Ampere Labs

WEM Quarterly Market Review

Q1 2025

30 April 2025

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:

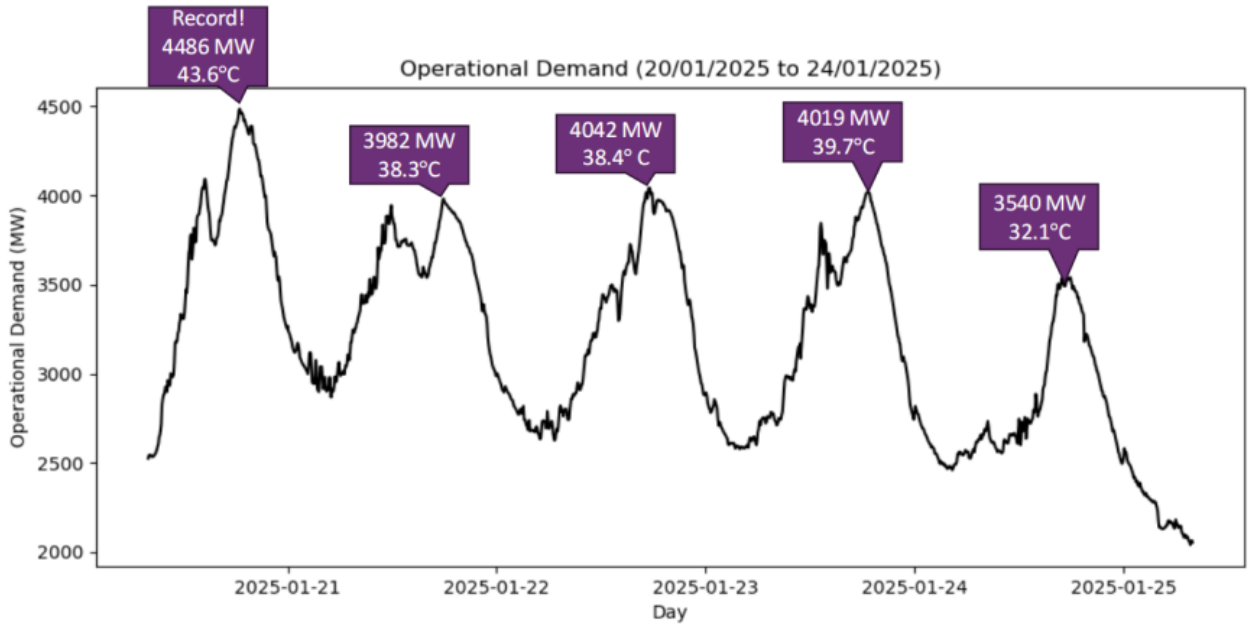
Data Source	Link
AEMO WA market data	http://data.wa.aemo.com.au/
WEM market fees	https://aemo.com.au/-/media/files/about_aemo/energy_market_budget_and_fees/2023/wa-budget-and-fees-2023-24.pdf?la=en
LGC spot prices (Demand Manager)	https://www.demandmanager.com.au/certificate-prices/
Perth daily temperatures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

(*) Ampere Labs is an independent consultancy and is not affiliated with any WEM participants.

Highlights from Q1 2025 (1)

A hot summer and a new peak operational demand record

- A new record **peak operational demand** of 4,486 MW was set at 6:30pm on 20 January 2025, breaking the previous record of 4,233 MW set last year on 18 February 2024.
  - Temperatures reached over 43°C on 20 January 2025, followed by a string of 3 days above 38°C where peak demand hovered around 4,000 MW.
  - The extreme late January weather led to pole-top fires, fuse trips and bushfires that left up to 38,000 homes without power.



Source: AEMO

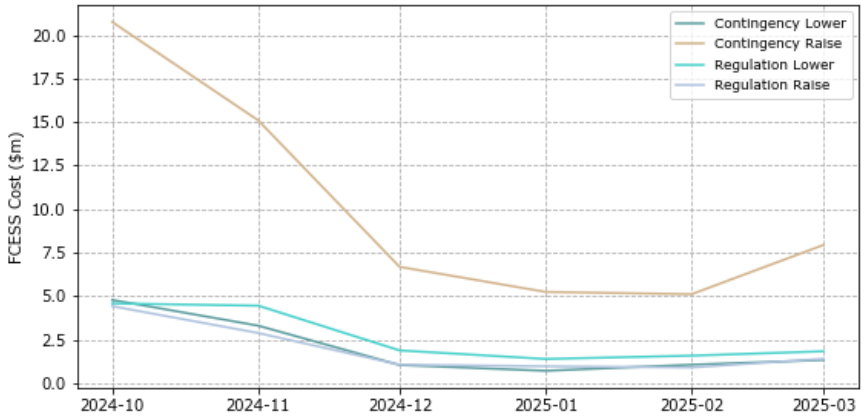
Highlights from Q1 2025 (2)

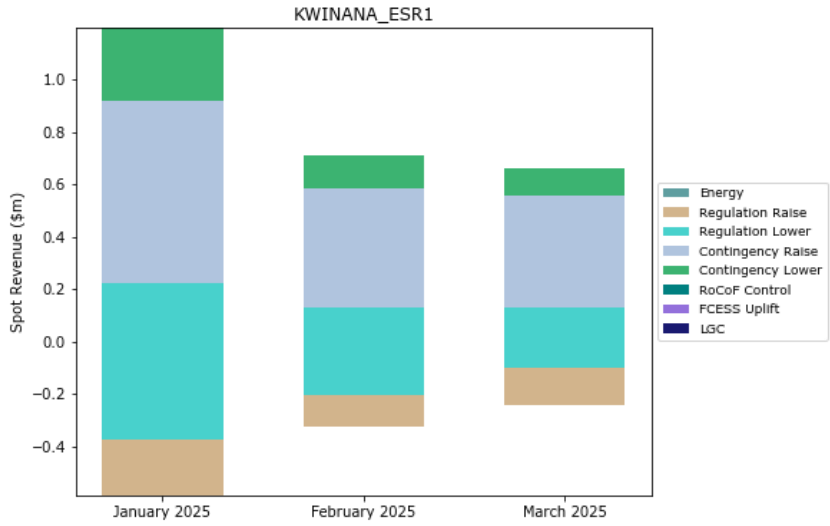
Big batteries provide more competition in the FCESS markets

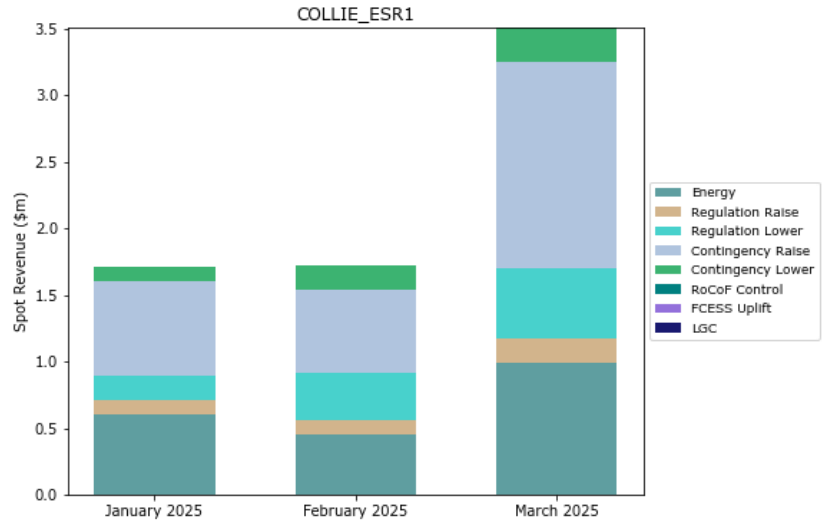
- Since December 2024, Collie BESS1 (COLLIE_ESR1) has been participating in the Frequency Co-optimised Essential System Services (FCESS) markets.
- In Q1 2025, the two BESS providing FCESS (COLLIE_ESR1 and KWINANA_ESR1) captured a material share of the market:

FCESS Market	BESS Market Share (%)
Contingency Lower	48.72%
Contingency Raise	23.39%
Regulation Lower	56.77%
Regulation Raise	39.06%

- However, the market cost impact is unclear as the FCESS Cost Review Amendments rule change also took effect on 20 November 2024, which also put downward pressure on FCESS costs:







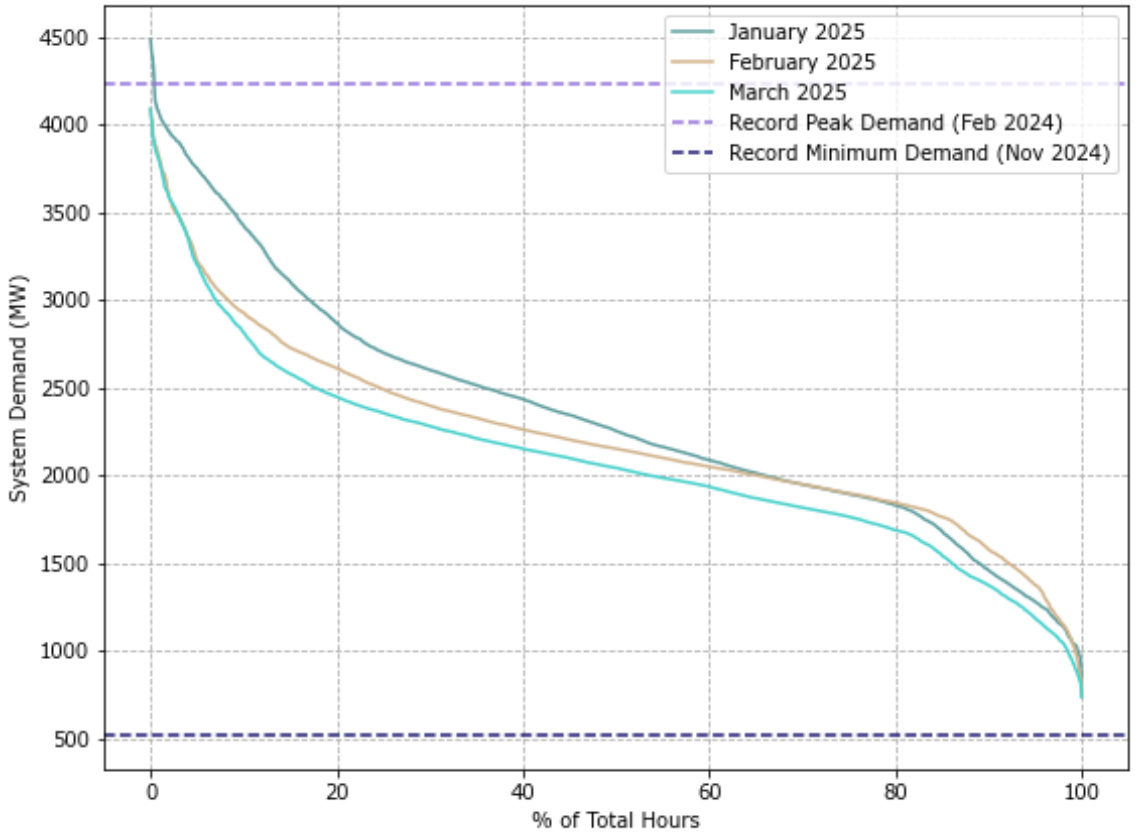
.01
System

Aggregate system level outcomes

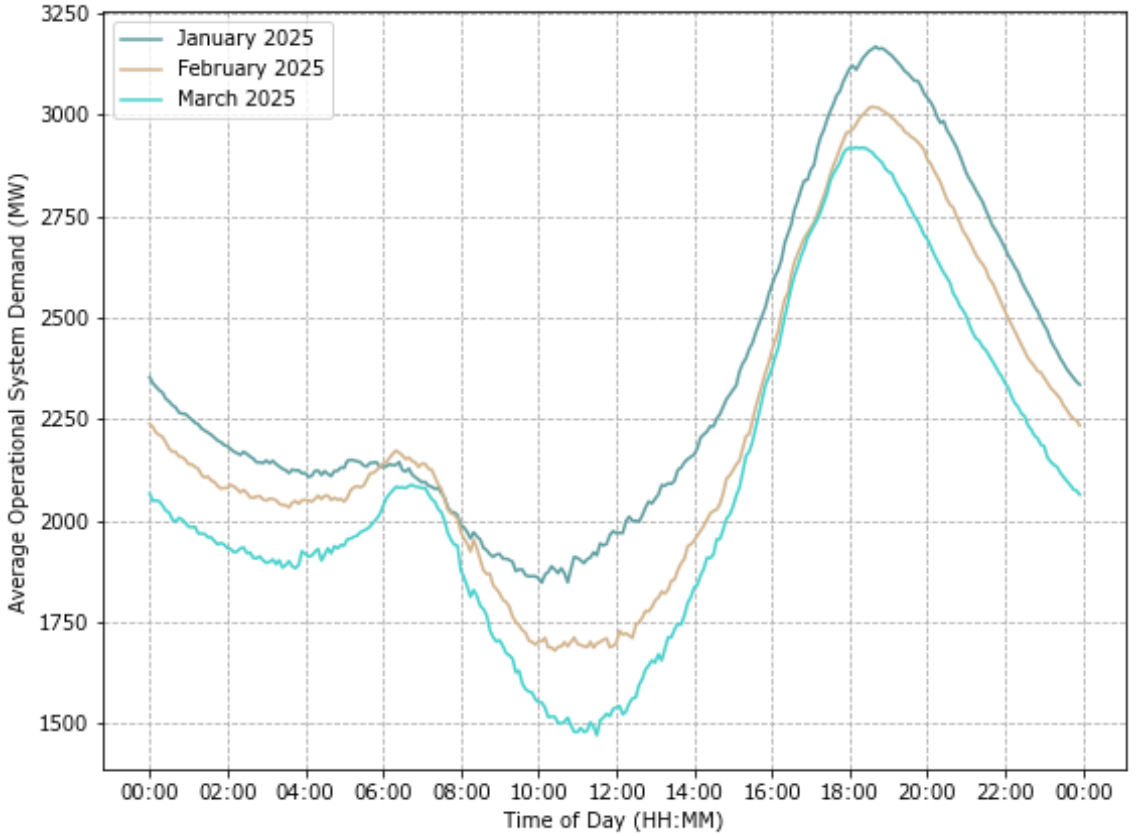
System Operational Demand

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

Demand Duration Curves



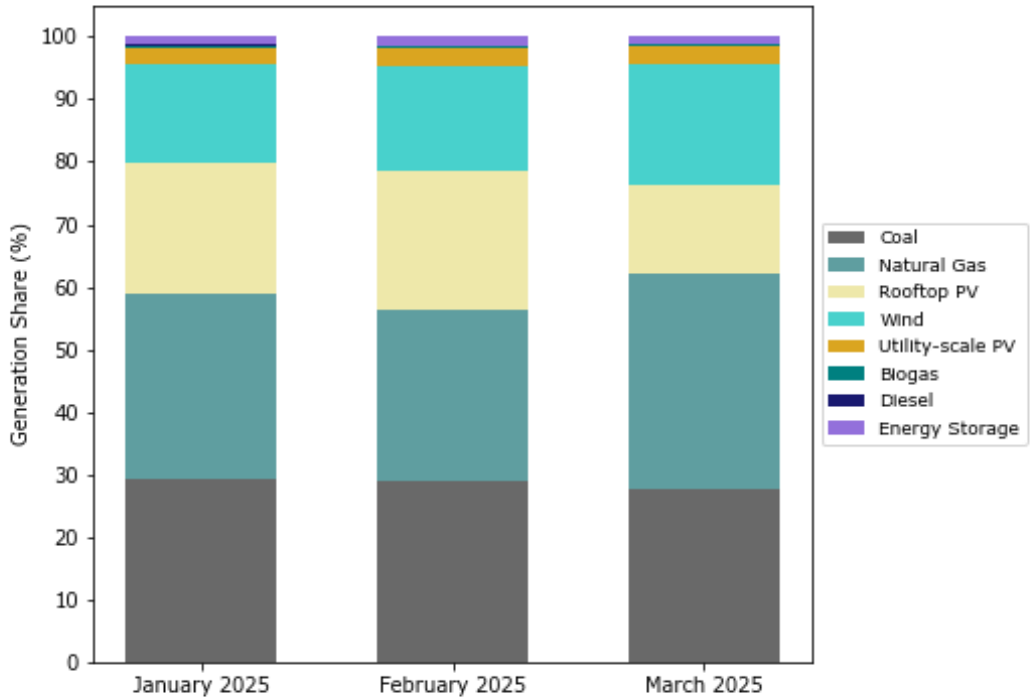
Average Time-of-Day Demand



Generation Mix

Categorised by fuel / technology type

Q1 2025 Generation Mix



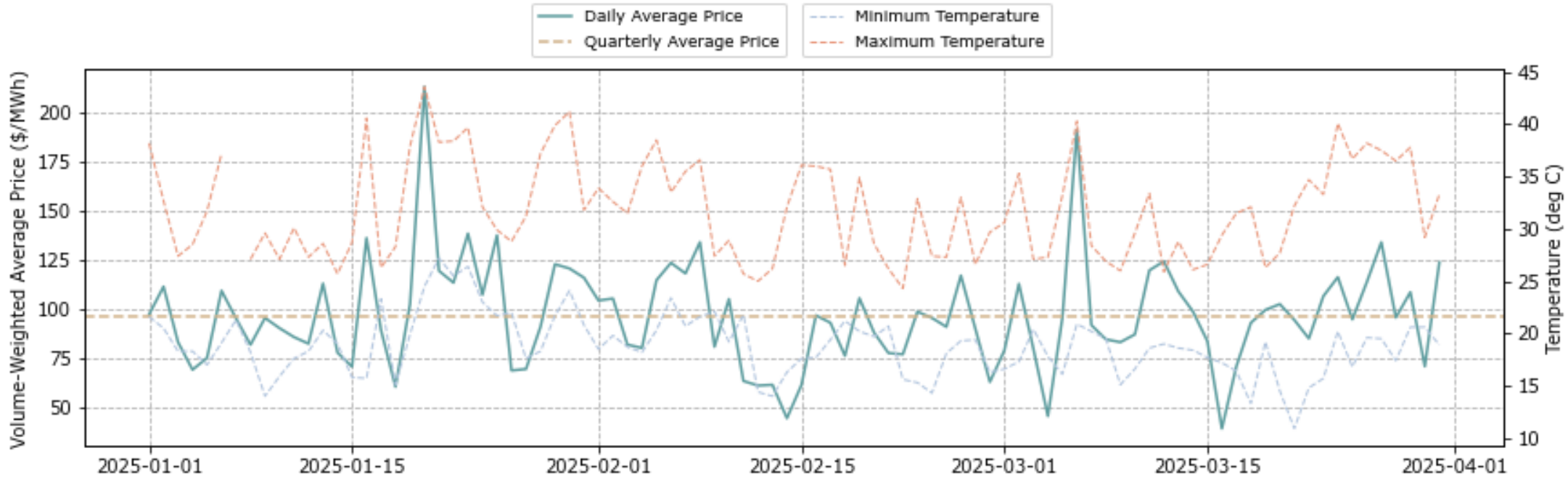
Generation Mix Breakdown

Category	Jan 2025	Feb 2025	Mar 2025
Coal	645 GWh (29.2%)	556 GWh (29.1%)	501 GWh (27.8%)
Natural Gas	652 GWh (29.5%)	522 GWh (27.3%)	617 GWh (34.3%)
Rooftop PV	464 GWh (21%)	423 GWh (22.1%)	252 GWh (14%)
Wind	348 GWh (15.8%)	318 GWh (16.6%)	352 GWh (19.6%)
Utility PV	60 GWh (2.7%)	56 GWh (2.9%)	51 GWh (2.8%)
Biogas	7 GWh (0.3%)	6 GWh (0.3%)	5 GWh (0.3%)
Diesel	2 GWh (0.1%)	1 GWh (0.1%)	0 GWh (0%)
Storage (*)	28 GWh (1.3%)	29 GWh (1.5%)	20 GWh (1.1%)
TOTAL	**2,206 GWh**	**1,911 GWh**	**1,798 GWh**

(*) Energy storage is only counted when discharging.

Energy Prices

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

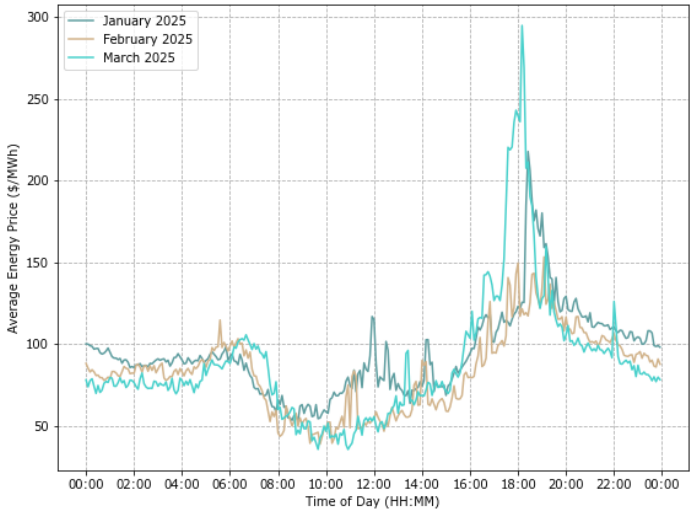


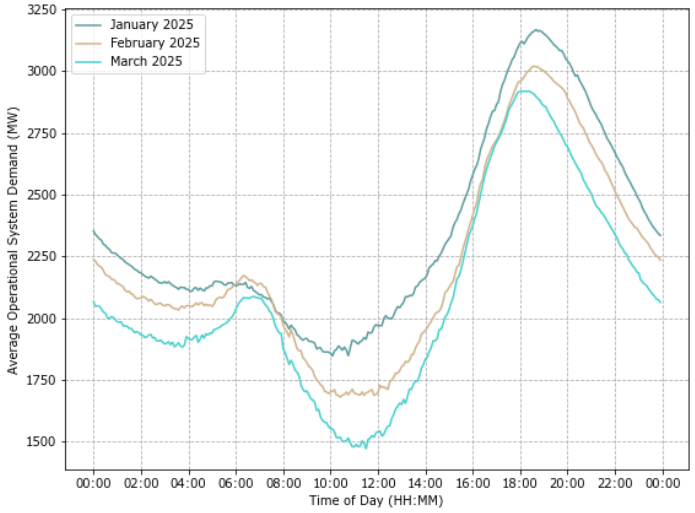
(*) Daily temperatures are based on BOM observations at the Perth Metro site.

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

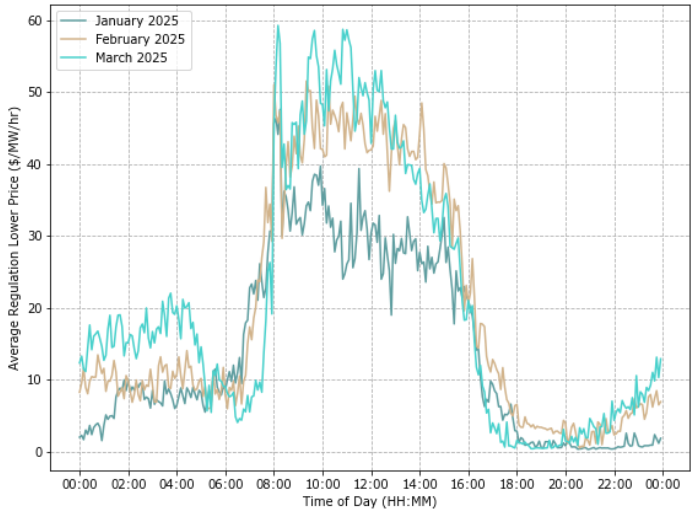
Energy, Regulation Lower and Regulation Raise ESS

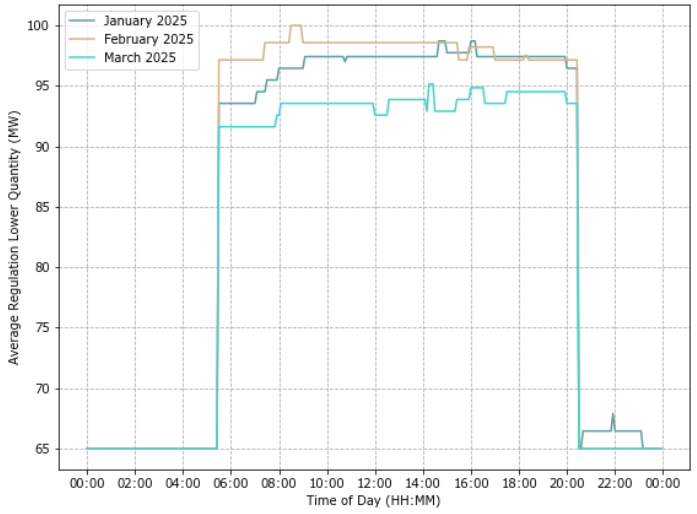
Energy



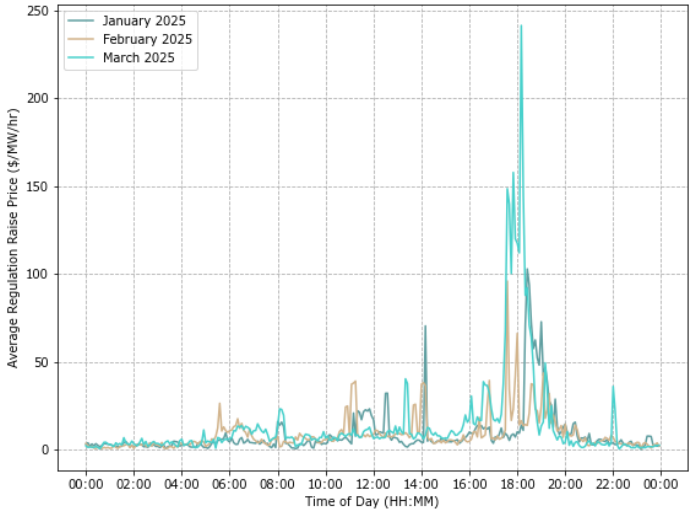


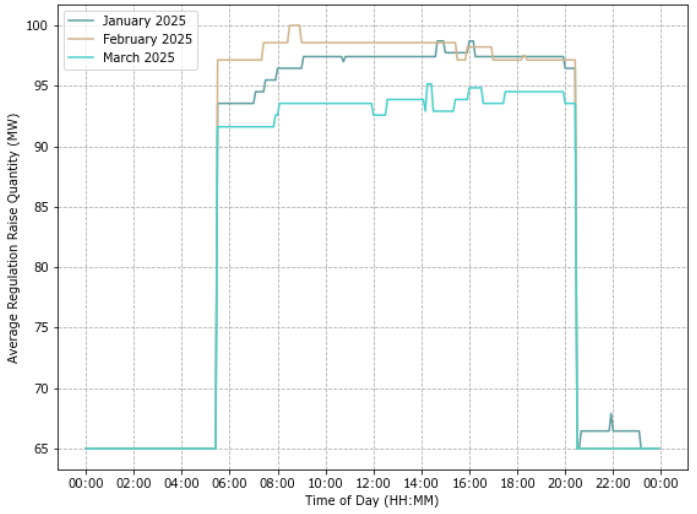
Regulation Lower (*)





Regulation Raise (*)



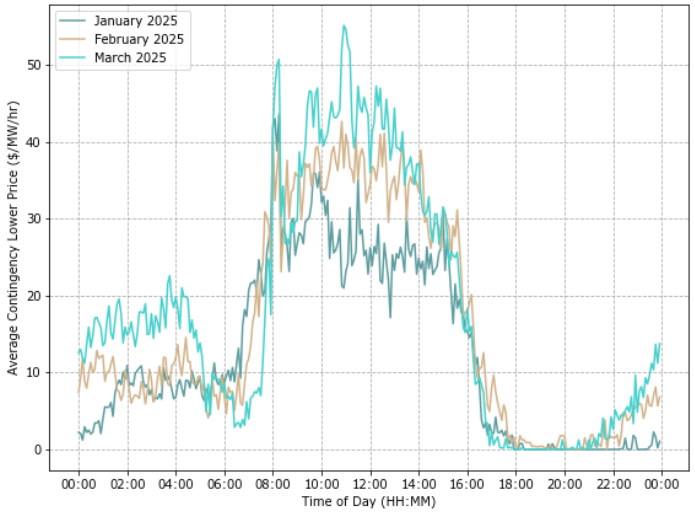


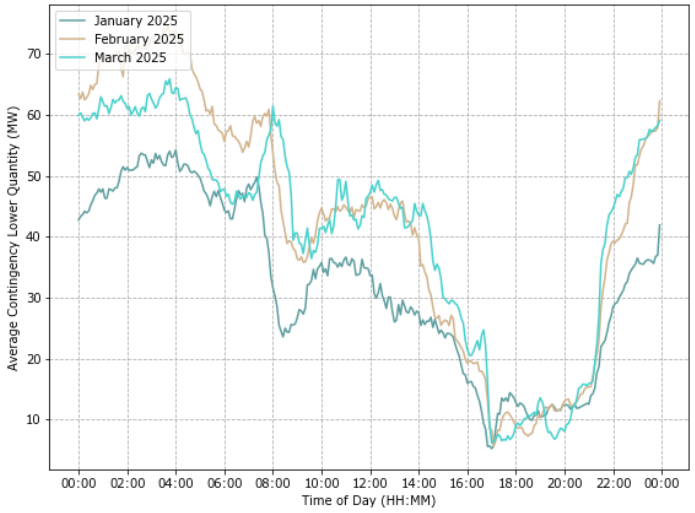
(*) Prices exclude FCESS Uplift Payments

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

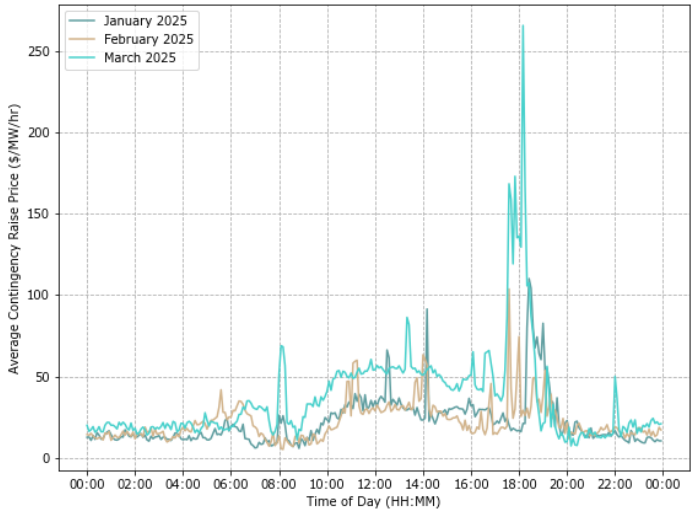
Contingency Lower, Contingency Raise and RoCoF Control ESS

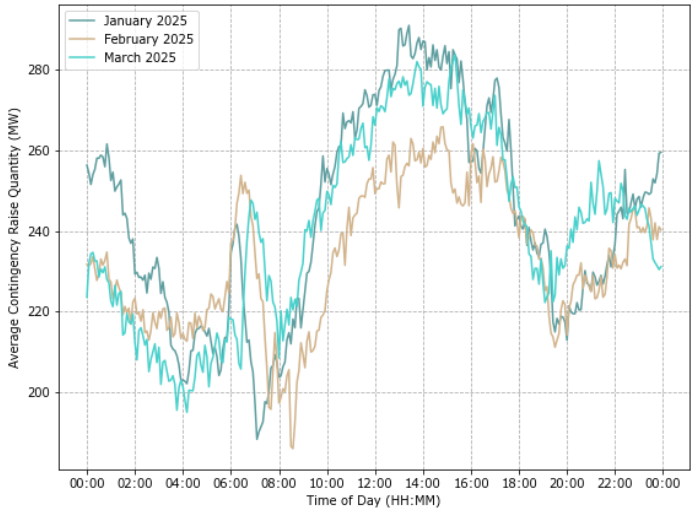
Contingency Lower (*)



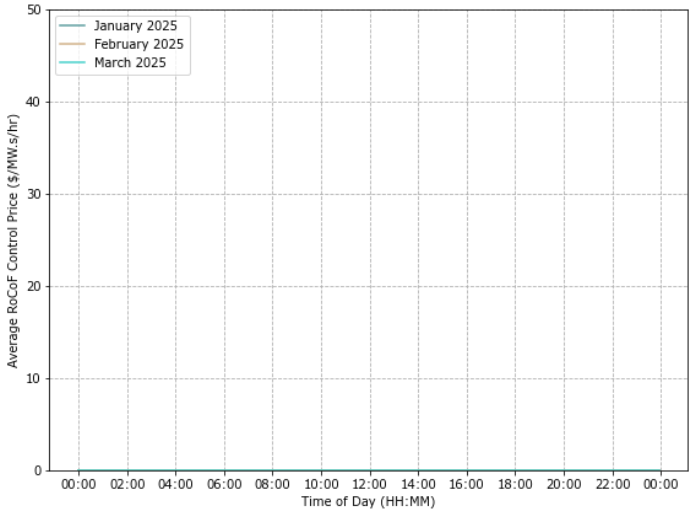


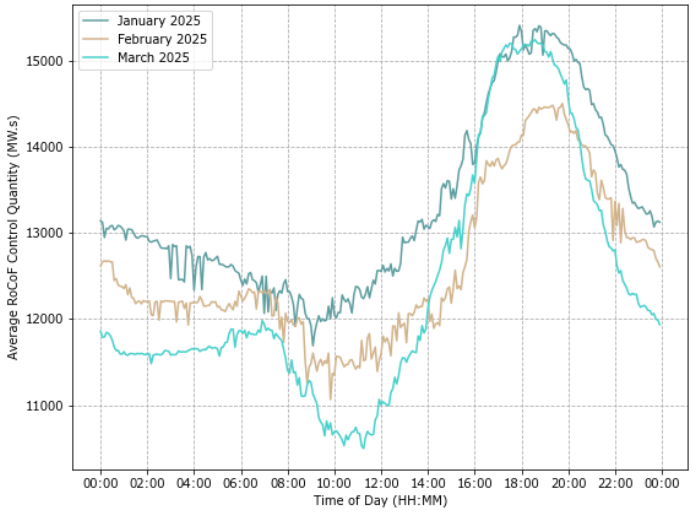
Contingency Raise (*)





RoCoF Control (*)



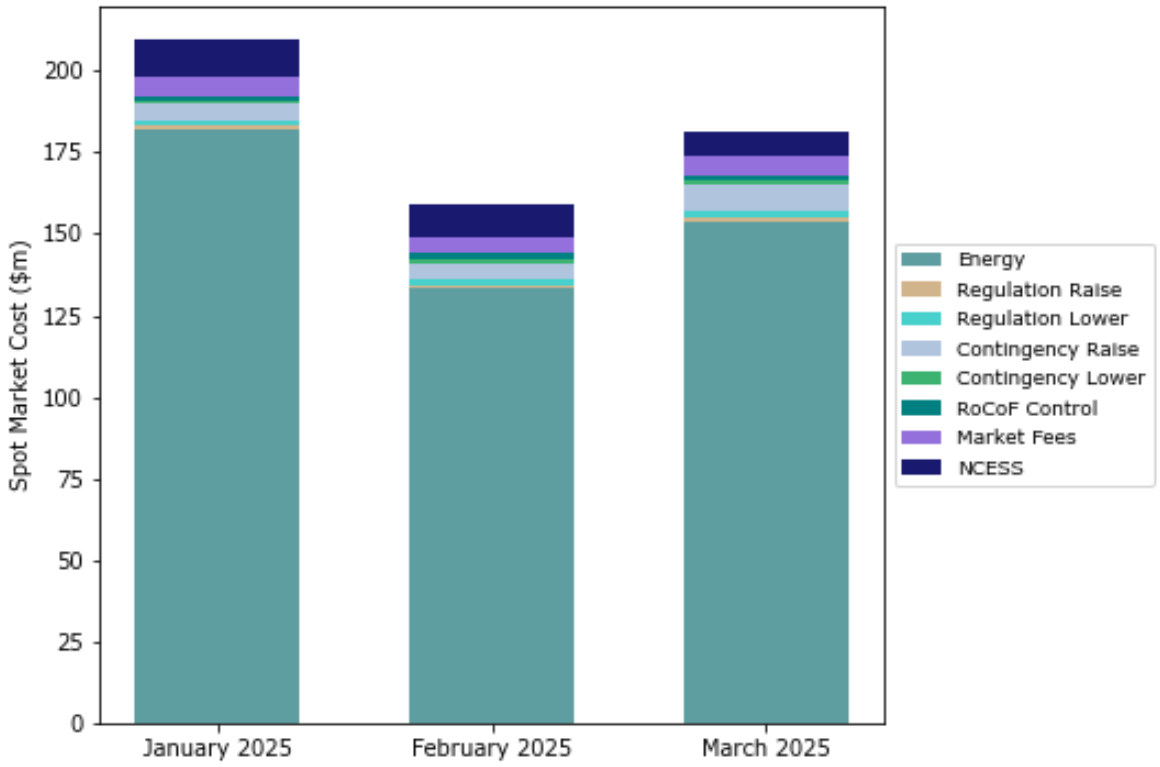


(*) Prices exclude FCESS Uplift Payments

WEM Total Spot Market Costs

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

Q1 2025 Market Costs



Market Cost Breakdown ($m AUD)

Category	Jan 2025	Feb 2025	Mar 2025
Energy	$182.33m	$133.41m	$153.75m
Regulation Raise (*)	$0.97m	$0.9m	$1.4m
Regulation Lower (*)	$1.39m	$1.58m	$1.83m
Contingency Raise (*)	$5.24m	$5.11m	$7.94m
Contingency Lower (*)	$0.71m	$1.06m	$1.33m
RoCoF Control (**)	$1.62m	$1.88m	$1.95m
Market Fees	$6.19m	$5.27m	$5.53m
NCESS	$10.96m	$9.82m	$7.69m
TOTAL	**$209.41m**	**$159.02m**	**$181.42m**
$ / MWh	**$122.43**	**$109.25**	**$118.73**

(*) Includes estimated FCESS Uplift Payments
(**) Excludes Energy Uplift Payments (not publicly available)

.02
Facilities

Selected facility level outcomes

Facility-Level Metrics

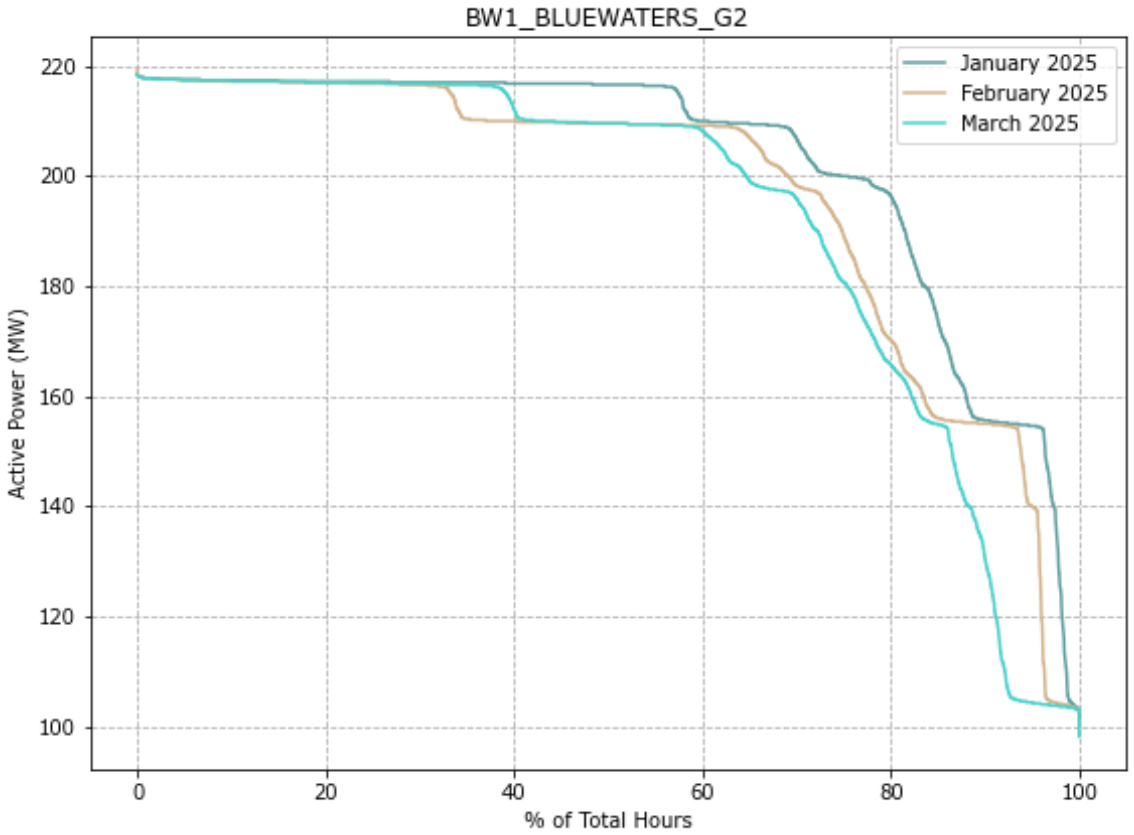
Definitions for the facility-level metrics reported in this section

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: $$Average\ Energy\ Capture\ Price = \frac{\sum Energy\ Revenue}{\sum \lvert Energy\ Generated\ or\ Consumed \rvert}$$

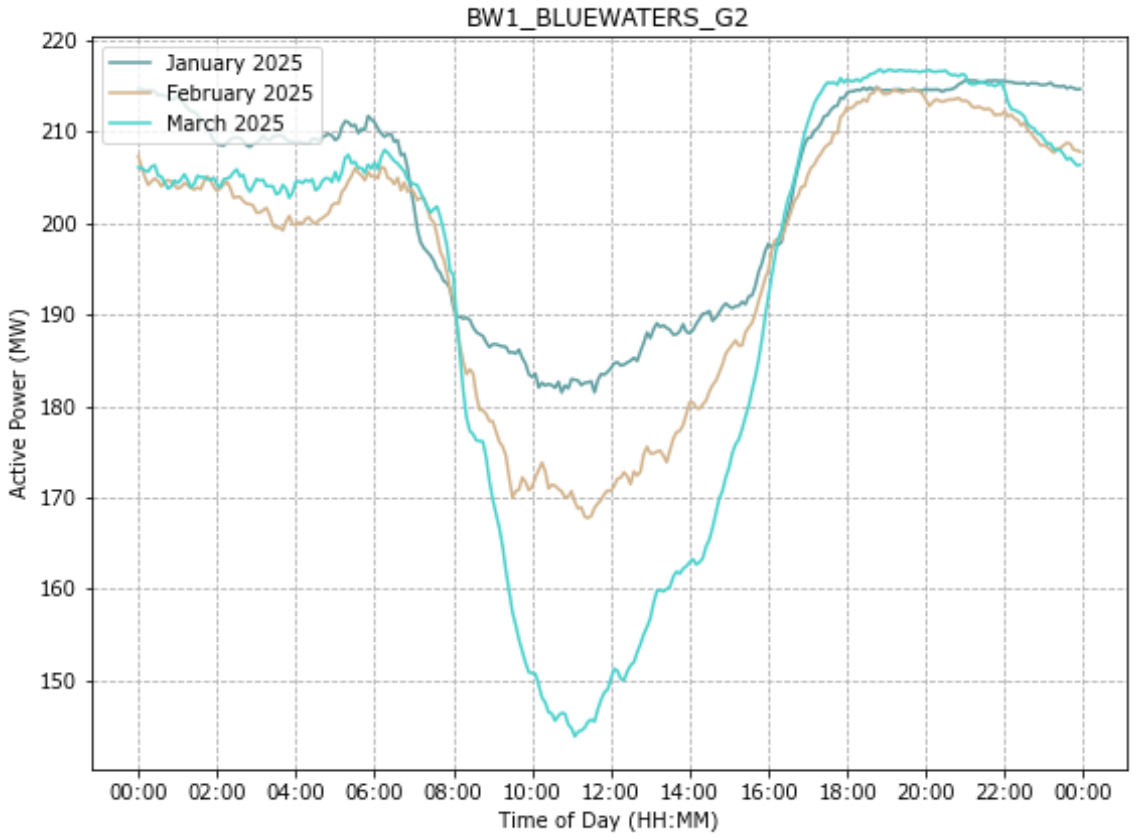
Bluewaters Power Station BW1-G2

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

Generation Duration Curves



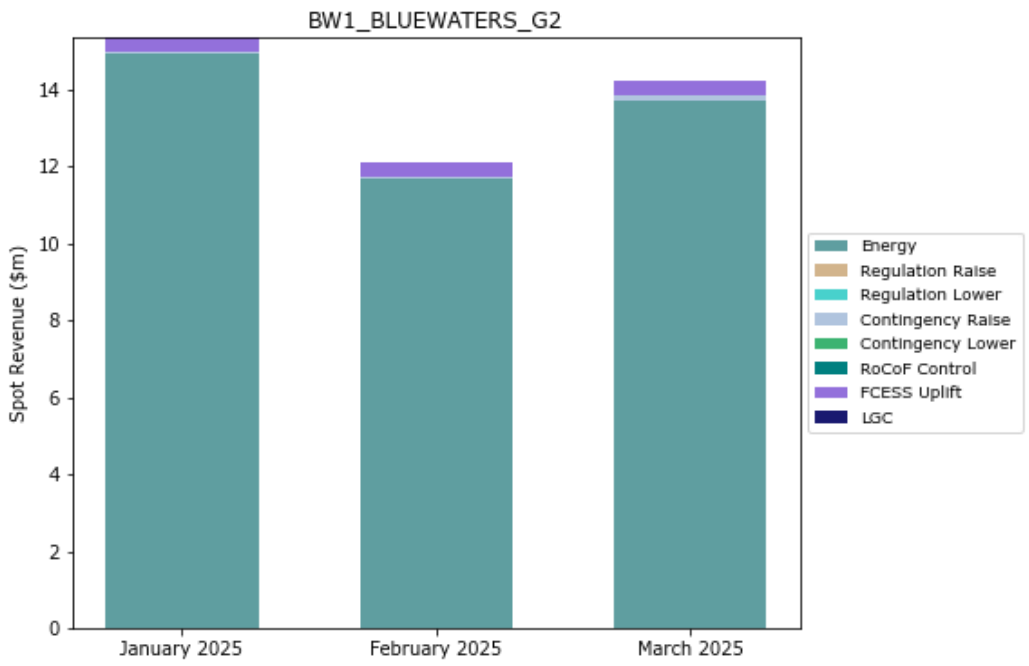
Average Time-of-Day Output



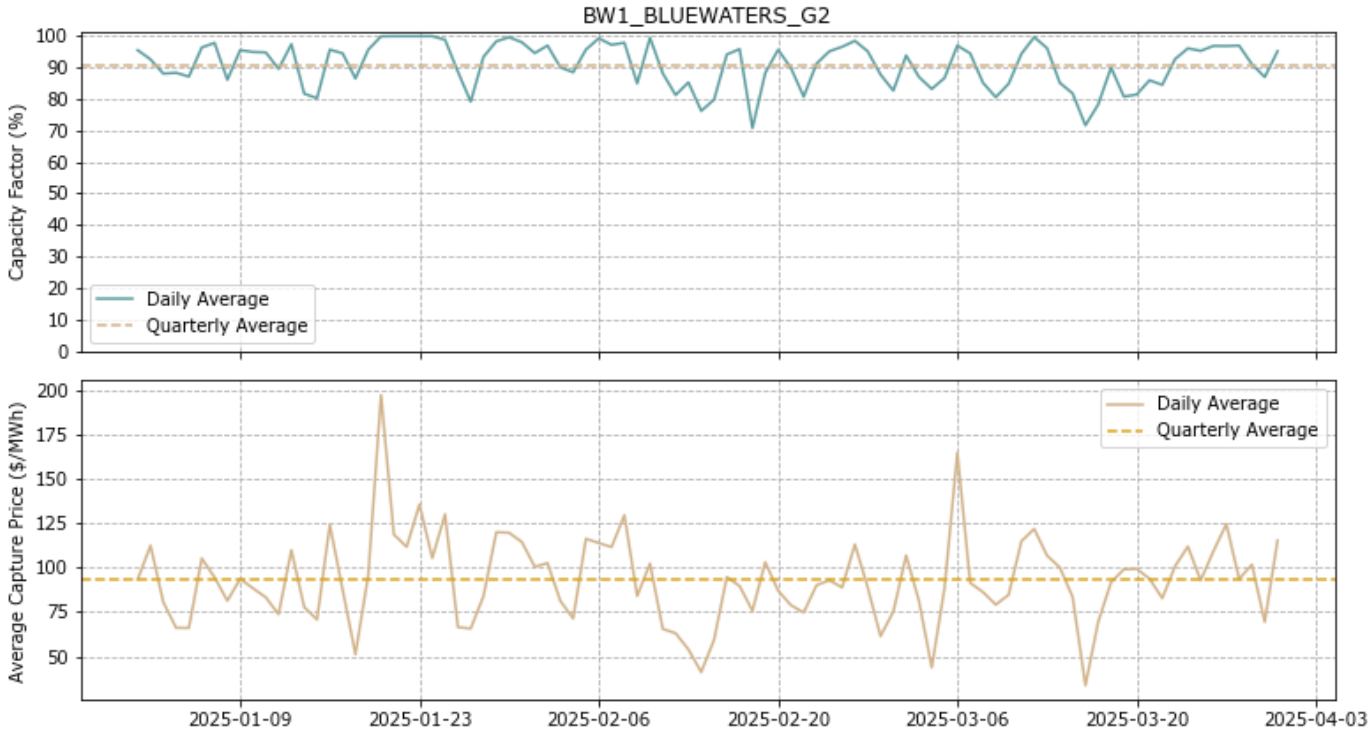
Bluewaters Power Station BW1-G2

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

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

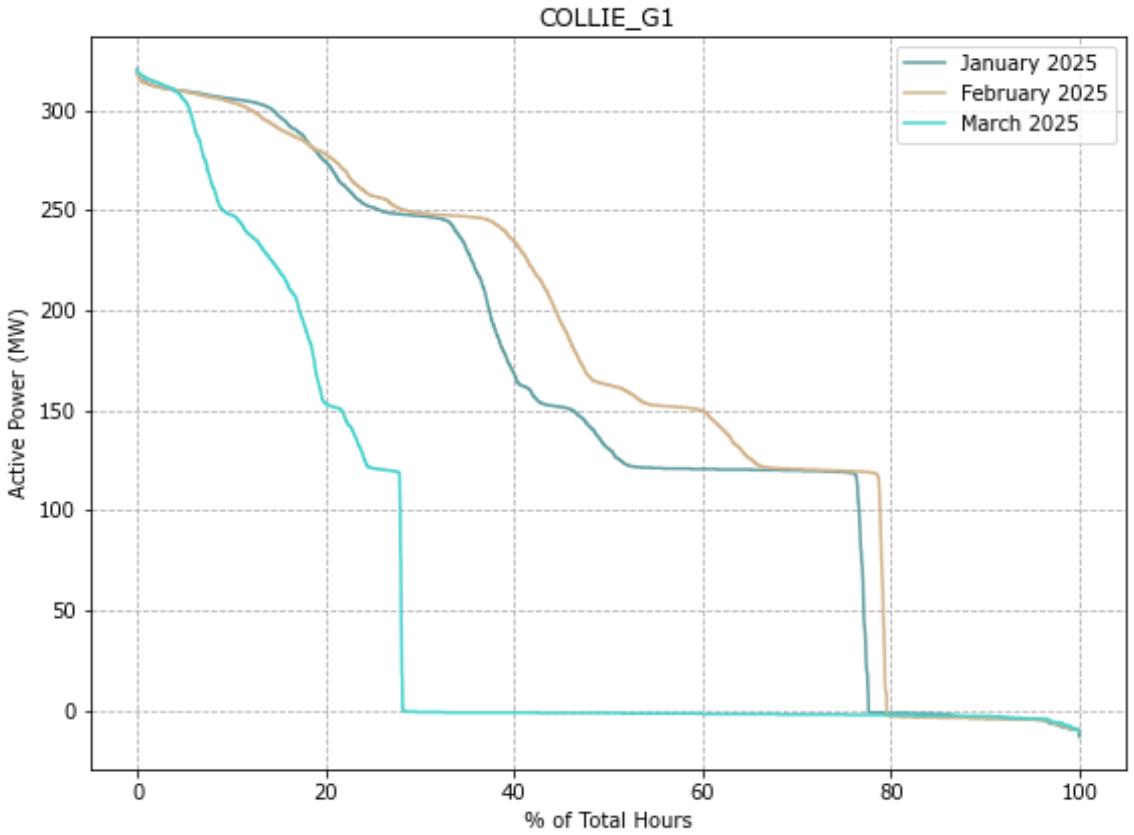


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	150.79	132.07	143.43
Total Spot Revenue ($m)	15.36	12.09	14.22
$ / MWh	**$101.89**	**$91.57**	**$99.13**

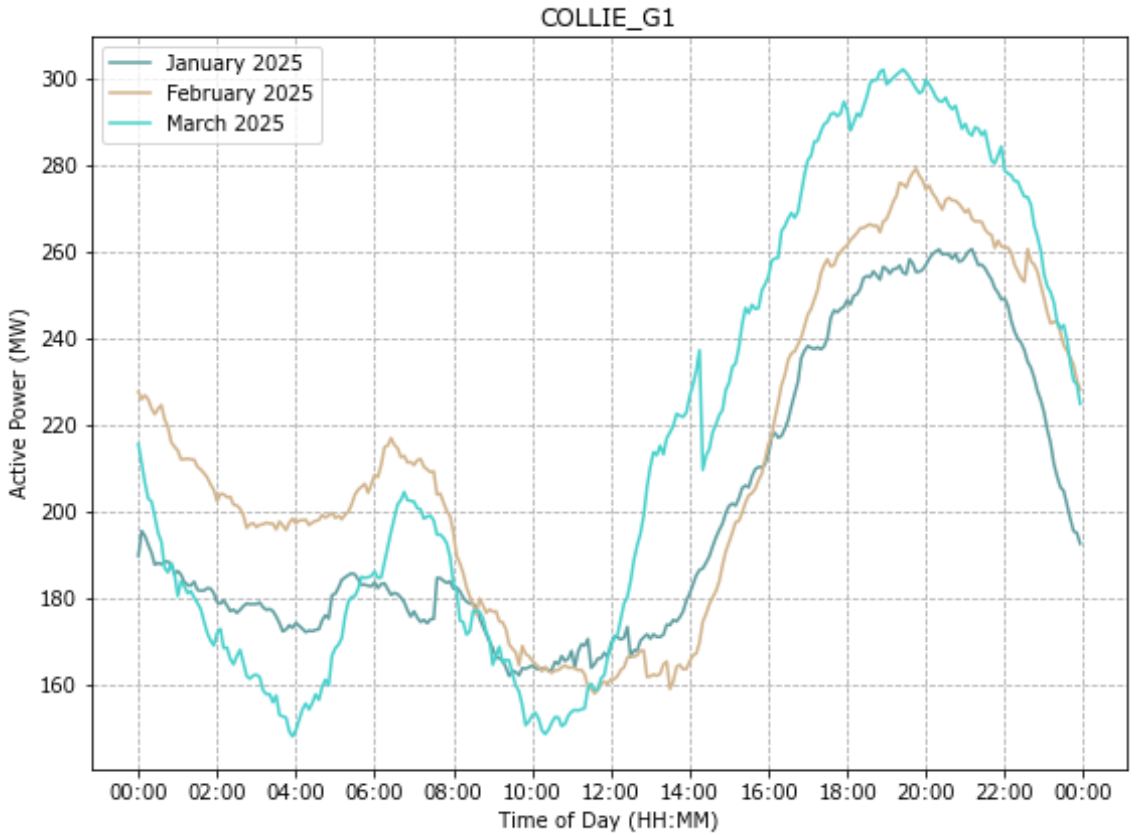
Collie Power Station G1

Coal-fired Scheduled Facility, 318.3 MW, Synergy

Generation Duration Curves



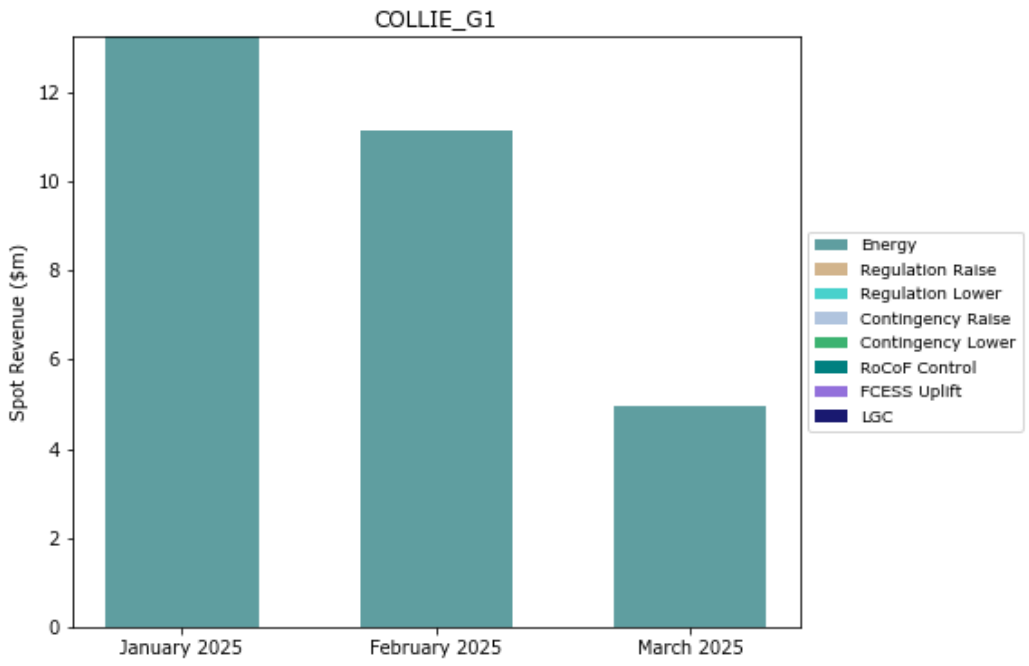
Average Time-of-Day Output



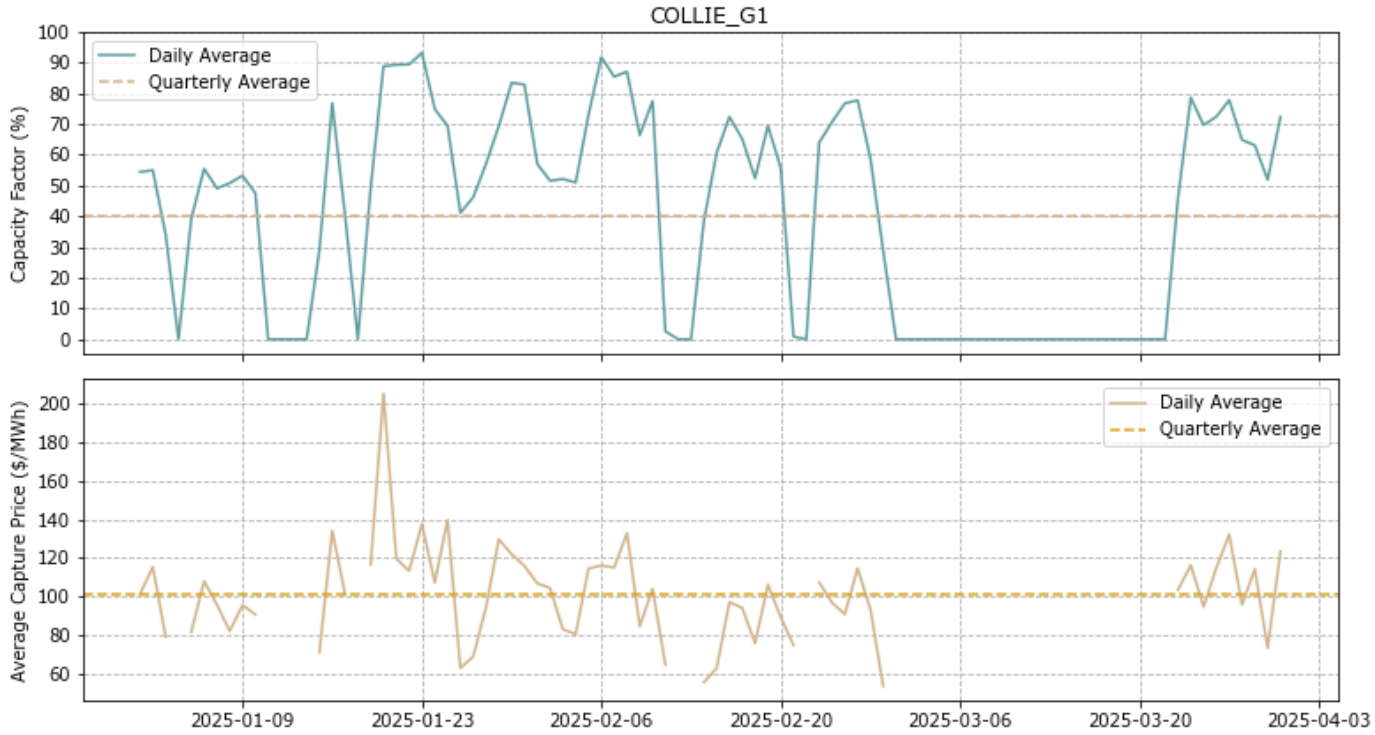
Collie Power Station G1

Coal-fired Scheduled Facility, 318.3 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

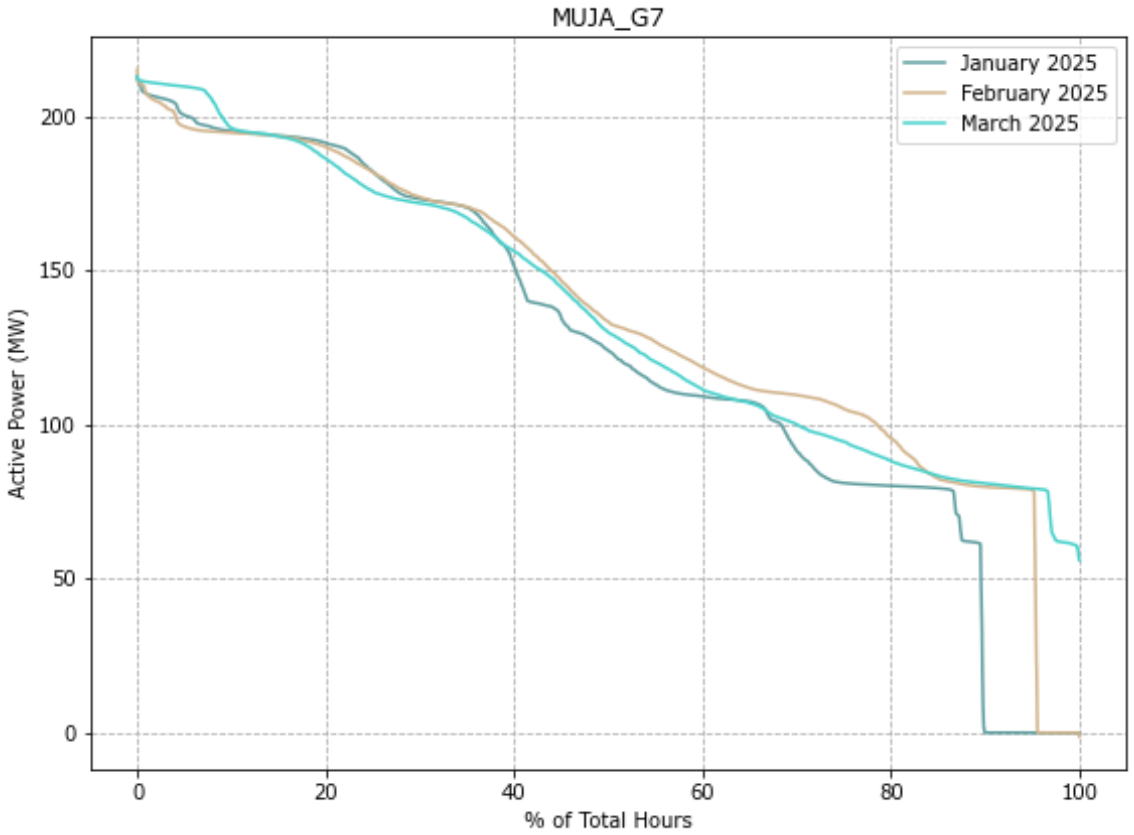


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	116.02	113.53	45.56
Total Spot Revenue ($m)	13.26	11.16	4.98
$ / MWh	**$114.29**	**$98.27**	**$109.26**

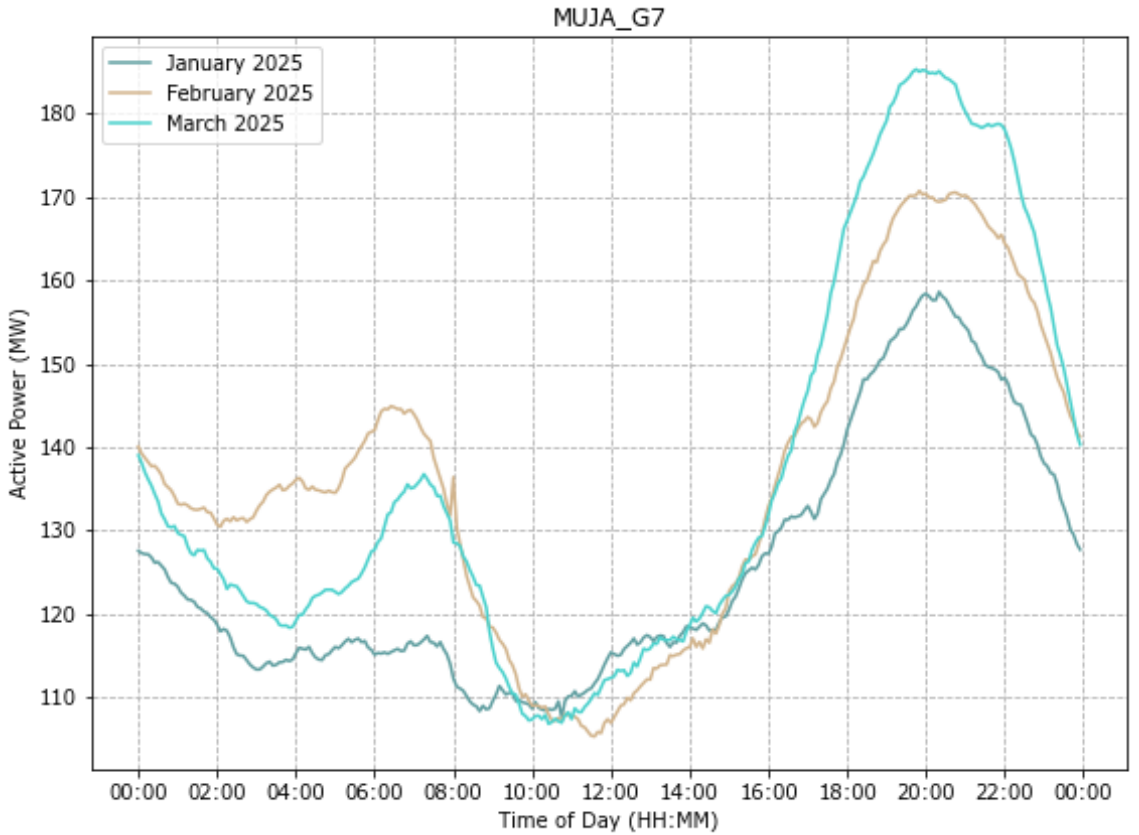
Muja Power Station G7

Coal-fired Scheduled Facility, 212.6 MW, Synergy

Generation Duration Curves



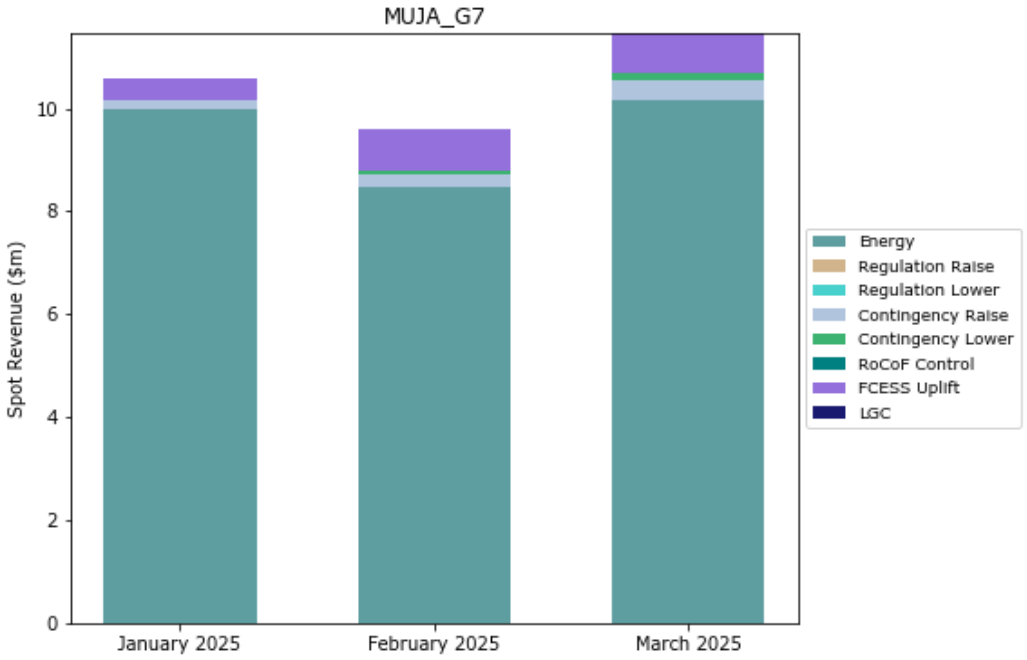
Average Time-of-Day Output



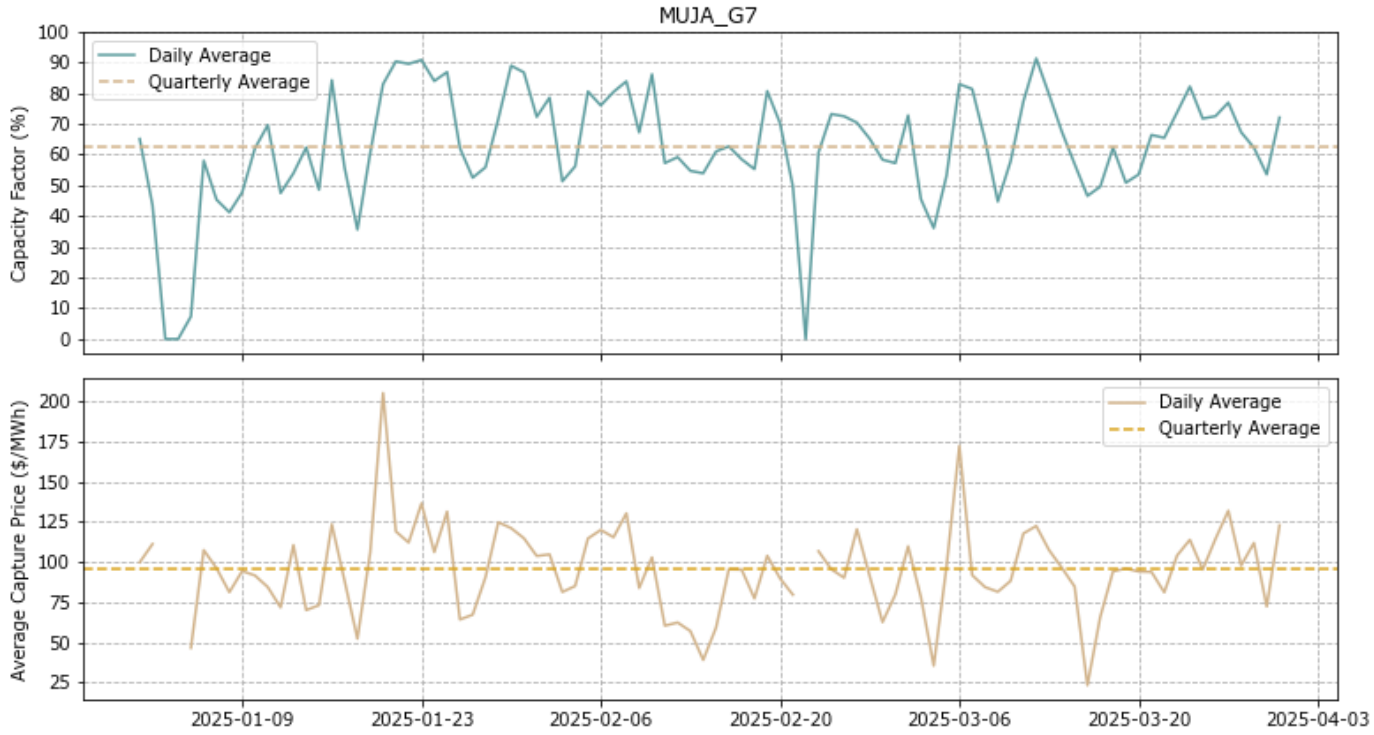
Muja Power Station G7

Coal-fired Scheduled Facility, 212.6 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

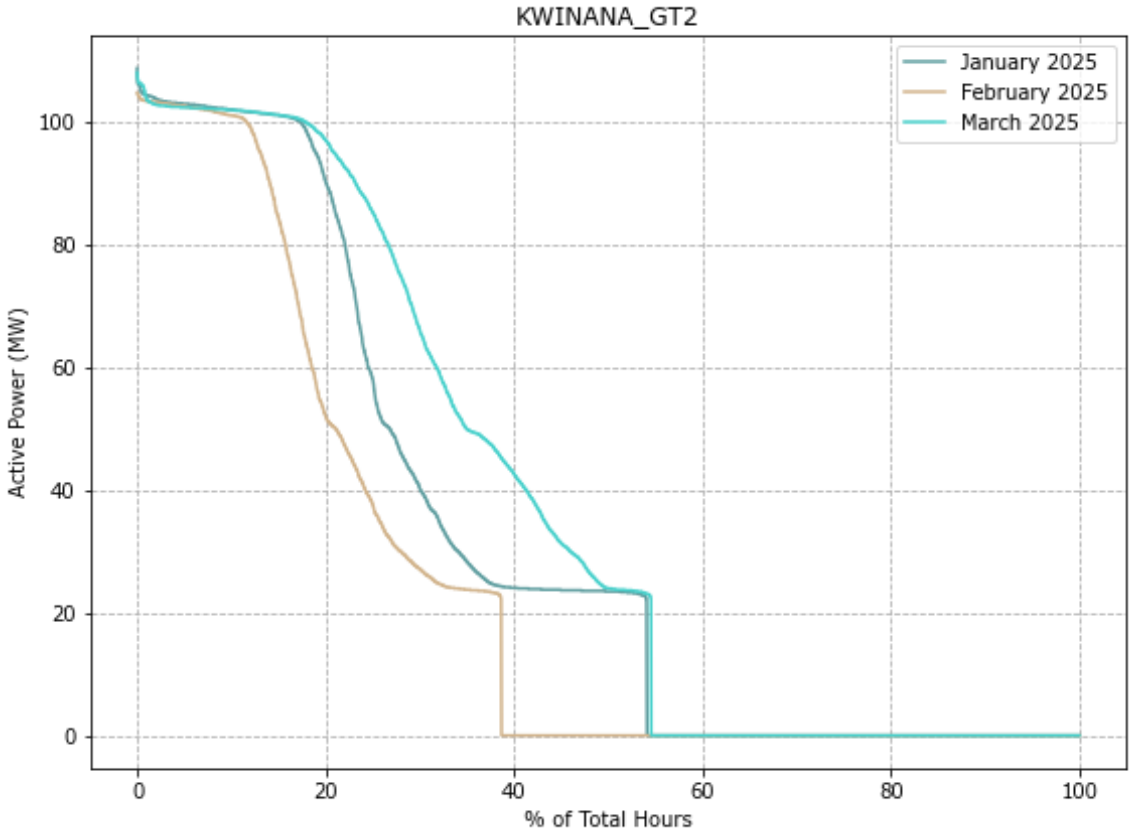


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	93.38	91.60	101.82
Total Spot Revenue ($m)	10.60	9.59	11.46
$ / MWh	**$113.48**	**$104.73**	**$112.59**

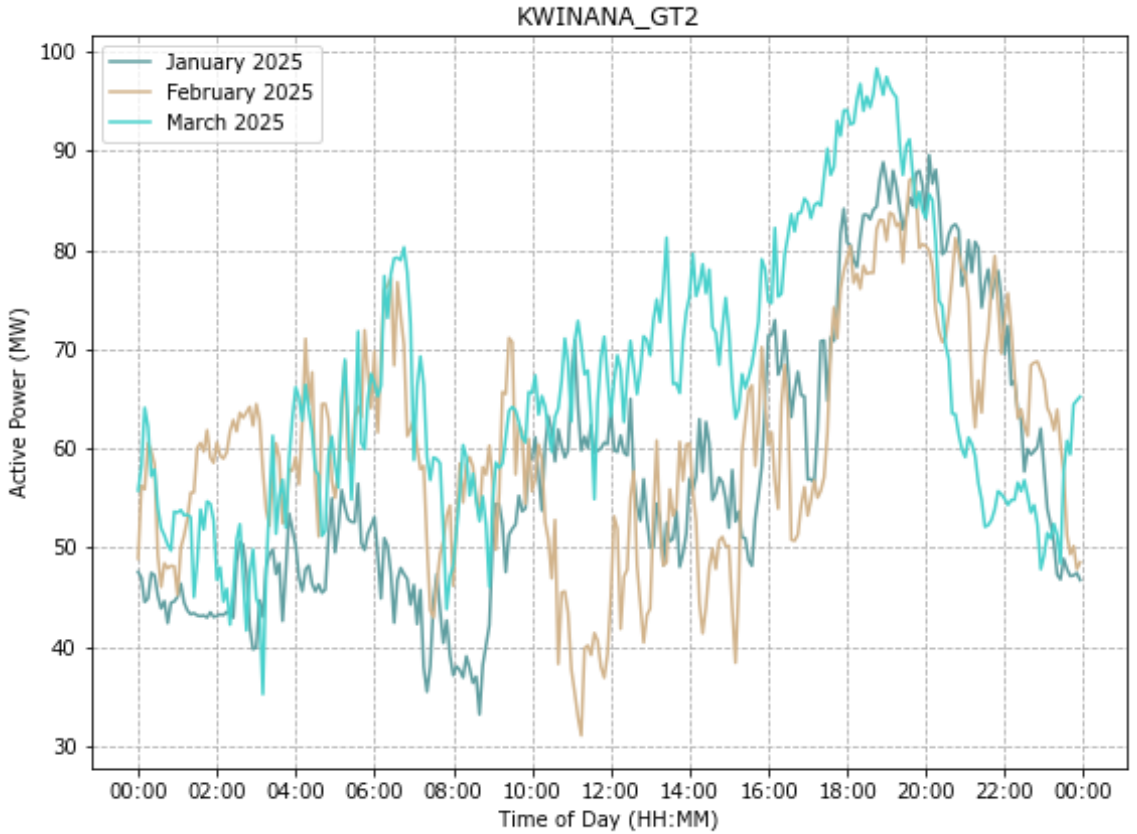
Kwinana Power Station GT2

Gas-fired Scheduled Facility, 103.94 MW, Synergy

Generation Duration Curves



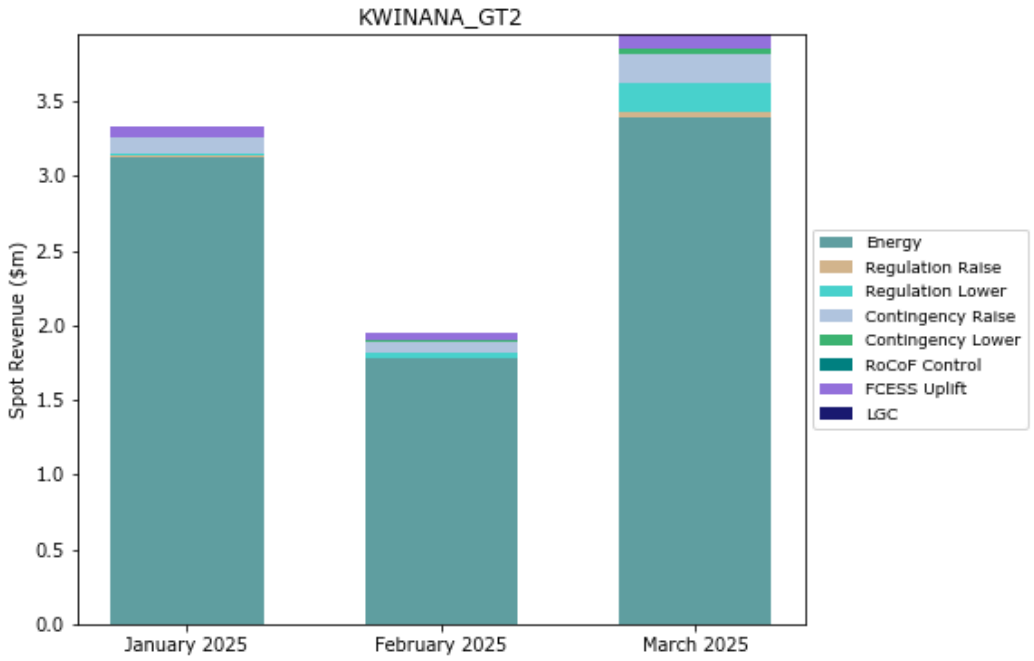
Average Time-of-Day Output



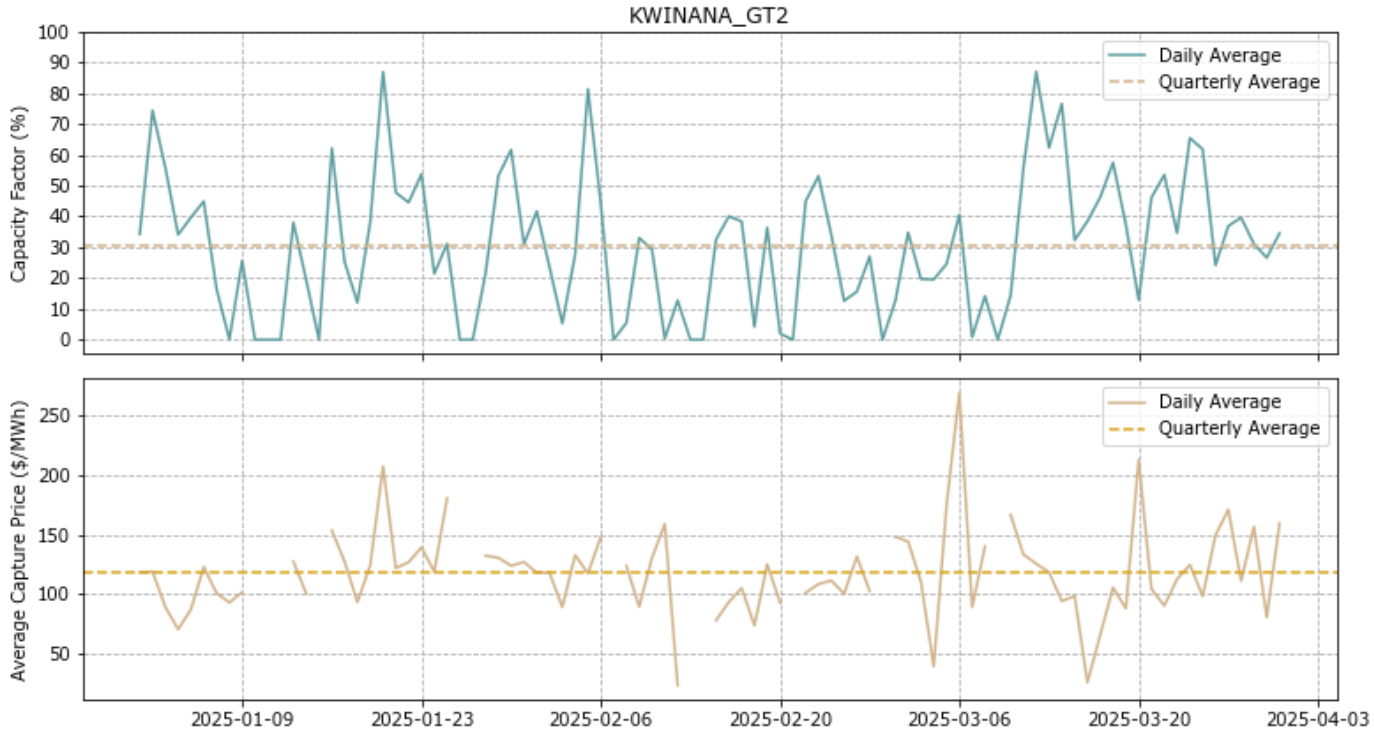
Kwinana Power Station GT2

Gas-fired Scheduled Facility, 103.94 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

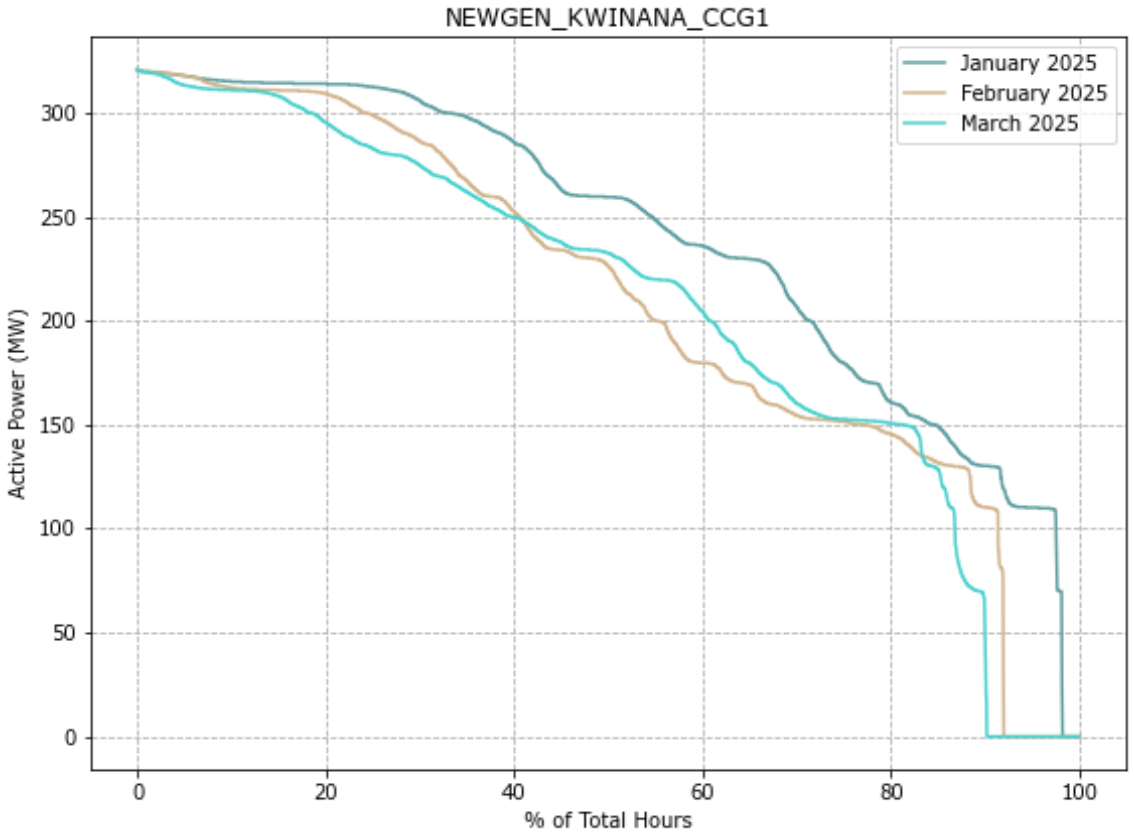


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	24.28	16.10	28.48
Total Spot Revenue ($m)	3.33	1.95	3.95
$ / MWh	**$137.10**	**$121.25**	**$138.74**

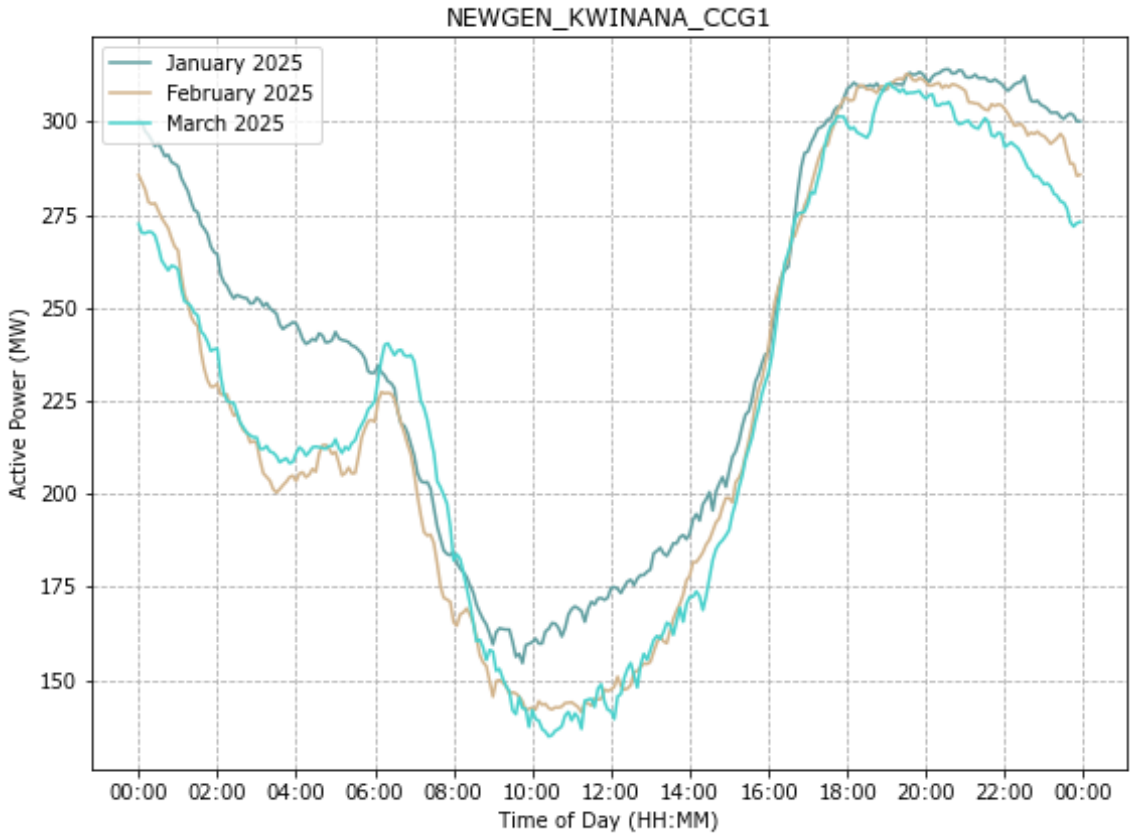
Newgen Kwinana Power Station

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

Generation Duration Curves



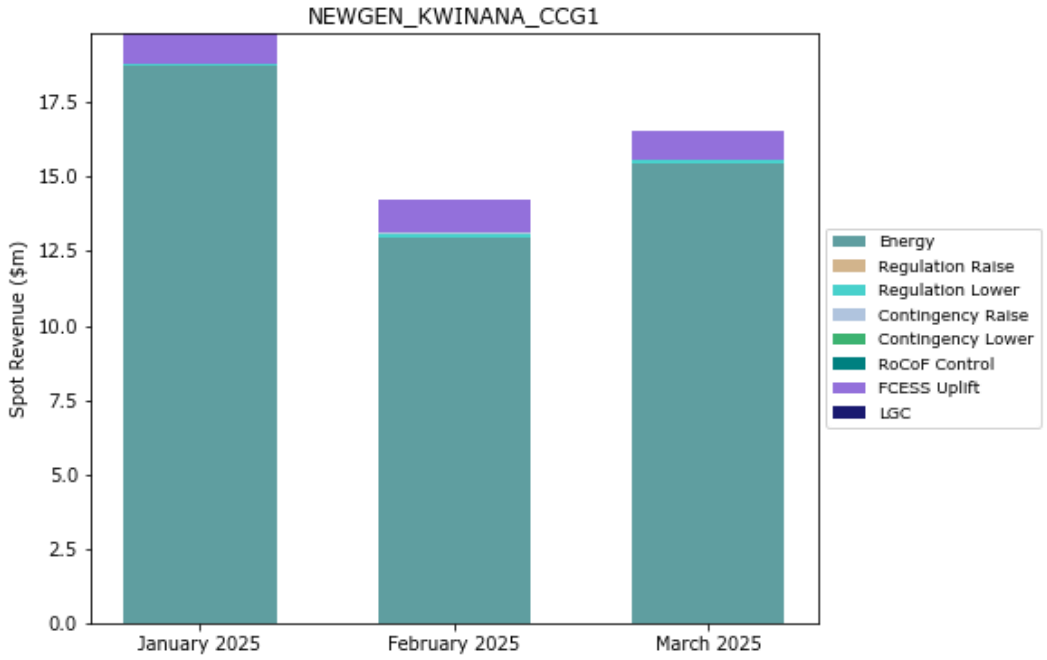
Average Time-of-Day Output



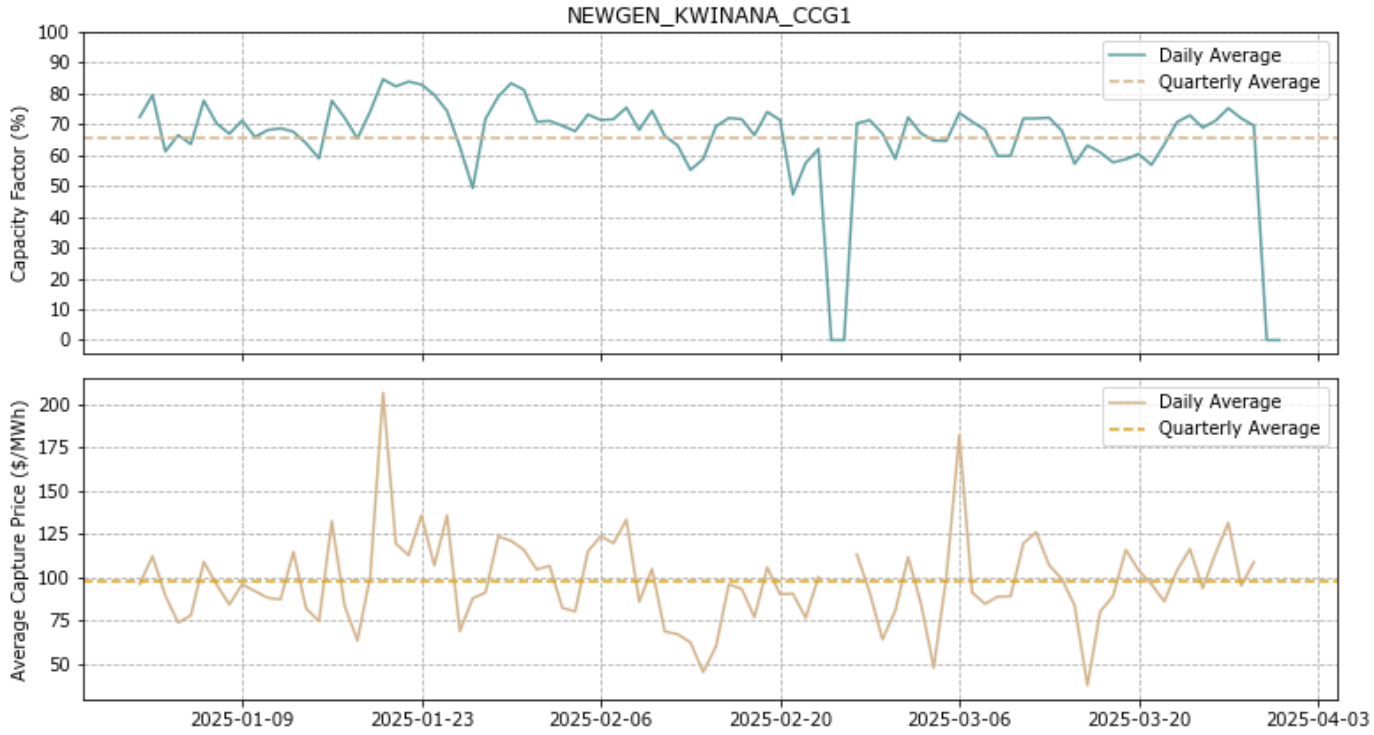
Newgen Kwinana Power Station

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

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

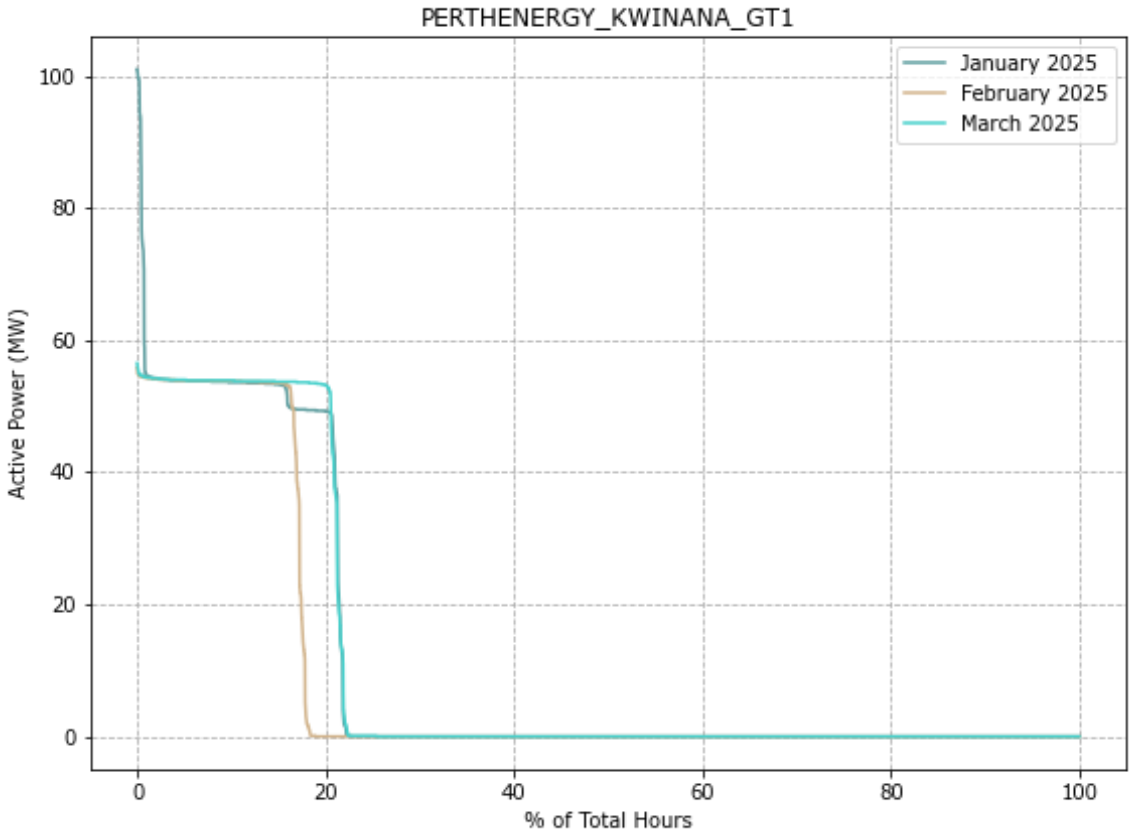


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	178.75	141.06	154.32
Total Spot Revenue ($m)	19.83	14.22	16.55
$ / MWh	**$110.95**	**$100.81**	**$107.27**

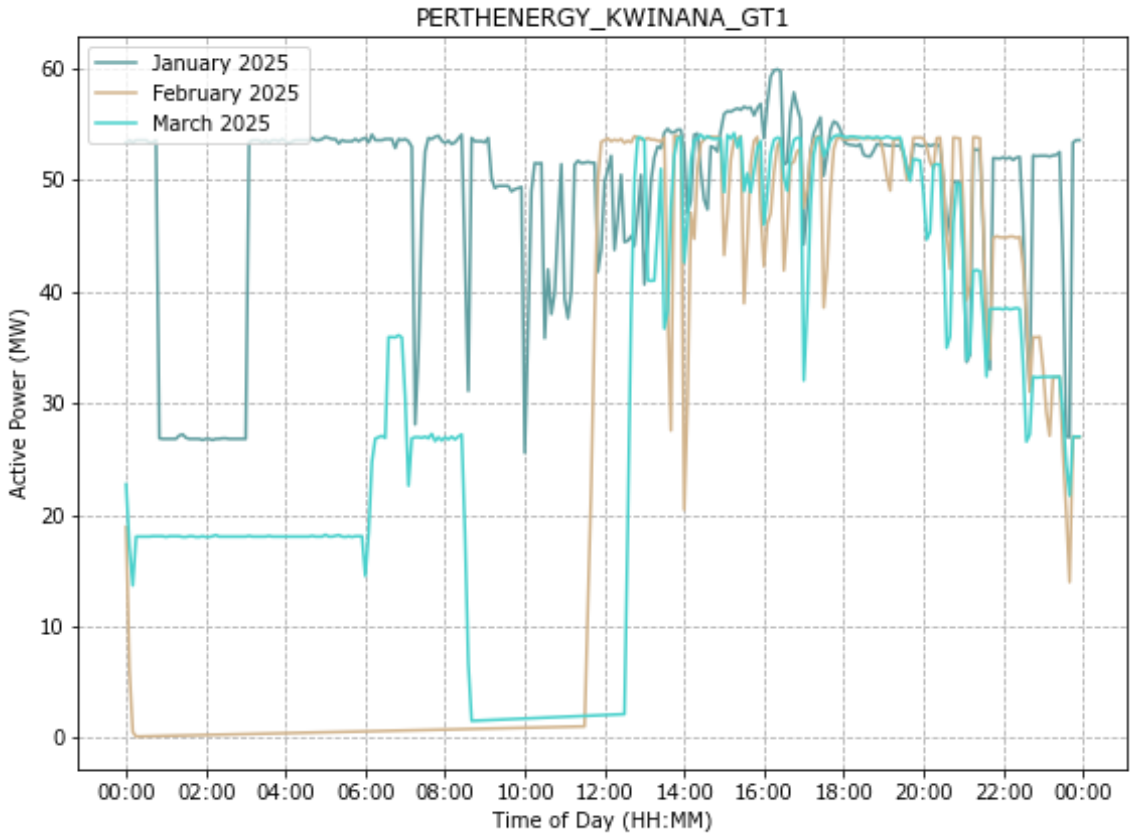
Kwinana Swift Power Station

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

Generation Duration Curves



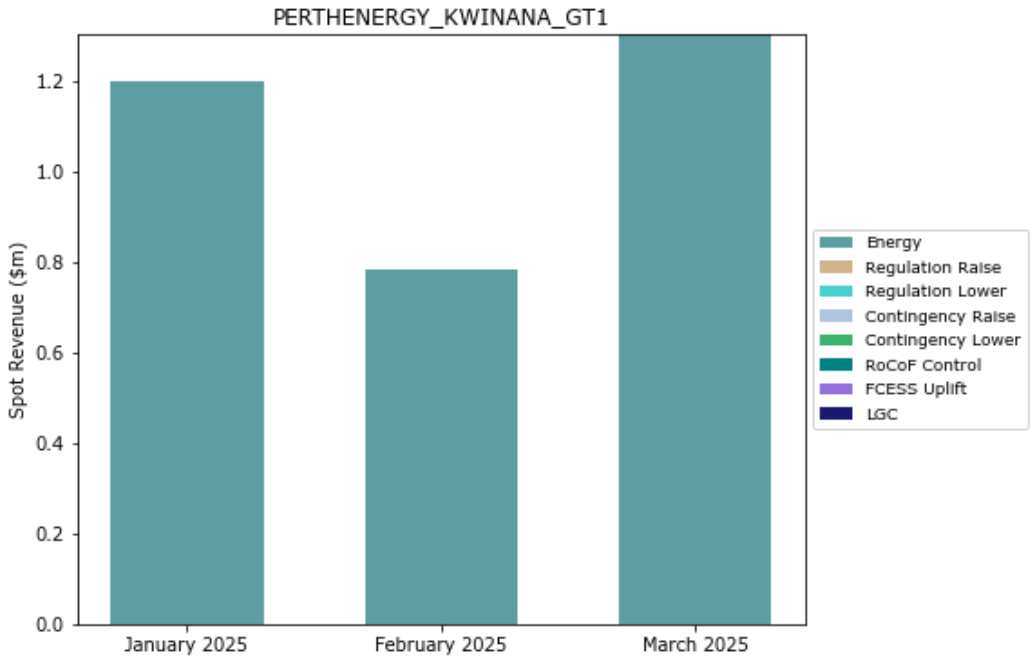
Average Time-of-Day Output



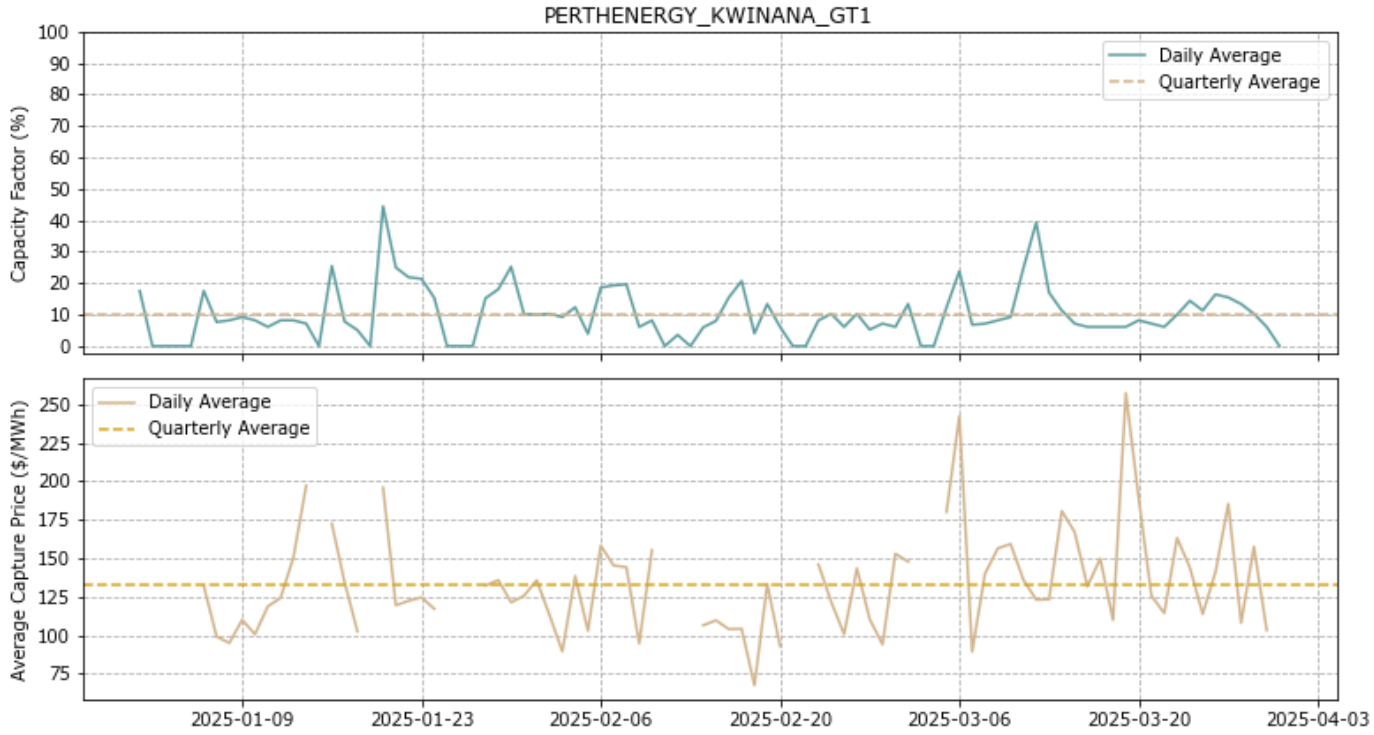
Kwinana Swift Power Station

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

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

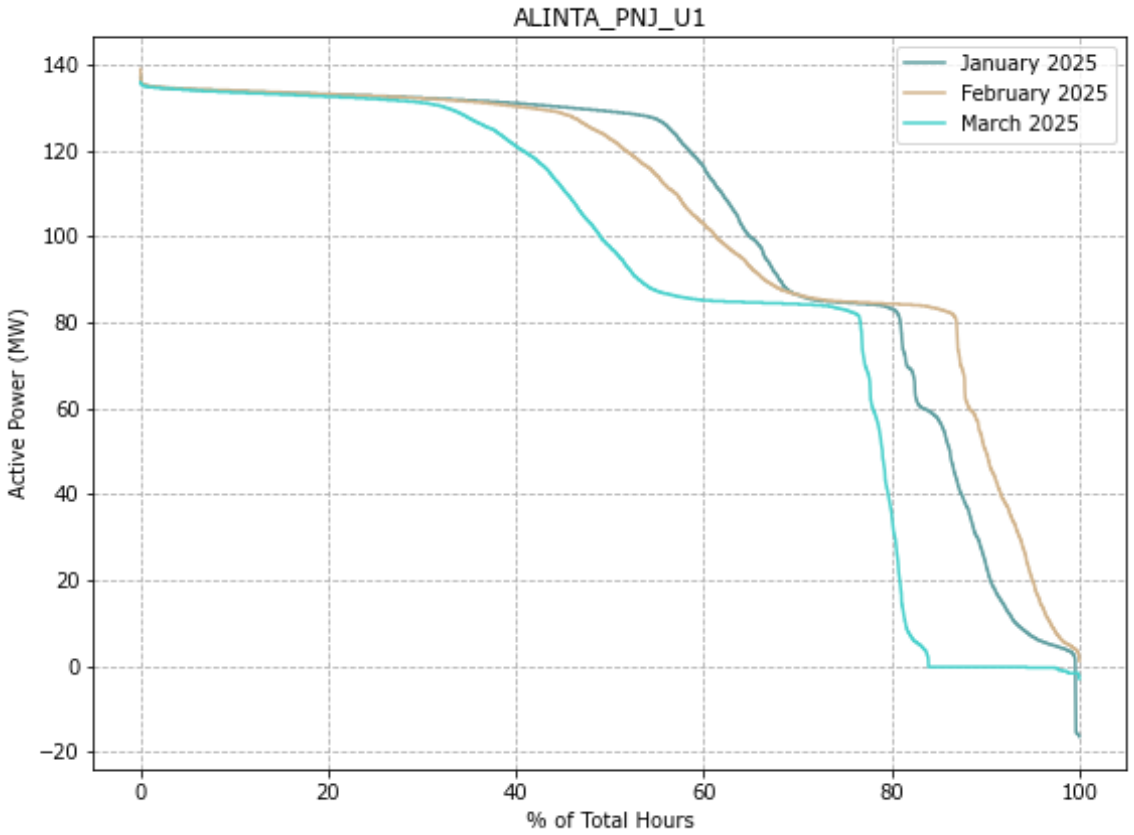


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	8.72	6.33	8.63
Total Spot Revenue ($m)	1.20	0.78	1.30
$ / MWh	**$137.36**	**$123.63**	**$150.92**

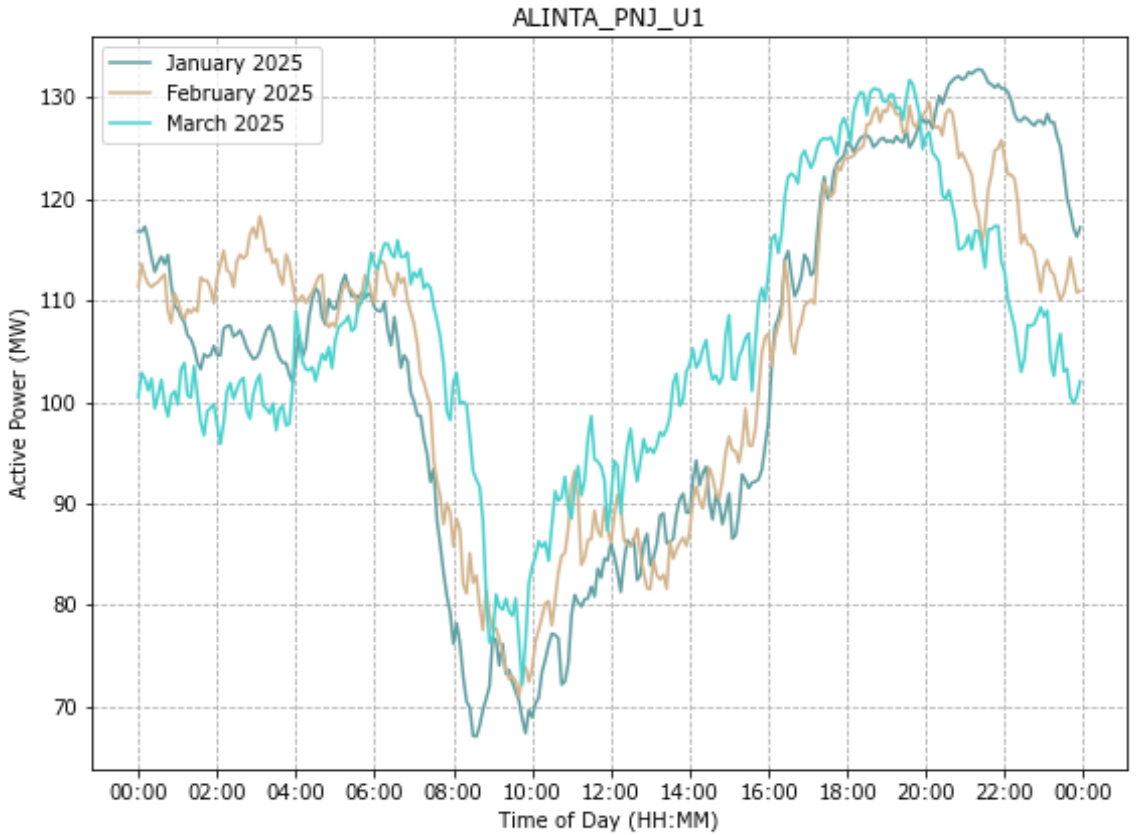
Pinjarra Power Station U1

Gas-fired Scheduled Facility, 143 MW, Alinta Energy

Generation Duration Curves



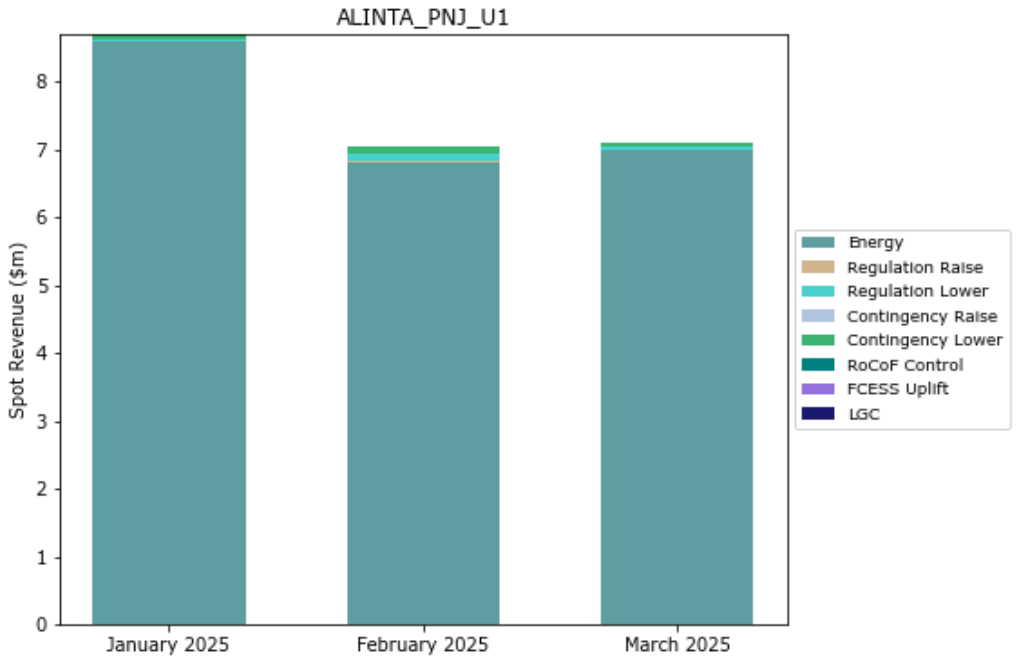
Average Time-of-Day Output



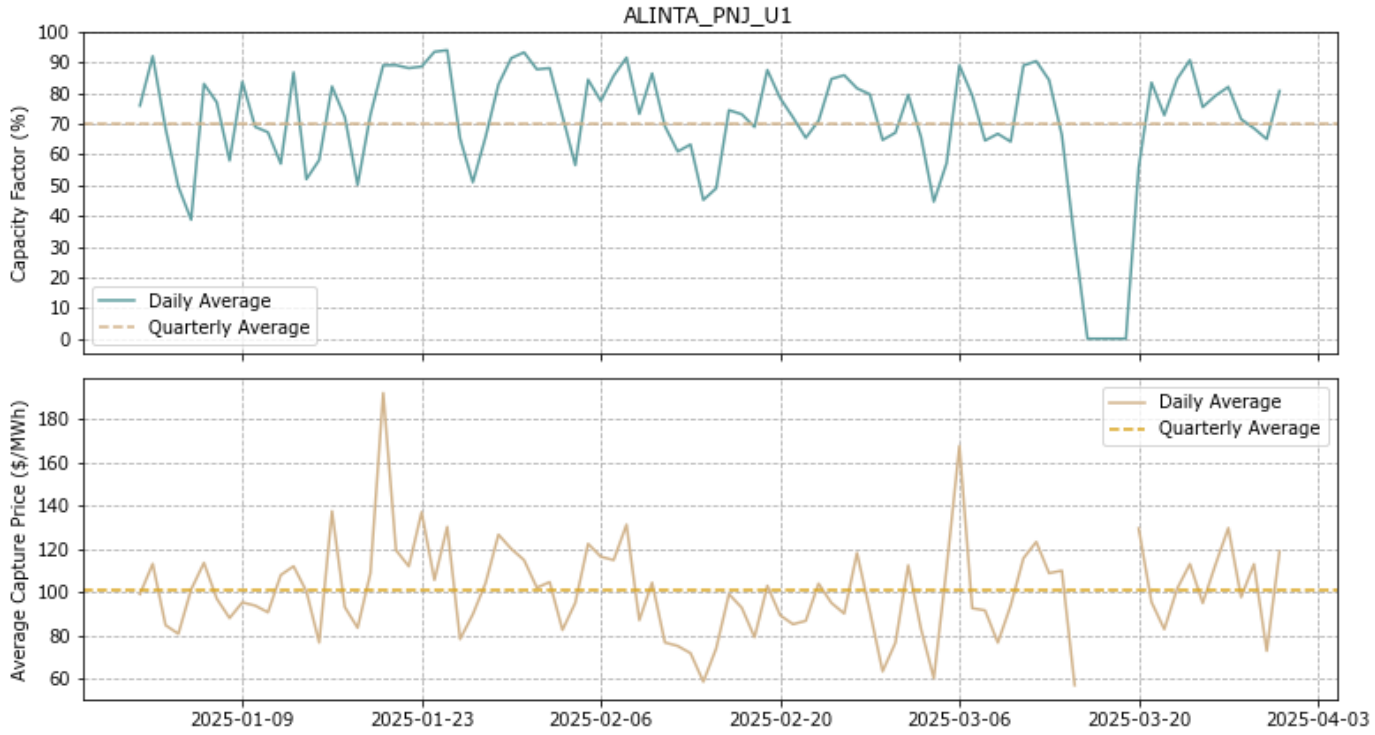
Pinjarra Power Station U1

Gas-fired Scheduled Facility, 143 MW, Alinta Energy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

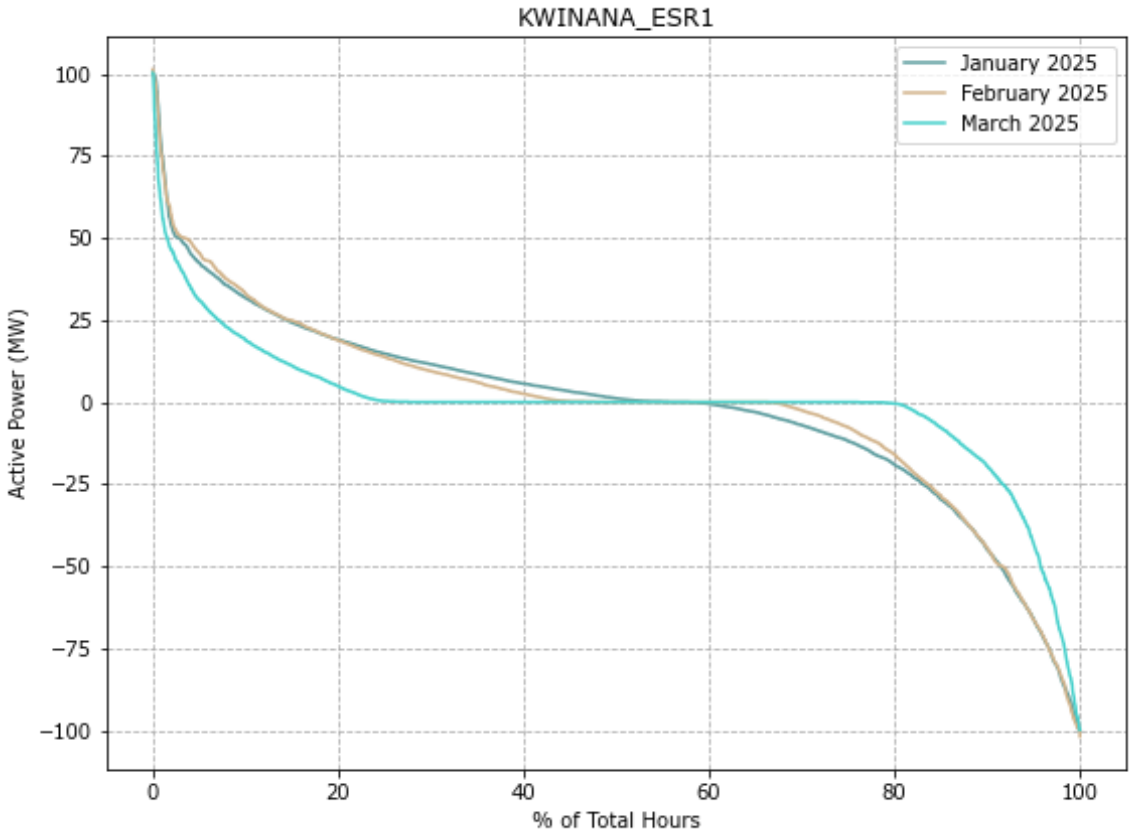


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	78.47	71.30	66.87
Total Spot Revenue ($m)	8.70	7.05	7.08
$ / MWh	**$110.89**	**$98.93**	**$105.94**

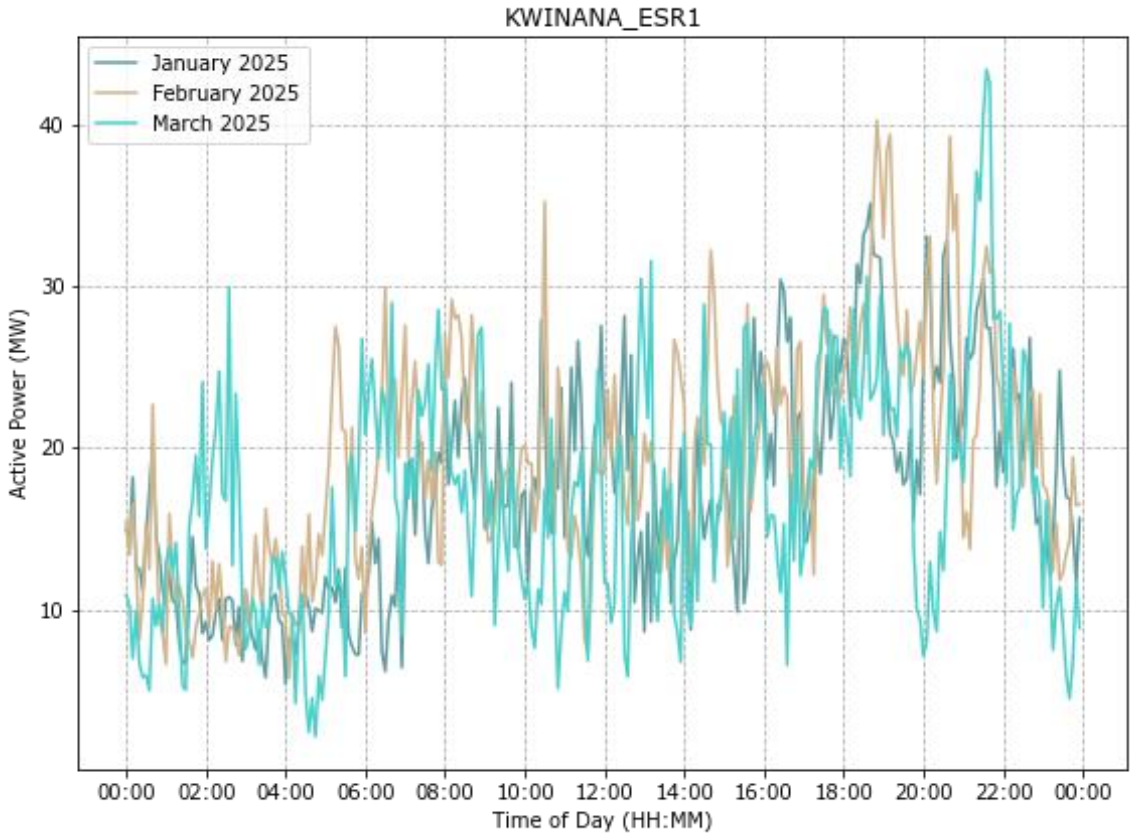
Kwinana BESS 1

Energy Storage Scheduled Facility, 100 MW, Synergy

Generation Duration Curves



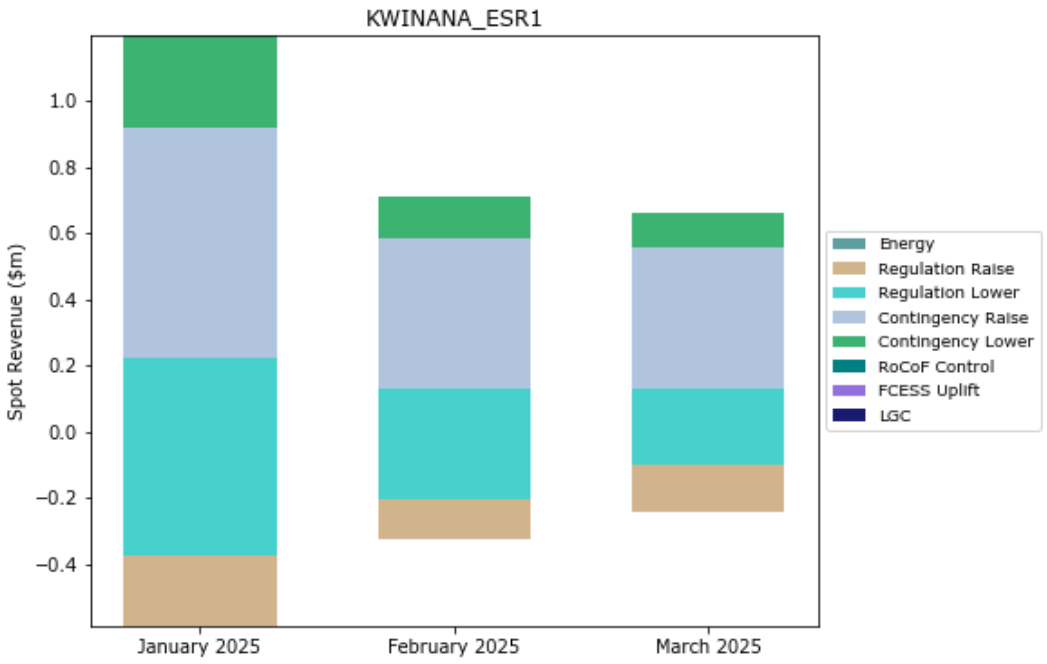
Average Time-of-Day Output



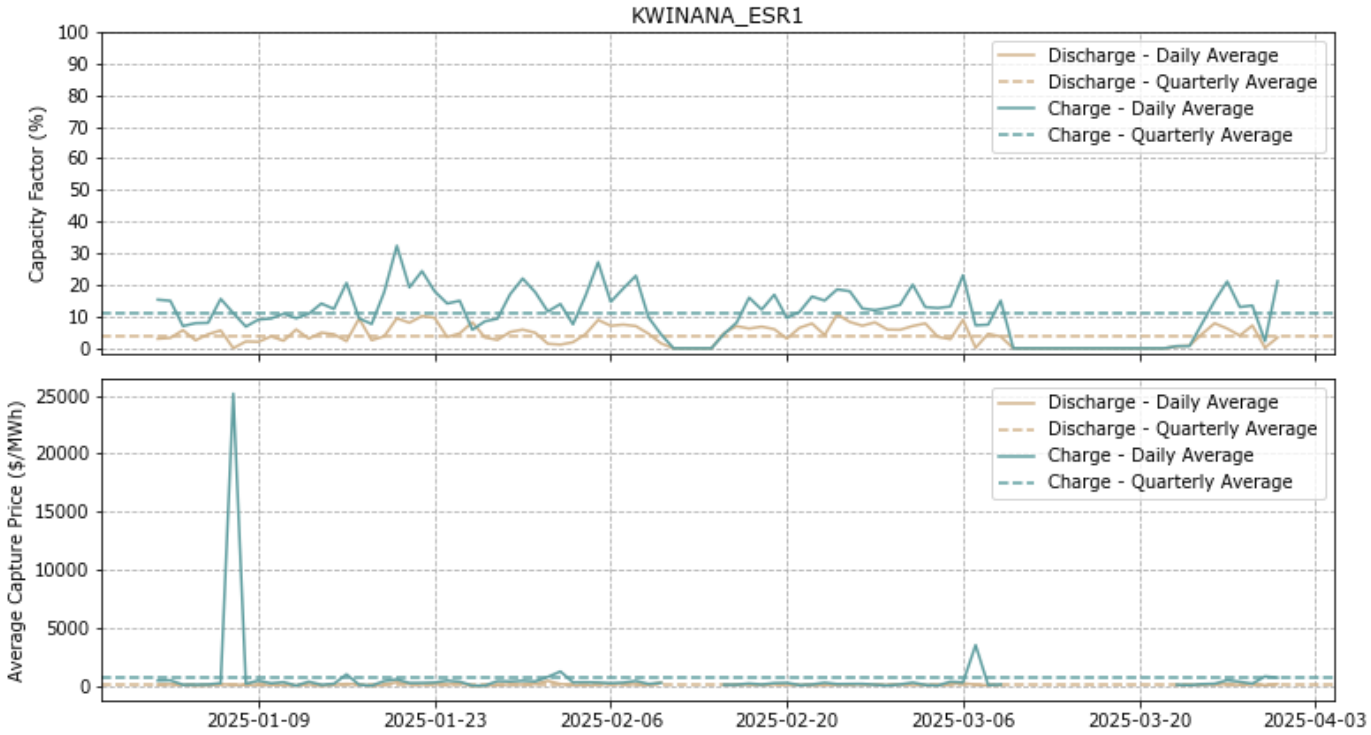
Kwinana BESS 1

Energy Storage Scheduled Facility, 100 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

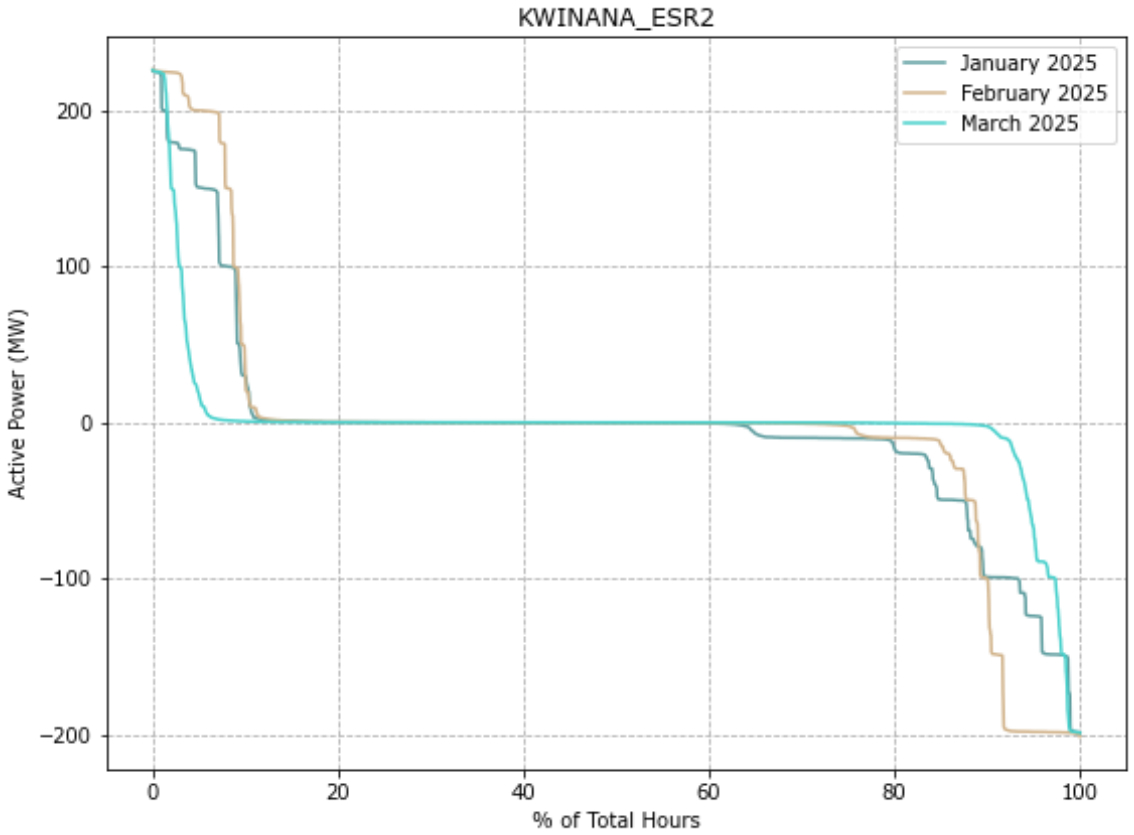


	Jan 2025	Feb 2025	Mar 2025
Total Spot Revenue ($m)	1.20	0.71	0.66

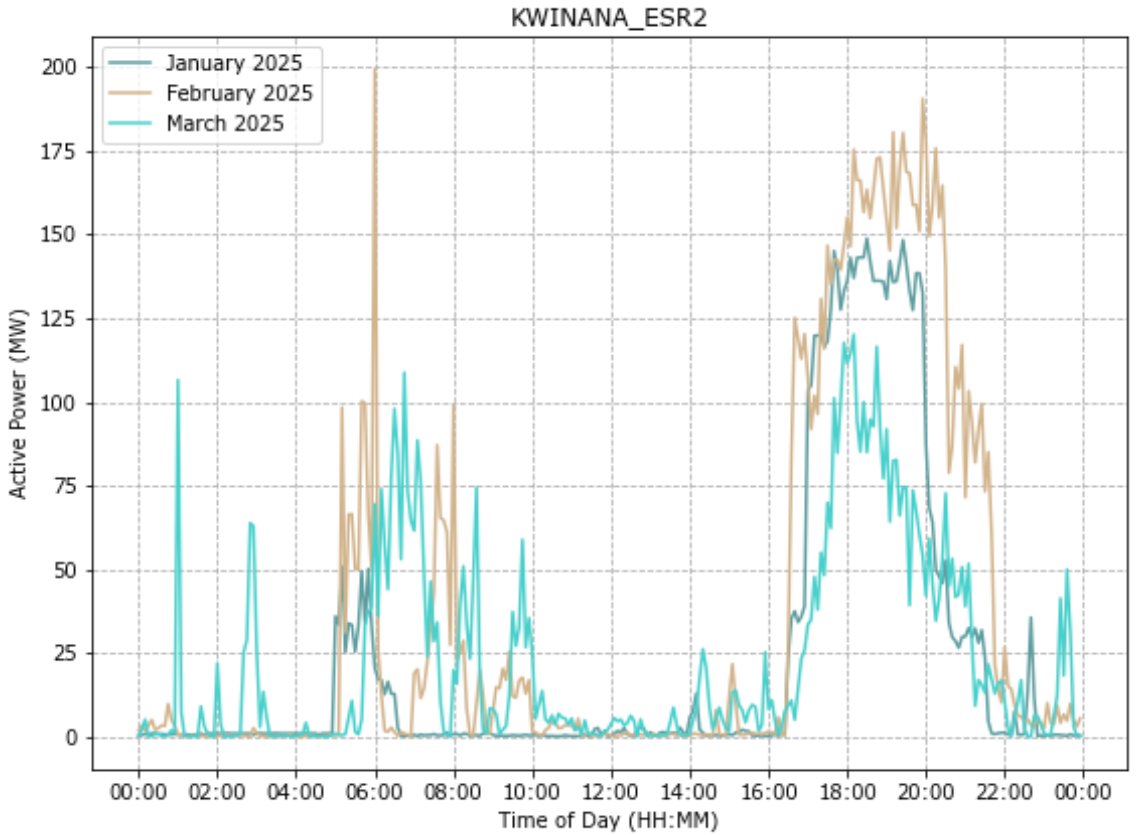
Kwinana BESS 2

Energy Storage Scheduled Facility, 225 MW, Synergy

Generation Duration Curves



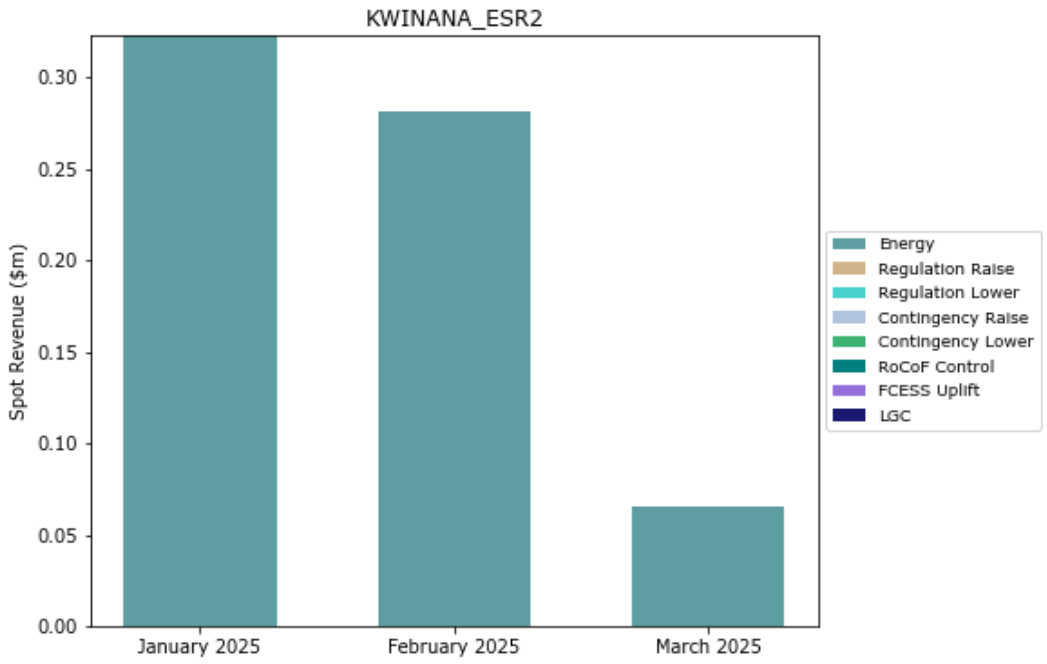
Average Time-of-Day Output



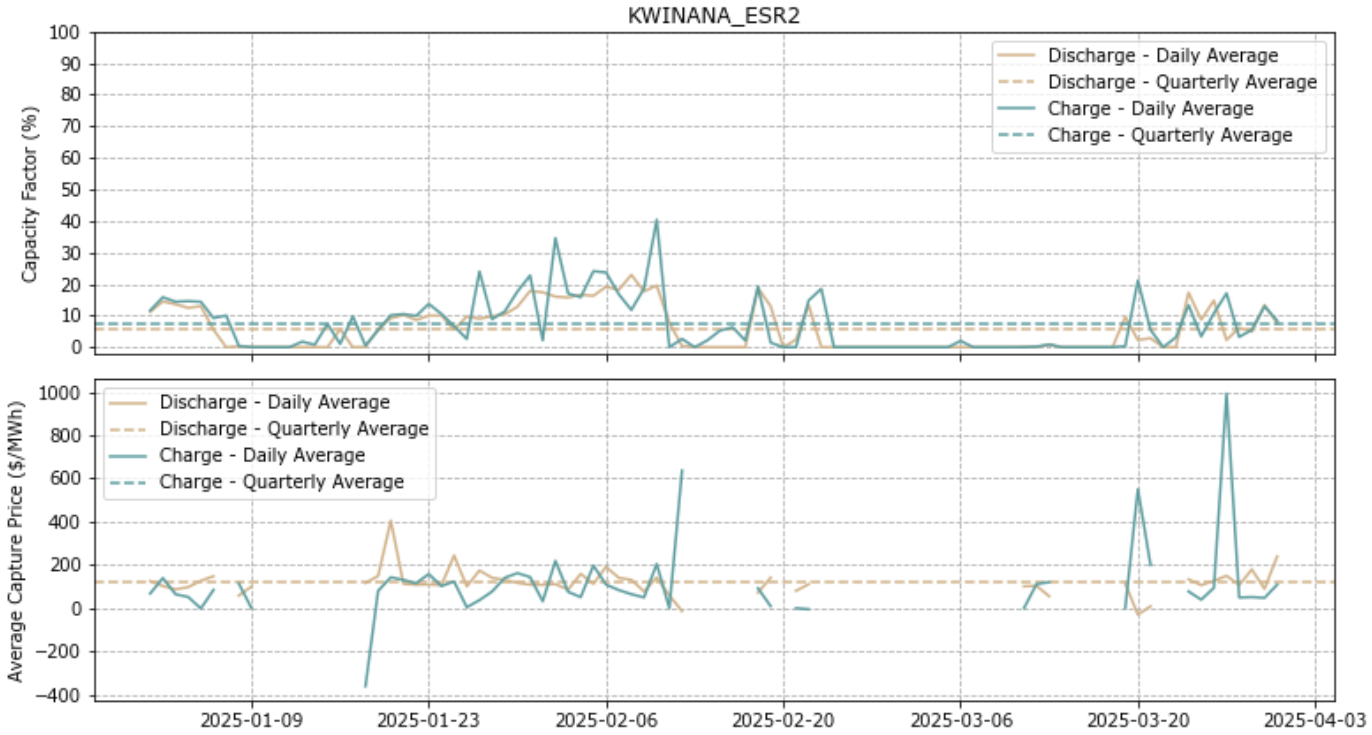
Kwinana BESS 2

Energy Storage Scheduled Facility, 225 MW, Synergy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

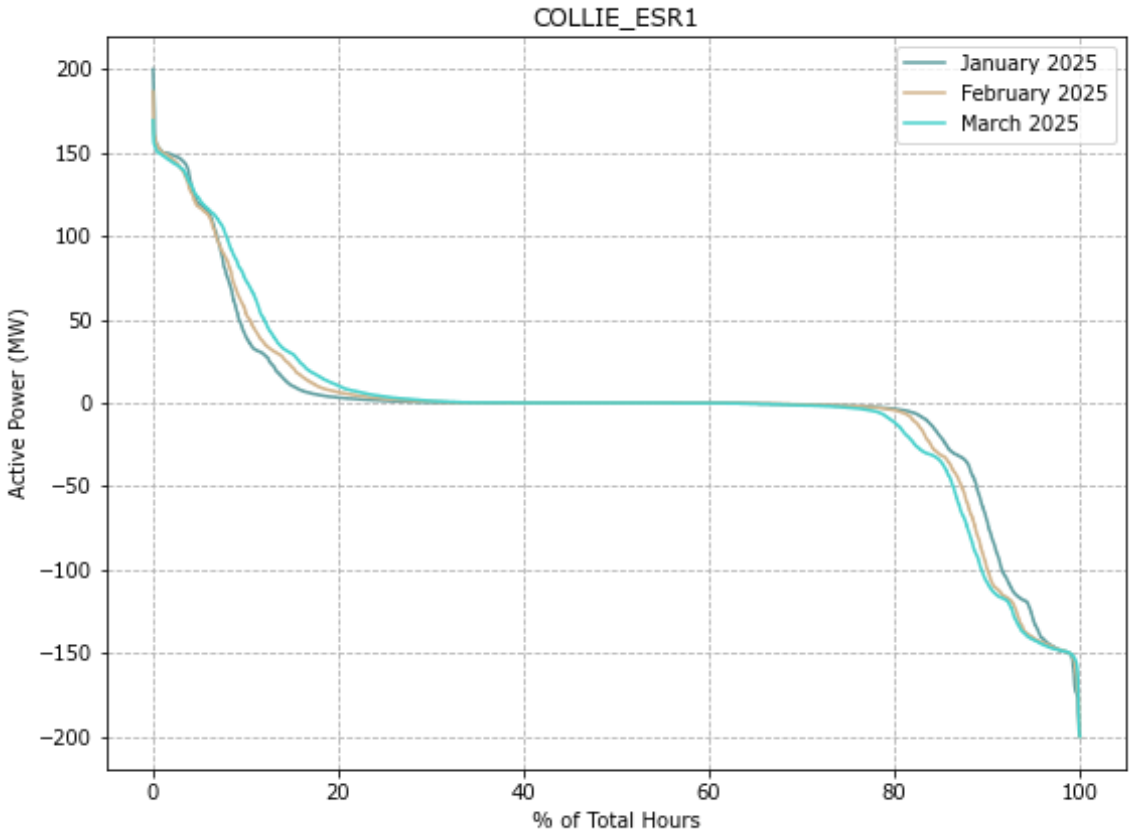


	Jan 2025	Feb 2025	Mar 2025
Total Spot Revenue ($m)	0.32	0.28	0.07

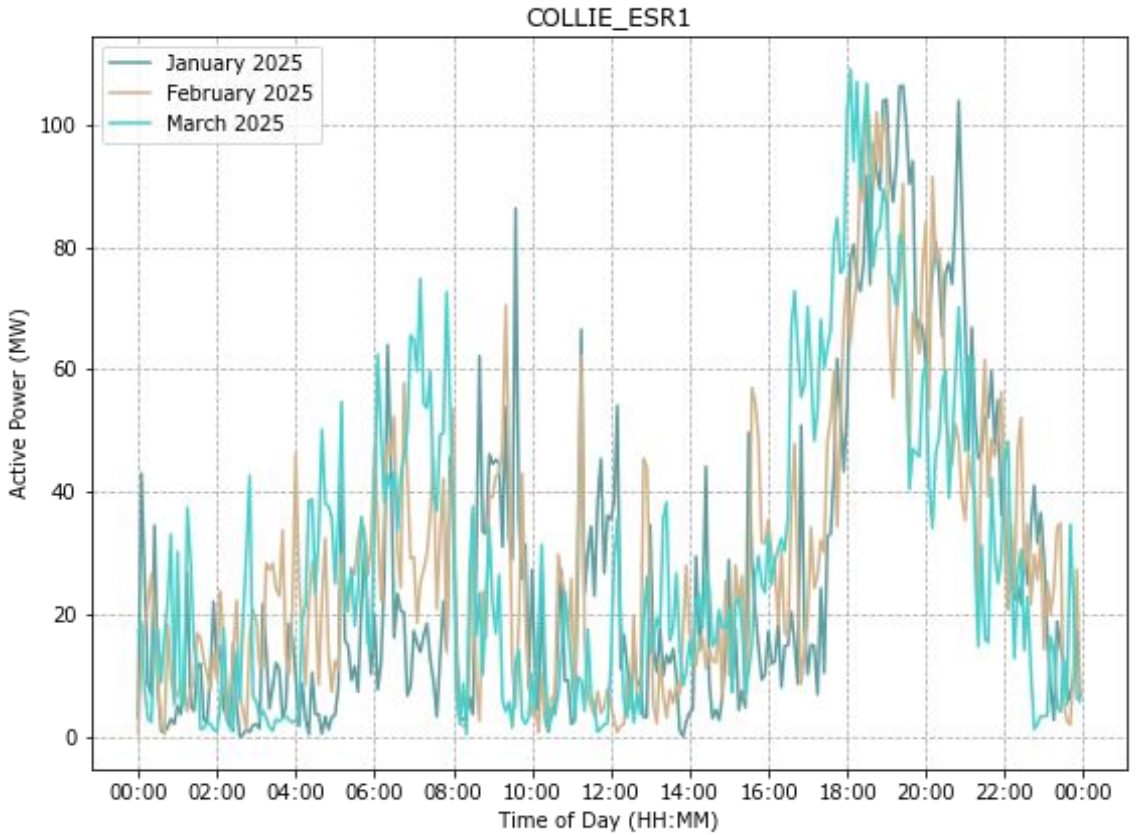
Collie BESS 1

Energy Storage Scheduled Facility, 200 MW, Neoen

Generation Duration Curves



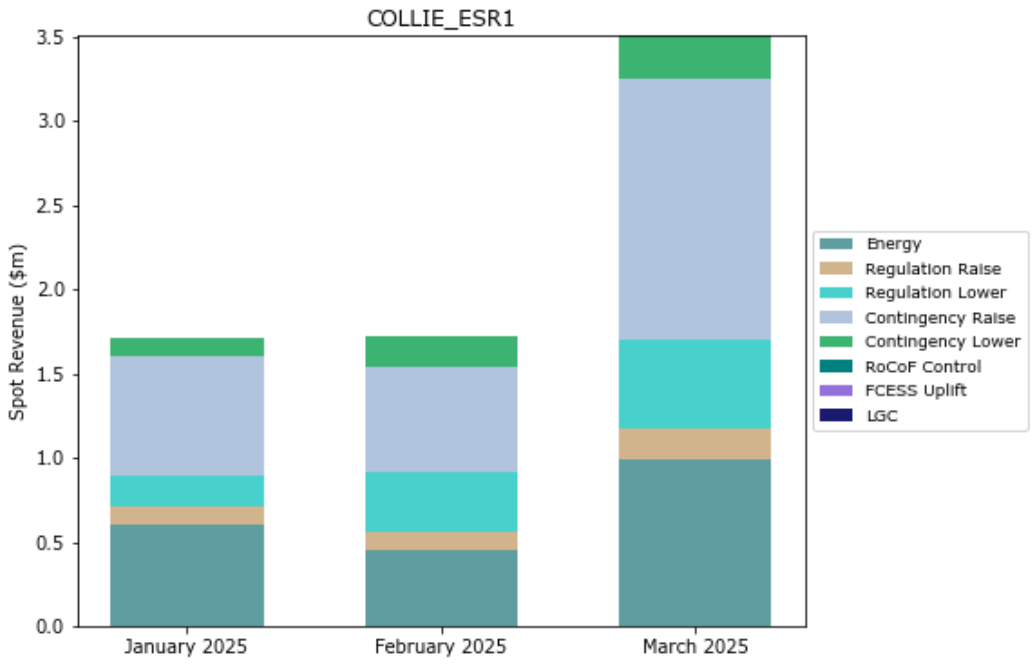
Average Time-of-Day Output



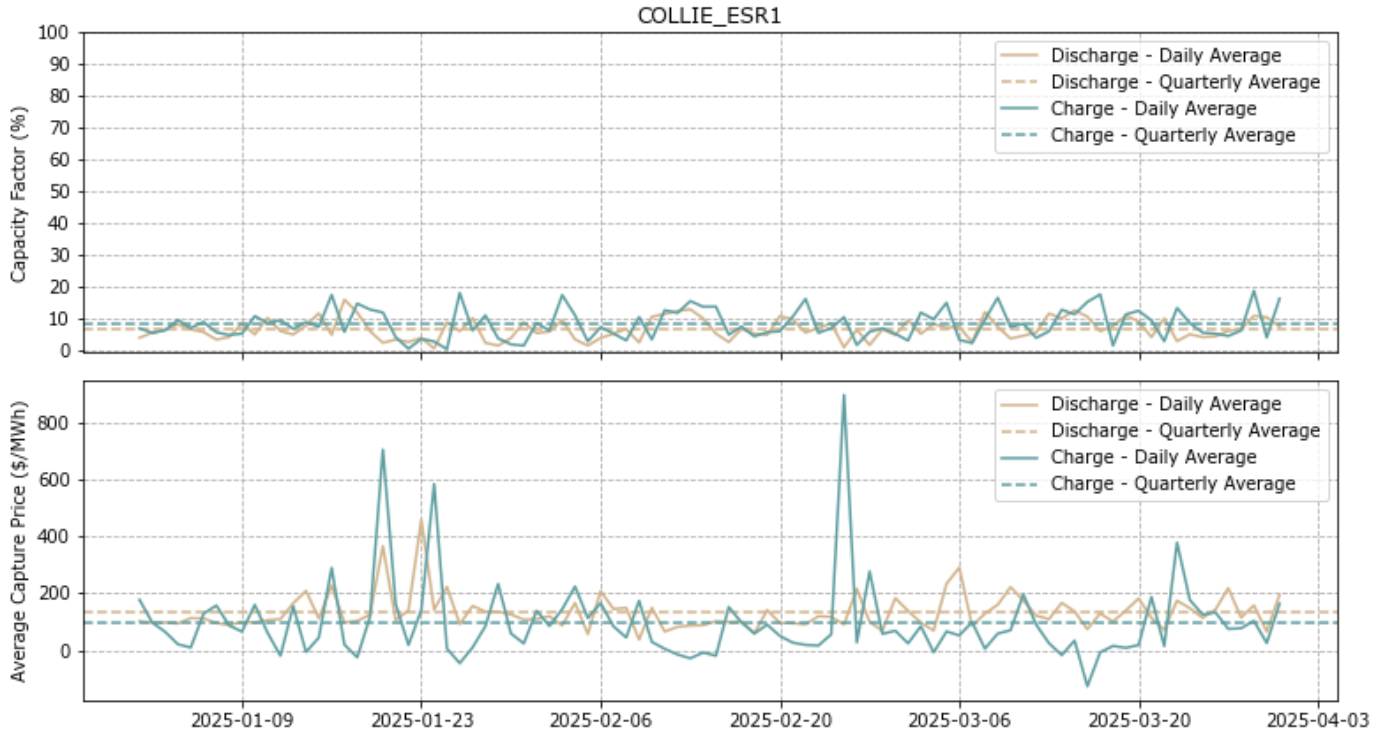
Collie BESS 1

Energy Storage Scheduled Facility, 200 MW, Neoen

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

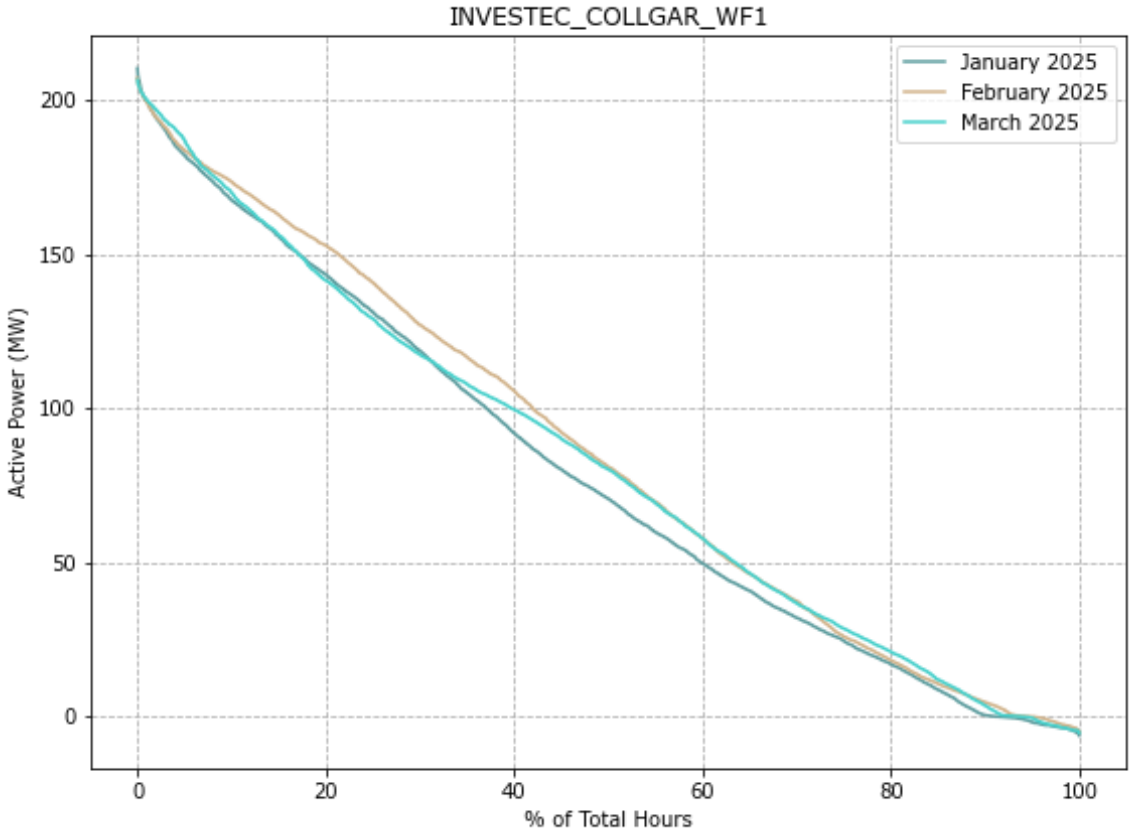


	Jan 2025	Feb 2025	Mar 2025
Total Spot Revenue ($m)	1.72	1.72	3.51

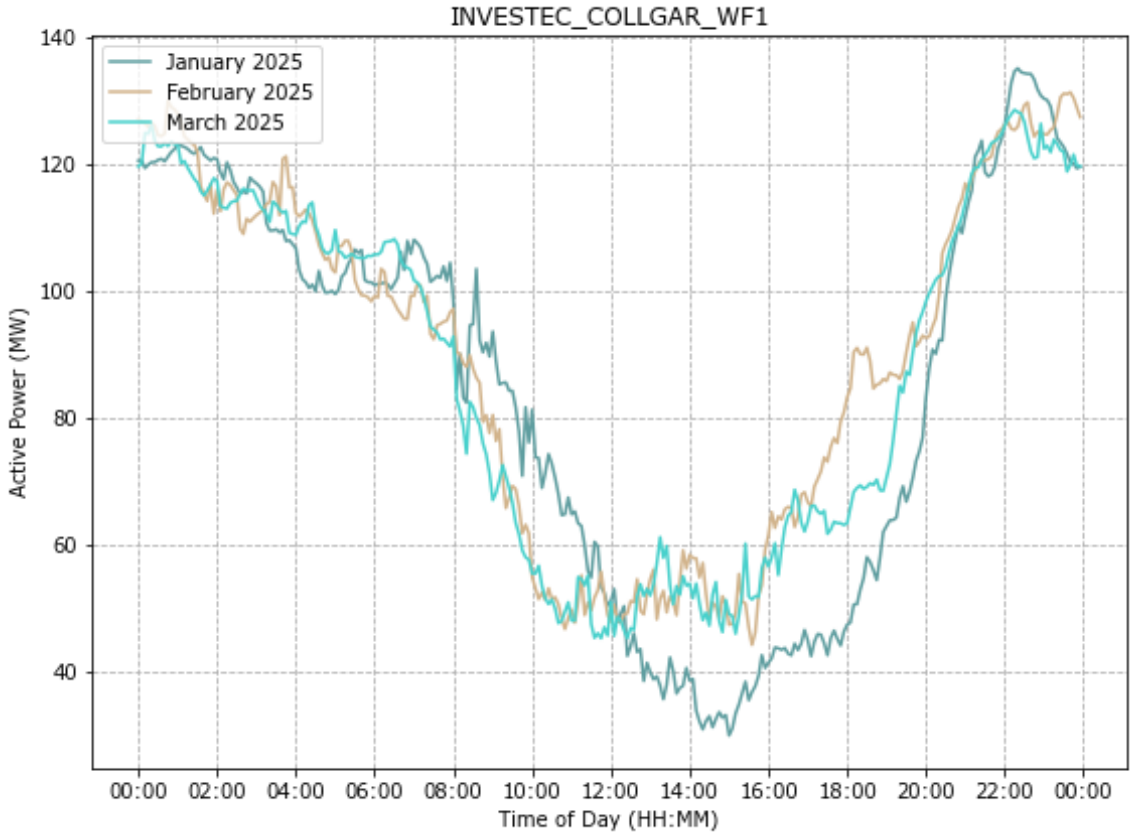
Collgar Wind Farm

Wind Semi-Scheduled Facility, 218.5 MW, Collgar Renewables

Generation Duration Curves



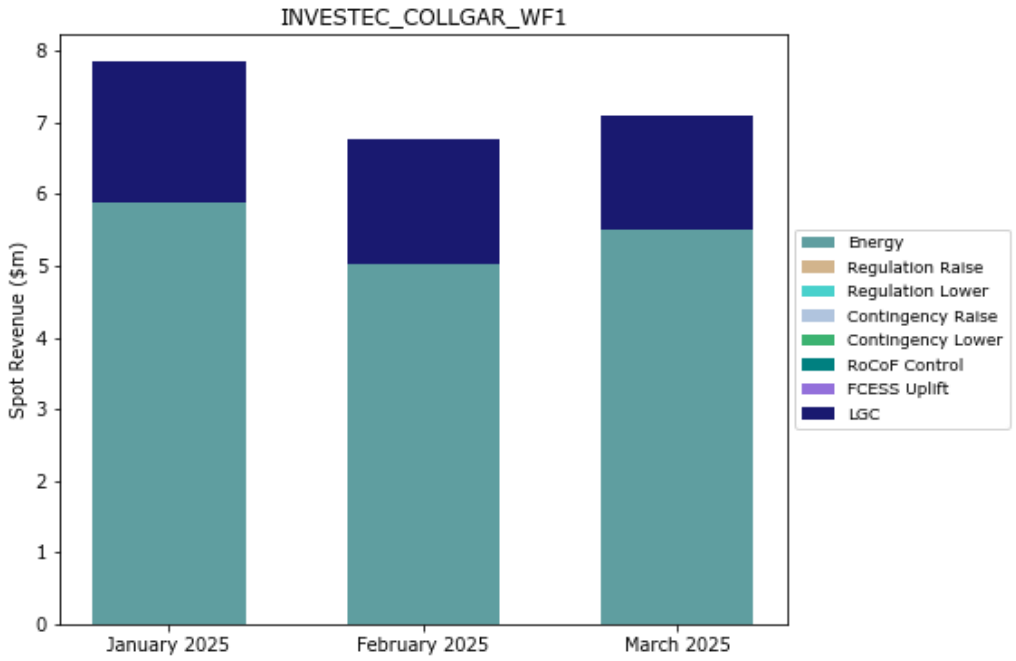
Average Time-of-Day Output



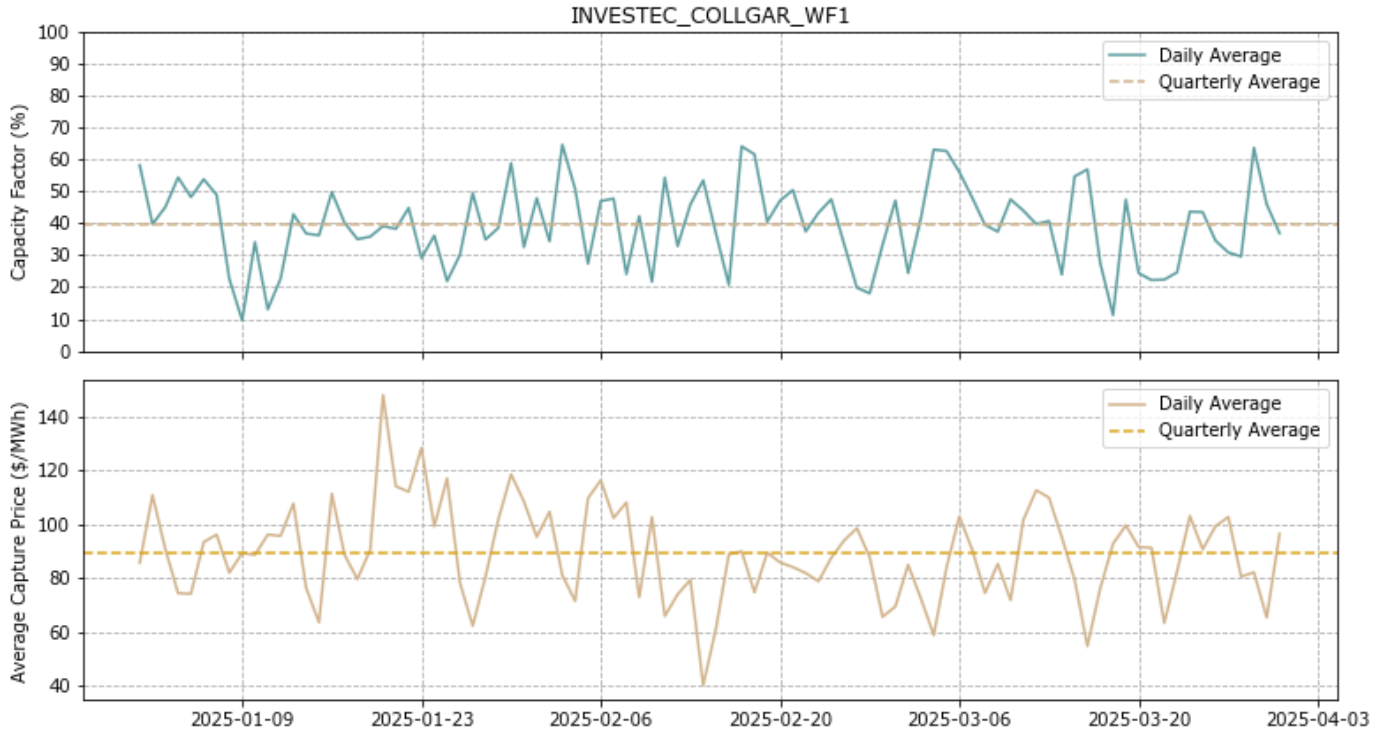
Collgar Wind Farm

Wind Semi-Scheduled Facility, 218.5 MW, Collgar Renewables

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

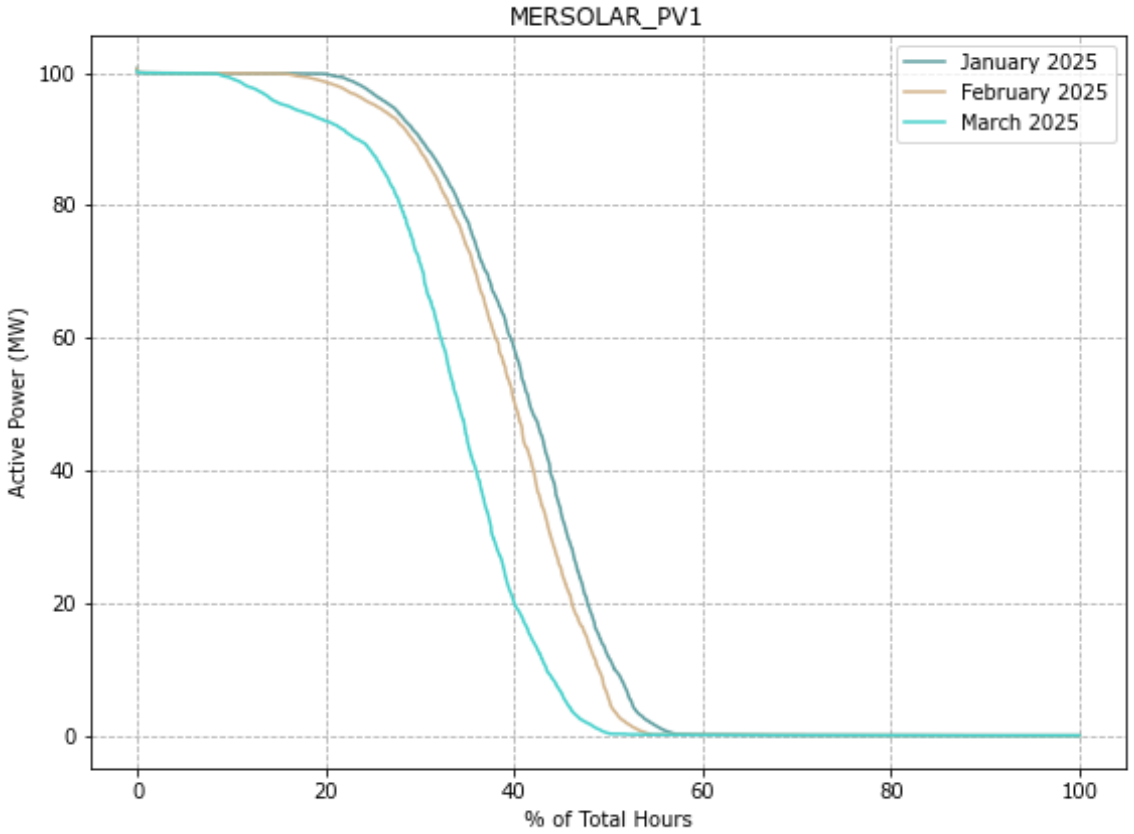


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	61.84	60.16	64.74
Total Spot Revenue ($m)	7.84	6.76	7.10
$ / MWh	**$126.84**	**$112.43**	**$109.72**

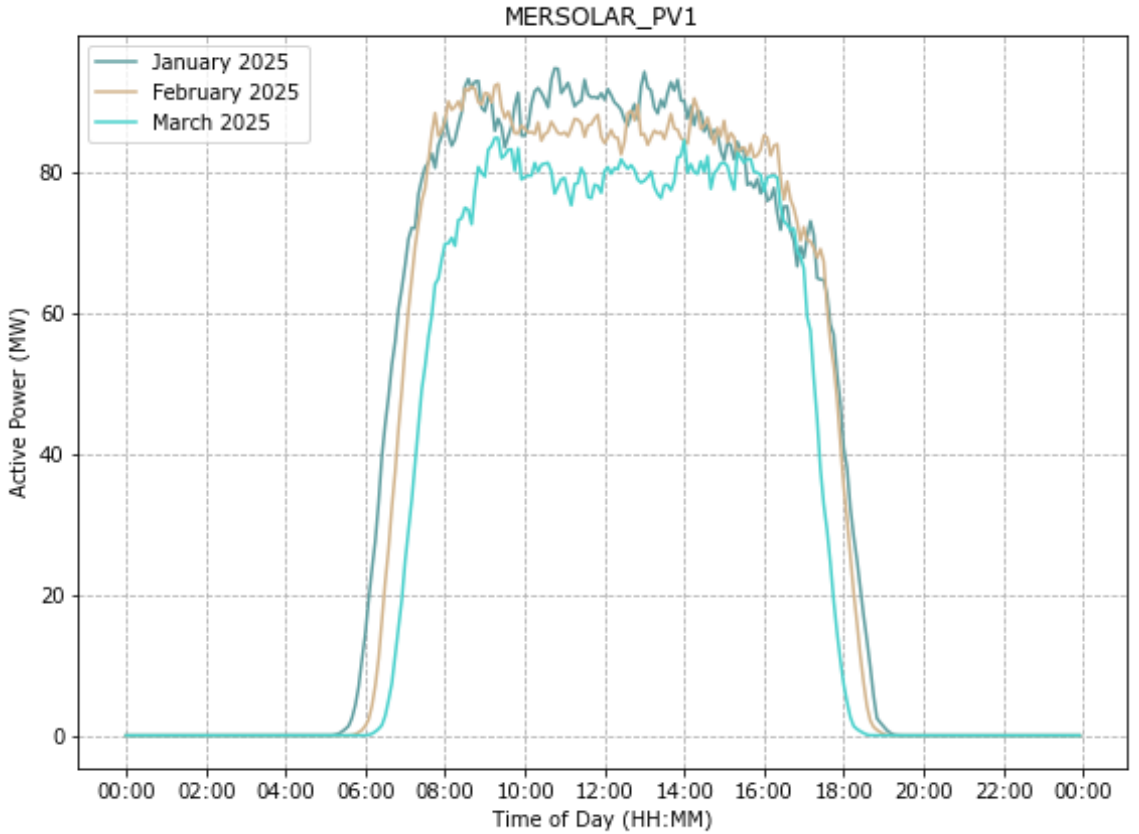
Merredin Solar Farm

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

Generation Duration Curves



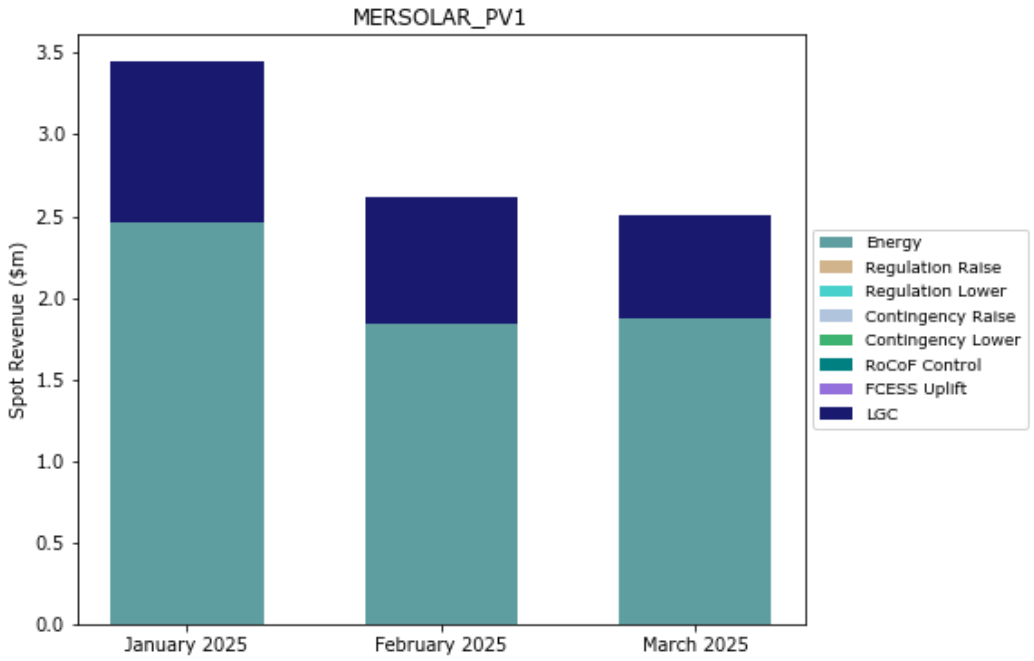
Average Time-of-Day Output



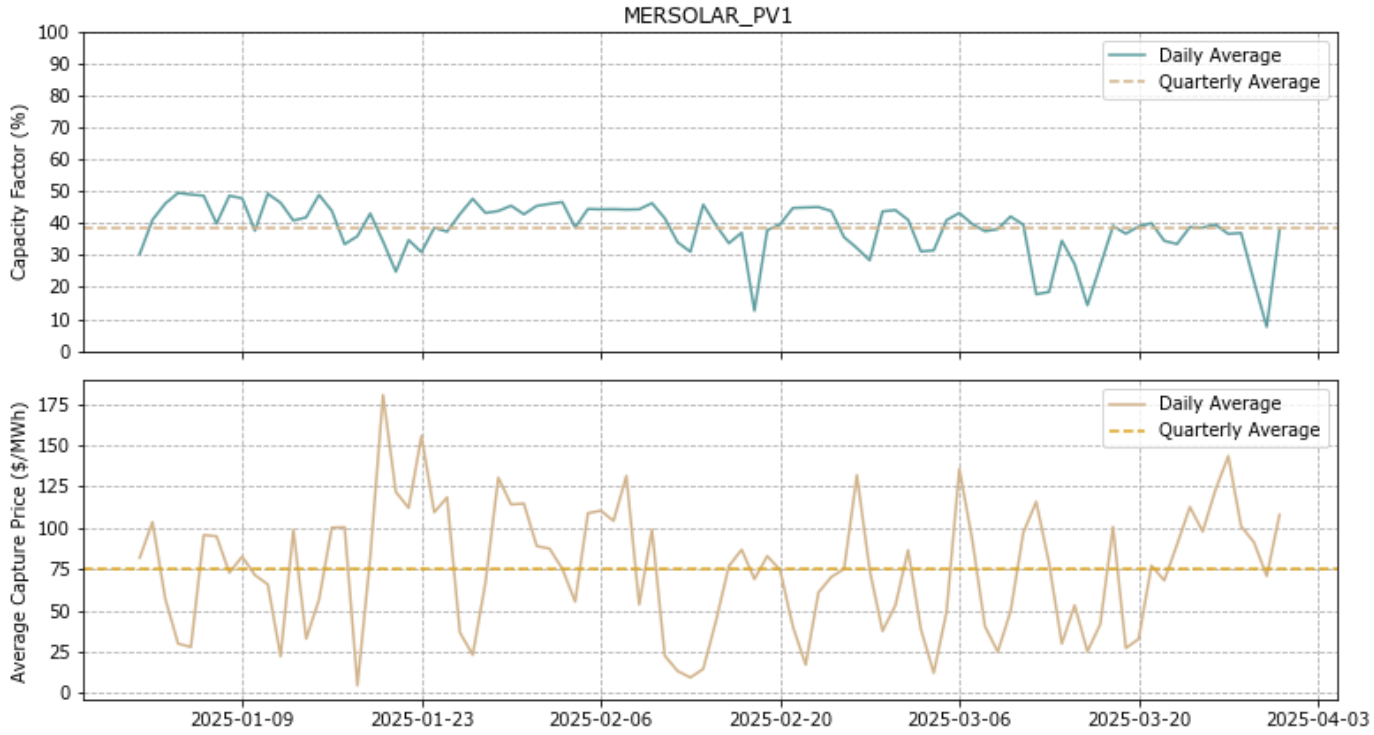
Merredin Solar Farm

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

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

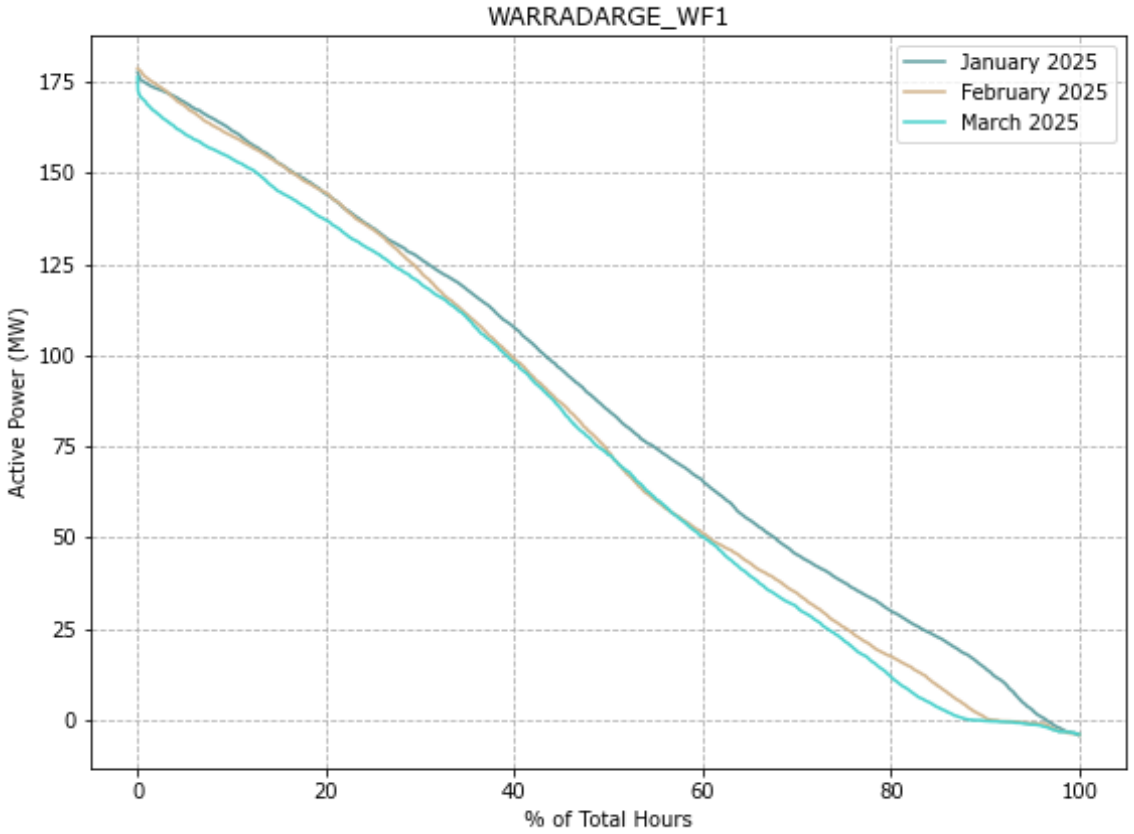


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	30.92	26.78	25.16
Total Spot Revenue ($m)	3.44	2.62	2.50
$ / MWh	**$111.41**	**$97.81**	**$99.48**

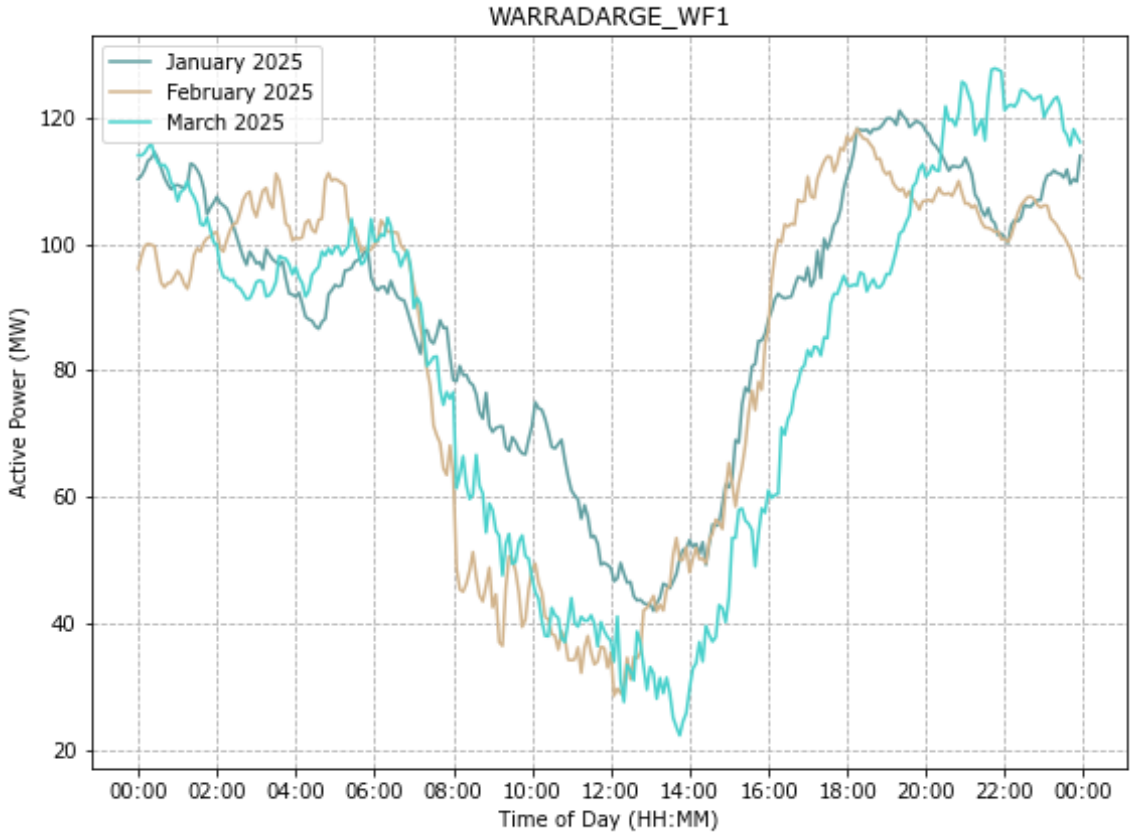
Warradarge Wind Farm

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

Generation Duration Curves



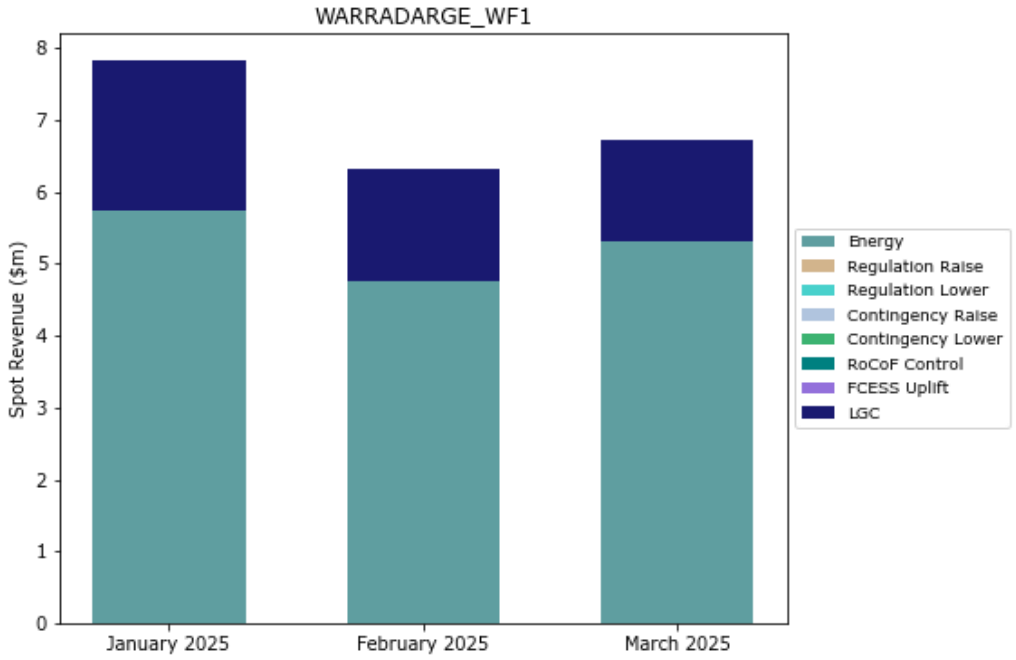
Average Time-of-Day Output



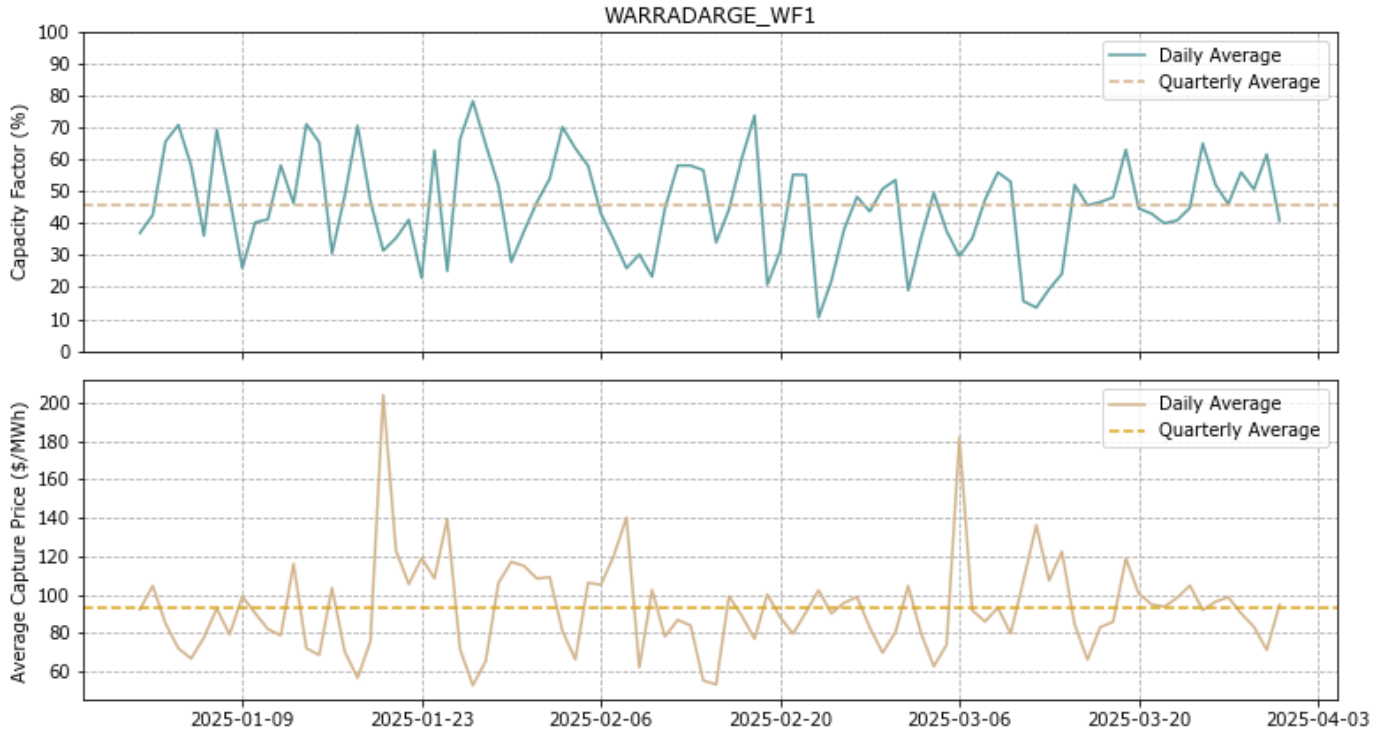
Warradarge Wind Farm

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

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price

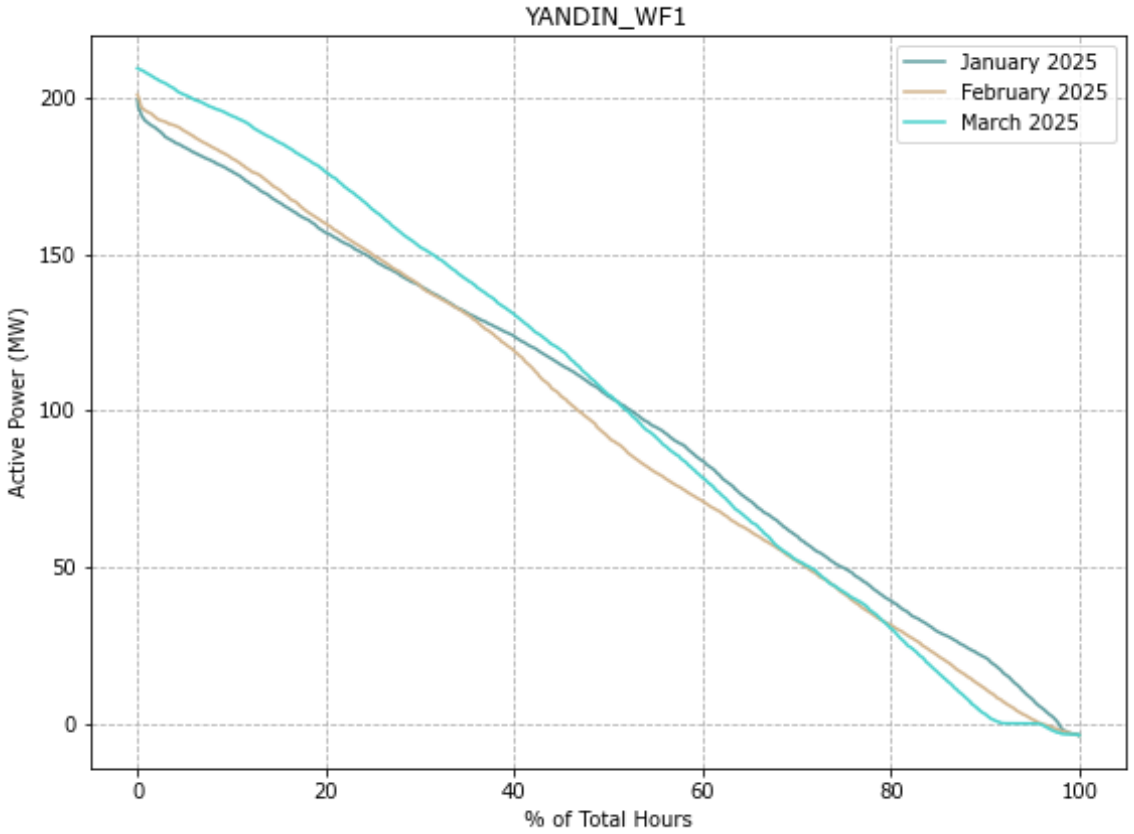


	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	65.53	54.17	57.41
Total Spot Revenue ($m)	7.82	6.33	6.72
$ / MWh	**$119.38**	**$116.83**	**$117.07**

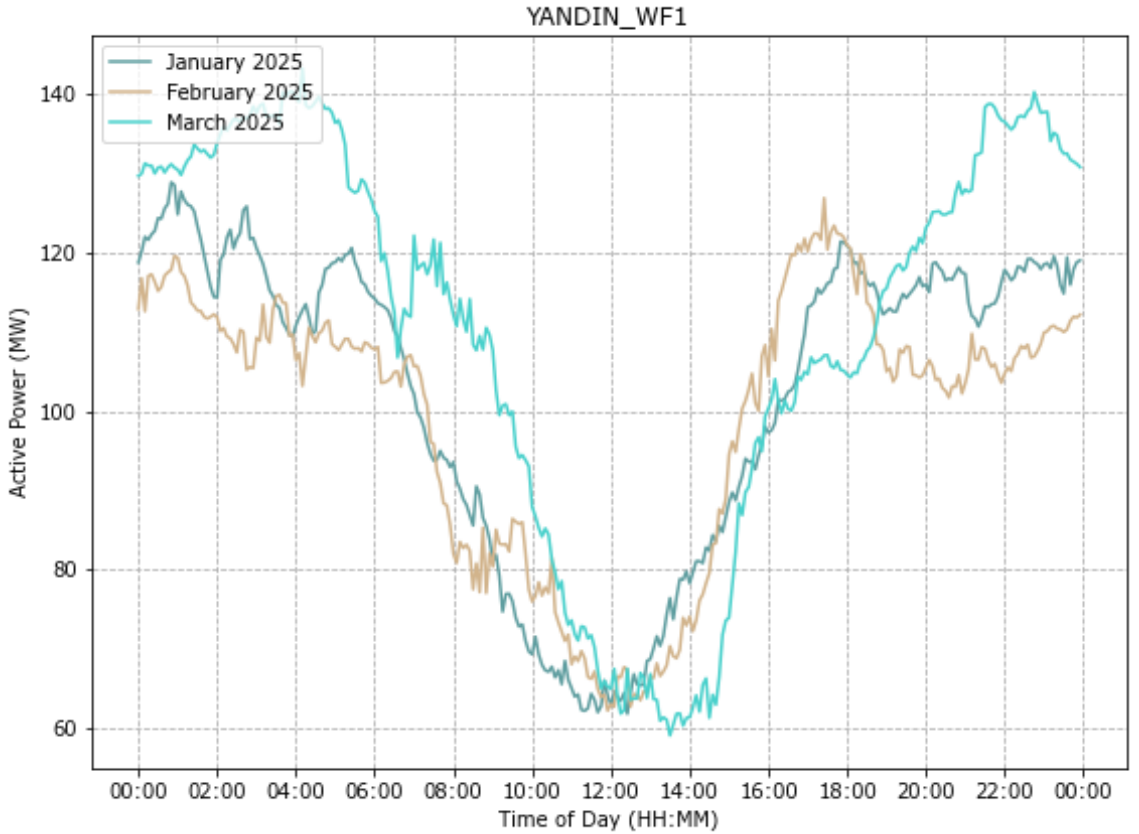
Yandin Wind Farm

Wind Semi-Scheduled Facility, 214.2 MW, Alinta Energy

Generation Duration Curves



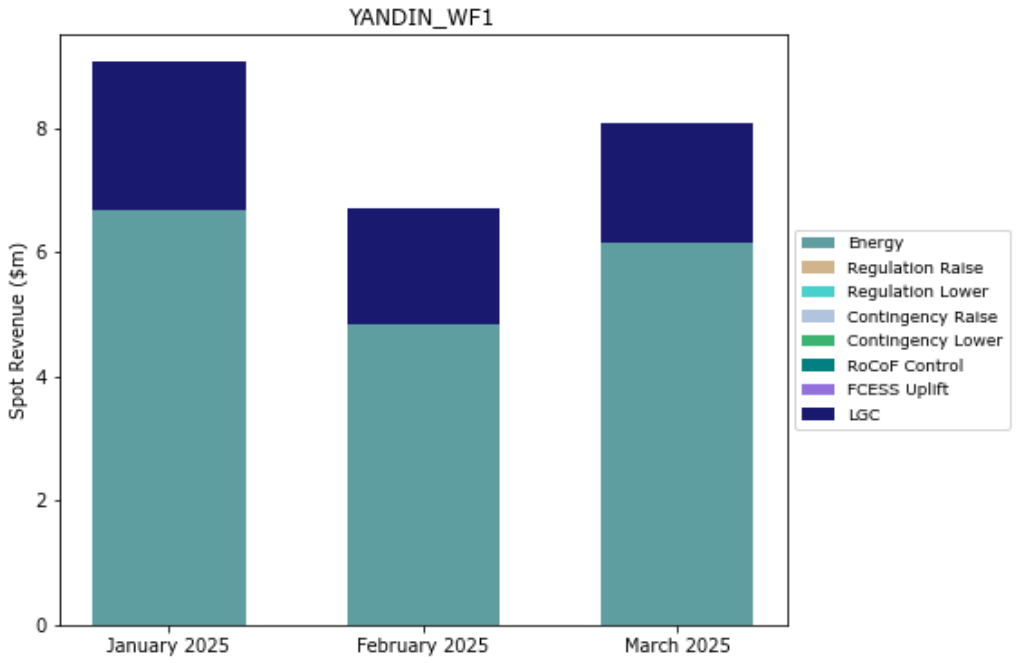
Average Time-of-Day Output



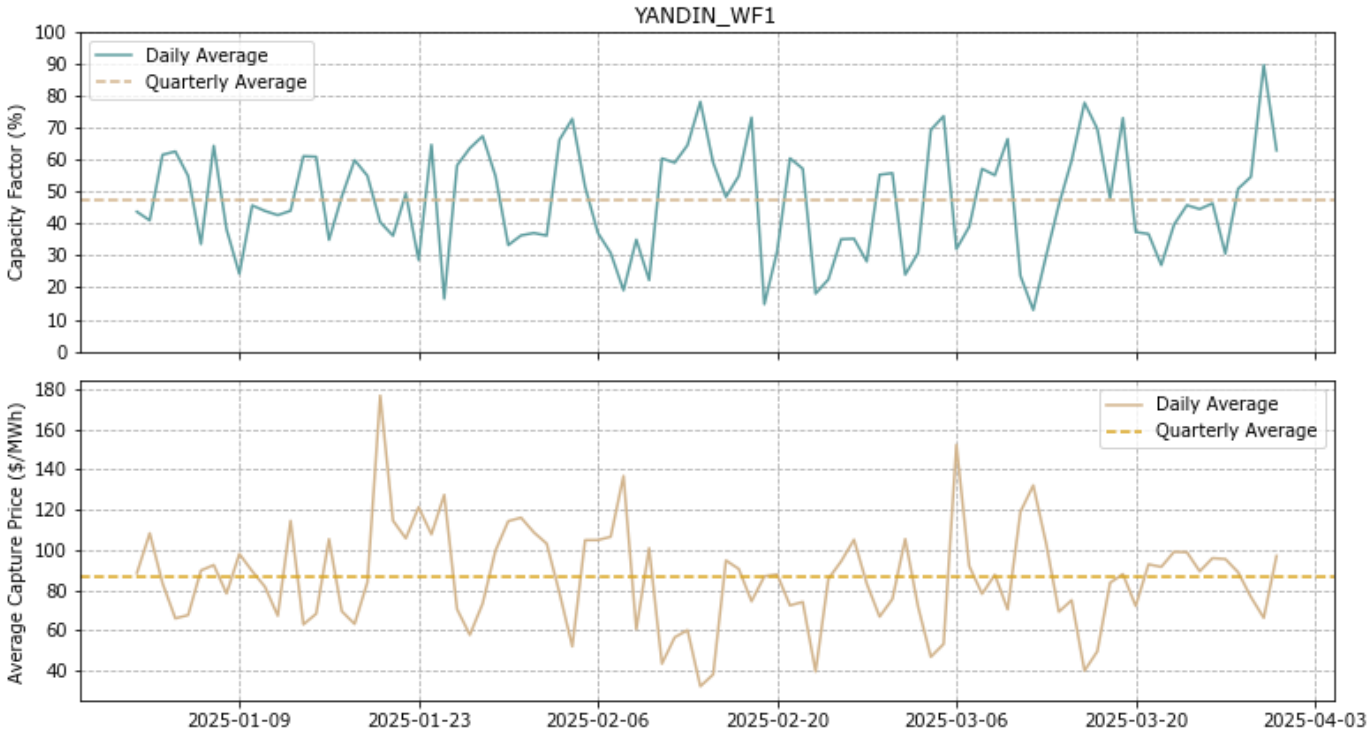
Yandin Wind Farm

Wind Semi-Scheduled Facility, 214.2 MW, Alinta Energy

Facility Merchant Spot Revenue



Daily Capacity Factor and Average Energy Capture Price



	Jan 2025	Feb 2025	Mar 2025
Energy Generated (GWh)	75.51	64.92	77.57
Total Spot Revenue ($m)	9.06	6.72	8.09
$ / MWh	**$120.02**	**$103.55**	**$104.29**

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wem@amperelabs.com.au

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