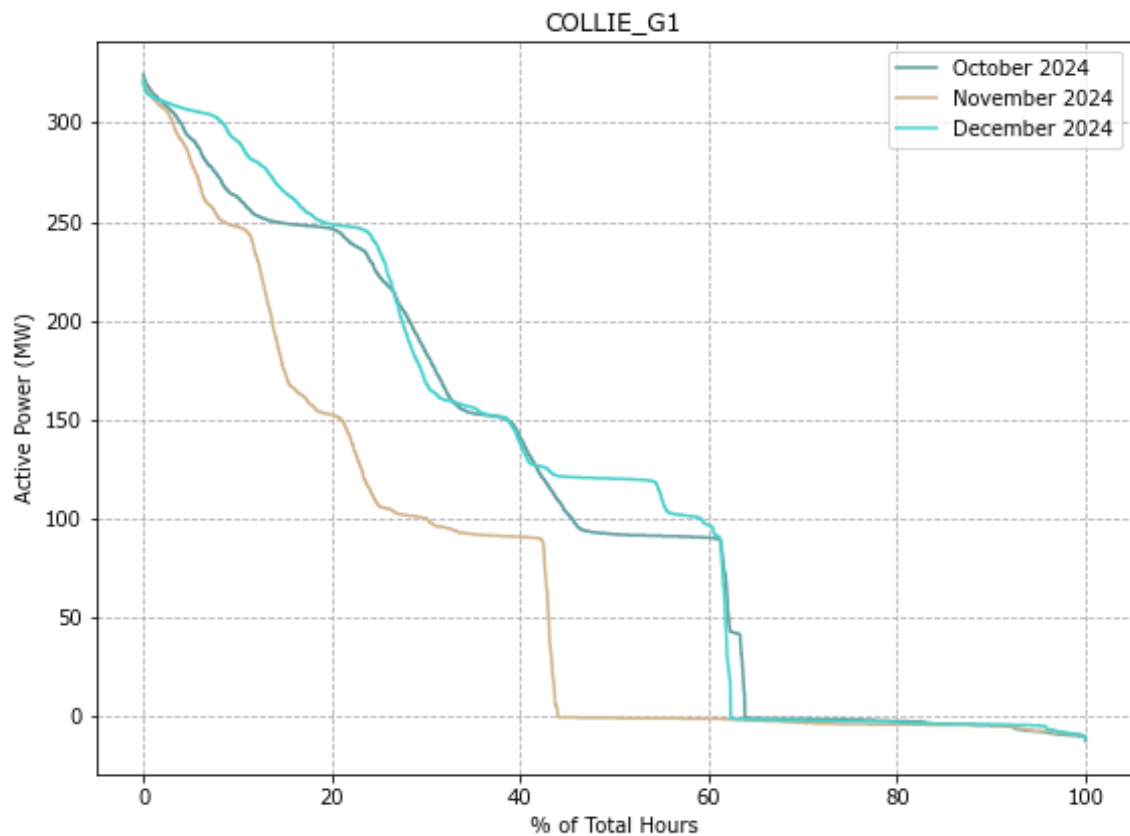


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	76.47	36.59	133.17
Total Spot Revenue (\$m)	11.44	3.15	12.79
\$ / MWh	\$149.56	\$86.09	\$96.03

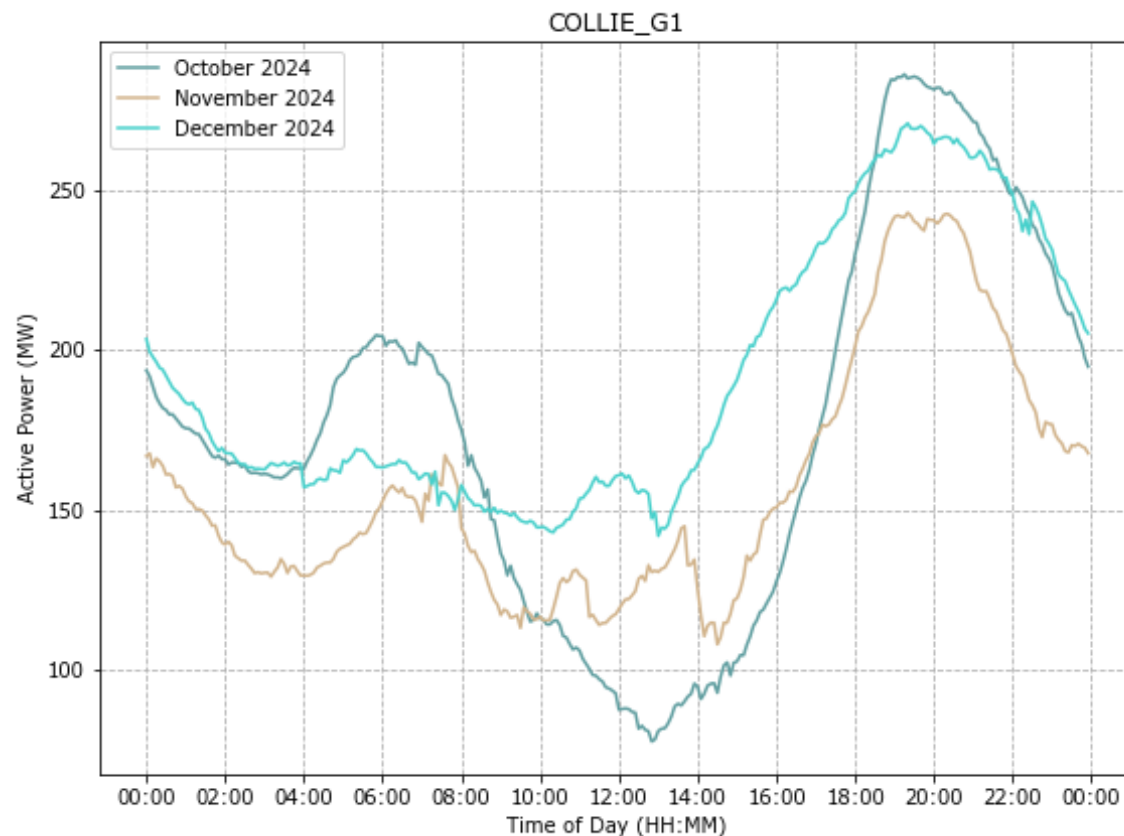
Collie Power Station G1

Coal-fired Scheduled Facility, 318.3 MW, Synergy

Generation Duration Curves



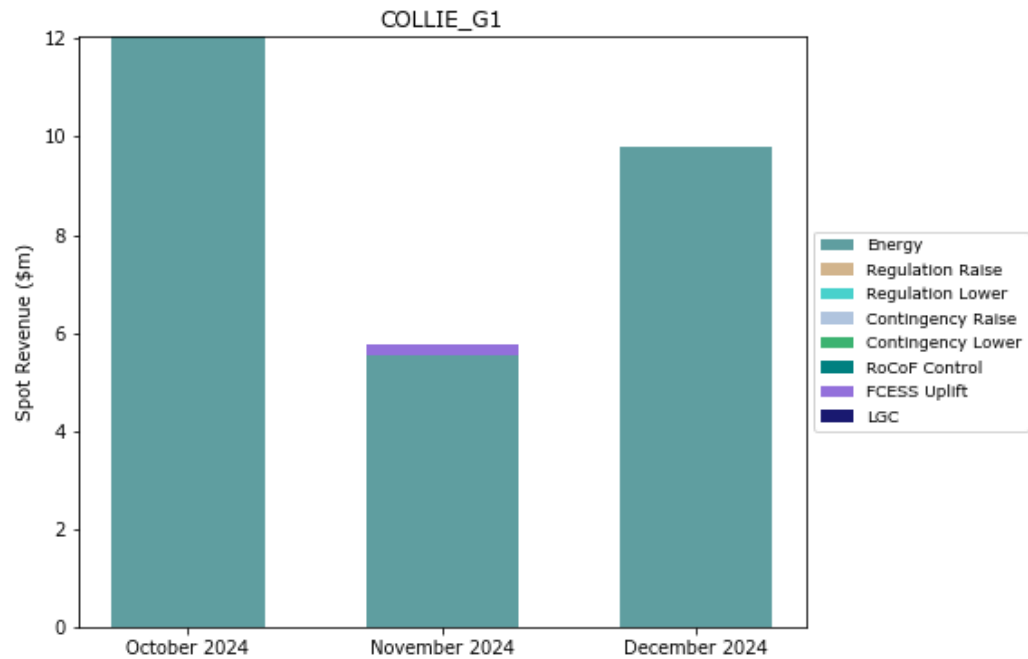
Average Time-of-Day Output



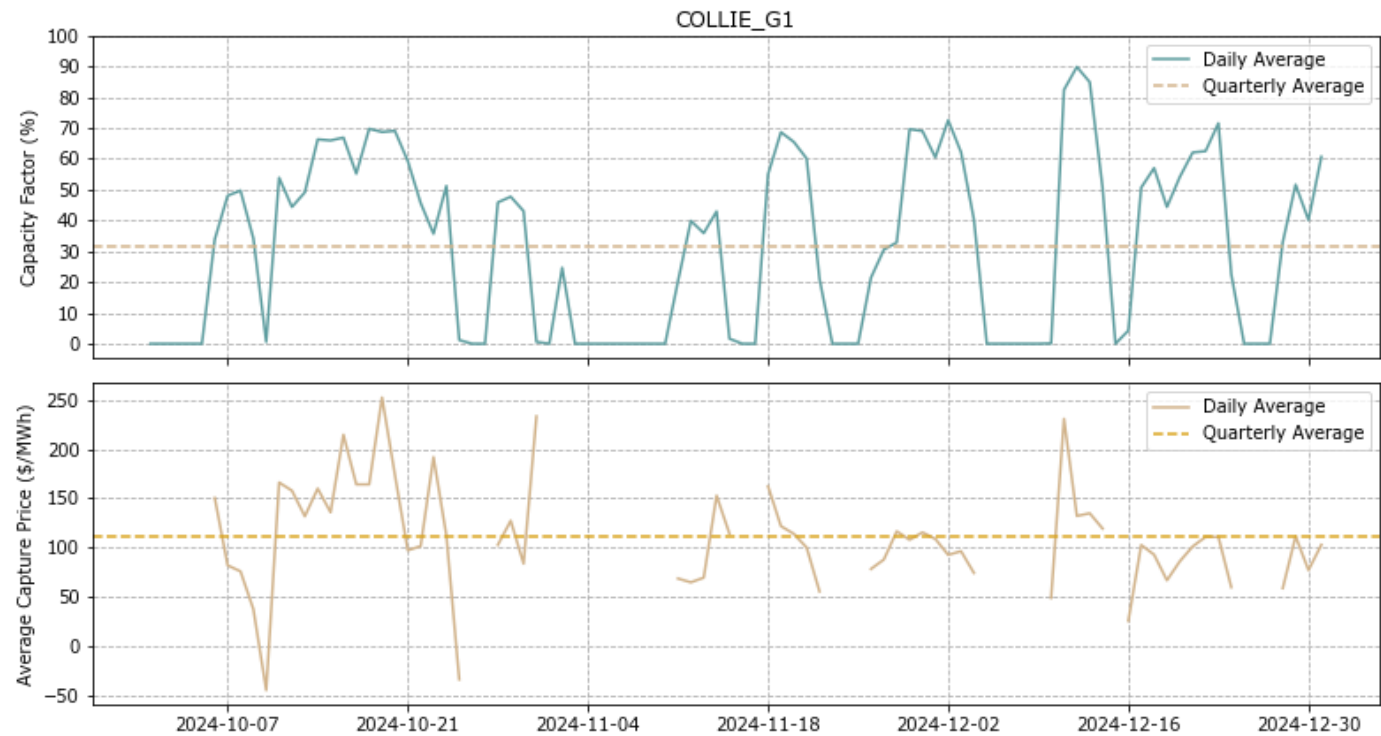
Collie Power Station G1

Coal-fired Scheduled Facility, 318.3 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

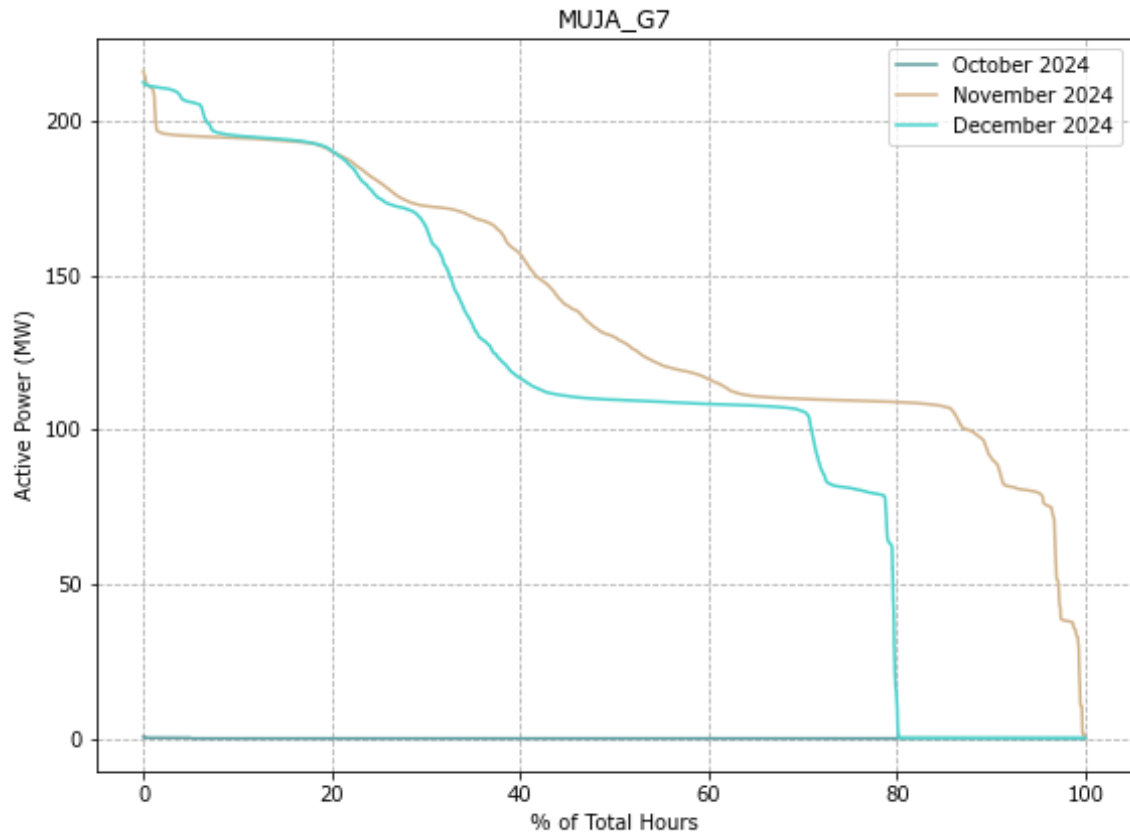


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	84.55	50.43	88.50
Total Spot Revenue (\$m)	12.05	5.75	9.80
\$ / MWh	\$142.57	\$114.09	\$110.77

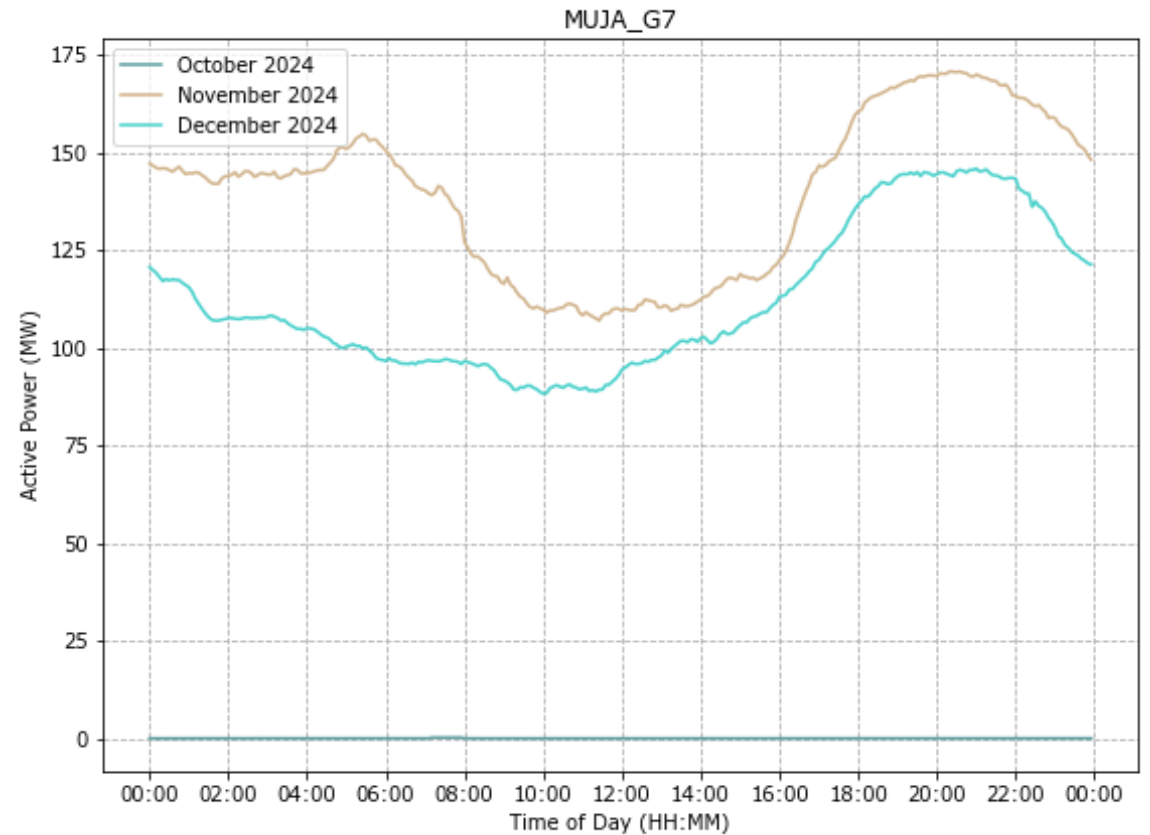
Muja Power Station G7

Coal-fired Scheduled Facility, 212.6 MW, Synergy

Generation Duration Curves



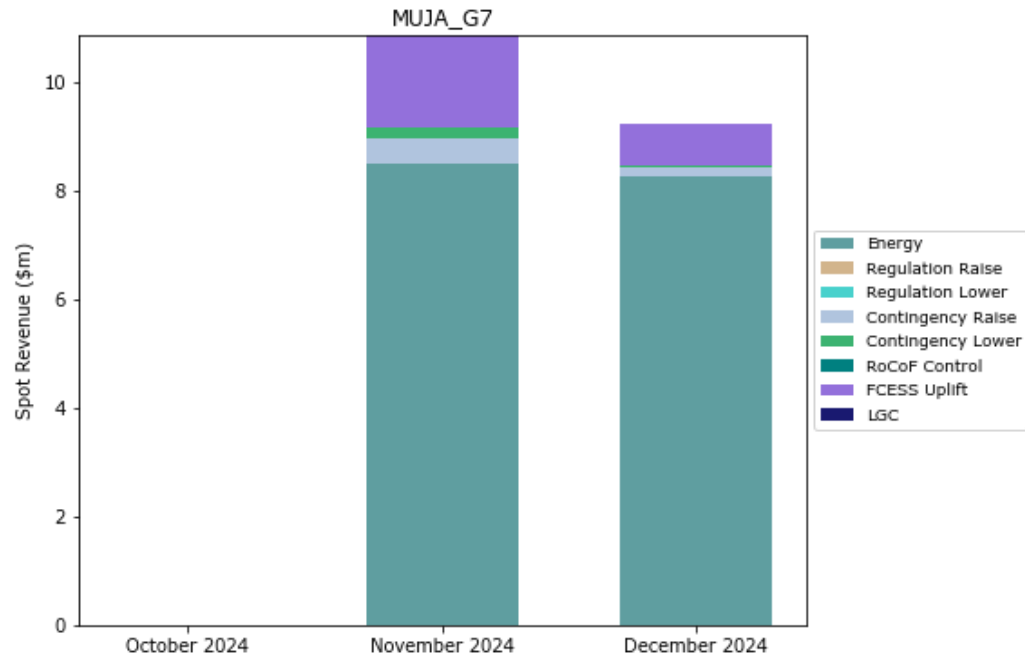
Average Time-of-Day Output



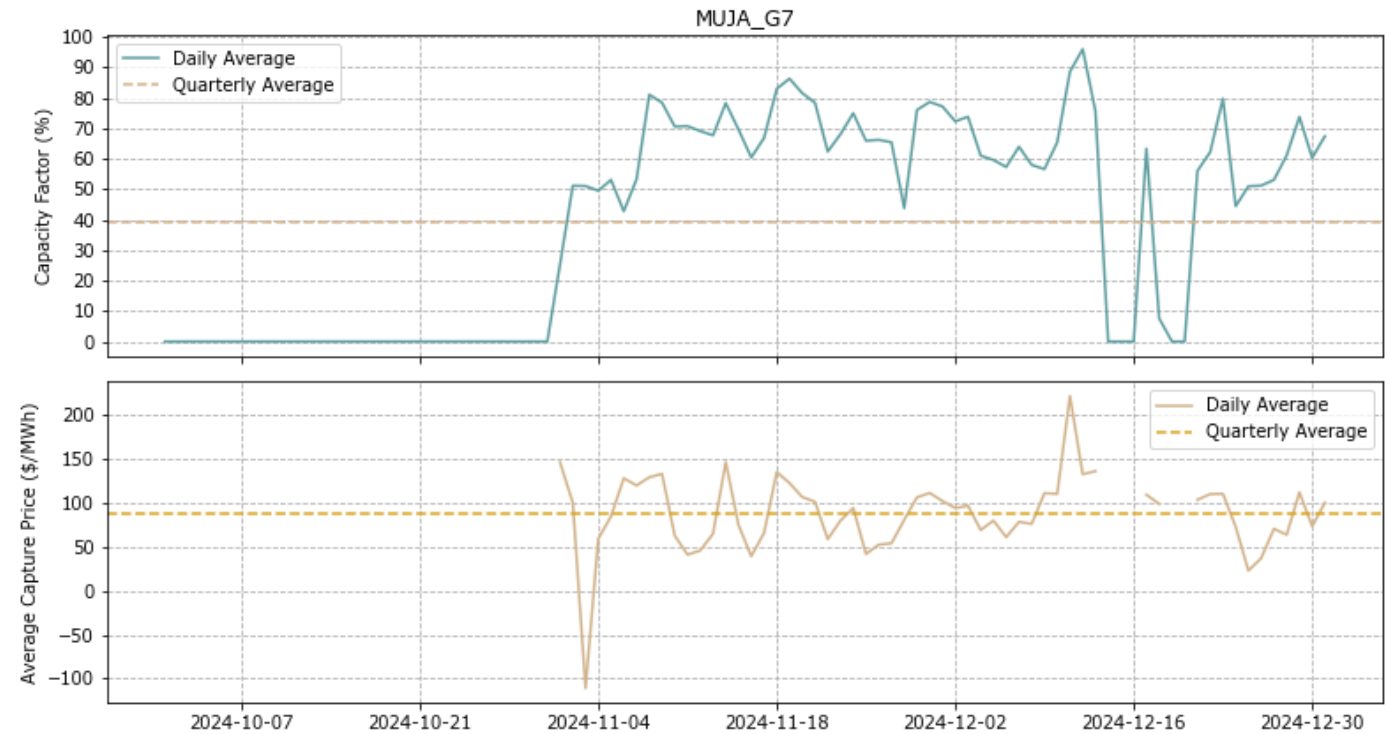
Muja Power Station G7

Coal-fired Scheduled Facility, 212.6 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

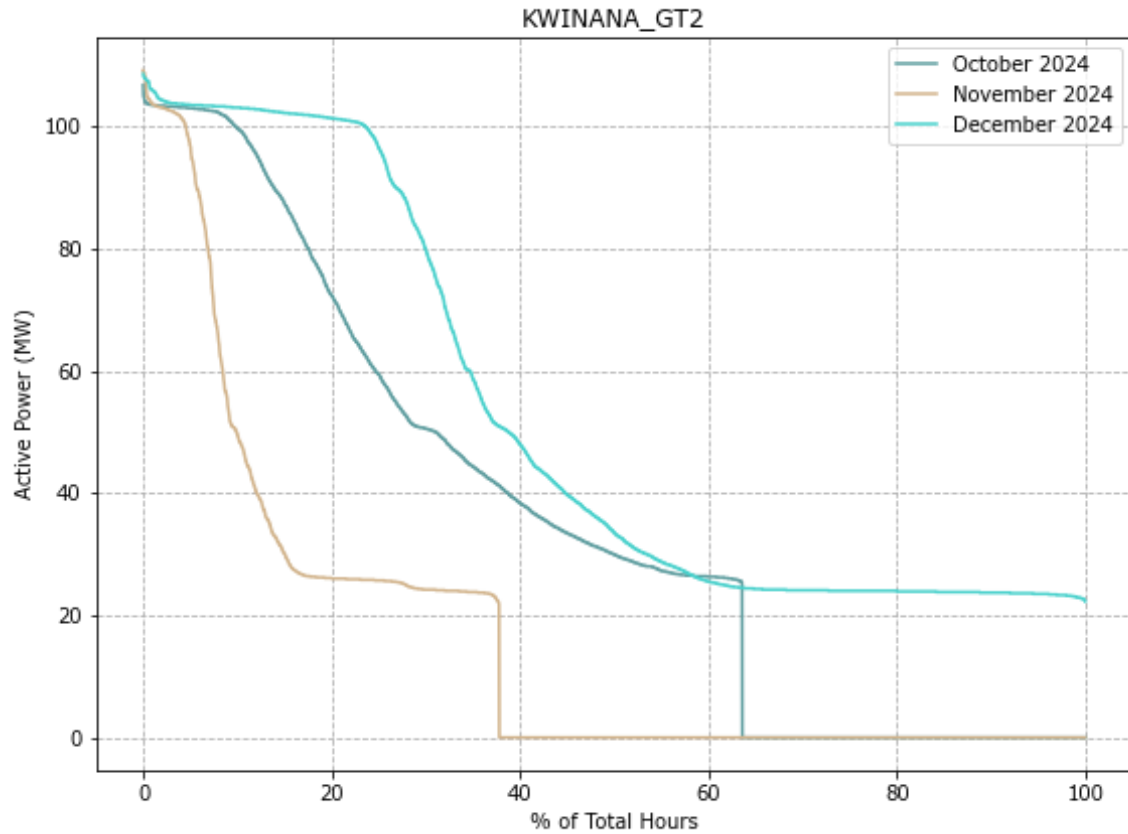


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	0.00	100.40	83.42
Total Spot Revenue (\$m)	0.00	10.85	9.22
\$ / MWh	\$0.00	\$108.12	\$110.57

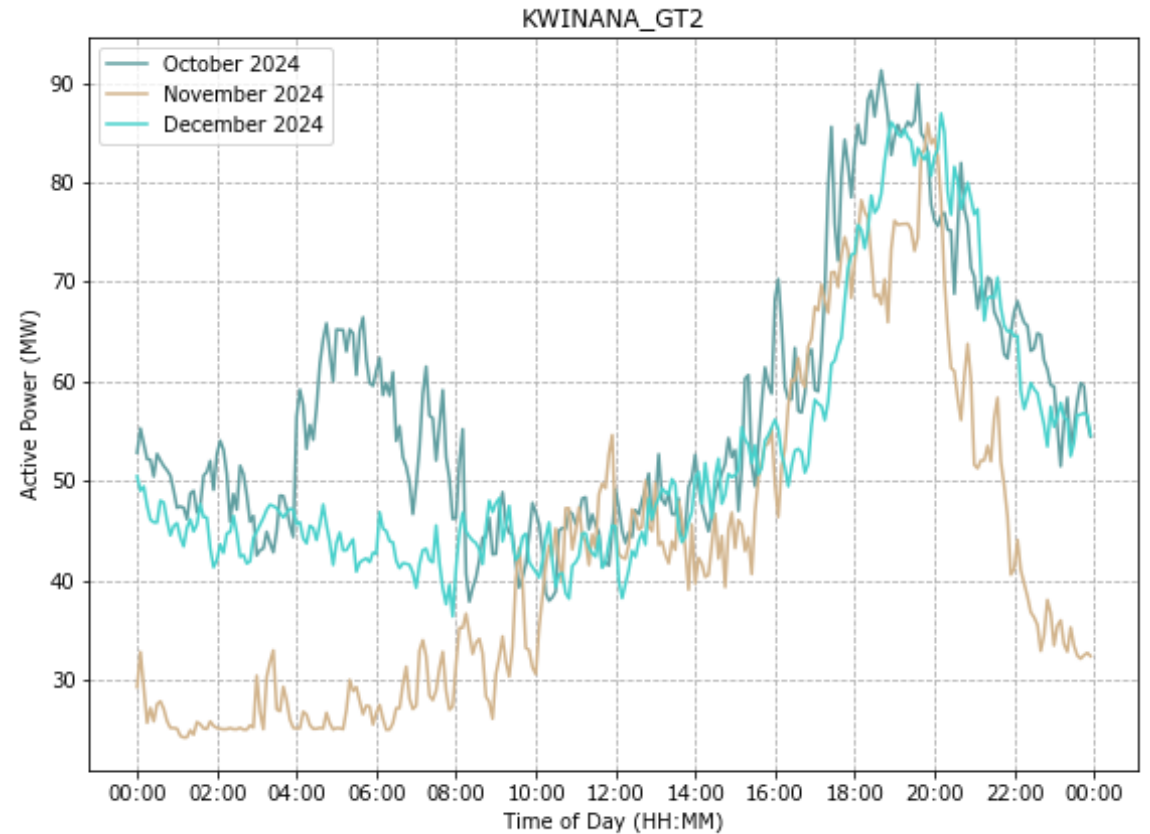
Kwinana Power Station GT2

Gas-fired Scheduled Facility, 103.94 MW, Synergy

Generation Duration Curves



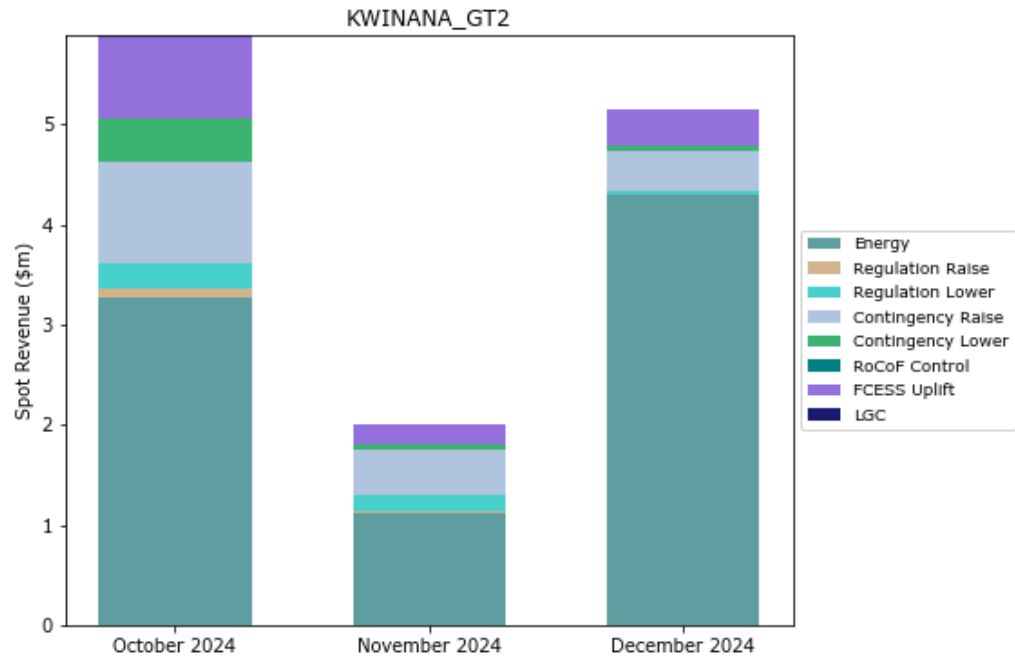
Average Time-of-Day Output



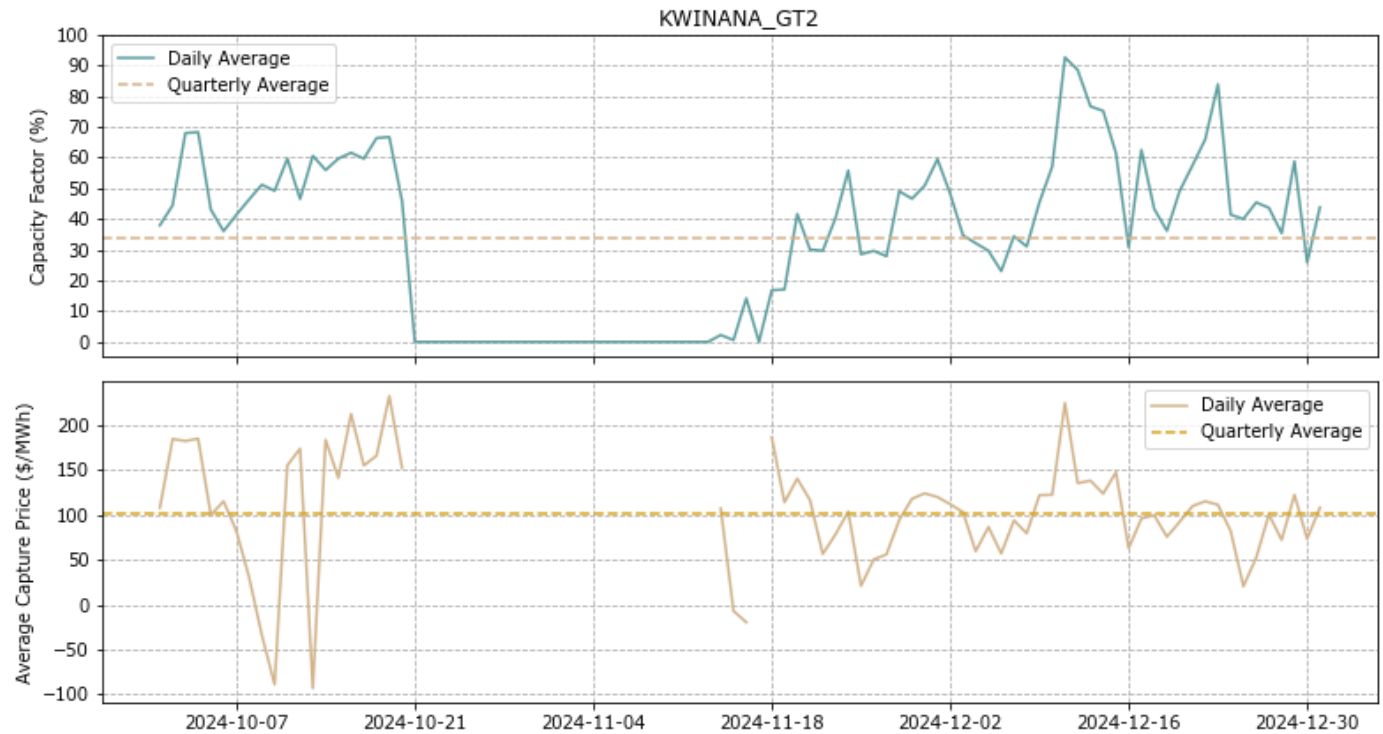
Kwinana Power Station GT2

Gas-fired Scheduled Facility, 103.94 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

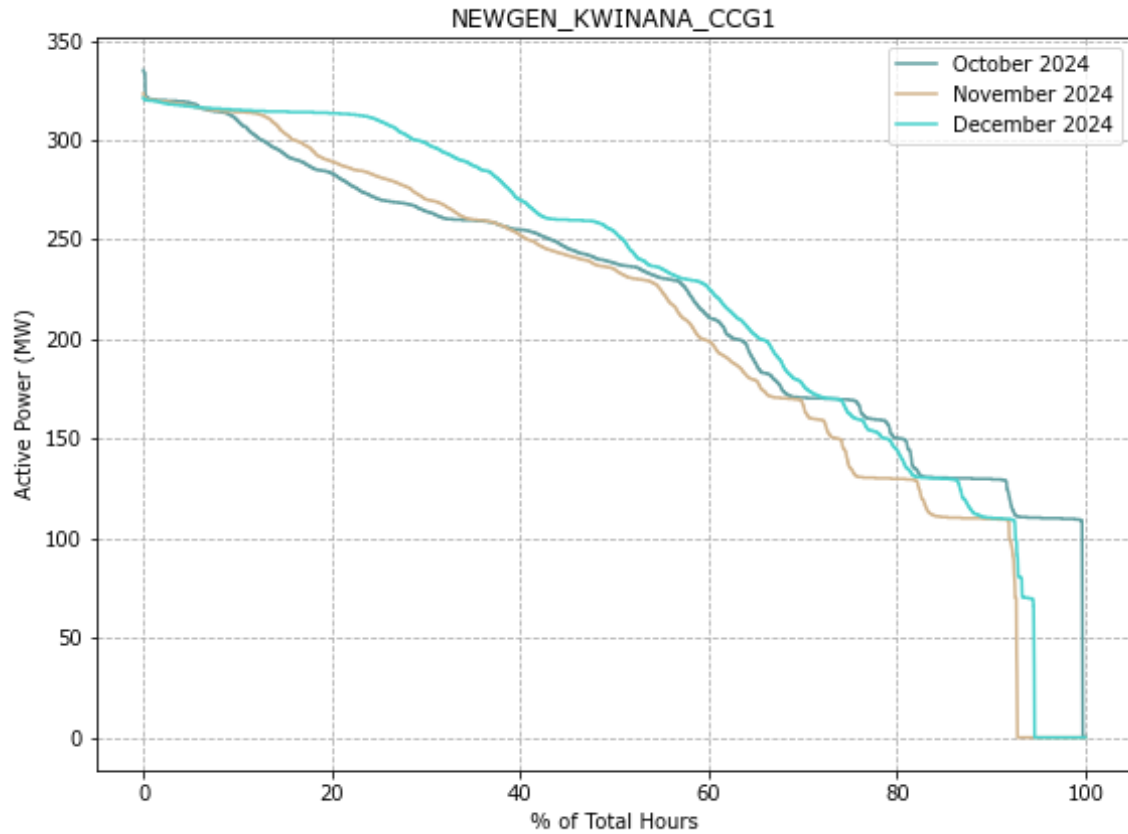


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	26.64	11.99	30.72
Total Spot Revenue (\$m)	5.89	2.00	5.14
\$ / MWh	\$221.14	\$167.14	\$132.80

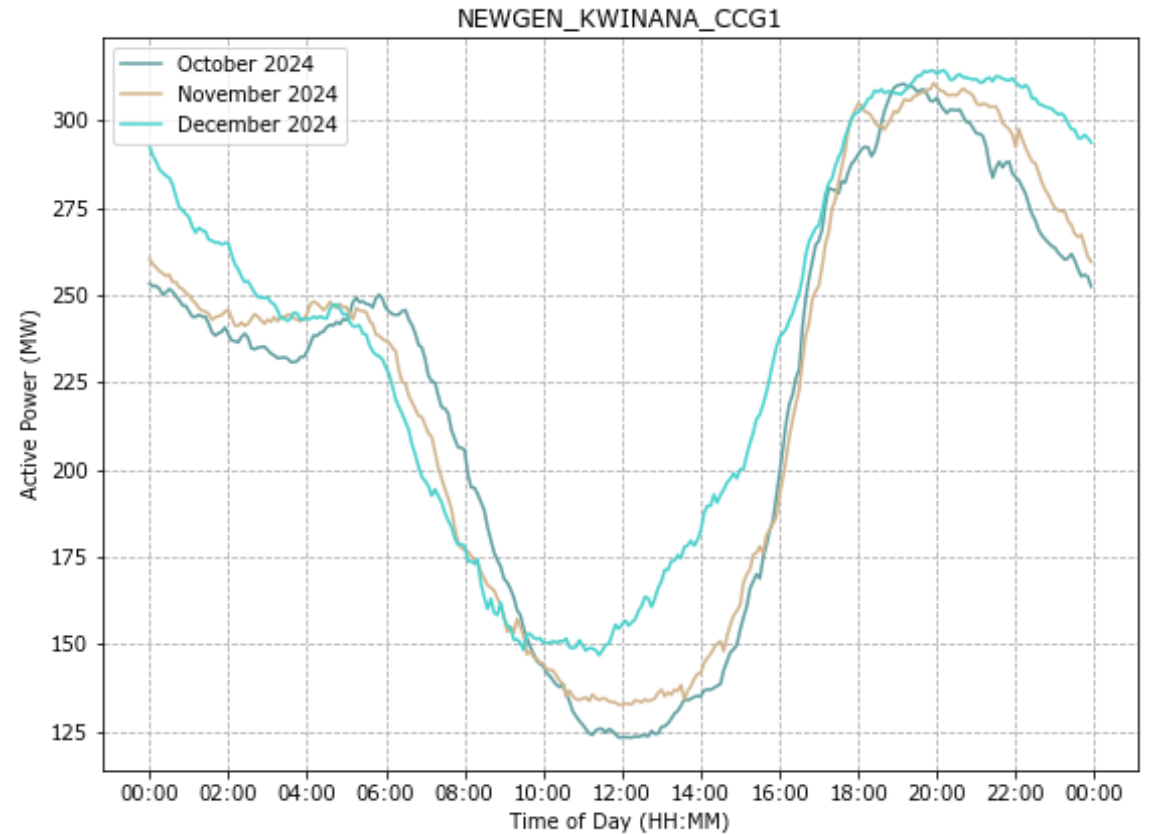
Newgen Kwinana Power Station

Gas-fired Scheduled Facility, 334.8 MW, Summit Southern Cross Power

Generation Duration Curves



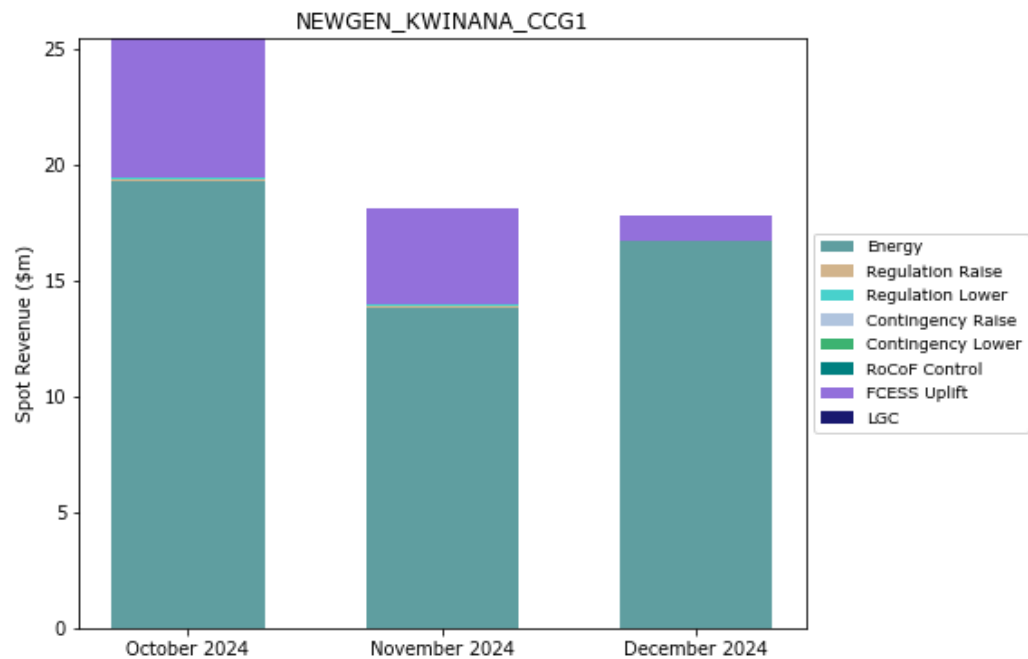
Average Time-of-Day Output



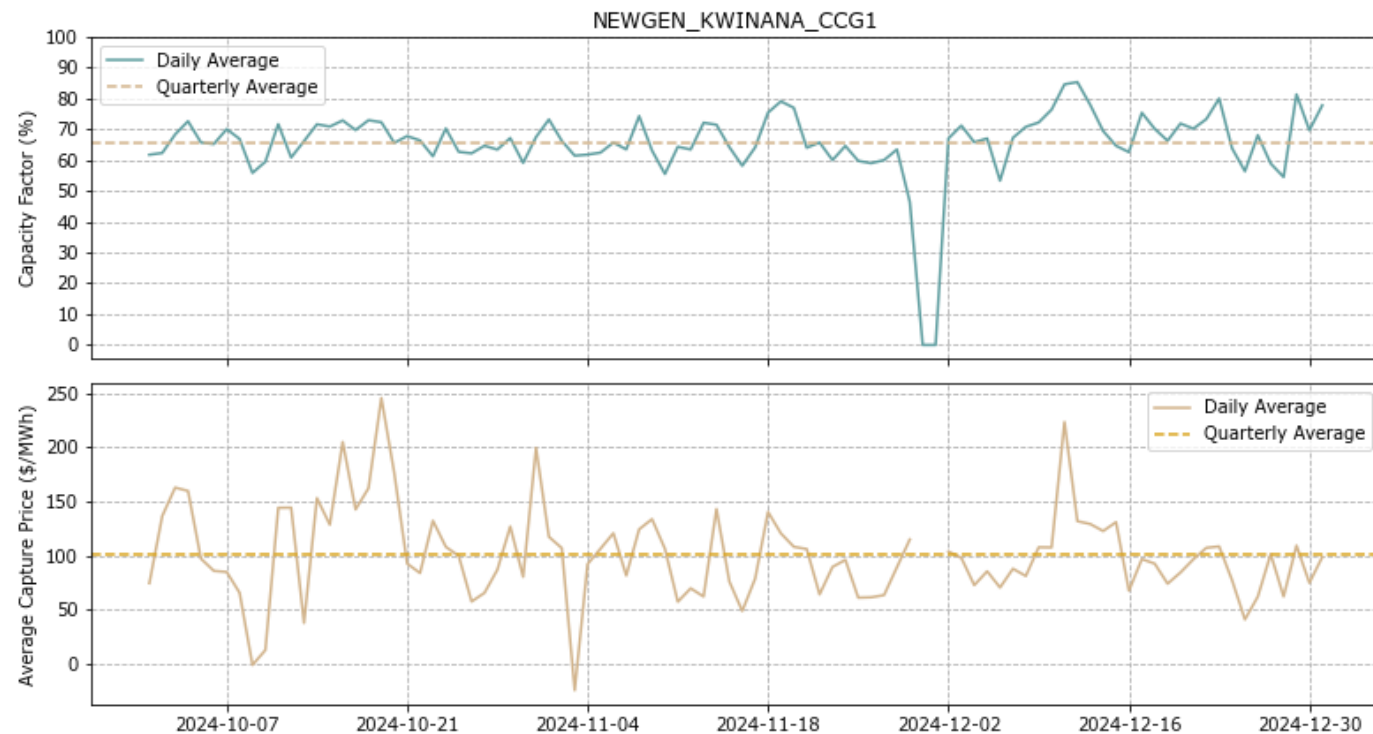
Newgen Kwinana Power Station

Gas-fired Scheduled Facility, 334.8 MW, Summit Southern Cross Power

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

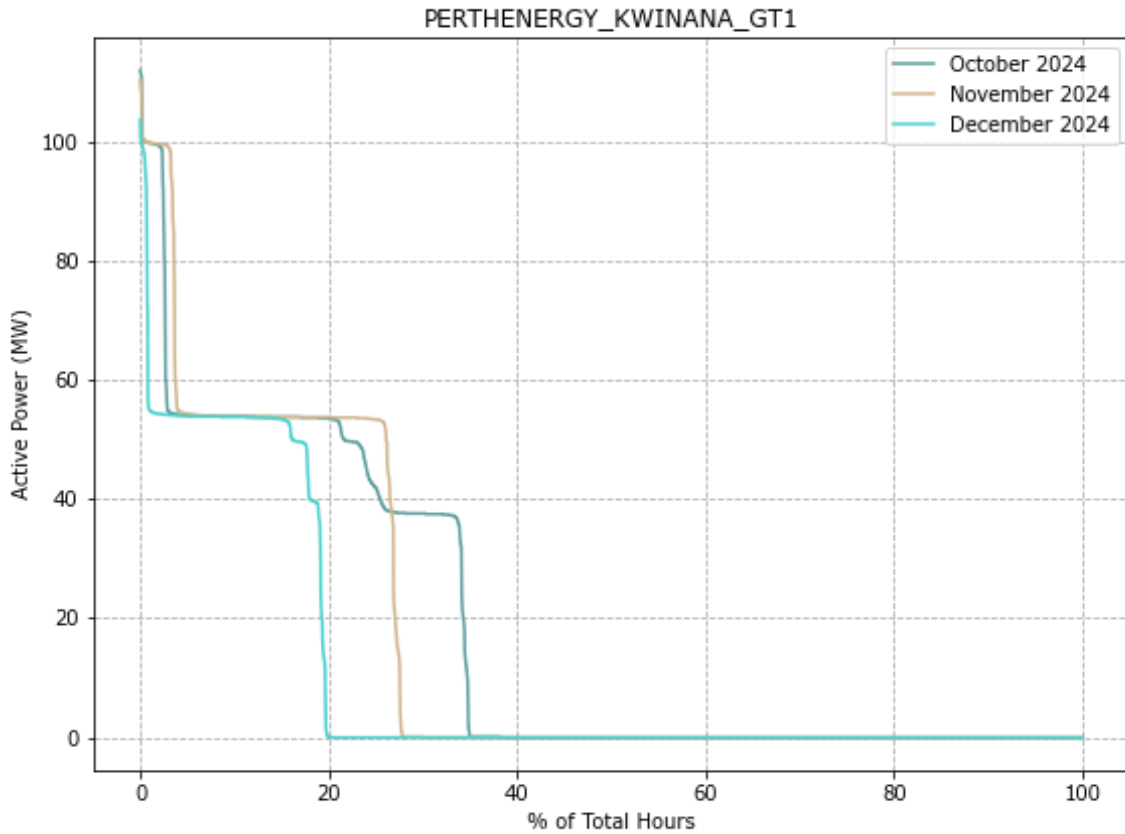


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	164.99	150.87	168.03
Total Spot Revenue (\$m)	25.48	18.09	17.77
\$ / MWh	\$154.42	\$119.92	\$105.76

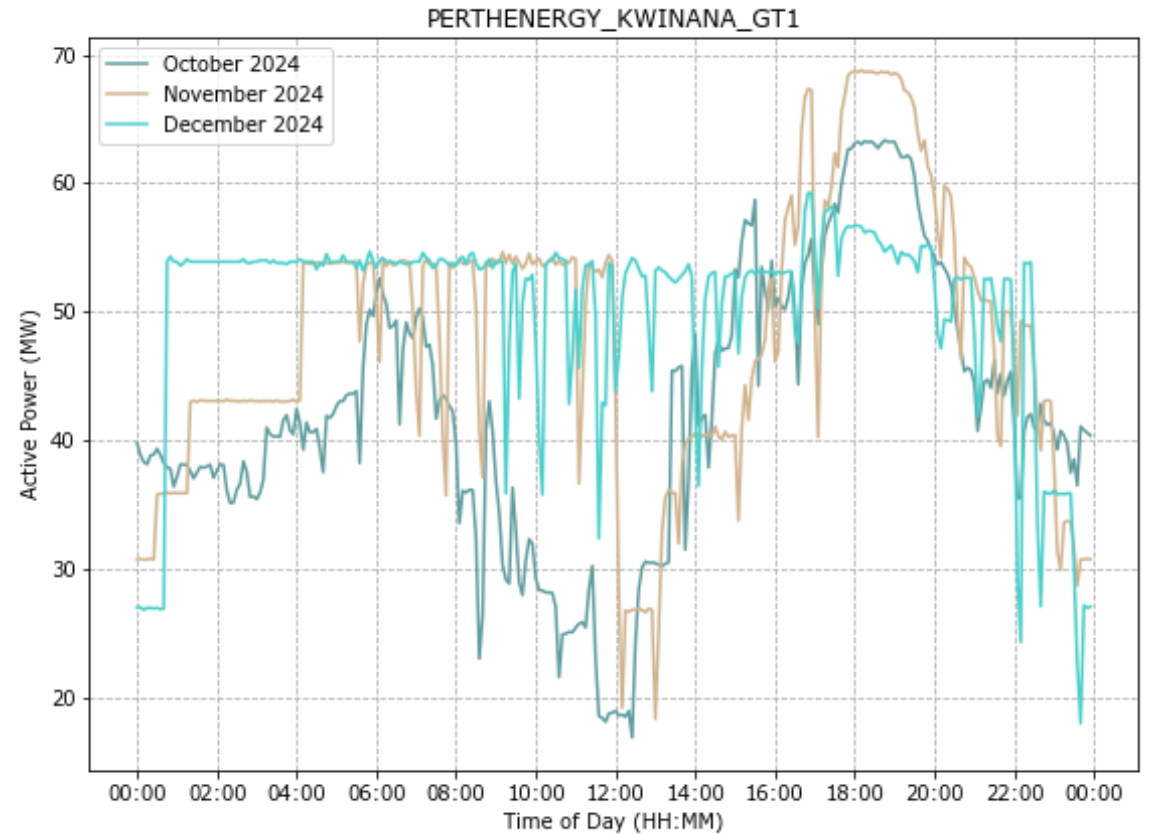
Kwinana Swift Power Station

Gas-fired Scheduled Facility, 109 MW, AGL (Perth Energy)

Generation Duration Curves



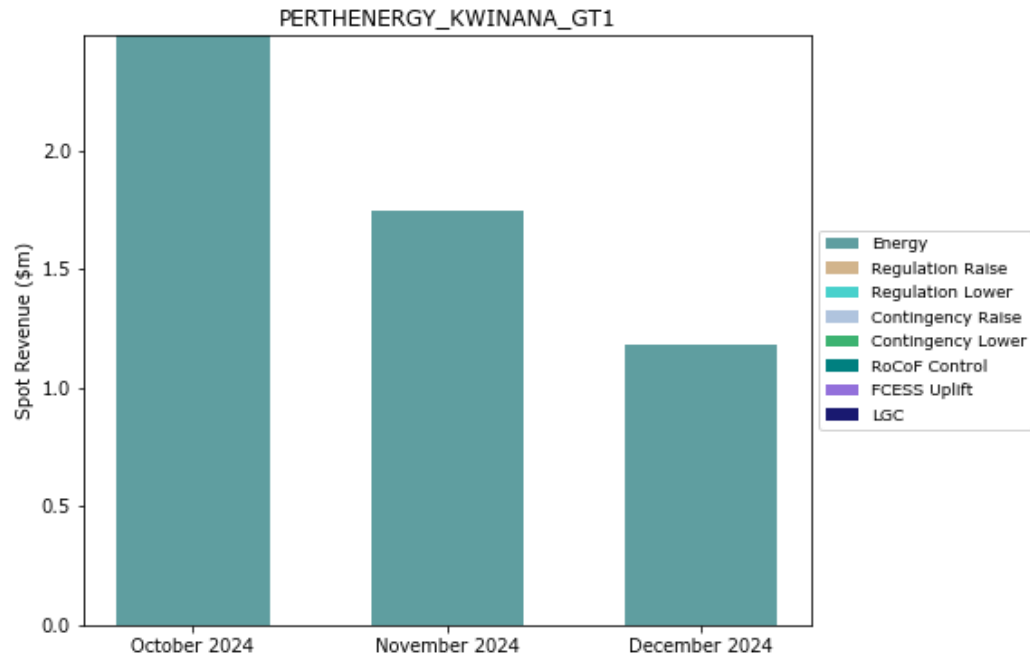
Average Time-of-Day Output



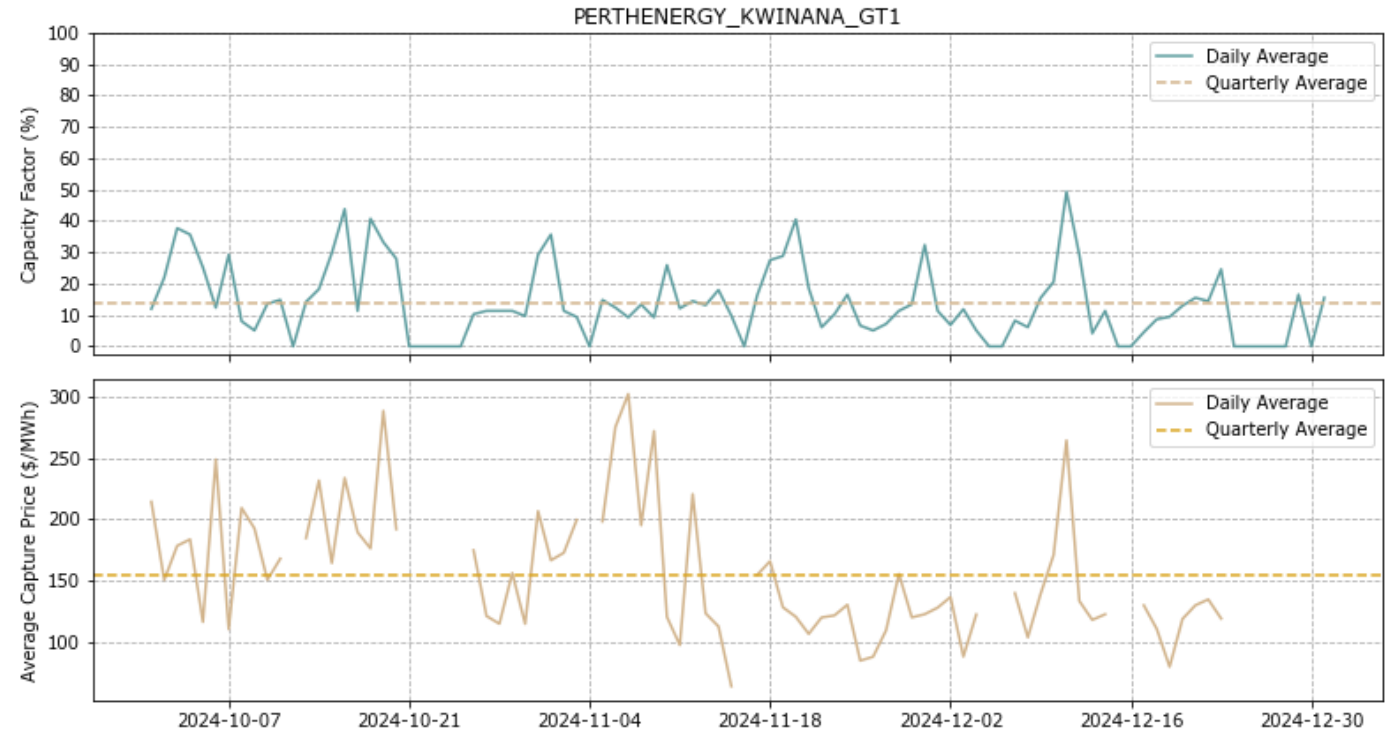
Kwinana Swift Power Station

Gas-fired Scheduled Facility, 109 MW, AGL (Perth Energy)

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

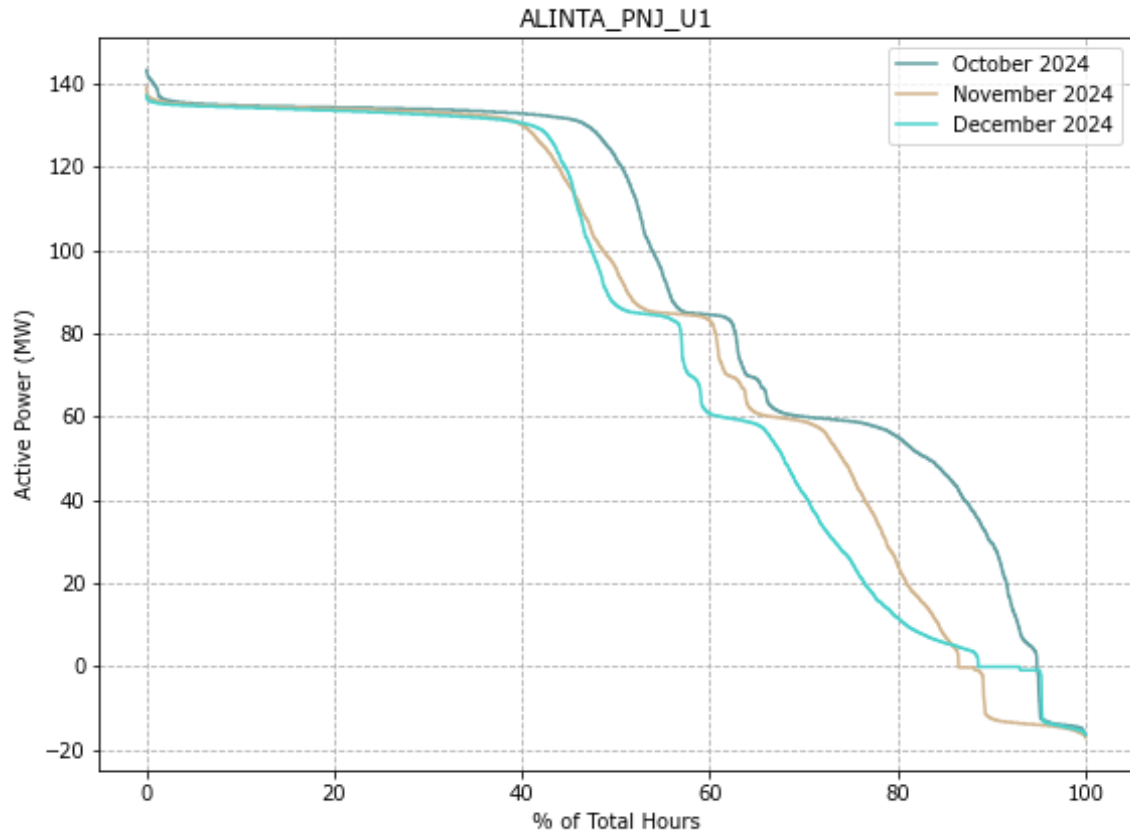


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	13.54	11.74	7.88
Total Spot Revenue (\$m)	2.49	1.75	1.18
\$ / MWh	\$183.90	\$148.62	\$150.28

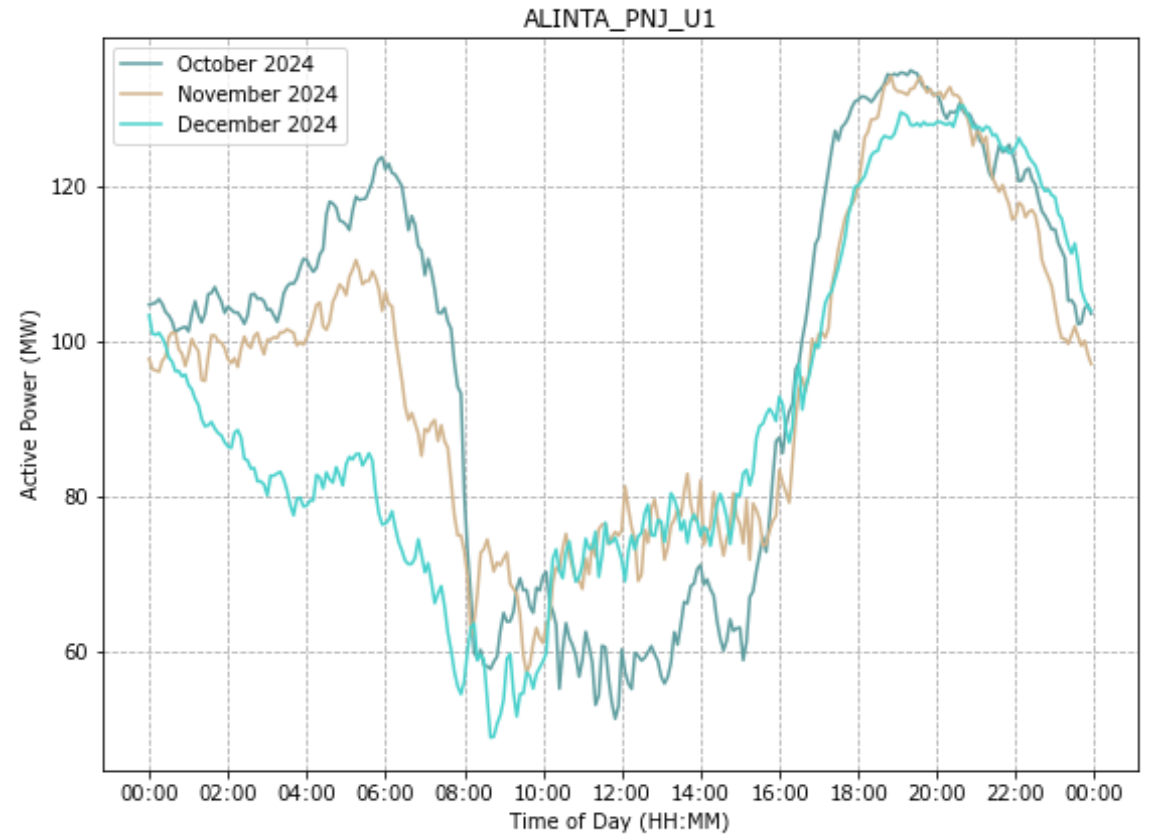
Pinjarra Power Station U1

Gas-fired Scheduled Facility, 143 MW, Alinta Energy

Generation Duration Curves



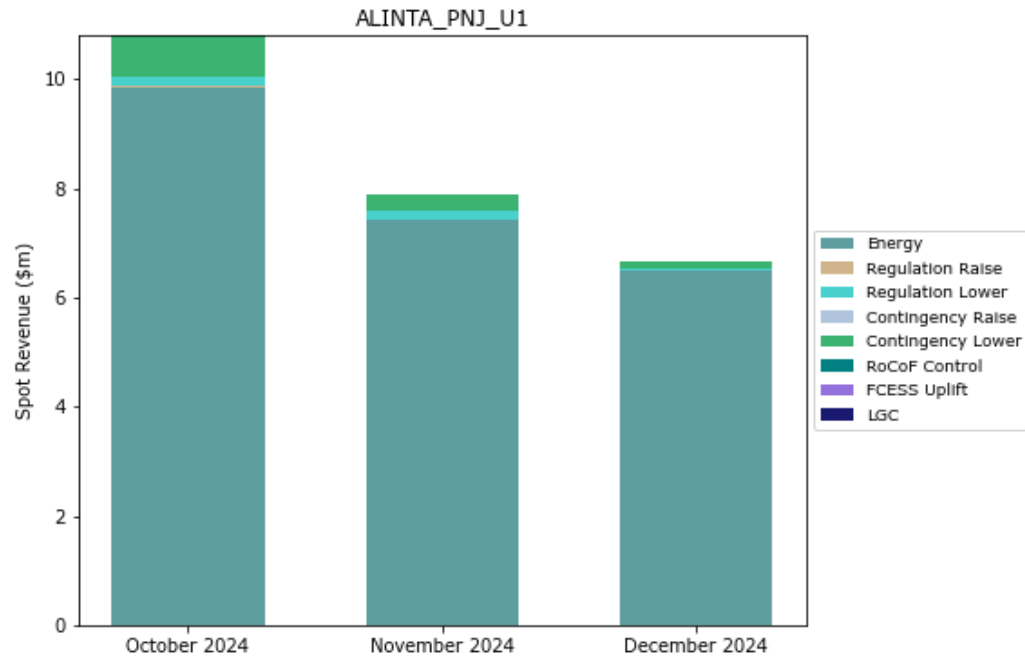
Average Time-of-Day Output



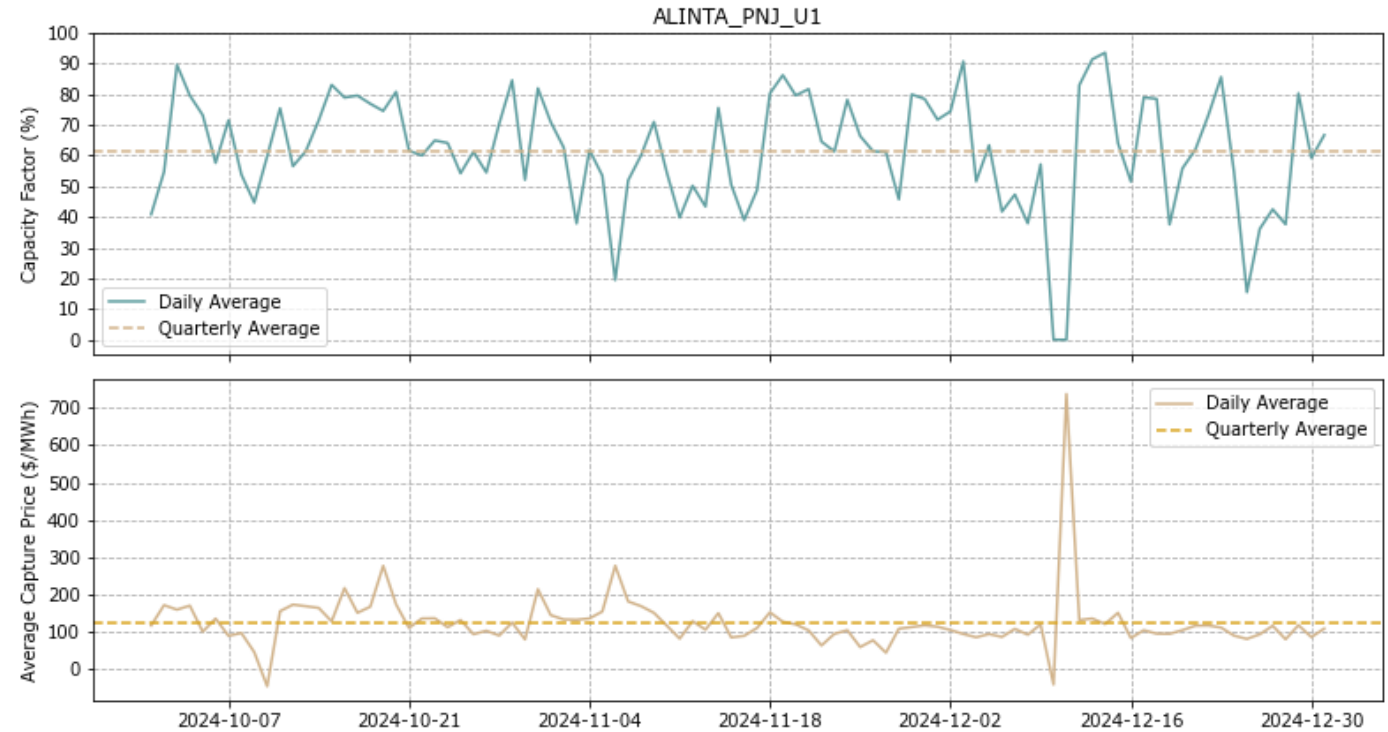
Pinjarra Power Station U1

Gas-fired Scheduled Facility, 143 MW, Alinta Energy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

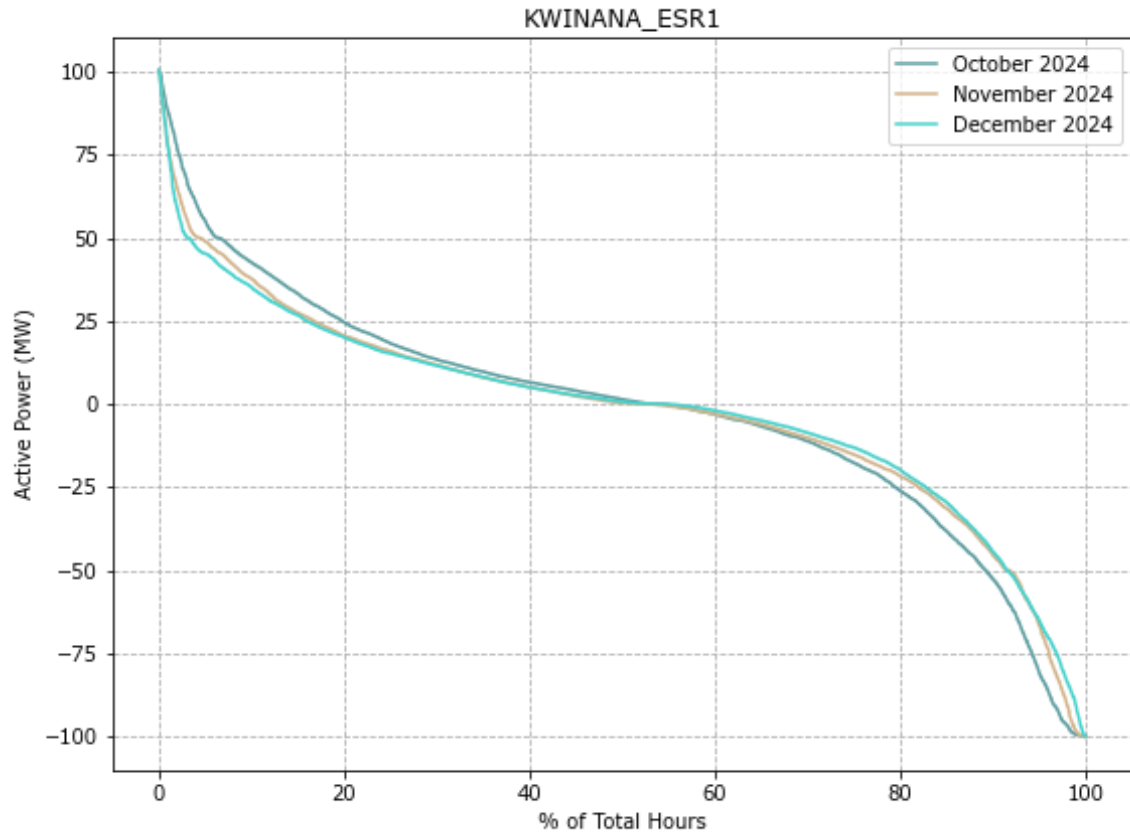


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	71.68	63.46	61.70
Total Spot Revenue (\$m)	10.81	7.89	6.65
\$ / MWh	\$150.78	\$124.68	\$107.77

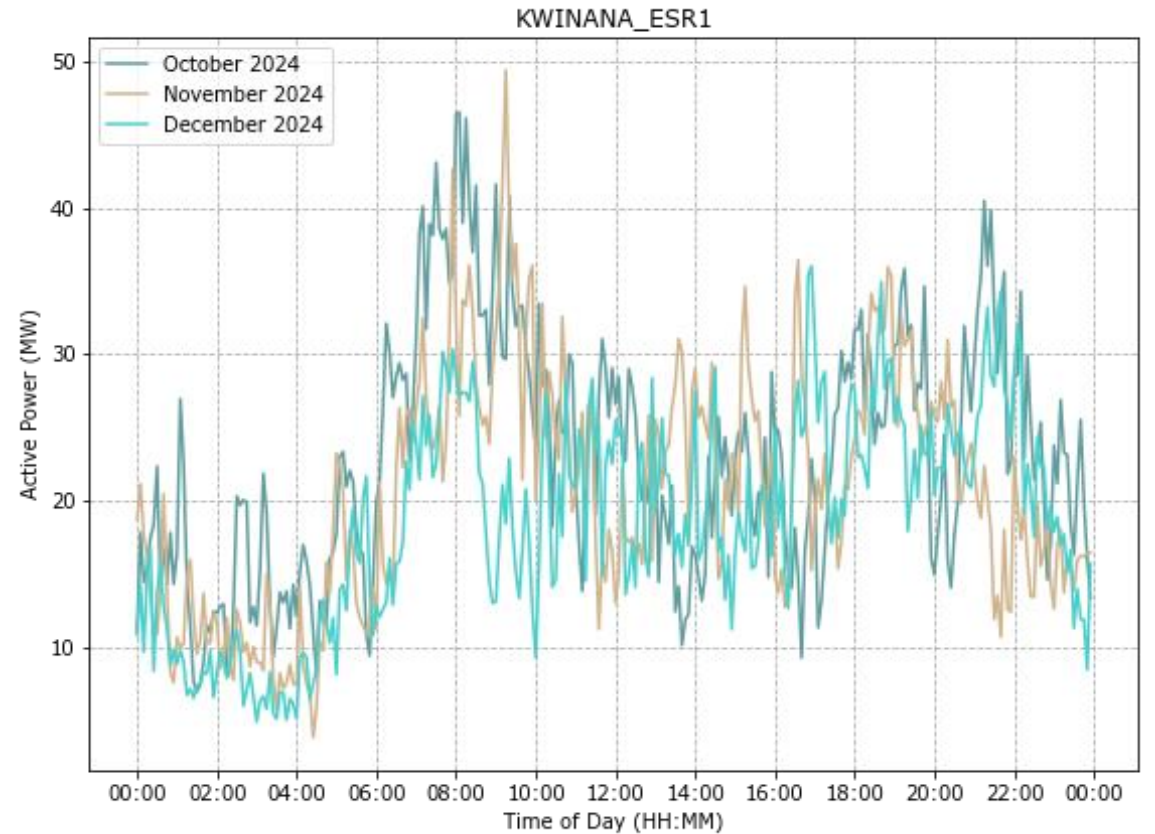
Kwinana BESS 1

Energy Storage Scheduled Facility, 100 MW, Synergy

Generation Duration Curves



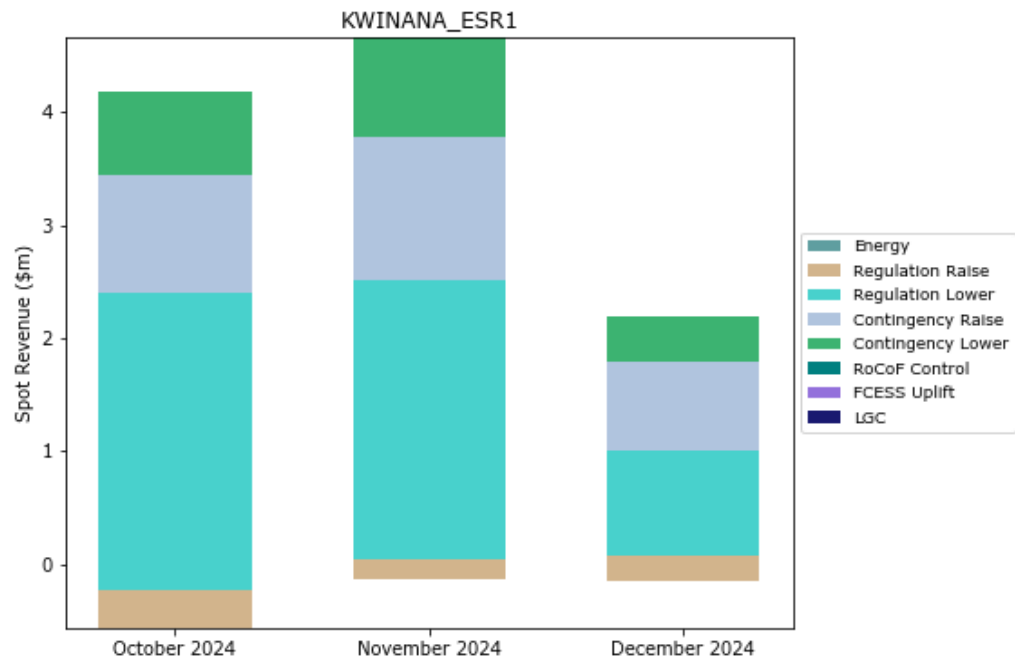
Average Time-of-Day Output



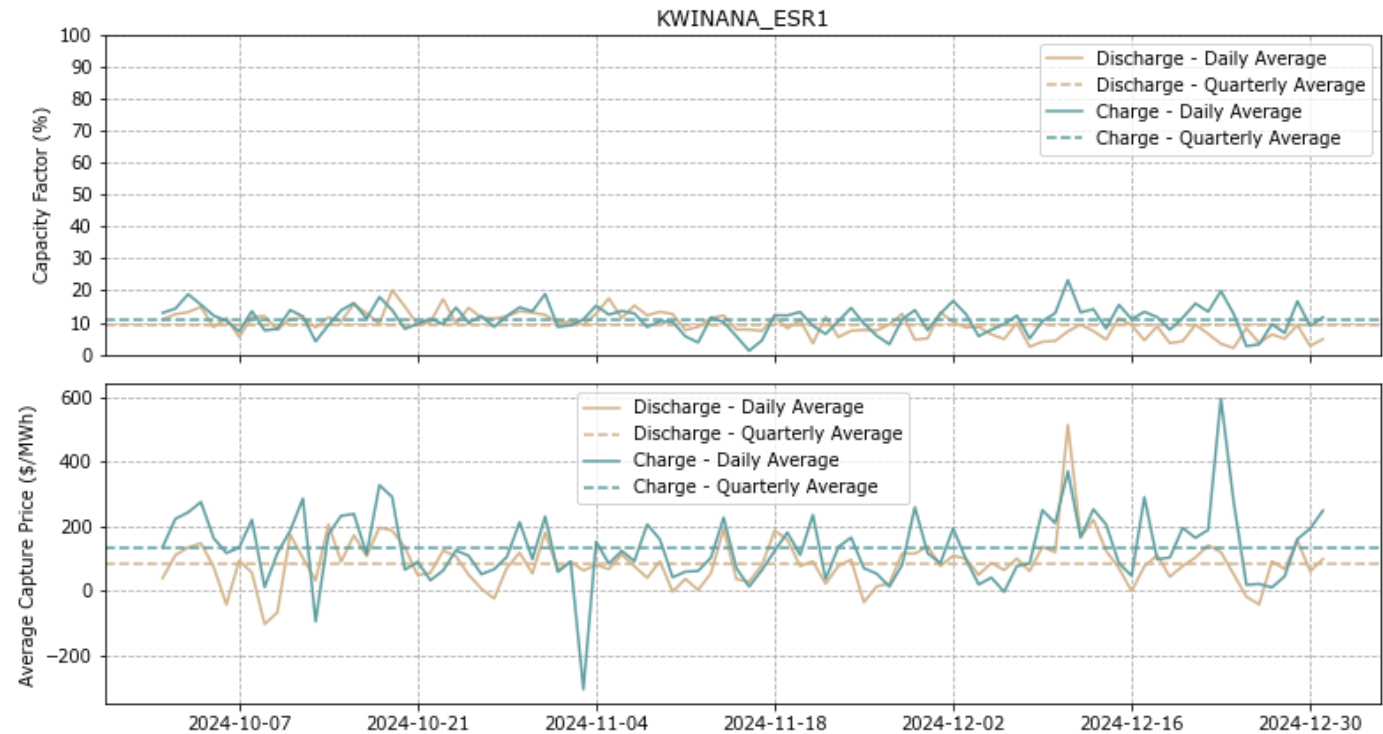
Kwinana BESS 1

Energy Storage Scheduled Facility, 100 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

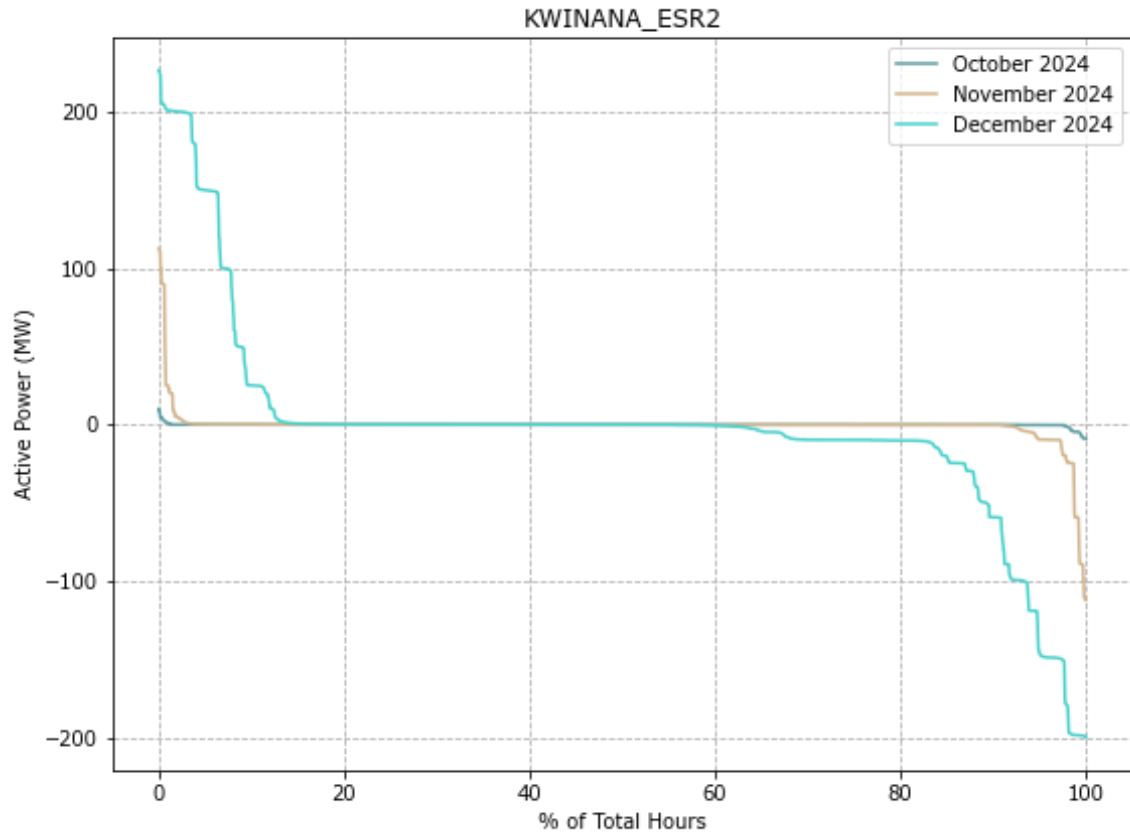


	Oct 2024	Nov 2024	Dec 2024
Total Spot Revenue (\$m)	4.18	4.66	2.19

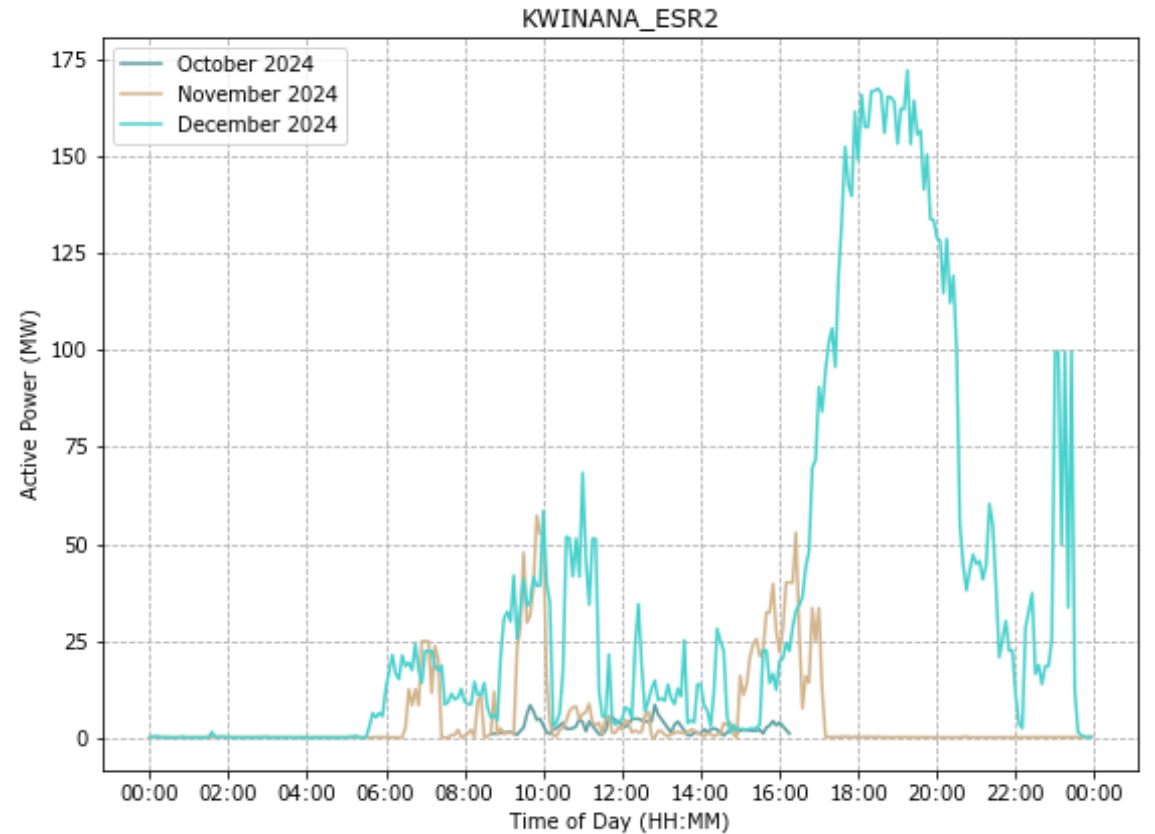
Kwinana BESS 2

Energy Storage Scheduled Facility, 225 MW, Synergy

Generation Duration Curves



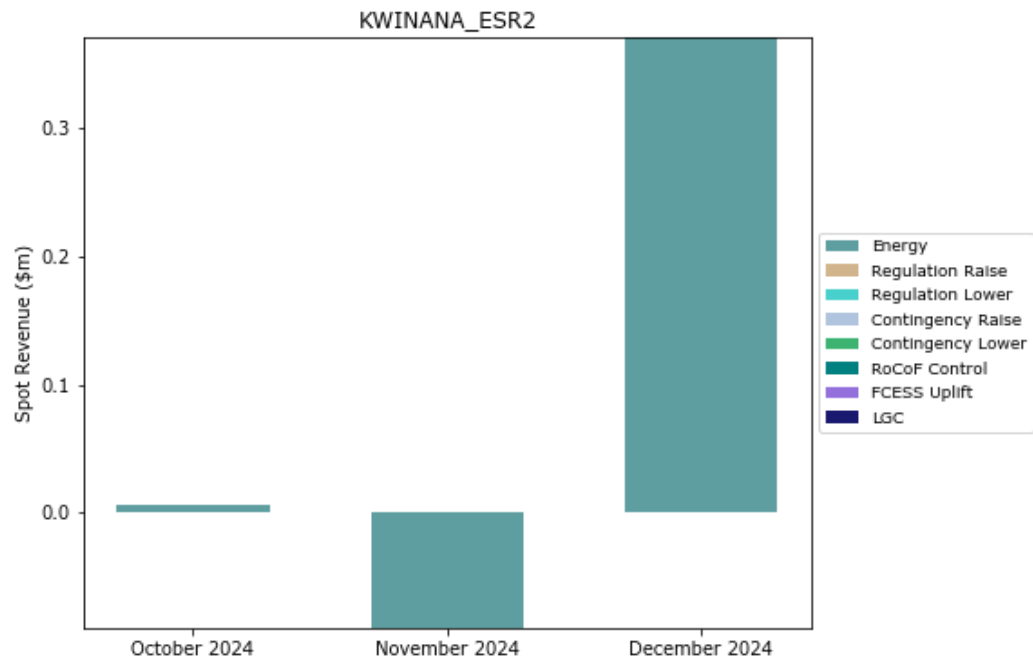
Average Time-of-Day Output



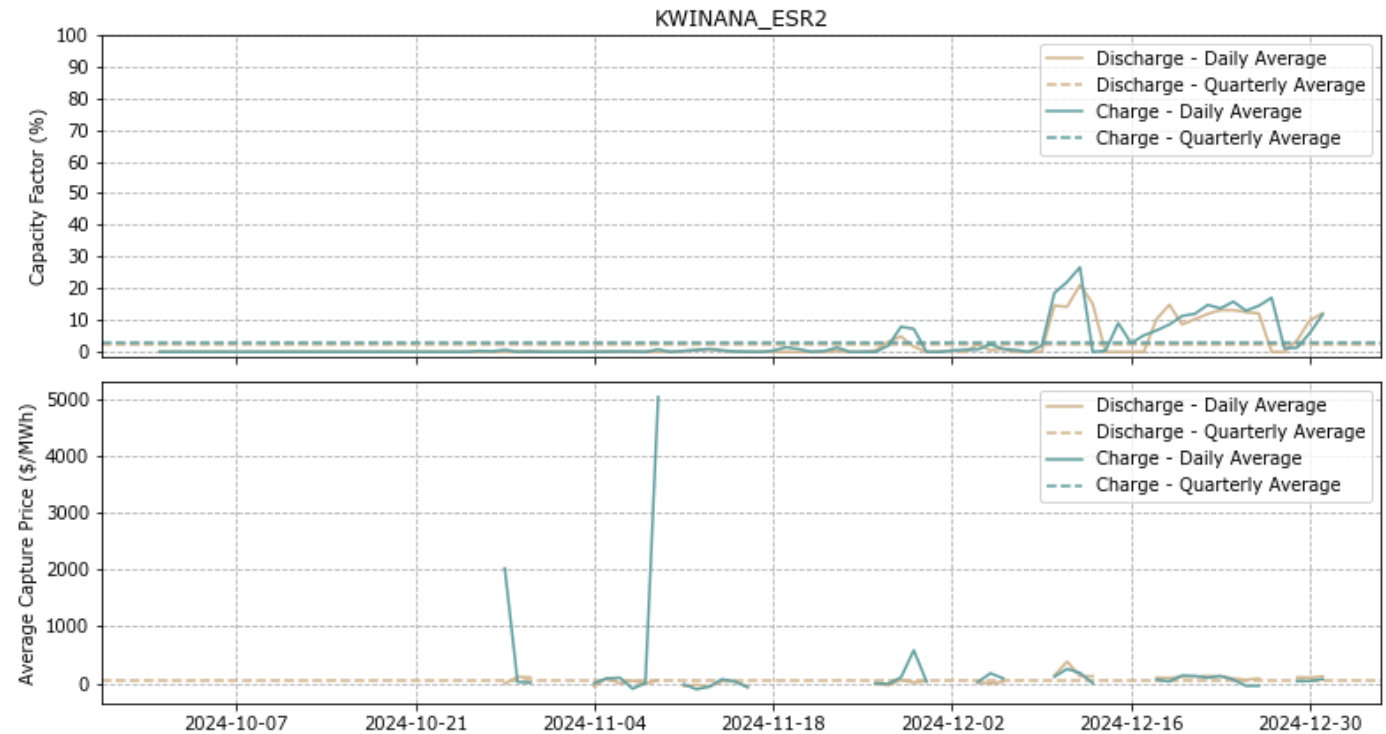
Kwinana BESS 2

Energy Storage Scheduled Facility, 225 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

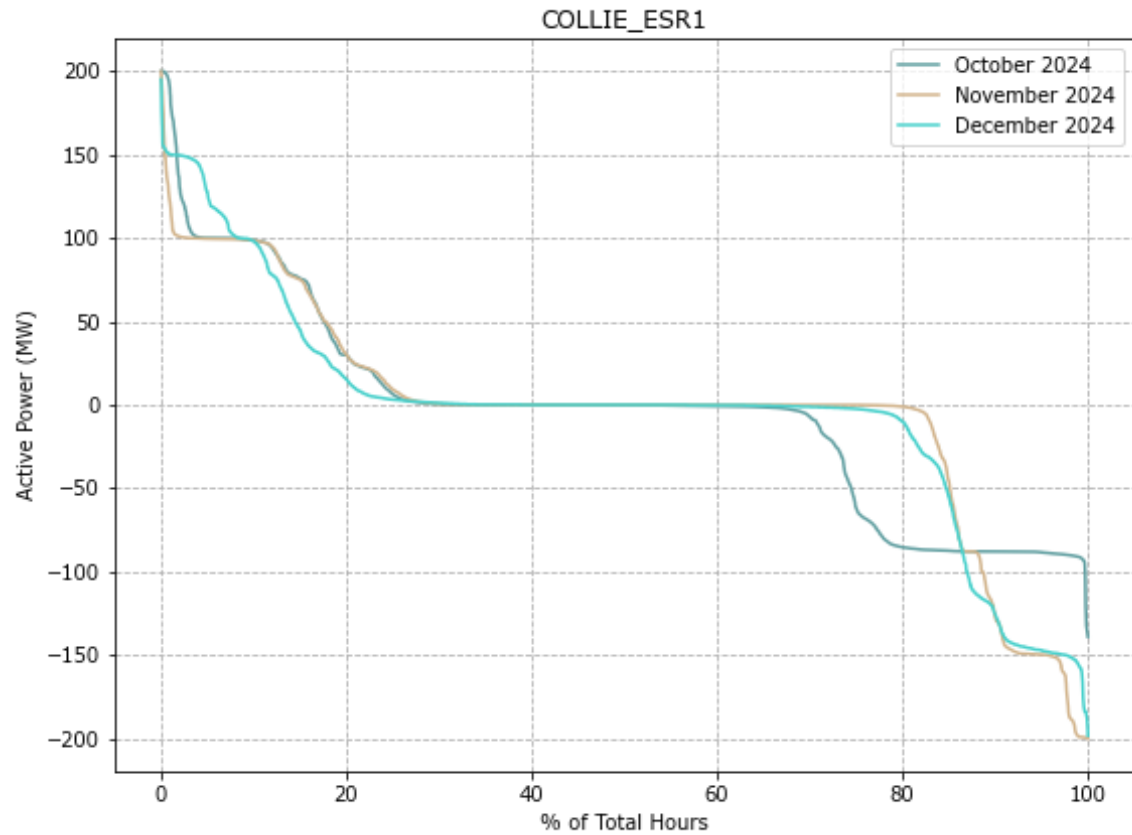


	Oct 2024	Nov 2024	Dec 2024
Total Spot Revenue (\$m)	0.01	-0.09	0.37

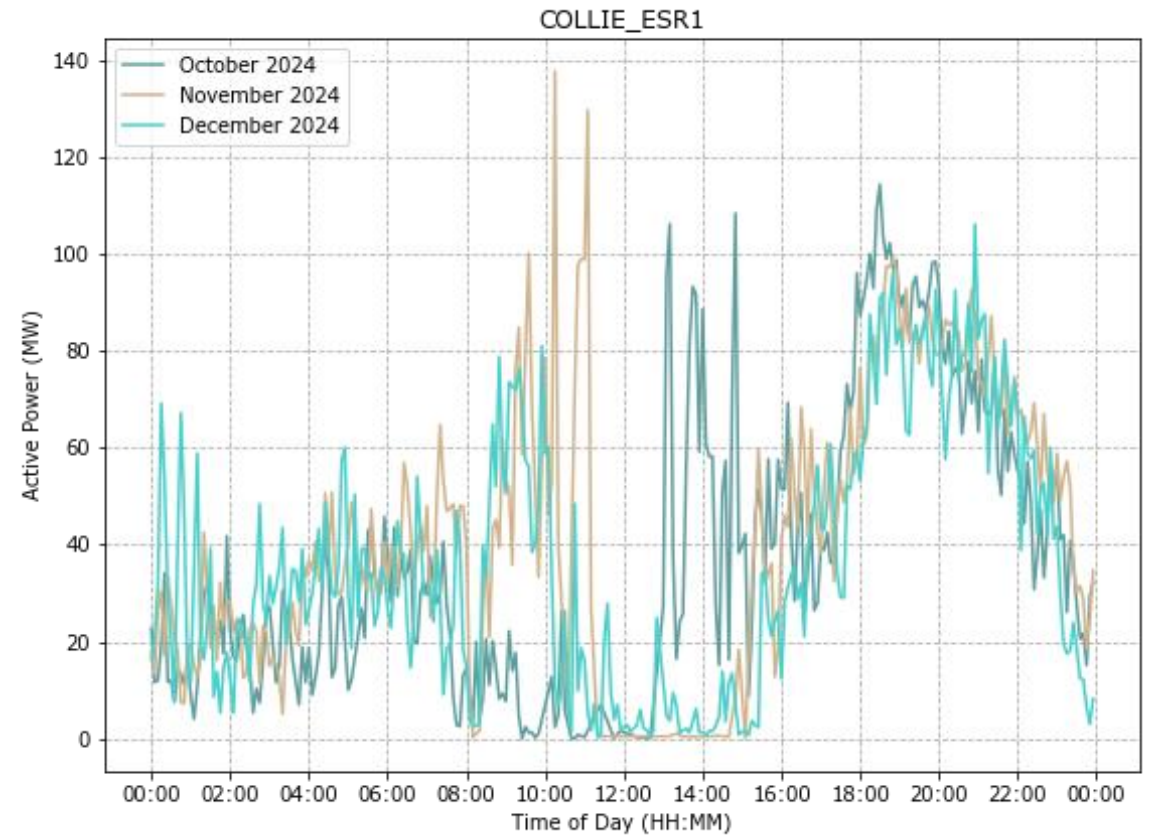
Collie BESS 1

Energy Storage Scheduled Facility, 200 MW, Neoen

Generation Duration Curves



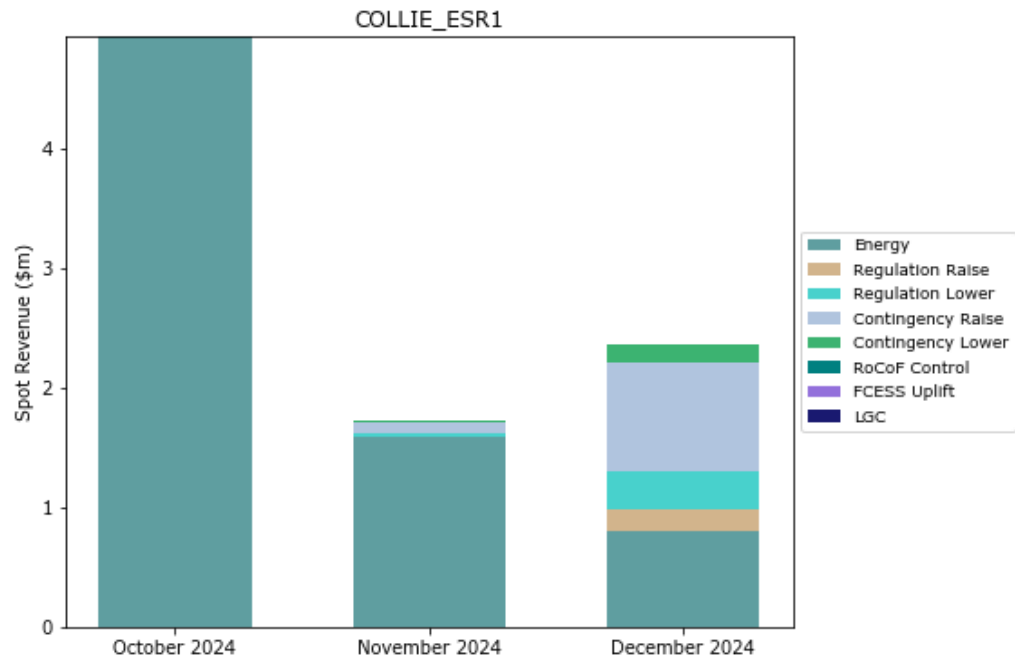
Average Time-of-Day Output



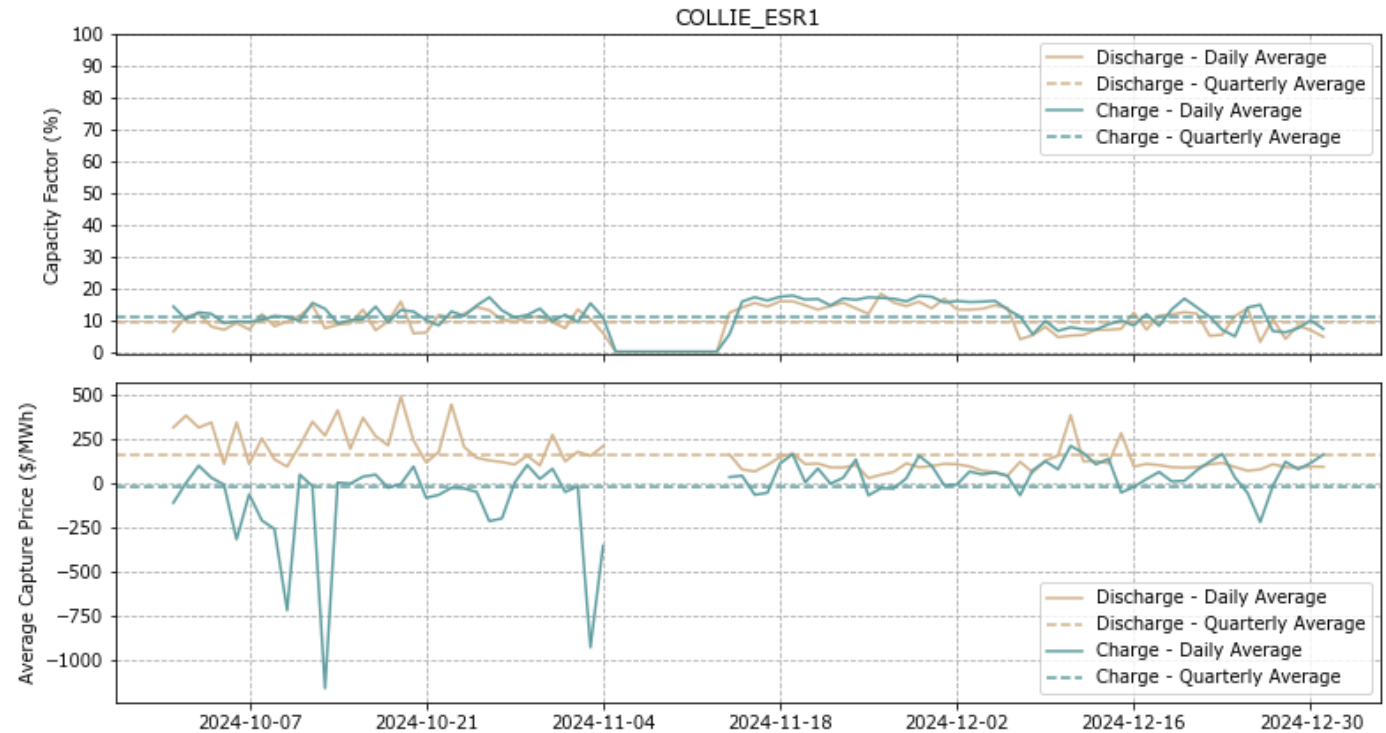
Collie BESS 1

Energy Storage Scheduled Facility, 200 MW, Neoen

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

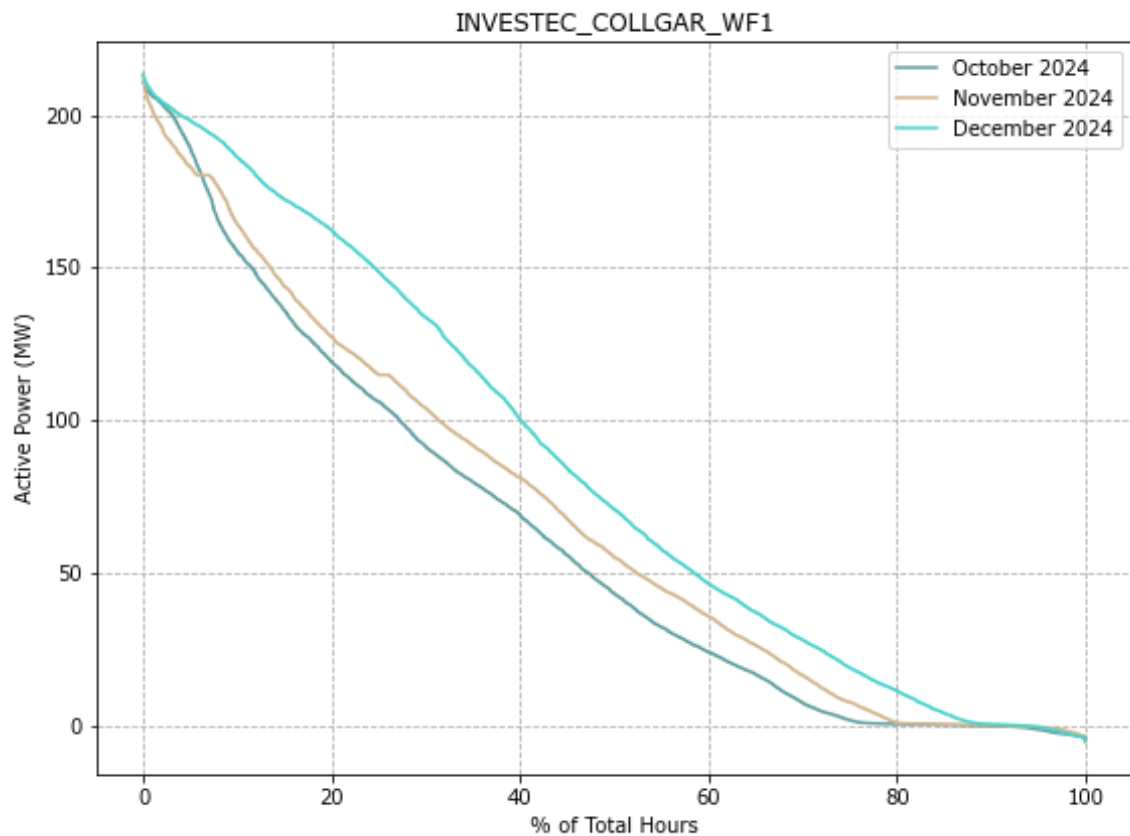


	Oct 2024	Nov 2024	Dec 2024
Total Spot Revenue (\$m)	4.94	1.72	2.37

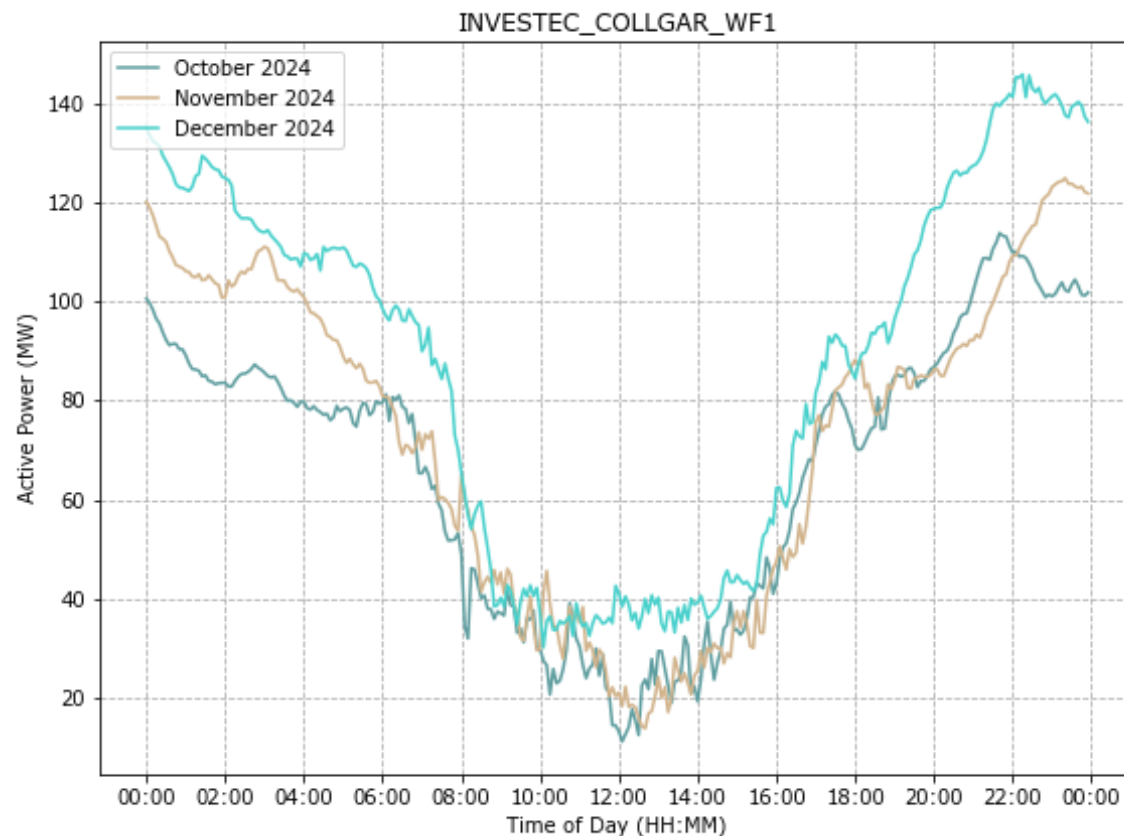
Collgar Wind Farm

Wind Semi-Scheduled Facility, 218.5 MW, Collgar Renewables

Generation Duration Curves



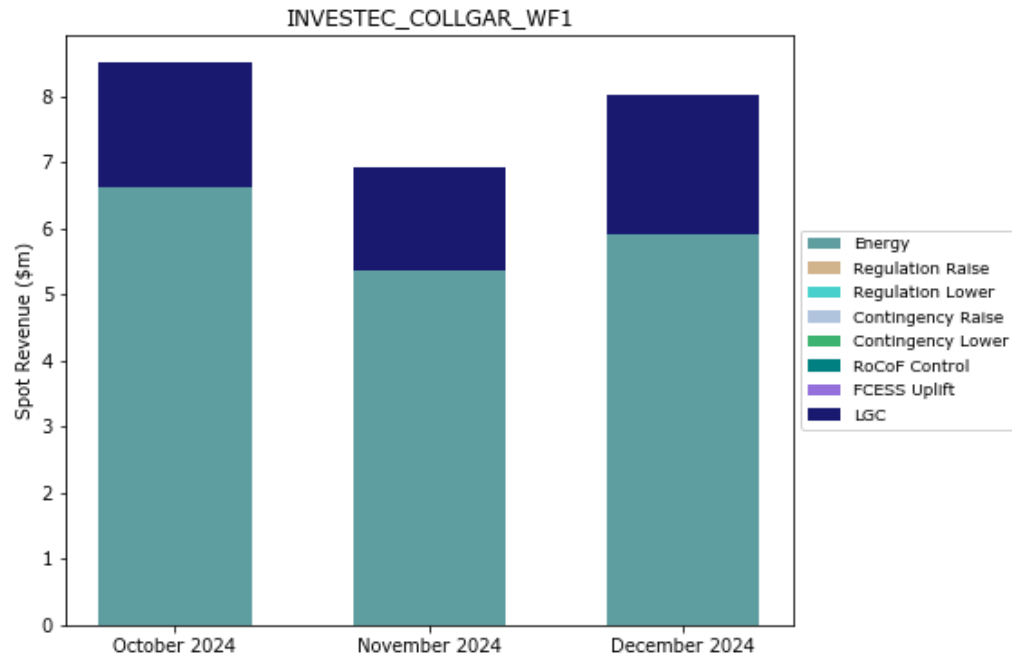
Average Time-of-Day Output



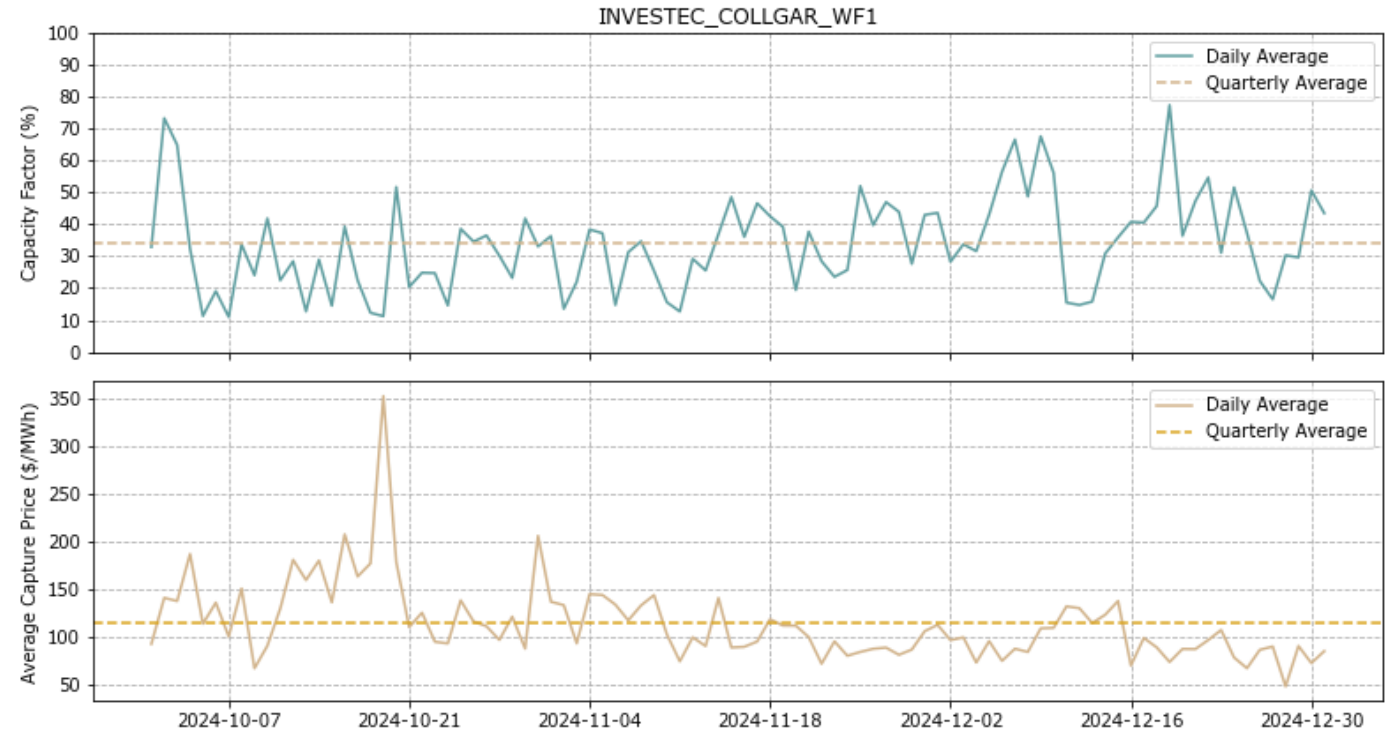
Collgar Wind Farm

Wind Semi-Scheduled Facility, 218.5 MW, Collgar Renewables

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

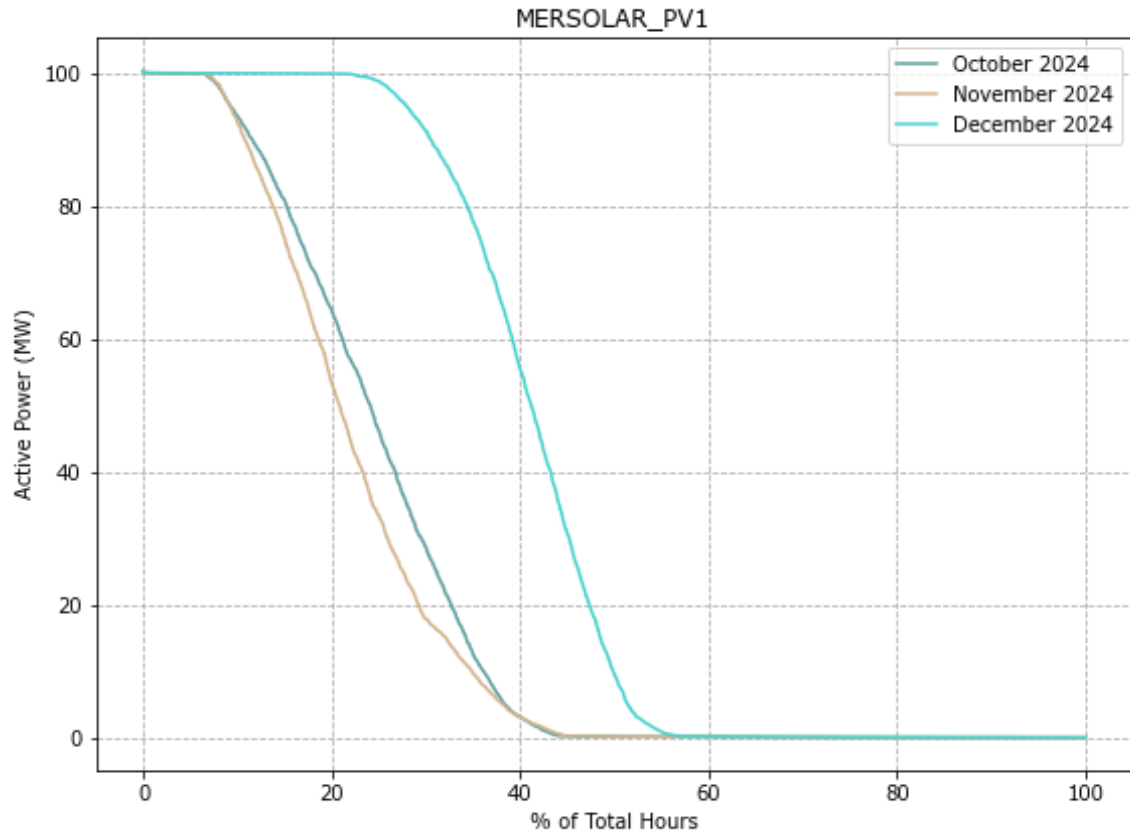


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	47.69	51.03	65.16
Total Spot Revenue (\$m)	8.50	6.92	8.02
\$ / MWh	\$178.31	\$135.57	\$123.09

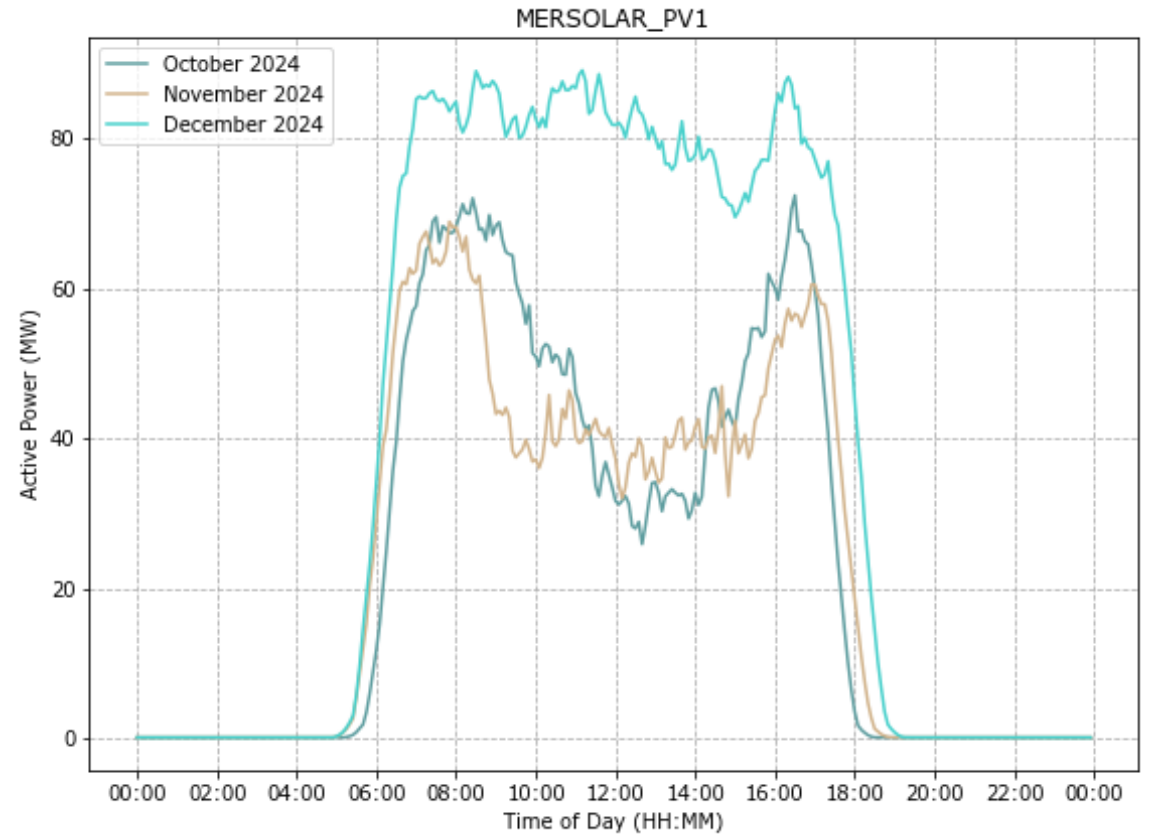
Merredin Solar Farm

Solar PV Semi-Scheduled Facility, 100 MW, SUN Energy

Generation Duration Curves



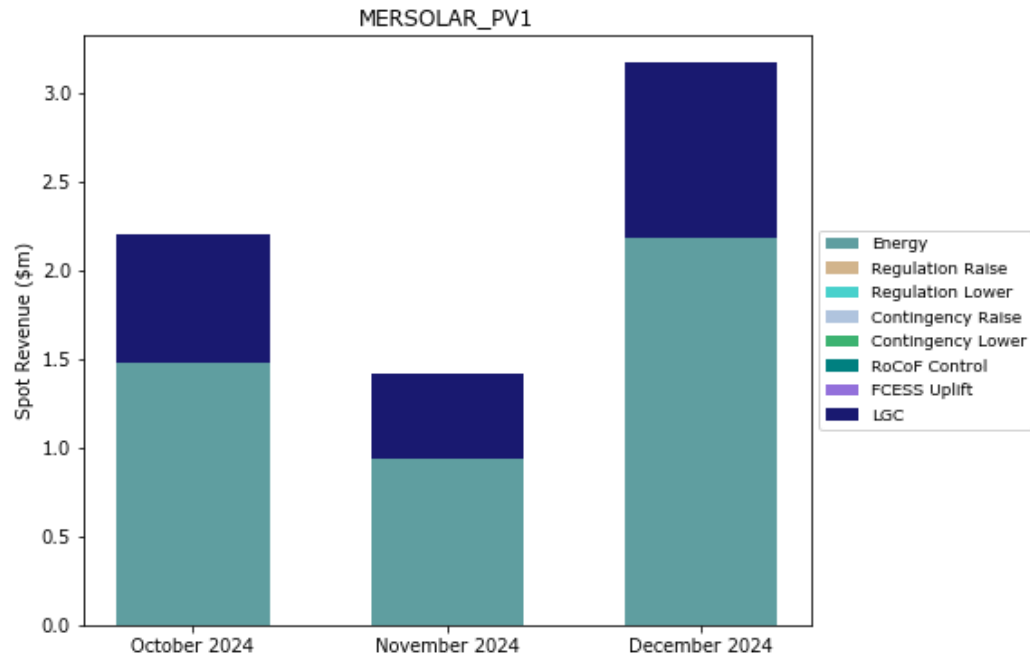
Average Time-of-Day Output



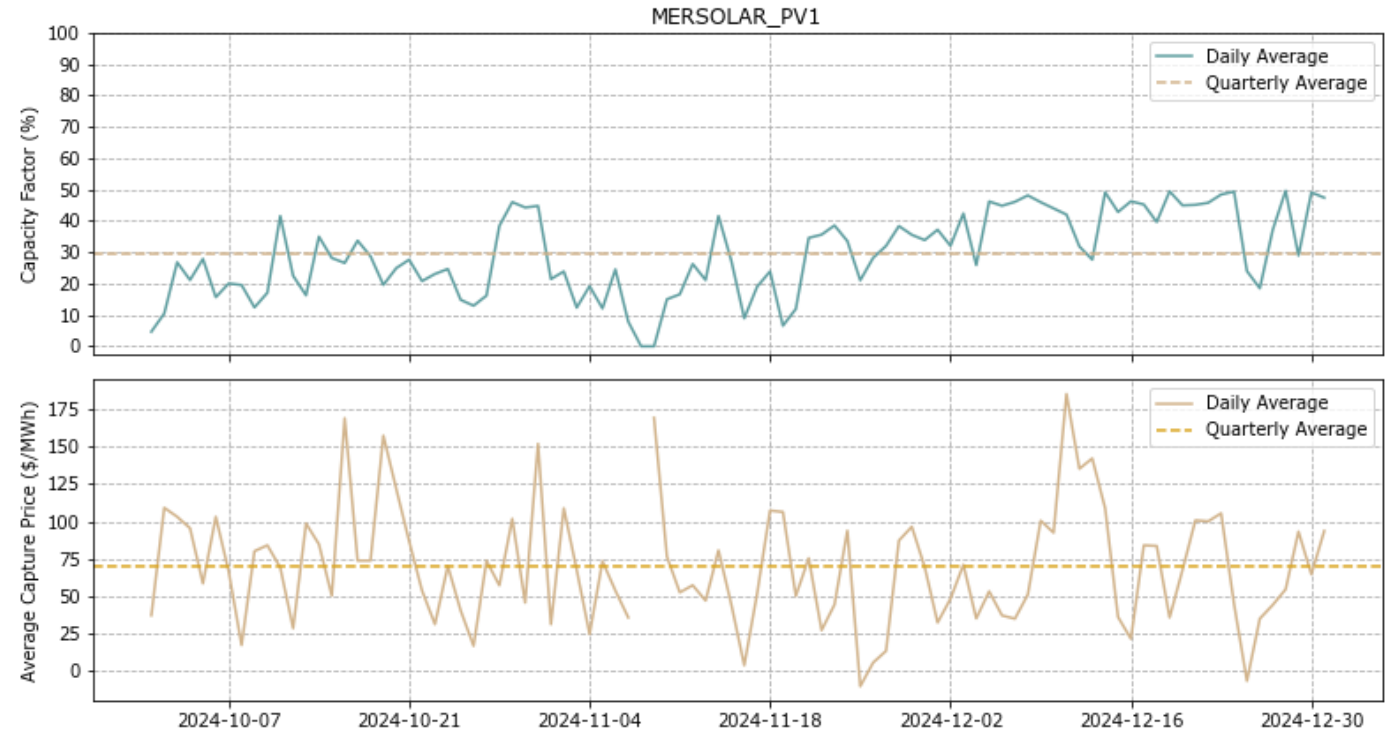
Merredin Solar Farm

Solar PV Semi-Scheduled Facility, 100 MW, SUN Energy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

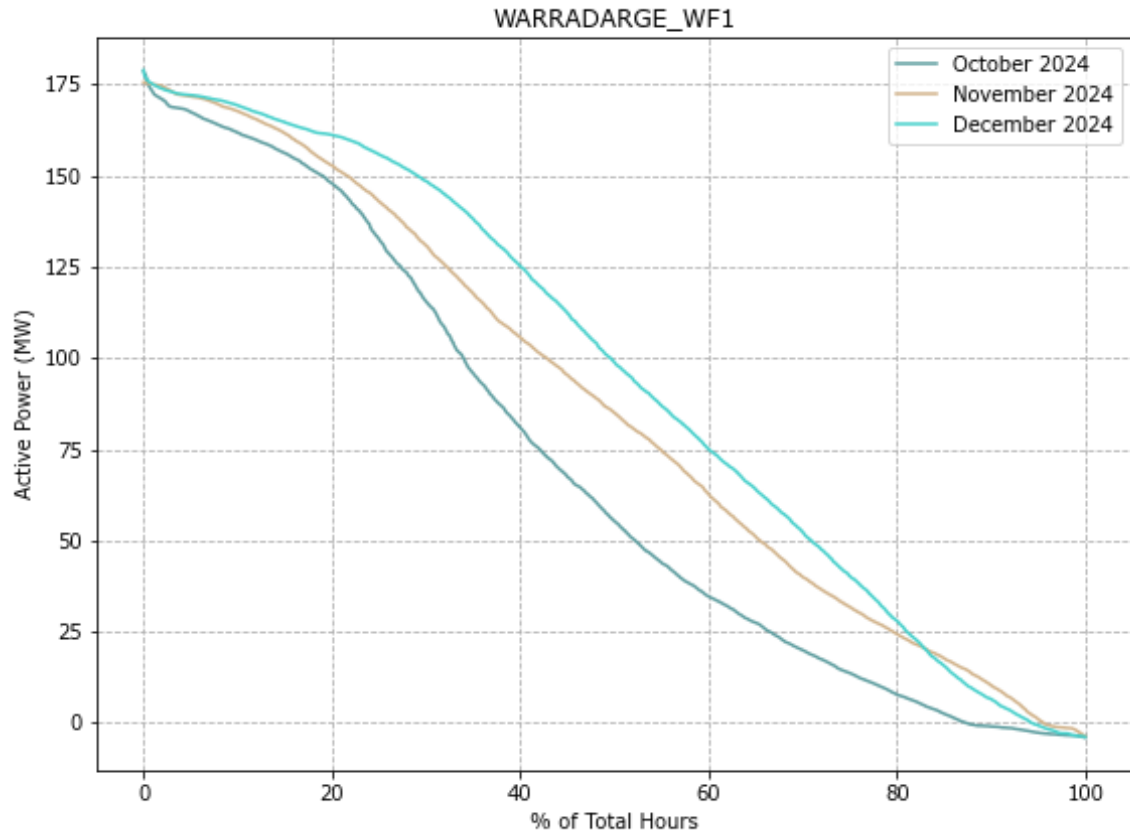


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	18.38	116.09	30.58
Total Spot Revenue (\$m)	2.20	1.42	3.17
\$ / MWh	\$119.78	\$88.30	\$103.59

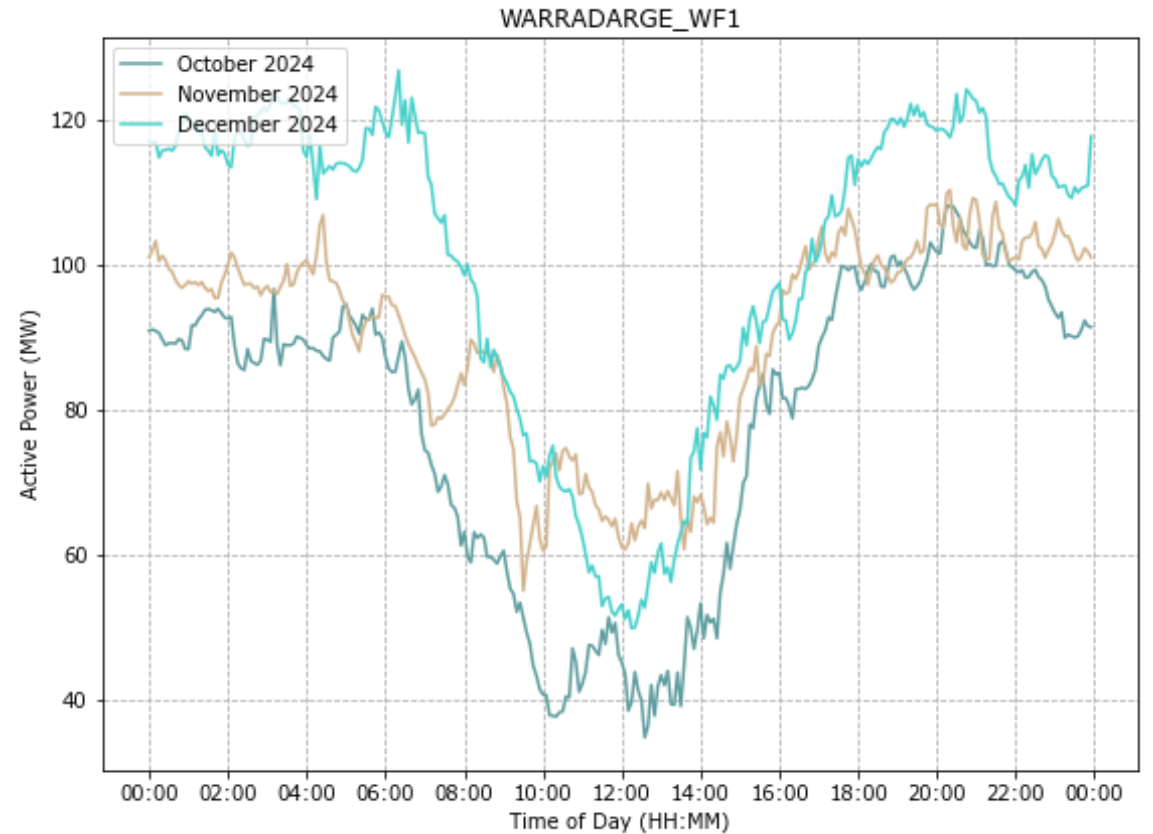
Warradarge Wind Farm

Wind Semi-Scheduled Facility, 180 MW, Bright Energy Investments

Generation Duration Curves



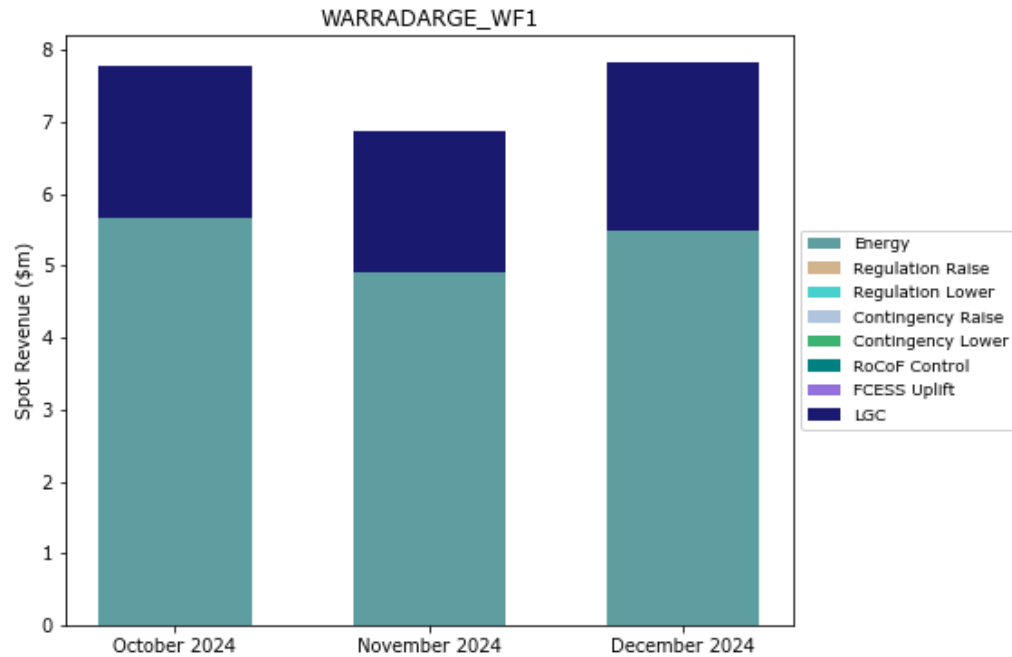
Average Time-of-Day Output



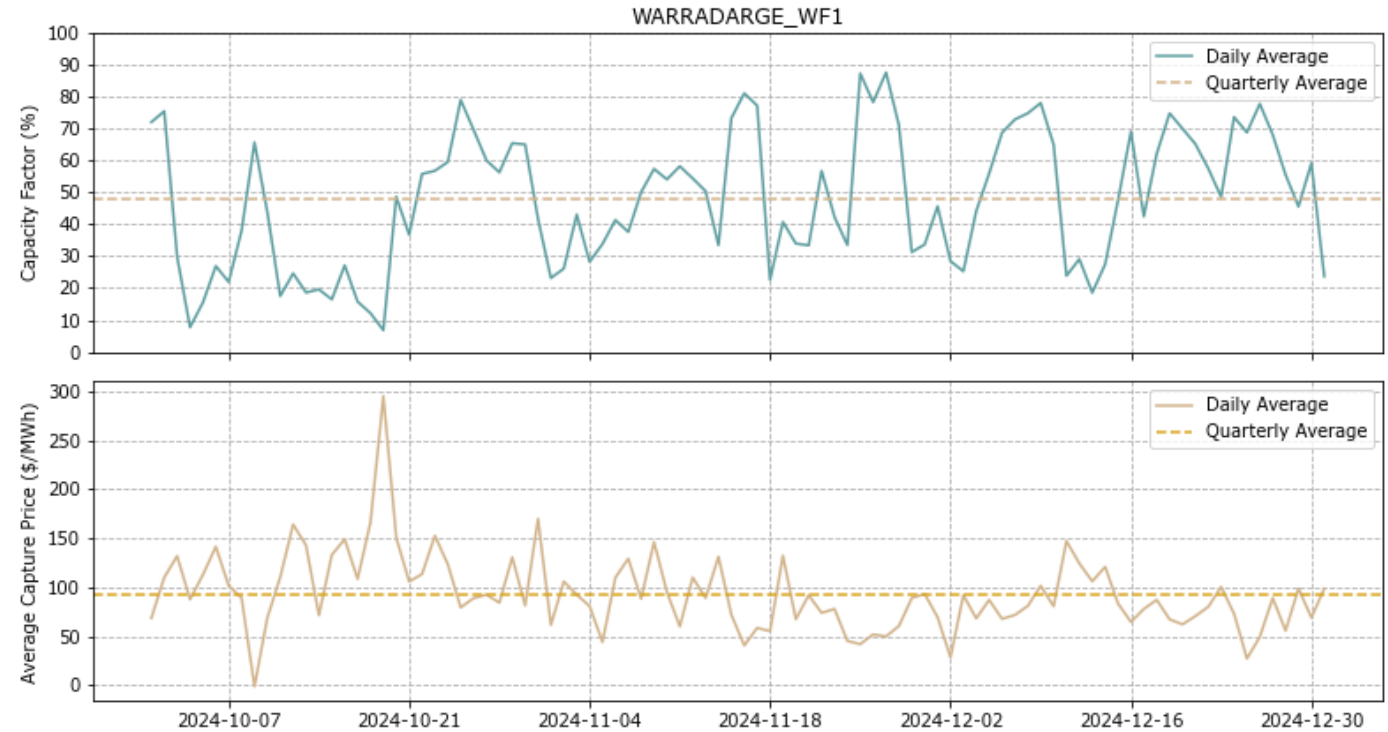
Warradarge Wind Farm

Wind Semi-Scheduled Facility, 180 MW, Bright Energy Investments

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

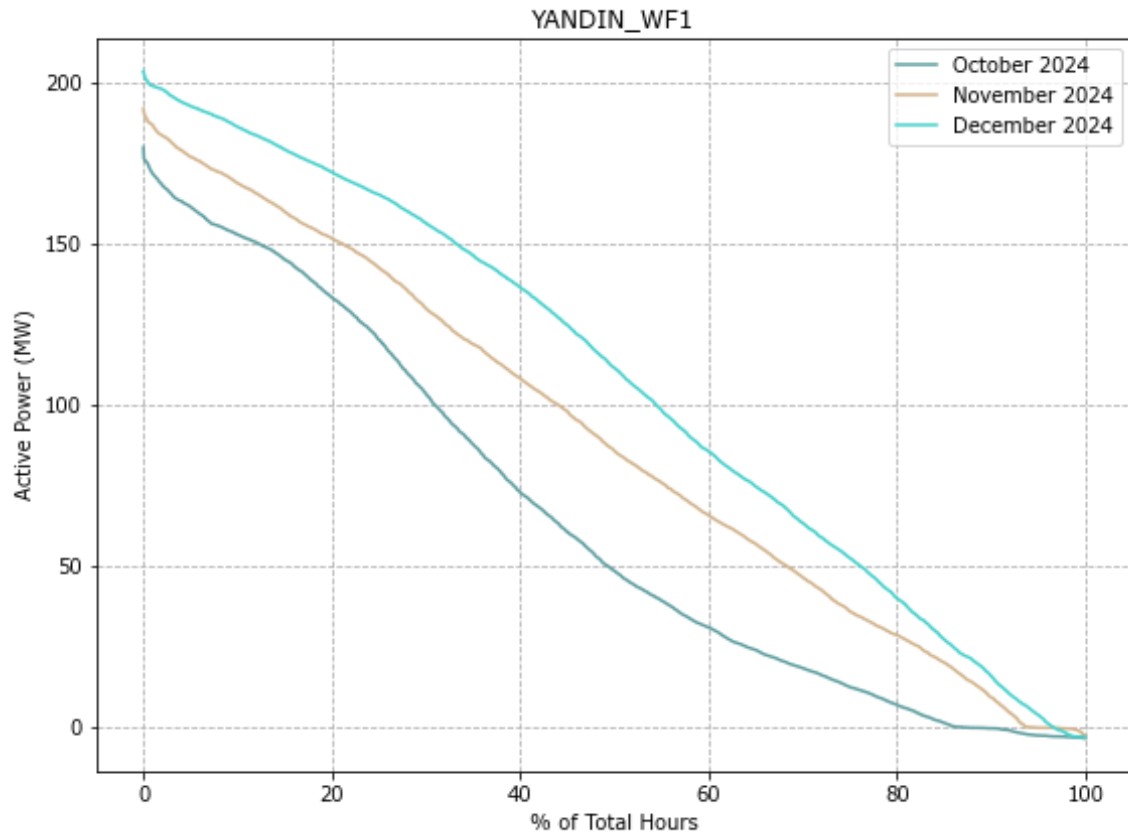


	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	53.94	63.67	71.95
Total Spot Revenue (\$m)	7.77	6.87	7.82
\$ / MWh	\$143.99	\$107.88	\$108.65

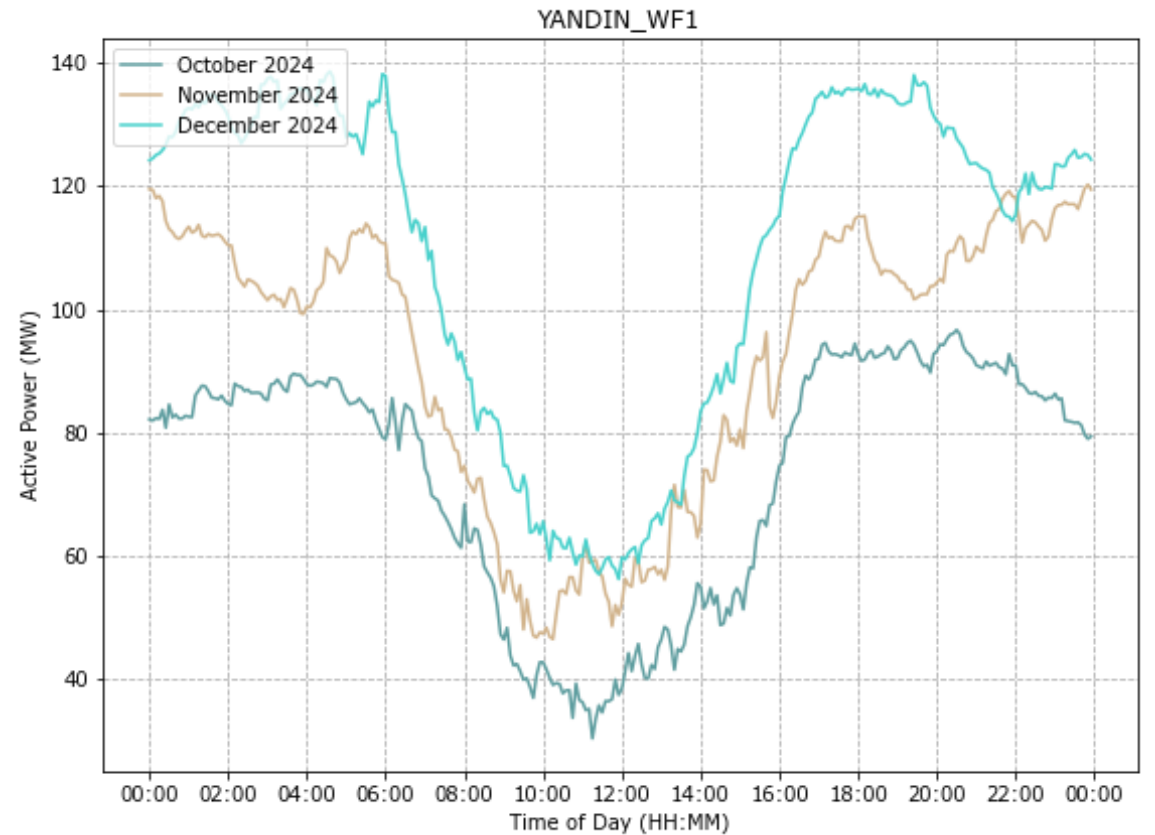
Yandin Wind Farm

Wind Semi-Scheduled Facility, 214.2 MW, Alinta Energy

Generation Duration Curves



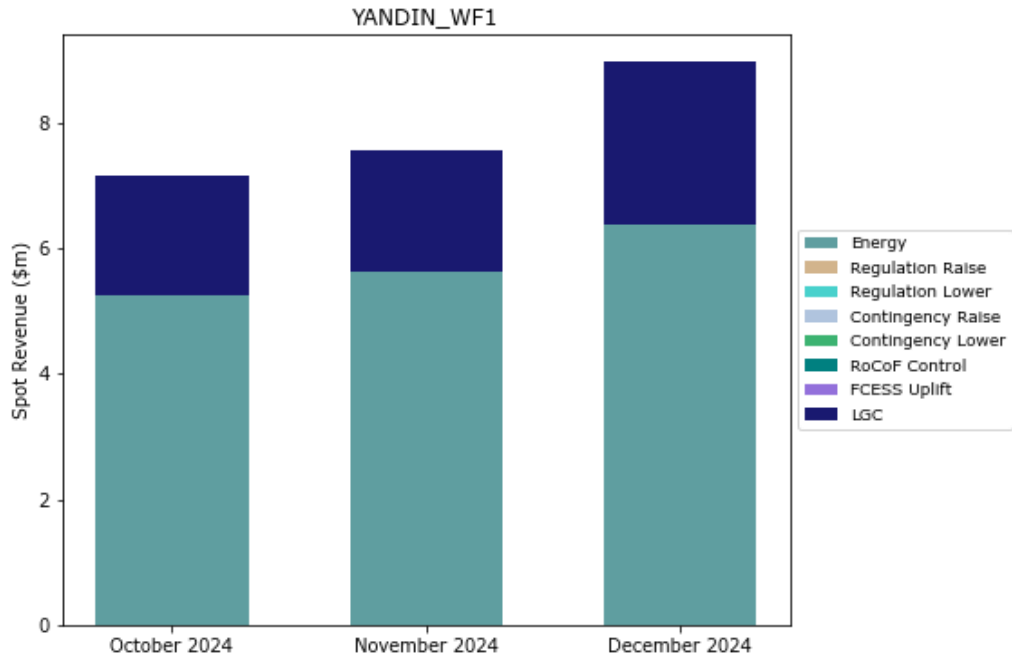
Average Time-of-Day Output



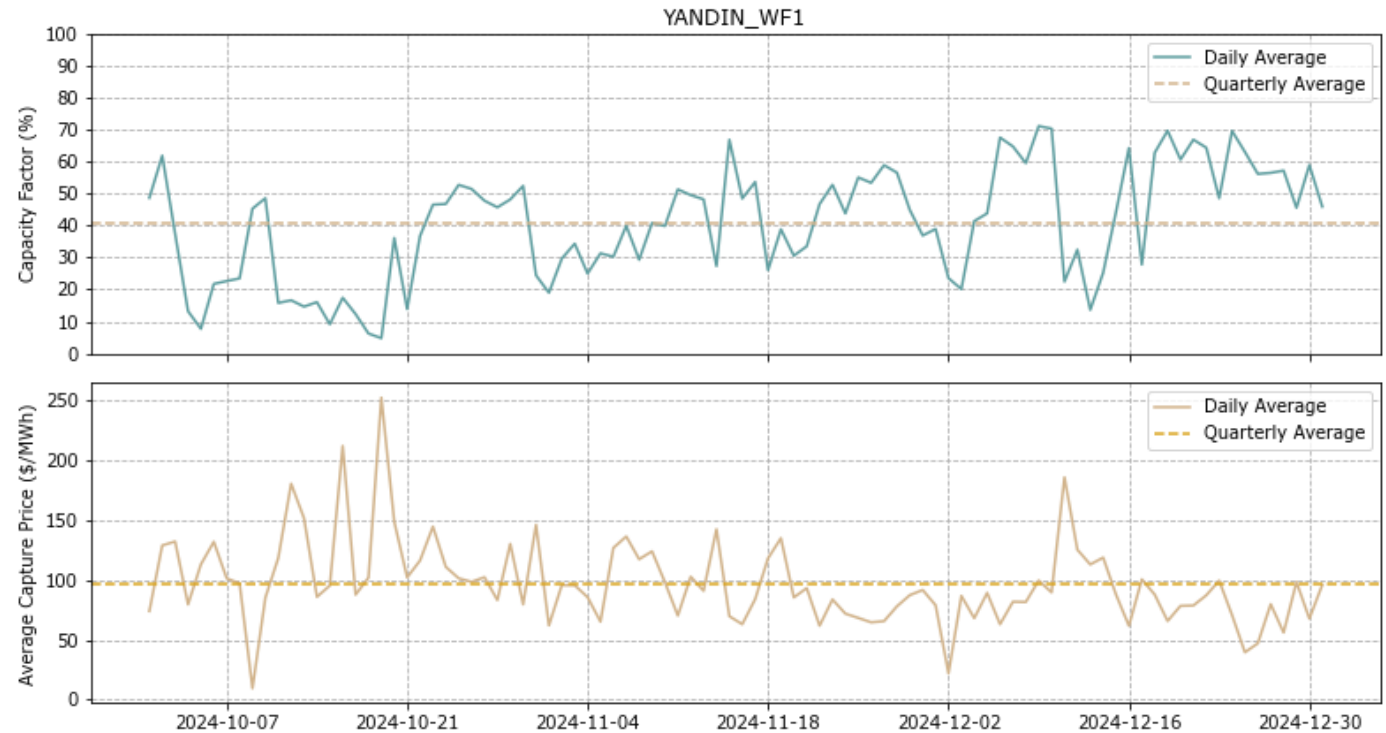
Yandin Wind Farm

Wind Semi-Scheduled Facility, 214.2 MW, Alinta Energy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price



	Oct 2024	Nov 2024	Dec 2024
Energy Generated (GWh)	48.61	63.84	79.99
Total Spot Revenue (\$m)	7.16	7.57	8.96
\$ / MWh	\$147.22	\$118.62	\$112.06



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