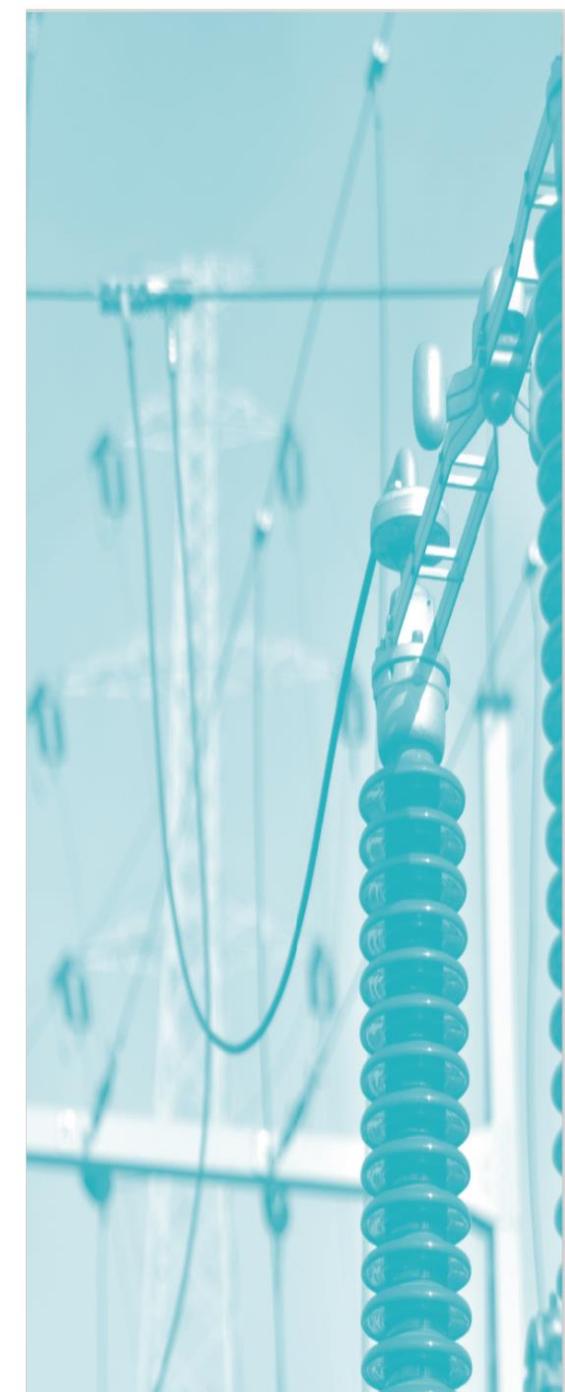


Energy Market Monitoring Report

November 2023



Market Results

Summary Dashboard

Monthly Averages	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
DAM (€/MWh)	276.52	162.16	159.19	145.25	125.57	105.19	117.11	96.24	106.46	111.62	125.54	122.9
% Change from previous month	93%	-41%	-2%	-9%	-14%	-16%	11%	-18%	11%	5%	12%	-2%
% Change from previous year	10%	-20%	-9%	-50%	-42%	-27%	-36%	-64%	-73%	-61%	-8%	-14%
Actual System Demand (MW)	4885	4885	4782	4833	4469	4276	4189	4101	4185	4335	4516	4873
% Change from previous month	6%	0%	-2%	1%	-8%	-4%	-2%	-2%	2%	4%	4%	8%
% Change from previous year	2%	1%	-1%	3%	1%	2%	0%	0%	2%	3%	4%	5%
Actual Wind Generation (MW)	1647	1987	2026	1748	1545	884	878	1316	1401	1384	1363	1811
% Change from previous month	-26%	21%	2%	-14%	-12%	-43%	-1%	50%	6%	-1%	-2%	33%
% Change from previous year	-16%	18%	-27%	12%	8%	-38%	-22%	54%	71%	28%	-33%	-19%
Gas Price p/therm	264.54	155.16	133.65	110.96	100.32	72.41	77.87	70.76	82.87	91.52	104.88	104.97
% Change from previous month	105%	-41%	-14%	-17%	-10%	-28%	8%	-9%	17%	10%	15%	0%
% Change from previous year	-3%	-22%	-29%	-64%	-38%	-24%	-44%	-68%	-77%	-61%	3%	-19%
Carbon Price (€/Tonne)	85.61	79.91	91.82	89.41	89.98	84.18	85.51	86.57	84.61	82.09	81.10	76.25
% Change from previous month	13%	-7%	15%	-3%	1%	-6%	2%	1%	-2%	-3%	-1%	-6%
% Change from previous year	8%	-5%	1%	20%	11%	-1%	2%	6%	-4%	17%	15%	1%
Coal Price (\$/tonne)	243.46	173.25	136.71	134.95	137.83	119.57	112.56	111.02	115.57	120.40	131.80	122.16
% Change from previous month	15%	-29%	-21%	-1%	2%	-13%	-6%	-1%	4%	4%	9%	-7%
% Change from previous year	78%	14%	-27%	-61%	-55%	-63%	-67%	-71%	-67%	-65%	-52%	-43%
EWIC % Import Periods	30.58%	49.03%	38.91%	50.00%	50.56%	75.86%	77.72%	67.11%	68.11%	73.75%	86.90%	68.78%
EWIC % Export Periods	35.08%	23.66%	27.19%	16.47%	13.65%	8.28%	4.06%	9.21%	11.96%	8.89%	2.99%	9.11%
EWIC % Not Flow Periods	34.34%	27.32%	33.89%	23.86%	30.80%	15.88%	18.22%	22.68%	19.93%	17.36%	10.11%	22.11%
Moyle % Import Periods	44.19%	62.05%	53.65%	64.68%	77.50%	85.42%	92.22%	84.04%	75.24%	83.33%	92.31%	83.47%
Moyle % Export Periods	55.78%	37.95%	46.02%	25.50%	27.43%	14.58%	7.67%	15.89%	20.33%	16.60%	7.66%	16.50%
Moyle % Not Flow Periods	0.03%	0.00%	0.33%	0.13%	0.07%	0.00%	0.10%	0.07%	4.44%	0.07%	0.03%	0.03%

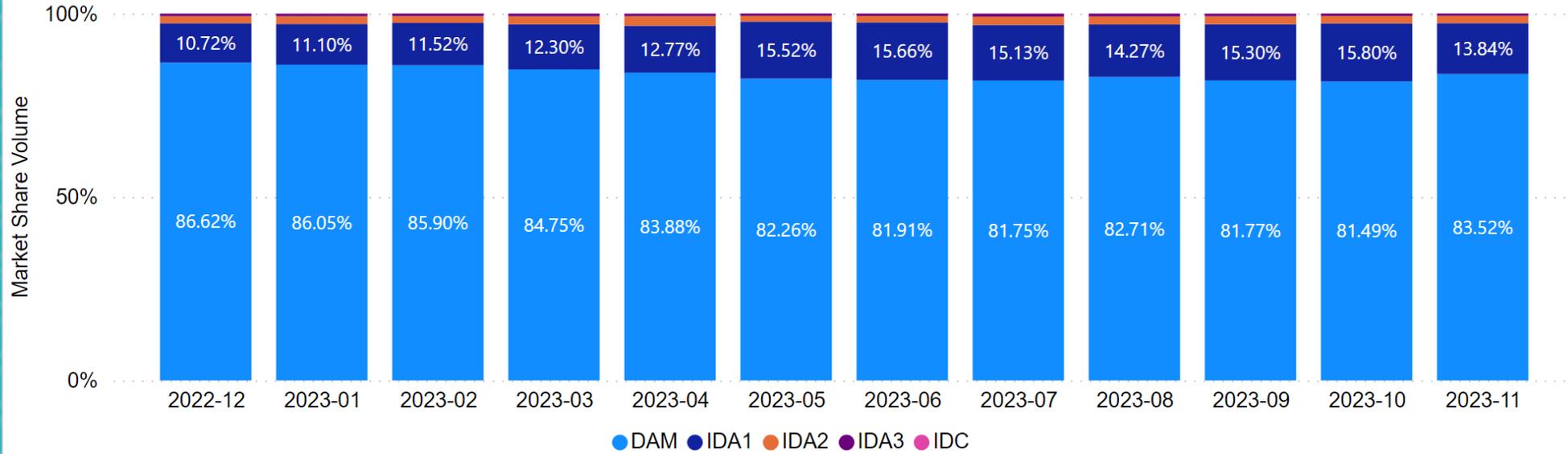
Market Volumes November 2023

Daily Average Volume	MWh
DAM	122,303
IDA1	20,917
IDA2	2,969
IDA3	906
IDC	24

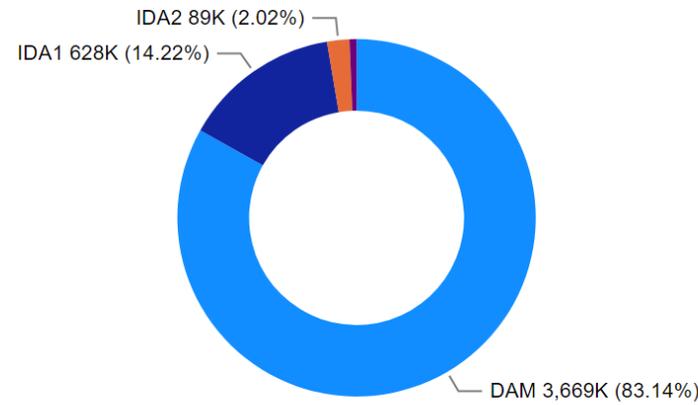
Total Monthly Volume	MWh
DAM	3,669,101
IDA1	627,522
IDA2	89,062
IDA3	27,177
IDC	472
Total	4,413,334

Total Market Value	€
DAM	€ 464,066,877
IDA1	€ 80,362,098
IDA2	€ 12,291,773
IDA3	€ 4,132,794
IDC	€ 70,886
Total	€ 560,924,429

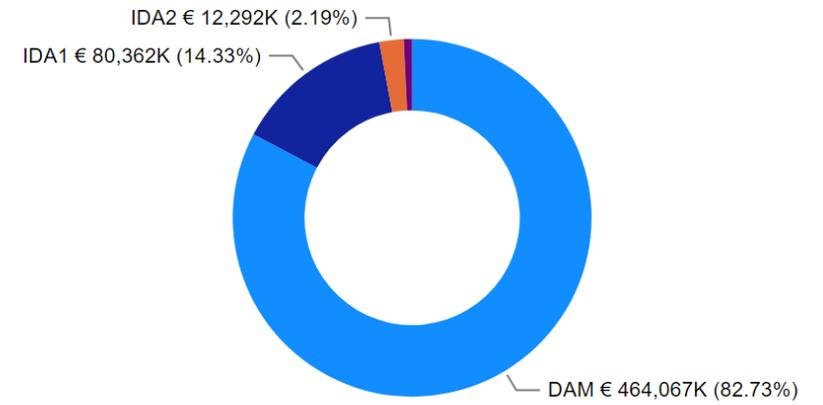
Ex-Ante Monthly Volume by Market



Ex-Ante Volumes (MWh)



Ex-Ante Values (€)

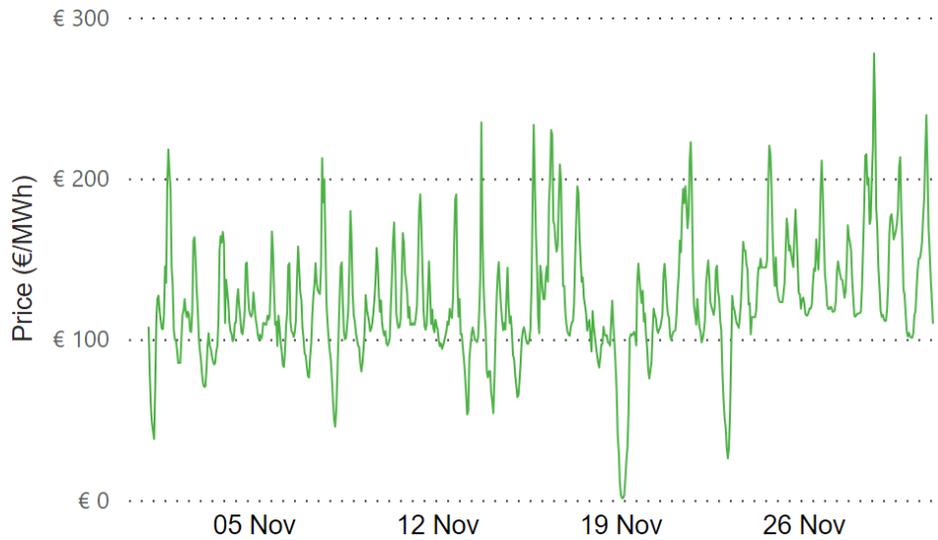


Day Ahead Market November 2023

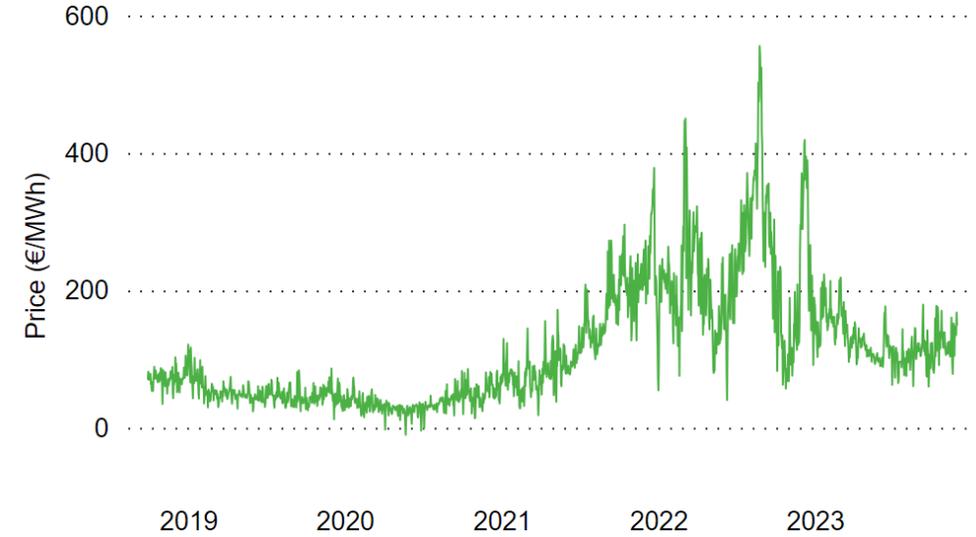
€ 122.90
Average DAM Price
€ 1.14
Min DAM Price
€ 277.60
Max DAM Price

The most frequent price range for November was between €80 and €120

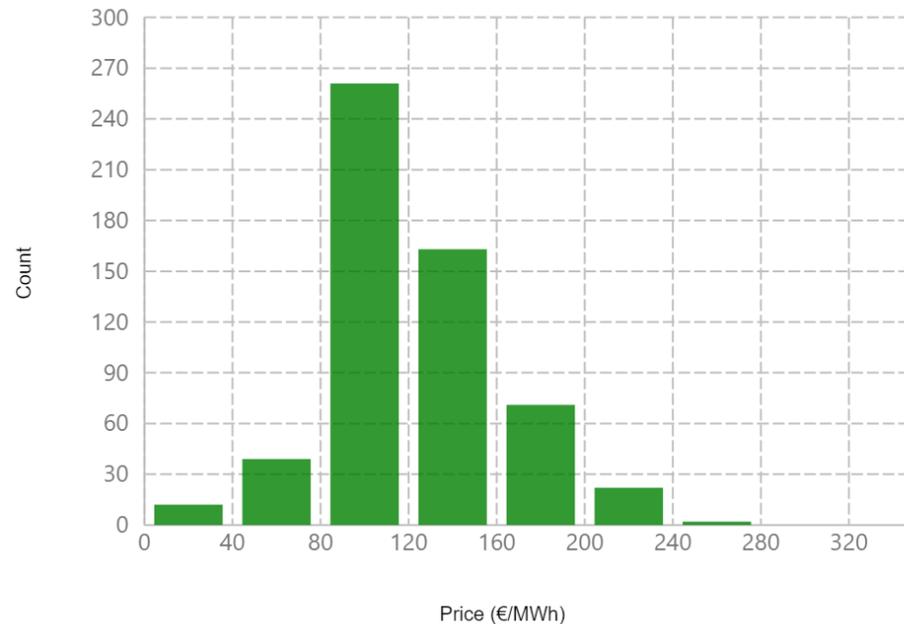
DAM Prices



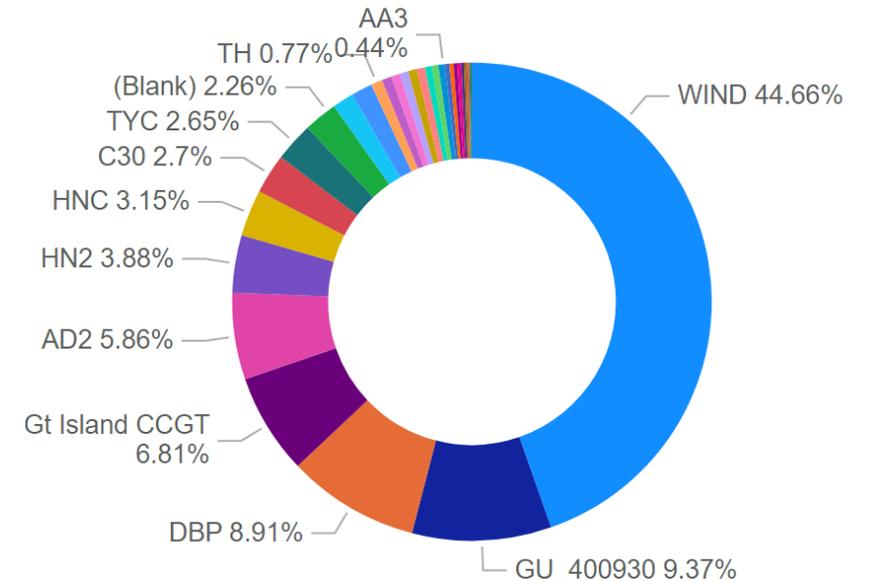
Historic Daily Average DAM Prices



Histogram of DAM Prices



DAM Sell Side Generator Order Results



Intraday Market November 2023

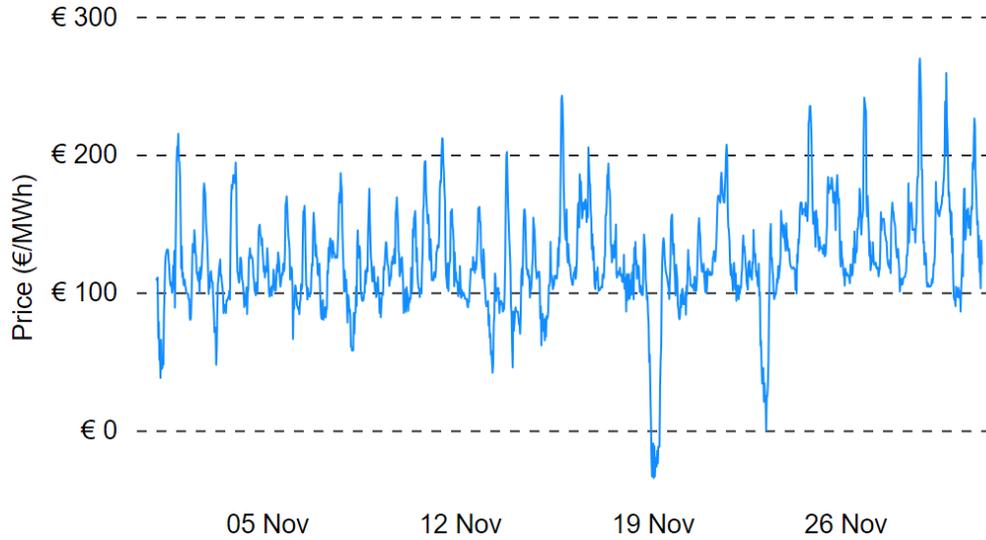
€ 122.45
Average IDA1 Price

-€ 34.75
Min IDA1 Price

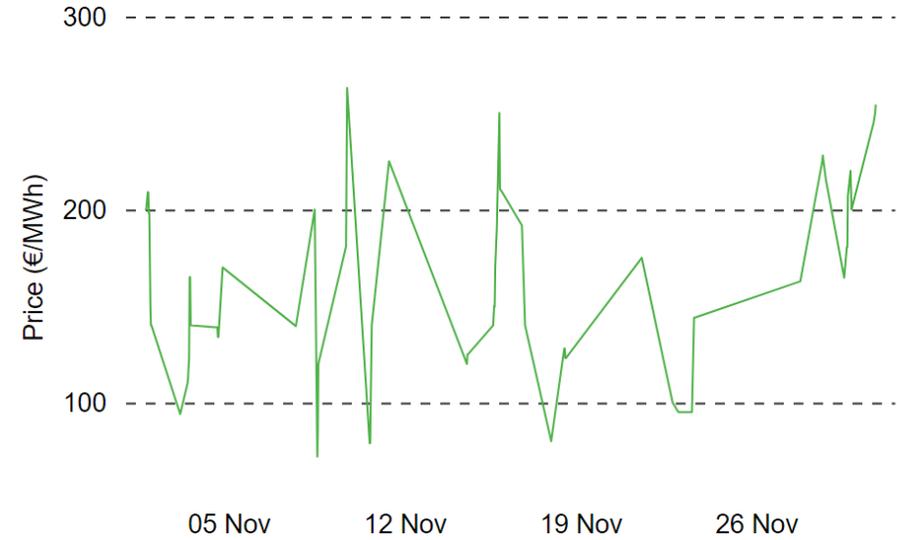
€ 269.56
Max IDA1 Price

The most frequent price range for November was between €80 and €120

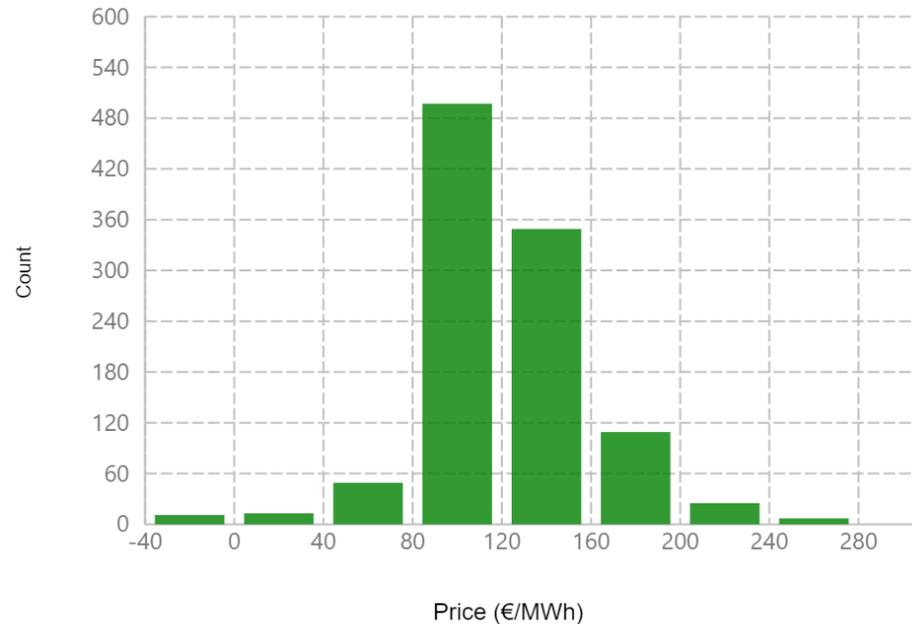
IDA 1 Prices



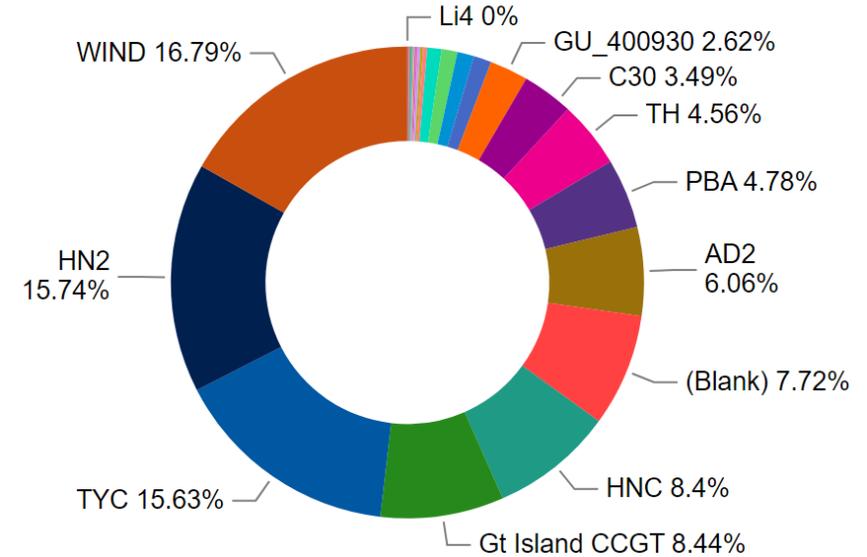
IDC Prices



Histogram of IDA1 Prices



IDA1 Sell Order Results By Market Participant



SEM vs GB

November 2023

SEM Day Ahead Price

€ 122.90
Average Price

€ 1.14
Min Price

€ 277.60
Max Price

GB Day Ahead Price

€ 108.83
Average Price

€ 2.90
Min Price

€ 264.84
Max Price

SEM IDA1 Price

€ 122.45
Average Price

-€ 34.75
Min Price

€ 269.56
Max Price

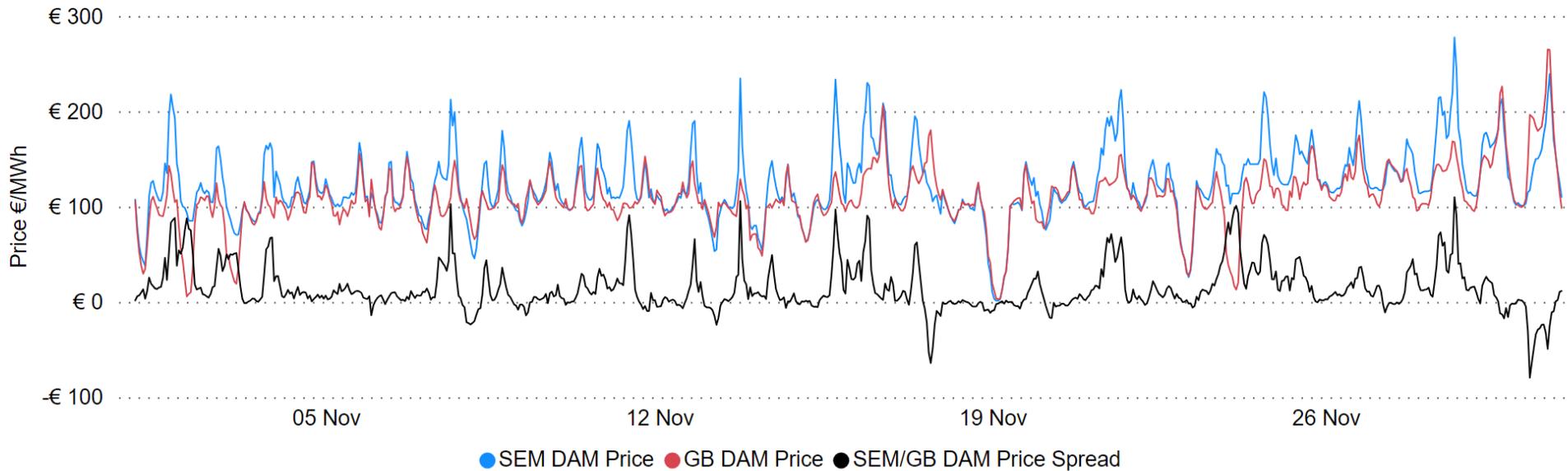
GB IDA1 Prices

€ 109.55
Average Price

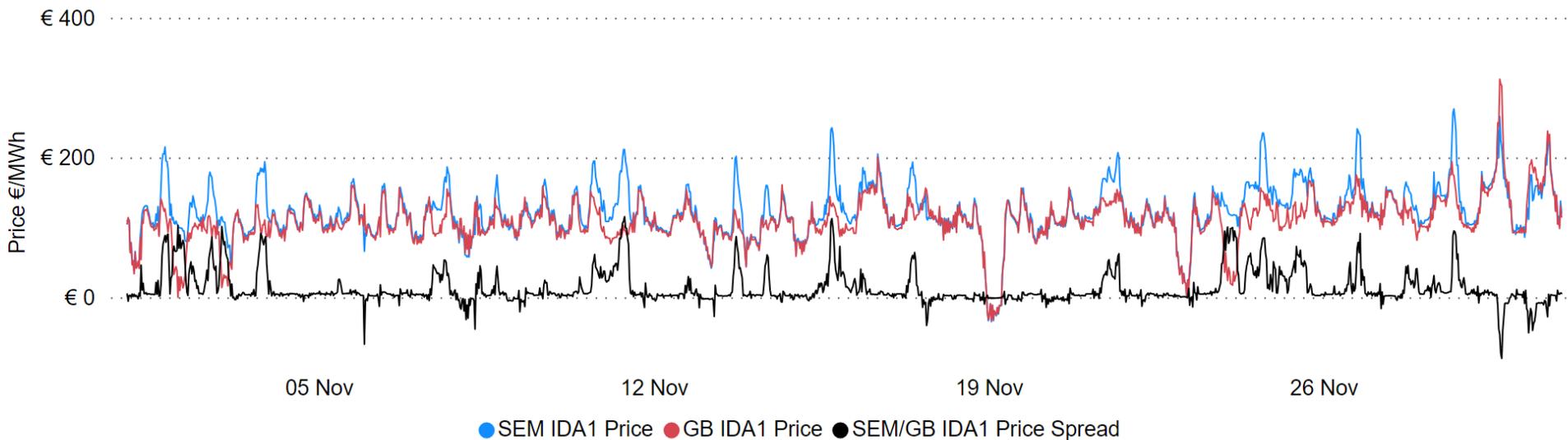
-€ 33.11
Min Price

€ 312.13
Max Price

SEM & GB DAM Prices

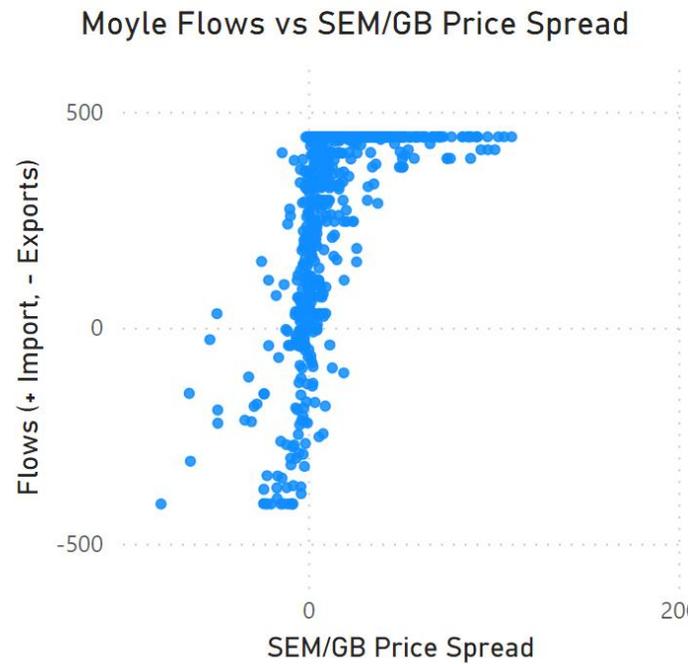
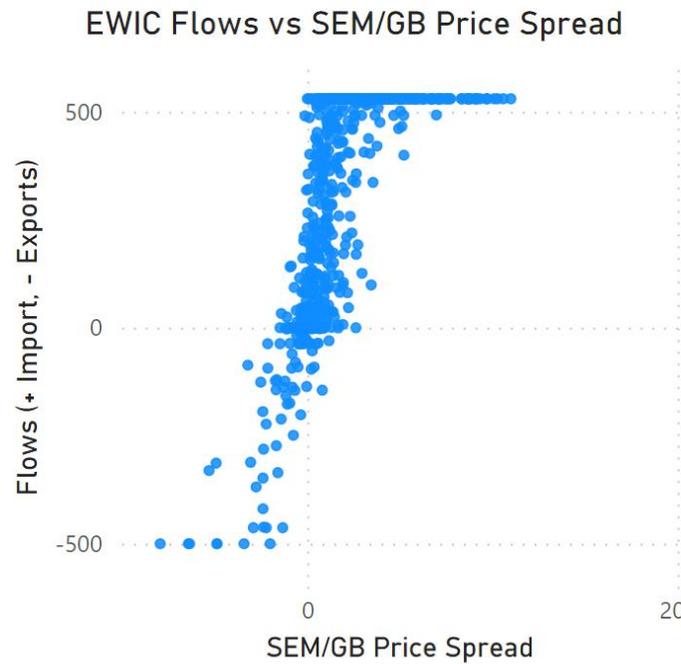
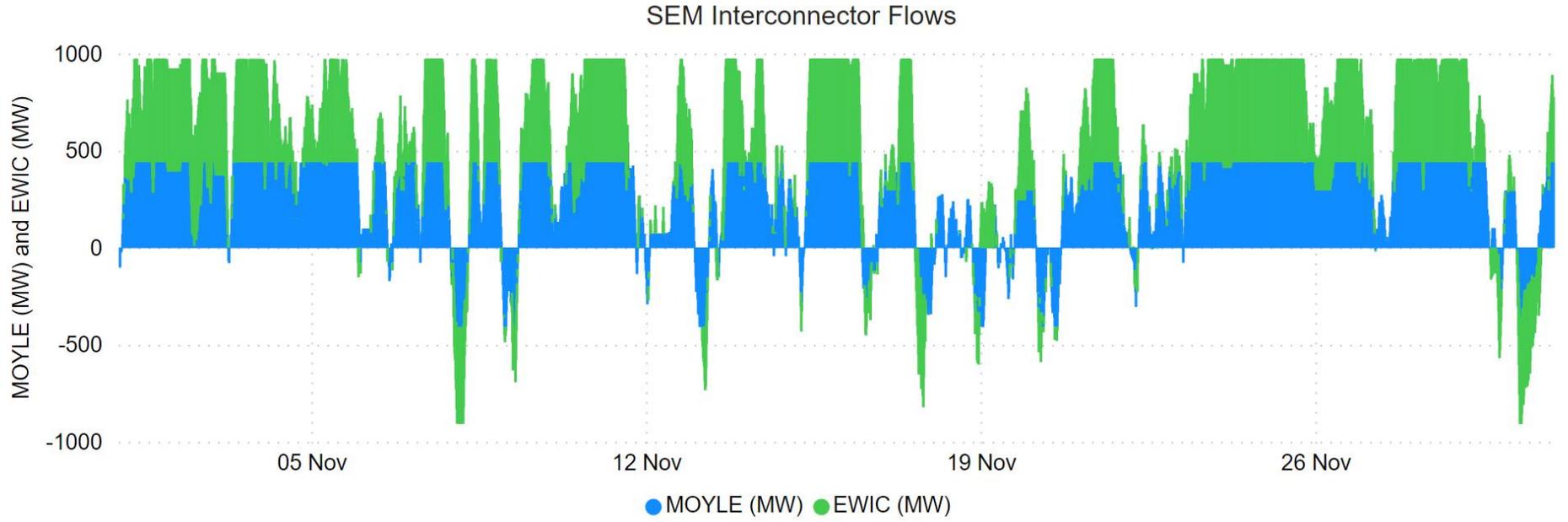


SEM & GB IDA1 Prices



SEM Interconnectors

November 2023



Interconnector Flows

November 2023	MW
Moyle Imports	350
EWIC Imports	358
Moyle Exports	-161
EWIC Exports	-187
SEM Imports	641
SEM Exports	-260
SEM Net Import/Export	495

Balancing Market November 2023

30 Minutes Imbalance Price

€ 116.61

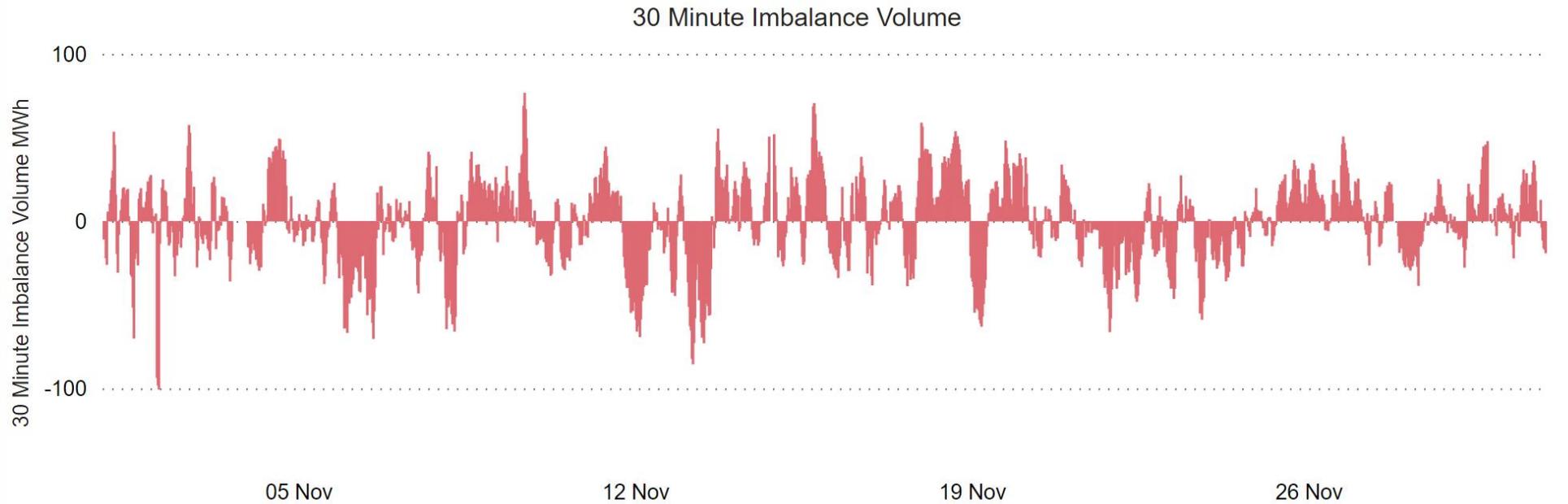
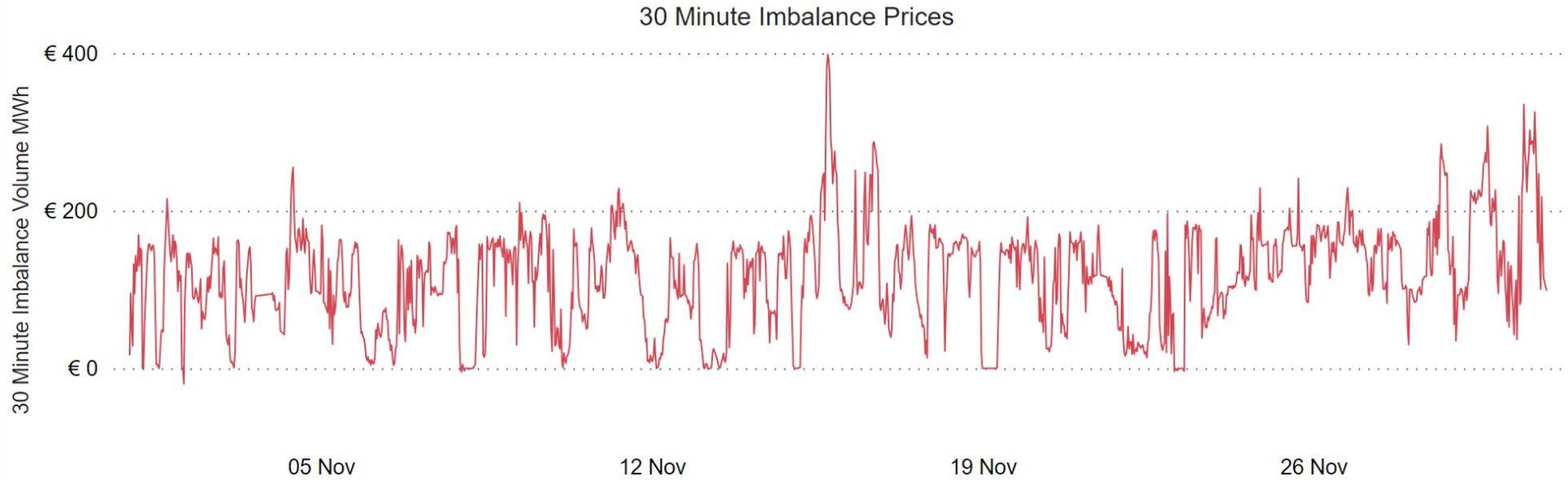
Average Price

-€ 19.75

Lowest Price

€ 398.01

Highest Price



Demand and Generation Mix

Demand

November 2023

SEM Demand (MW)

4,873.01	4,652.62
SEM Average 2023	SEM Average 2022
3,634.61	3,436.76
SEM Min 2023	SEM Min 2022
6,131.58	5,879.59
SEM Max 2023	SEM Max 2022

NI Demand (MW)

891.55	867.94
NI Average 2023	NI Average 2022
565.52	548.66
NI Min 2023	NI Min 2022
1,247.32	1,220.28
NI Max 2023	NI Max 2022

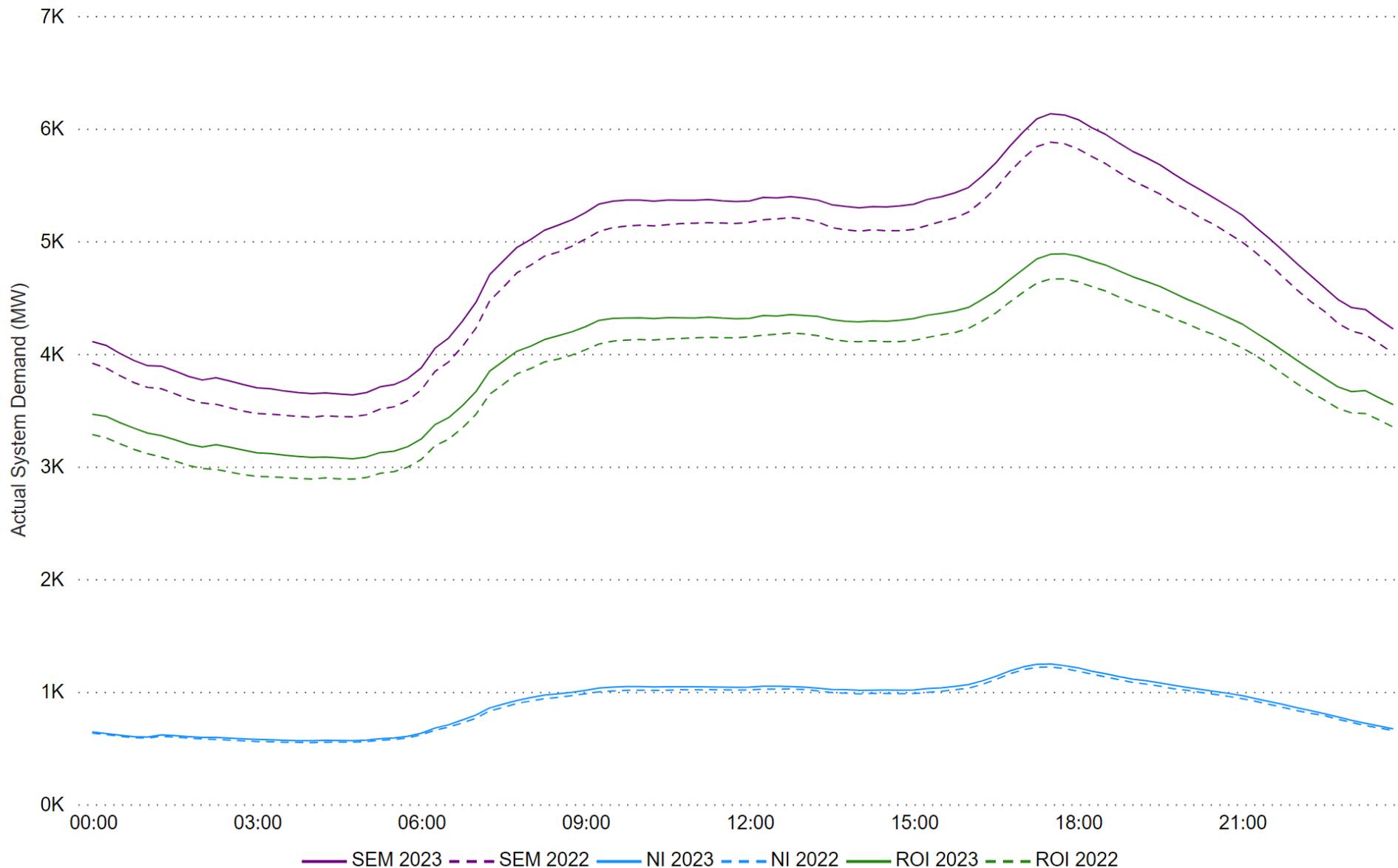
ROI Demand (MW)

3,981.45	3,785.01
ROI Average 2023	ROI Average 2022
3,067.94	2,888.21
ROI Min 2023	ROI Min 2022
4,888.77	4,665.21
ROI Max 2023	ROI Max 2022

Note

- * 2.5 hours of demand data is missing on 4th November 2022.
- * 4th of November 2022 Data removed from graph.

Monthly Average Hourly Demand Curves



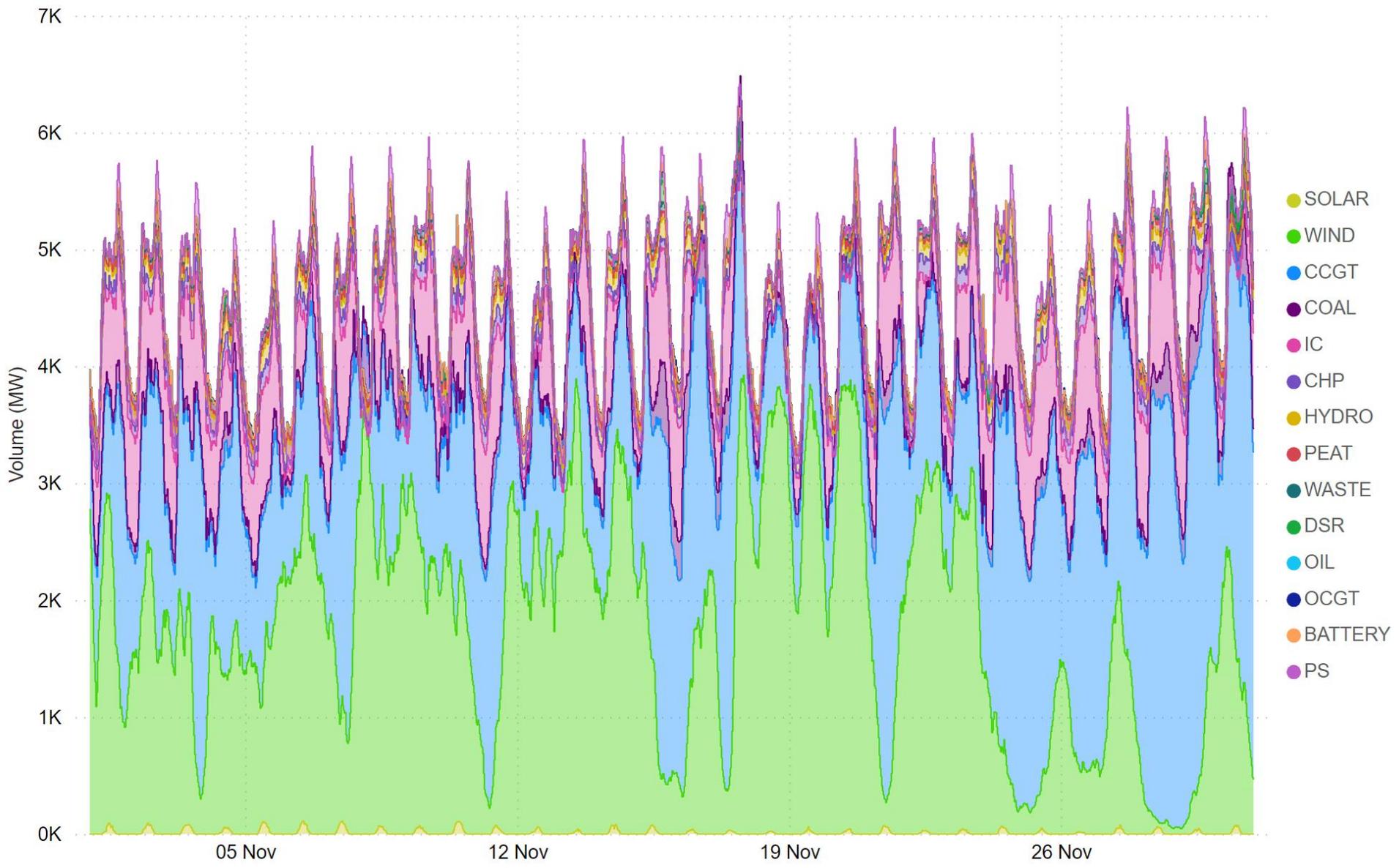
Fuel Mix

November 2023

Fuel Type	Monthly Average	Monthly %
CCGT	1,708	37.2%
WIND	1,812	39.4%
INTERCONNECTOR	501	10.9%
COAL	159	3.5%
HYDRO	152	3.3%
CHP	123	2.7%
PEAT	54	1.2%
WASTE	68	1.5%
SOLAR	12	0.3%
DSR	23	0.5%
OIL	5	0.1%
OCGT	1.0	0.0%
BATTERY	-4	-0.1%
PUMPED STORAGE	-18	-0.4%

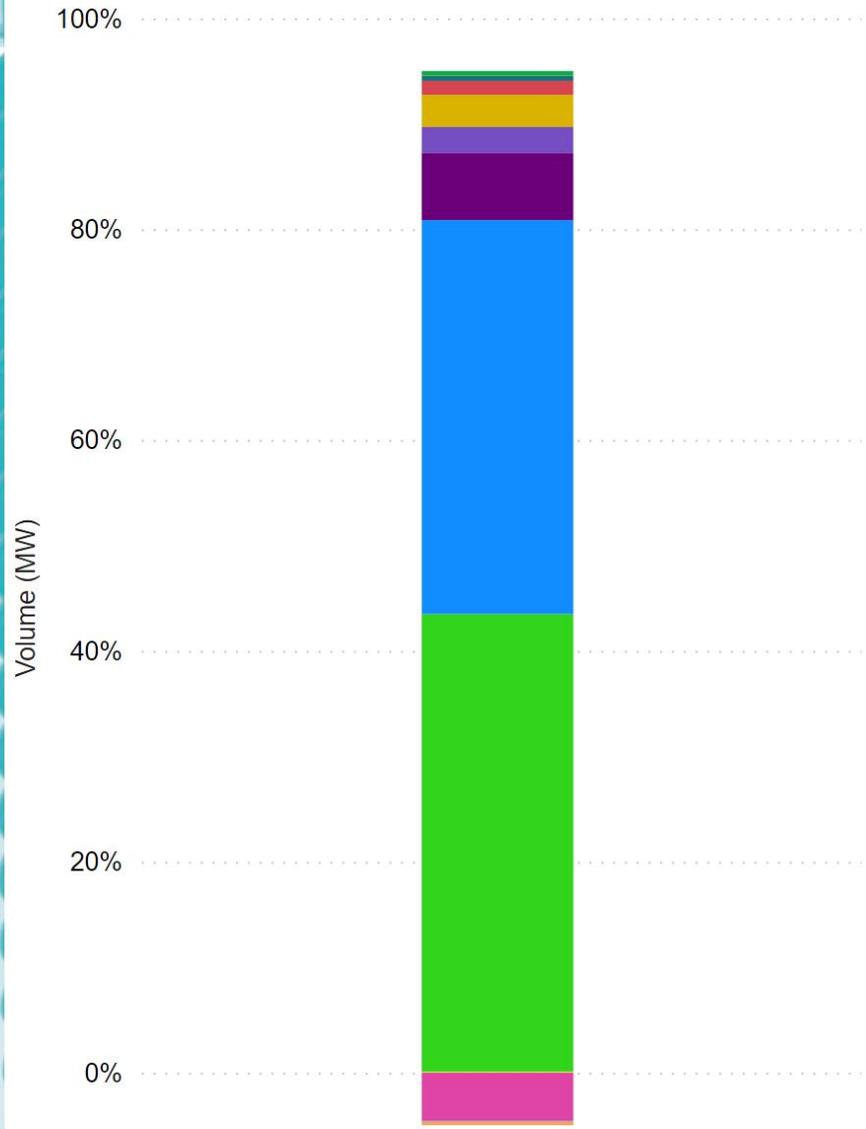
Fuel Type	Max	Min
CCGT	3,733	620
WIND	3,925	41
INTERCONNECTOR	979	-901
COAL	672	0
HYDRO	182	76
CHP	168	38
PEAT	97	0
WASTE	81	16
SOLAR	111	0
DSR	188	0
OIL	246	0
OCGT	51	0
BATTERY	119	-53
PUMPED STORAGE	292	-302

SEM 30 Minute Fuel Mix

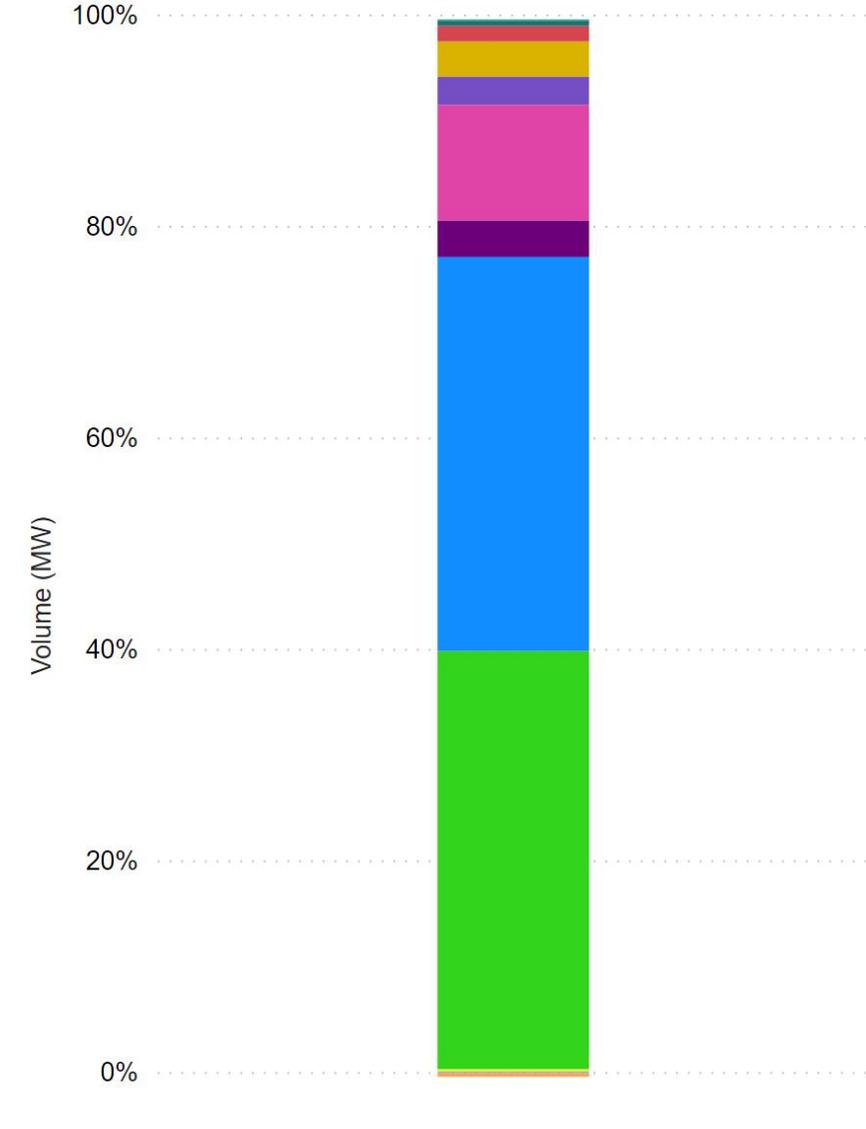


Fuel Mix Comparison November 2022 & 2023

SEM Fuel Mix November 2022



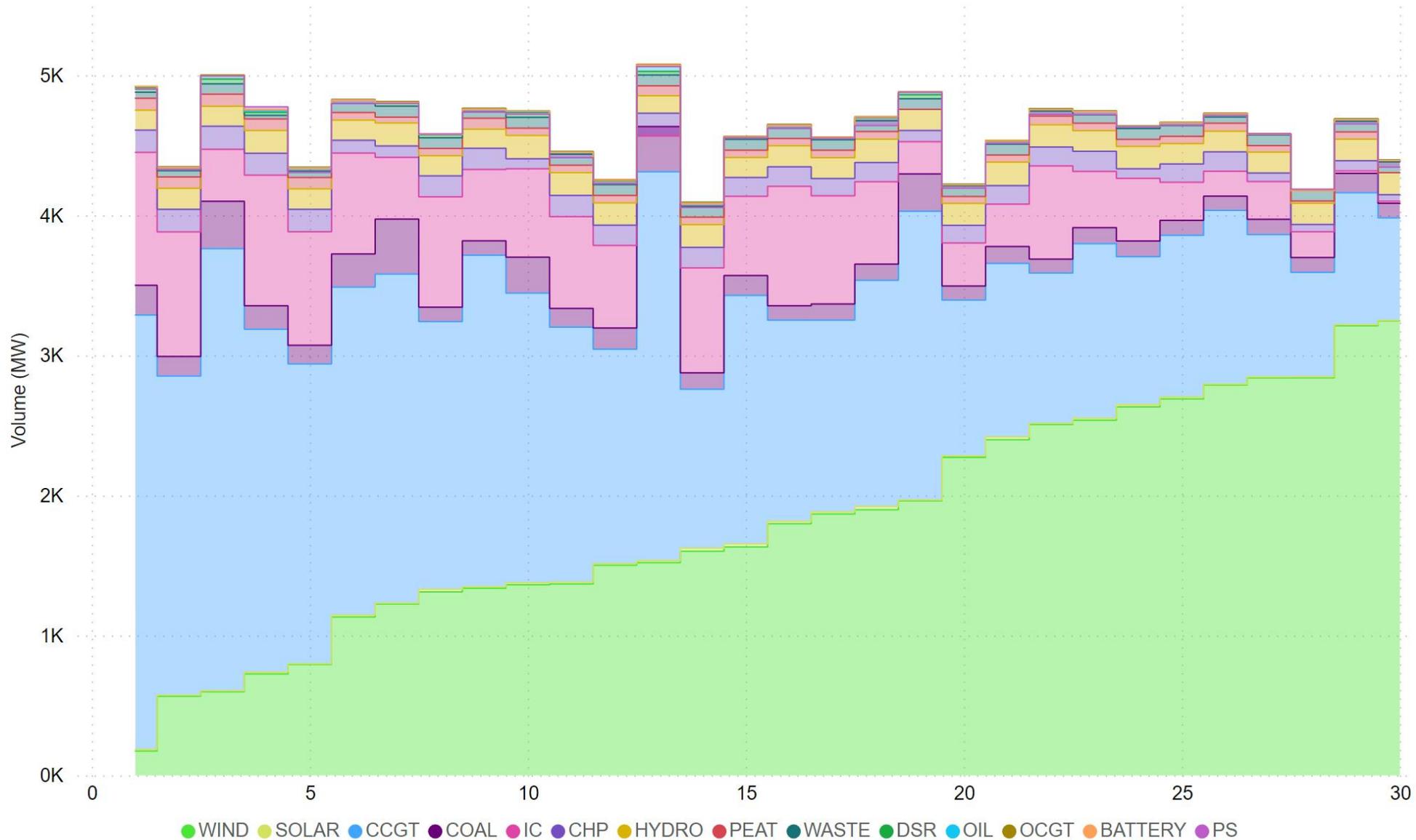
SEM Fuel Mix November 2023



Fuel Mix Ranked by Wind Volume November 2023

This chart shows the average daily fuel mix for the month but instead of being a timeline chart it is ranked by level of wind available from smallest to largest.

Daily SEM Fuel Mix Ranked by Wind Volume for the Month



North-South Tie Line November 2023

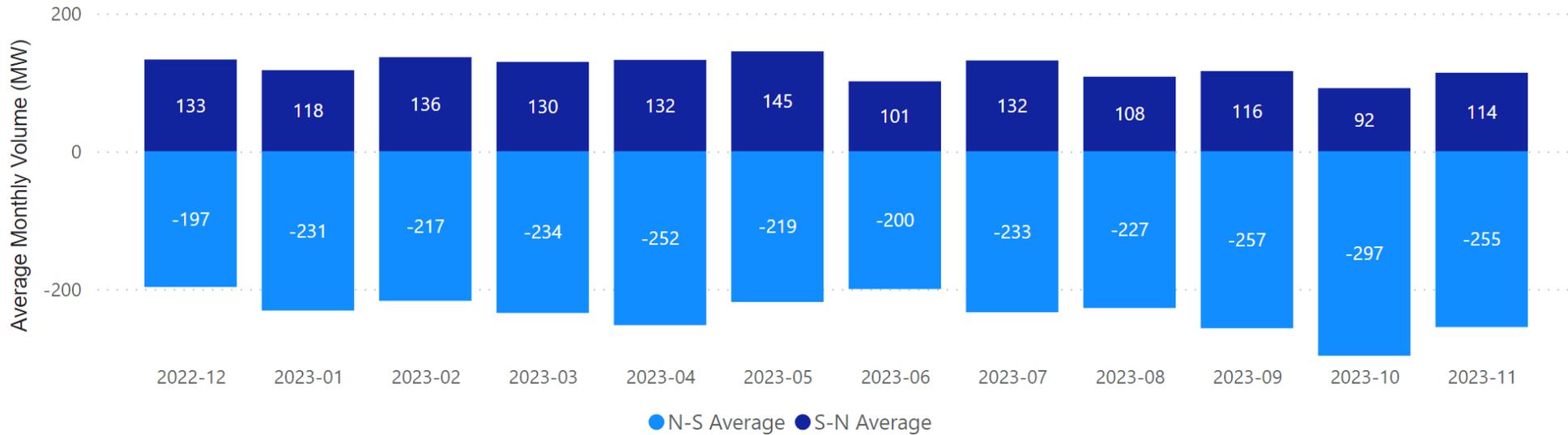
Average Flow NI to ROI (MW)
-254.97

Average Flow ROI to NI (MW)
113.89

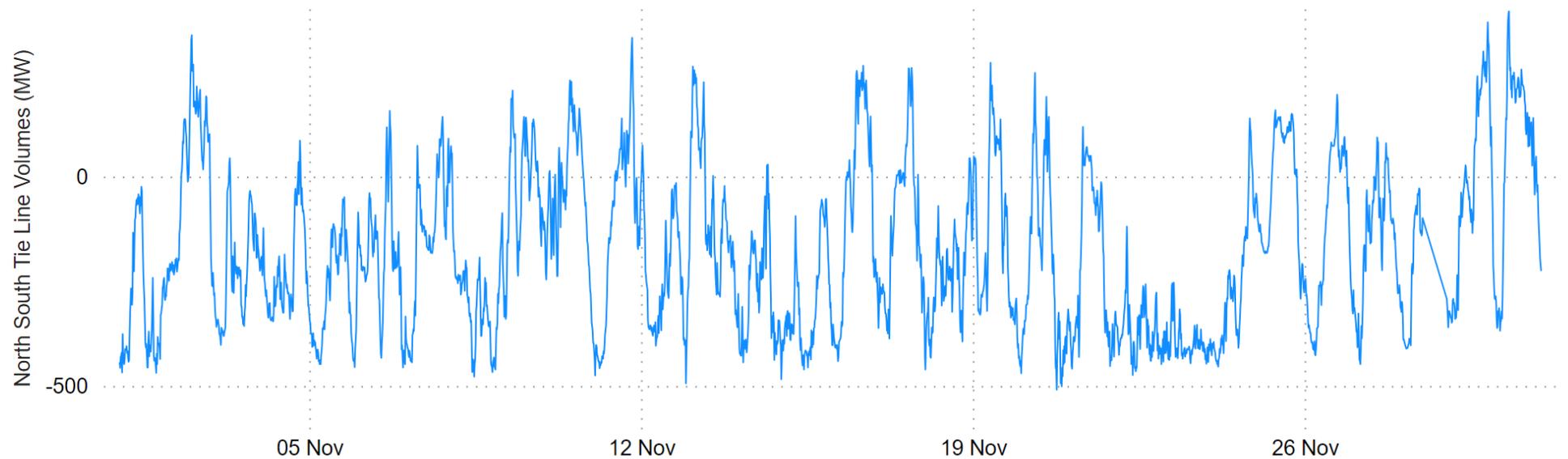
Average Net Flow (MW)
-175.92

-ve flow NI to ROI
+ve flow ROI to NI

Average Flows N-S Tie Line Long Term Trend



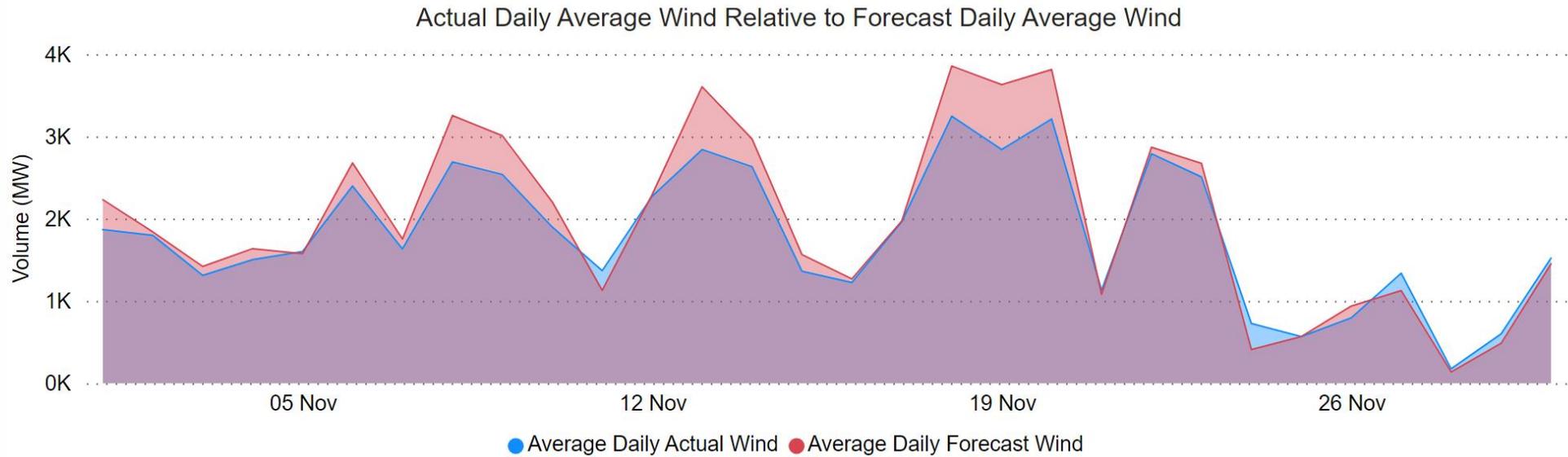
North South Tie Line Volumes 15 minute periods



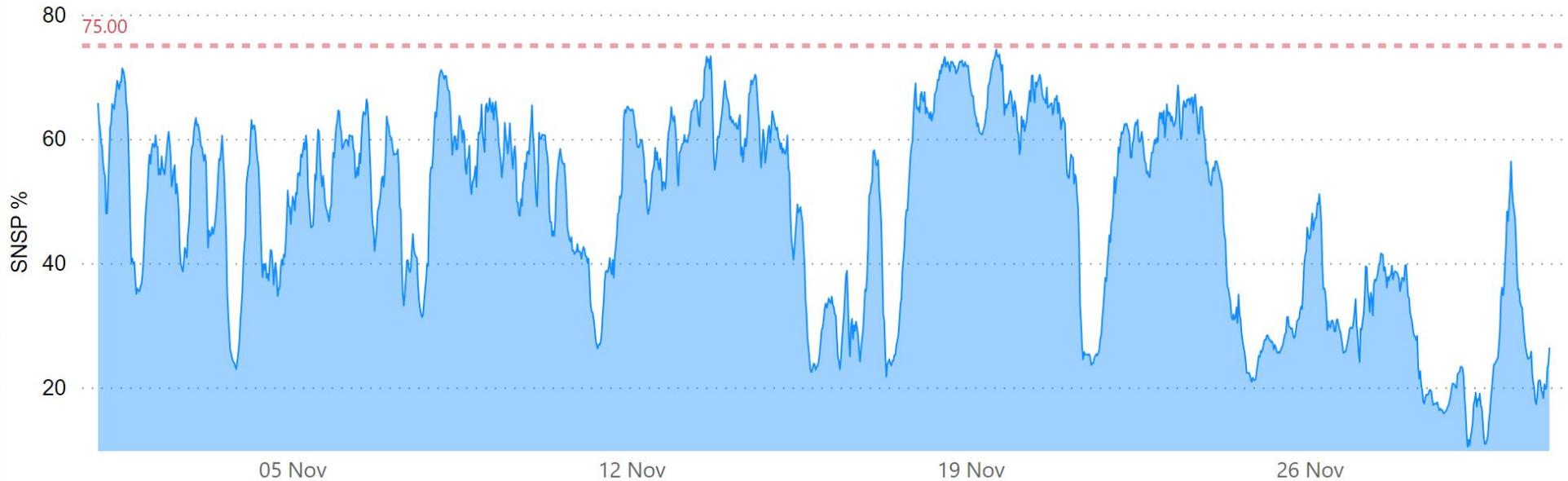
Wind Generation November 2023

Average Daily Actual Wind (MW)
1,811

Average Daily Forecast Wind (MW)
1,981



SNSP %



Min SNSP%
10.43

Max SNSP%
74.38

CO₂ November 2023

CO2 Intensity
 220.83
 Monthly Average (gCO₂/KWh)
 101
 Monthly Low (gCO₂/KWh)
 404
 Monthly High (gCO₂/KWh)

CO2 Emissions
 1159.25
 Monthly Average (tCO₂/hr)
 650
 Monthly Low (tCO₂/hr)
 2461
 Monthly High (tCO₂/hr)

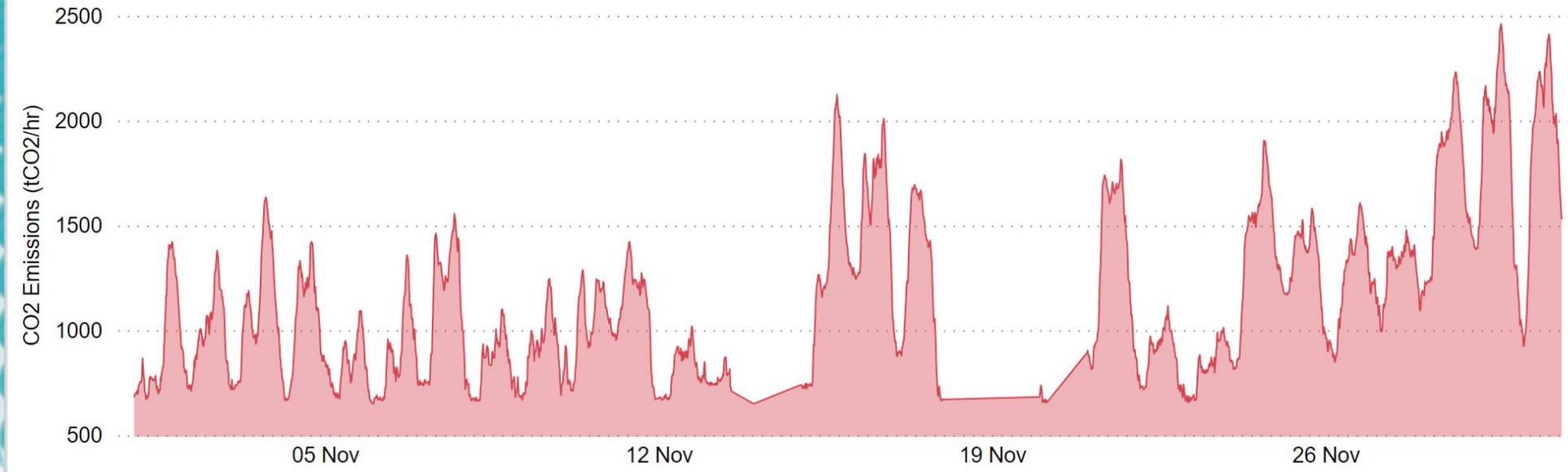
Note
 CO2 Emissions data missing
 14/11/23 00:00 to 15/11/23 00:00
 17/11/23 23:00 to 20/11/23 00:00
 20/11/23 03:45 to 21/11/23 00:00

Data sourced from - SONI/ERIGRID

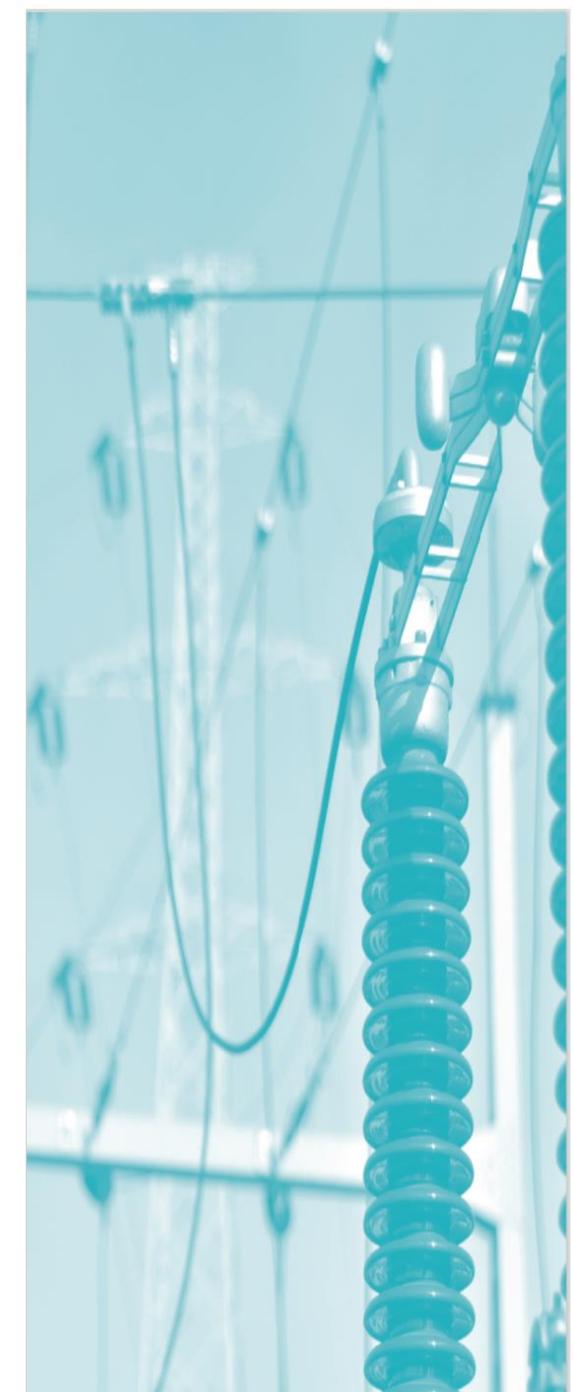
CO2 Intensity



CO2 Emissions



Fuel Costs and Spreads



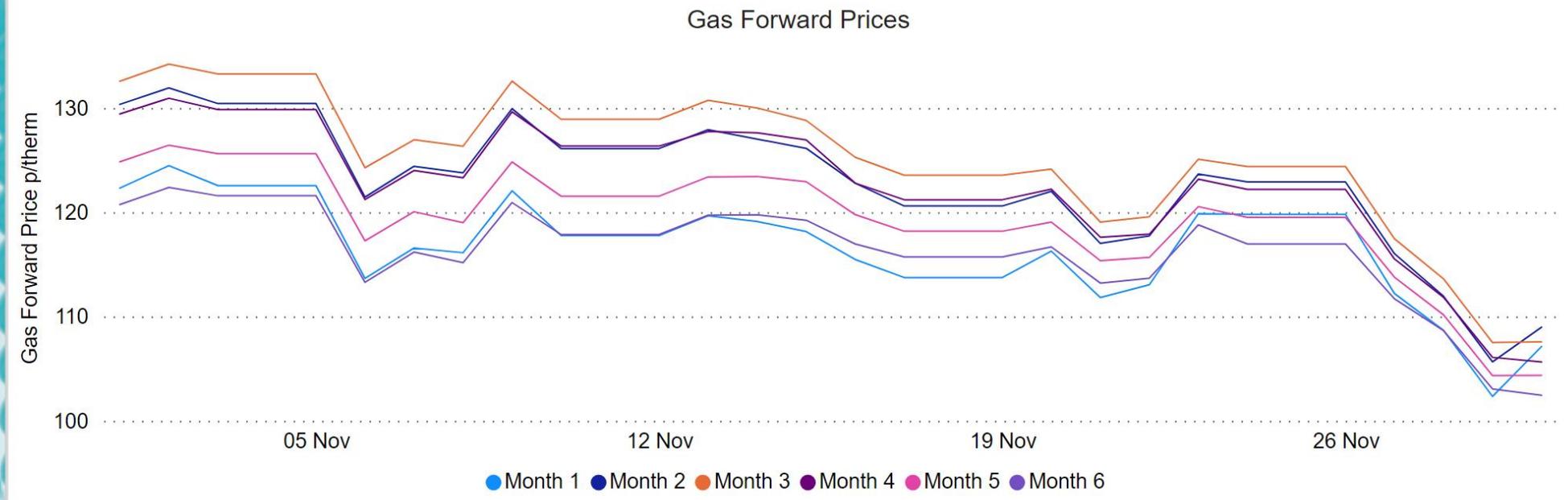
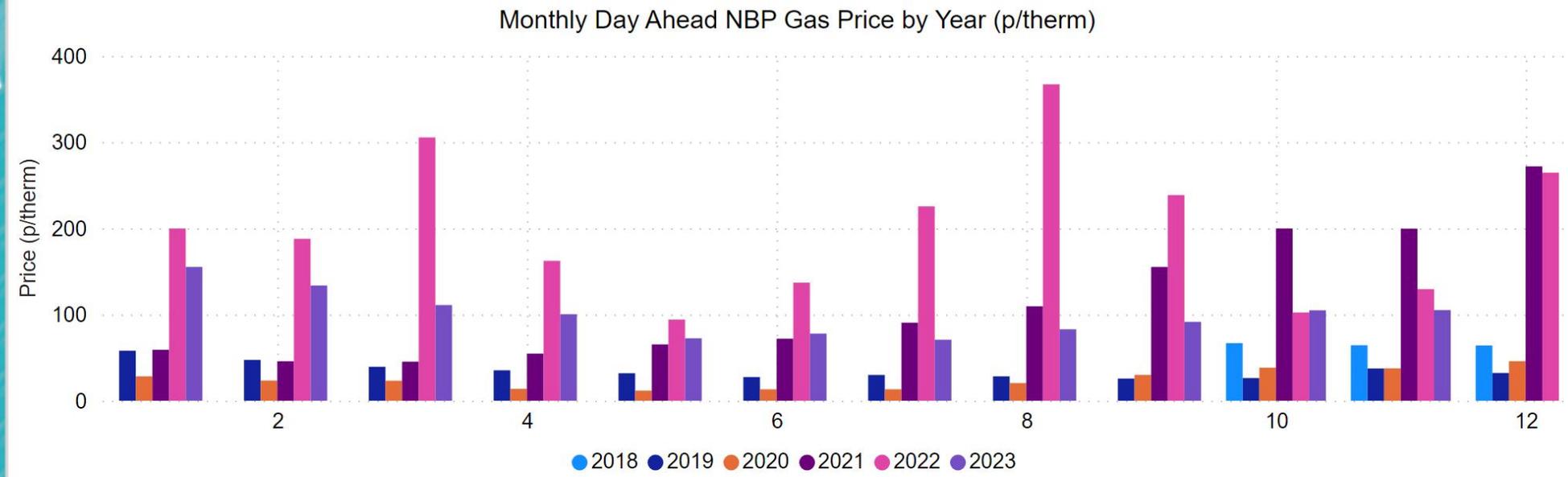
Gas Price

November 2023

104.97
Monthly Average (p/therm)

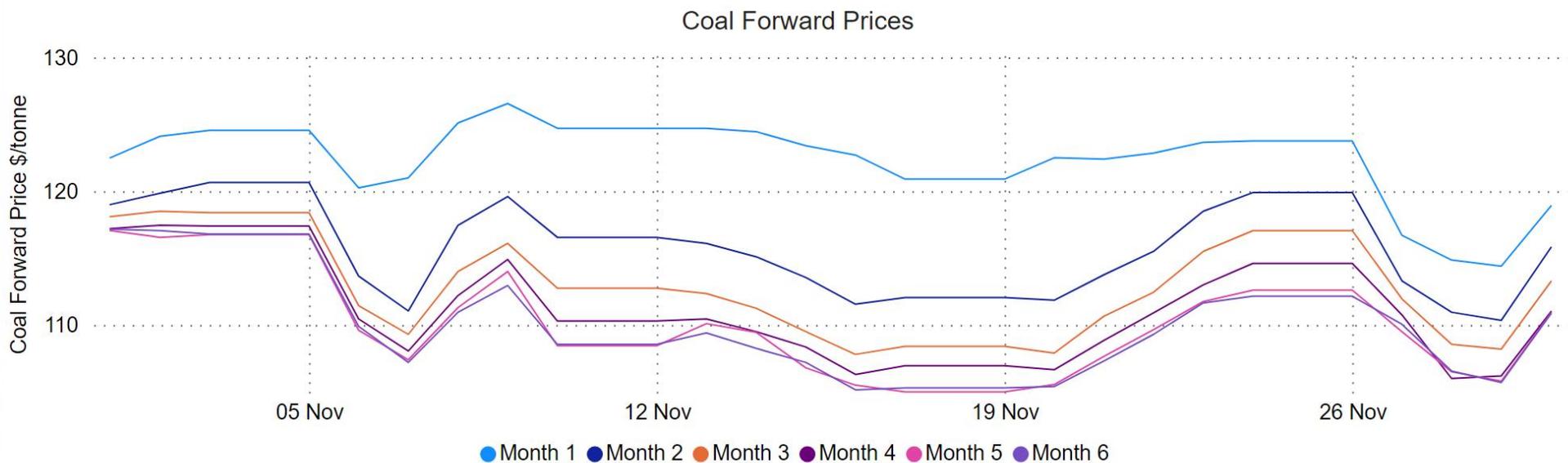
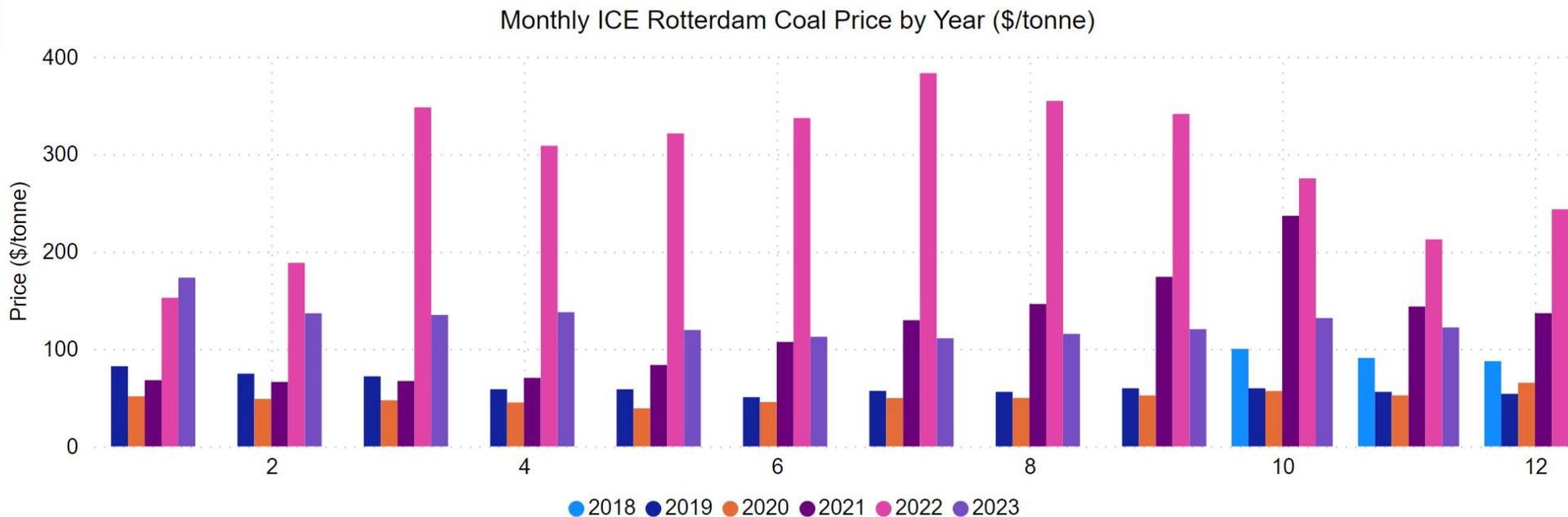
87.00
Monthly Low (p/therm)

120.05
Monthly High (p/therm)



Coal Price November 2023

\$122.16
Monthly Average \$/tonne
\$113.65
Monthly Low \$/tonne
\$126.55
Monthly High \$/tonne



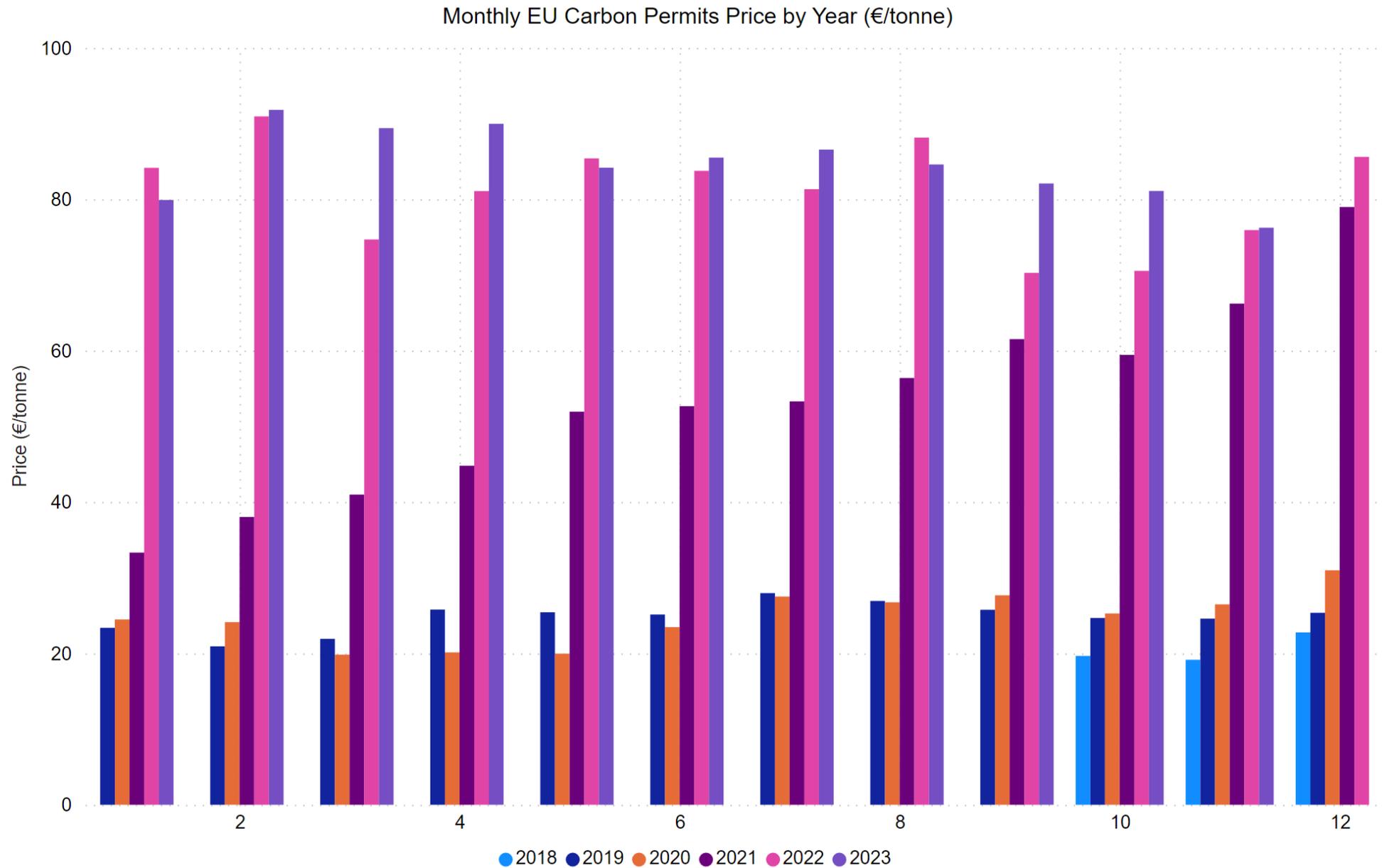
Carbon Price

November 2023

€ 76.25
Monthly Average €/tonne

€ 70.34
Monthly Low €/tonne

€ 79.44
Monthly High €/tonne

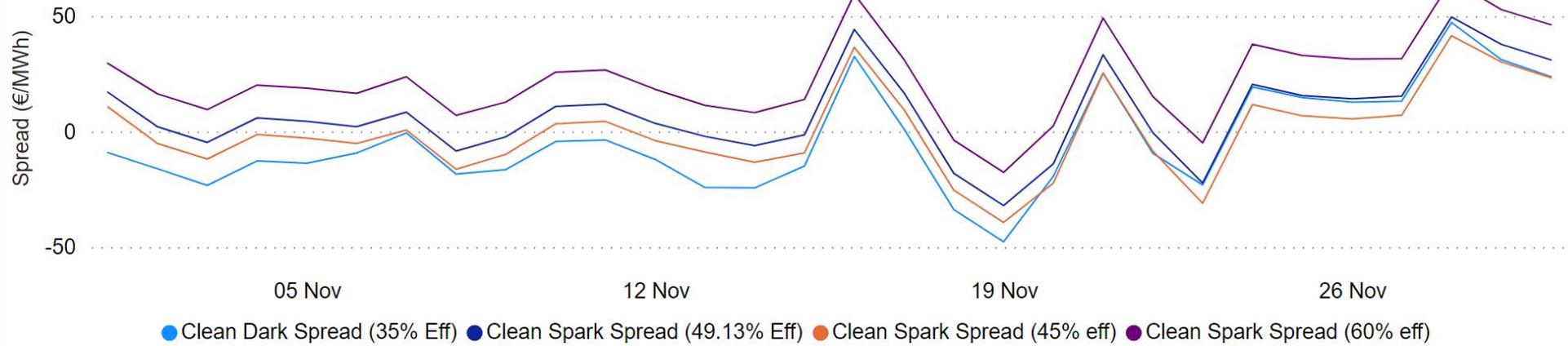


Spark Spreads November 2023

Clean Dark Spread measure the profitability of coal fired power generation based on the variable cost of inputs (coal and carbon credits) and the value of the output (electricity).

Clean Spark Spread is the difference between the price received by a generator for electricity produced and the cost of the natural gas + Carbon needed to produce that electricity.

Clean Dark Spread v Clean Spark Spread



Clean Dark Spread v Clean Spark Spread (October 2018 Onwards)

