



Annual Performance and Monitoring review EPR Permit JP3632ZH Cogen Plant - Dow Silicones UK Ltd

This report is to fulfil ERP permit JP3632ZH condition 4.2.2

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

It was agreed with previous inspectors that this report would be submitted by 31st March to allow enough time for the detailed information to be gathered.

Contents

Summary	2
Incidents	2
Air monitoring	3
CEMS data	3
Periodic extractive sampling	6
Fuel and Subsequent Emissions	8
Running Hours	8
Heat vs Electrical Efficiency	9
CHP efficiency	9

Summary

The report includes details of our performance during 2024 . SPC charts have been used for all CEMS monitoring we carry out for NOX and CO for the last 7 years. SPC charts have been used for extractive sampling we have carried out since 2008.

Points of interest for 2024 :

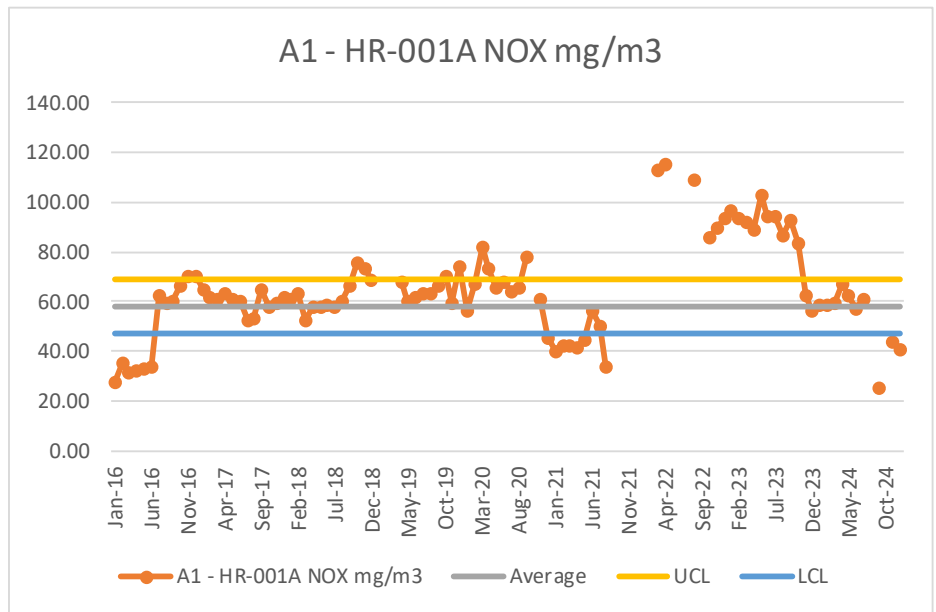
- New Analyser installed on all 3 units in 2024 - Unit B in April and Unit B/ Unit FB in August. The QAL2's were carried out for the new analysers in November. The reports have just been received and we have arranged for Envirosoft to train us to input these values into the DAHS. The old analysers were found to be in poor repair when they were removed.
- GT's operational for more time during 2024 than 2023.
- Power was exported to the grid during 2024, this wasn't done throughout 2023 and 2022.

Incidents

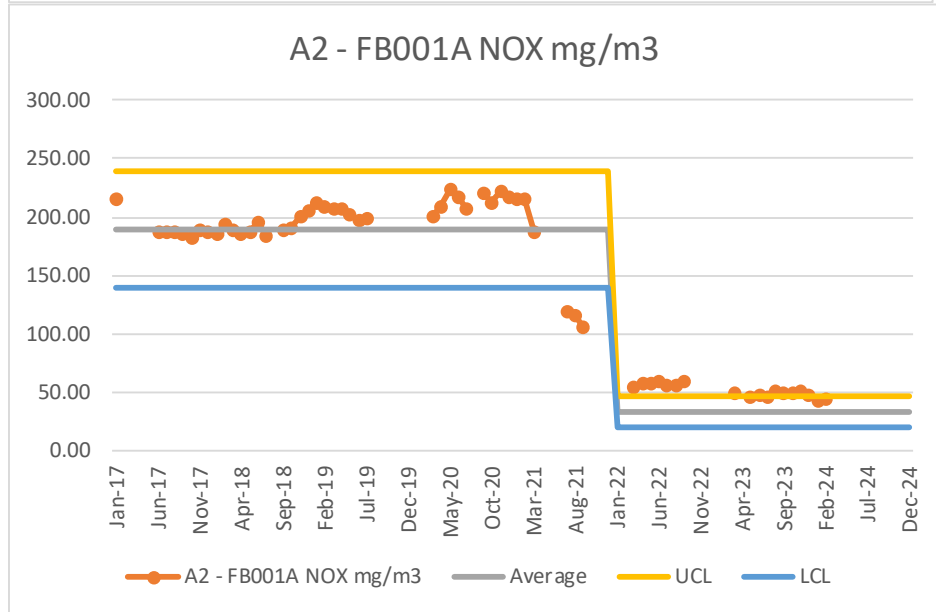
Schedule 5's submitted during 2024:

- Q4 Unit A CO and Unit B CO – burner O2 sensors needed recalibration after shutdown and plastic sheeting caught in fan due to high winds in Storm Darragh causing high CO in Unit A

Air monitoring
CEMS data
NOX

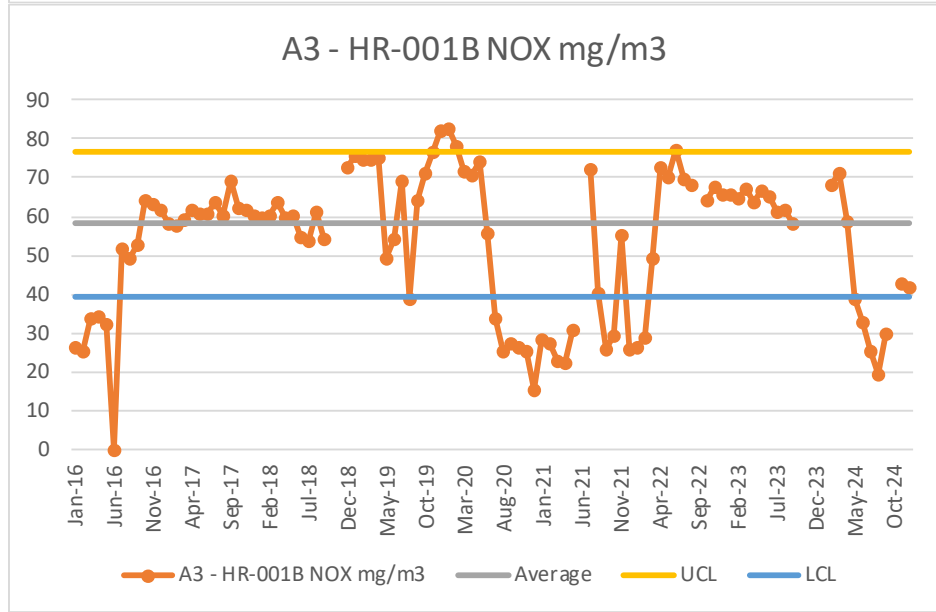


Permit limit:
Monthly ave 75mg/m3
Annual ave 55 mg/m3
(with GT running)
*O2 ref 15%



Permit limit:
Monthly ave 100 mg/m3
Annual ave 100 mg/m3
*O2 ref 3%

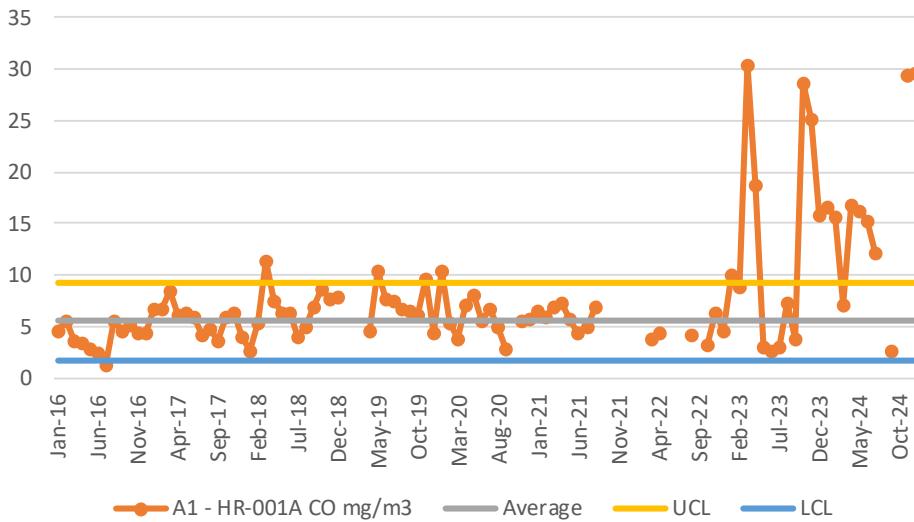
Burner was upgraded to reduce NOx during 2022. Optimisation was carried out in March 2022 and proved very successful as can be seen from the SPC chart (and updated limits).



Permit limit:
Monthly ave 75mg/m3
Annual ave 55 mg/m3
(with GT running)
*O2 ref 15%

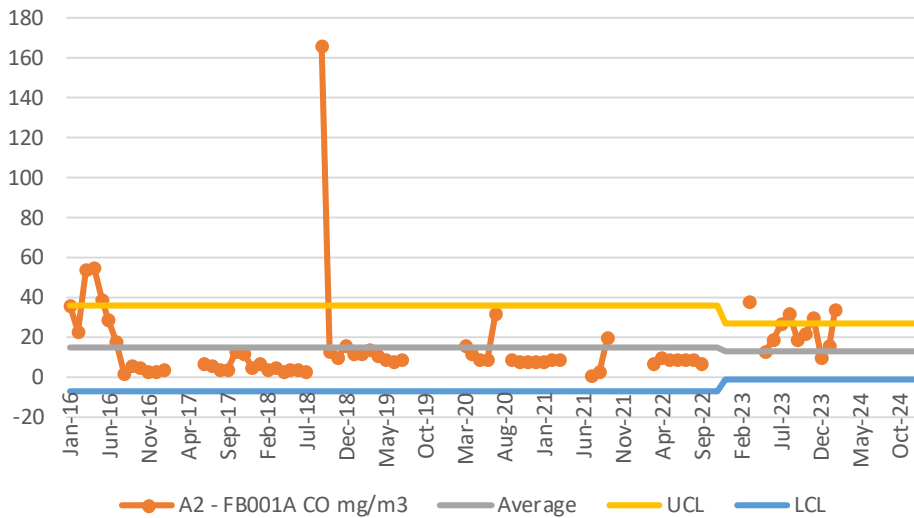
CO

A1 - HR-001A CO mg/m3



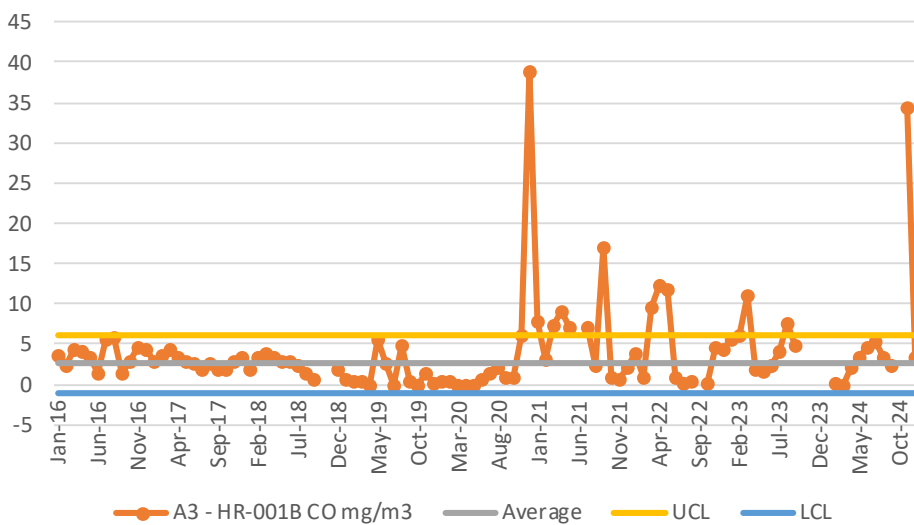
Permit limit:
 Monthly ave 80mg/m3
 Annual ave 30 mg/m3
 *O2 ref 15%

A2 - FB001A CO mg/m3



Permit limit:
 Monthly ave 100mg/m3
 Annual ave 40 mg/m3
 *O2 ref 3%

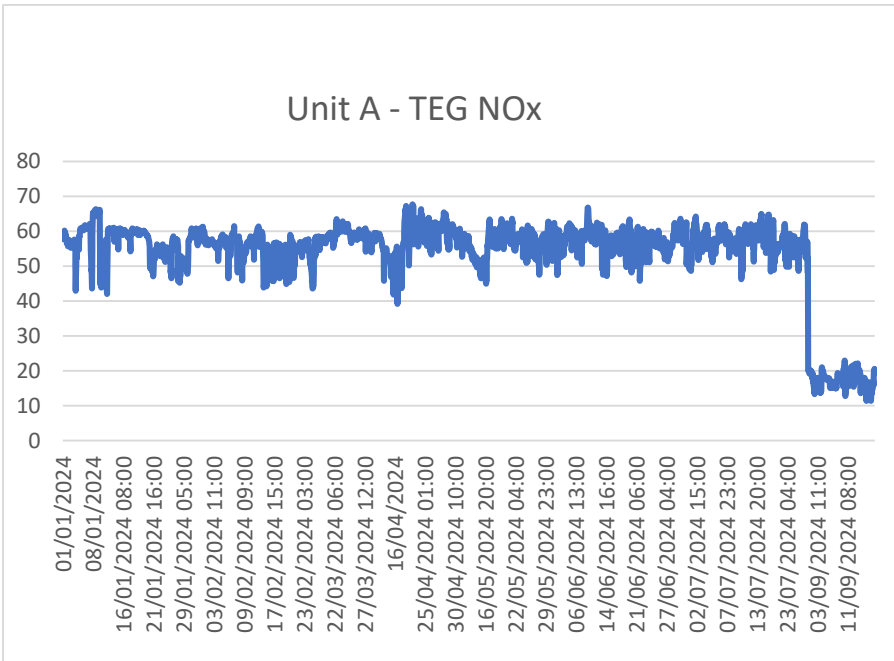
A3 - HR-001B CO mg/m3



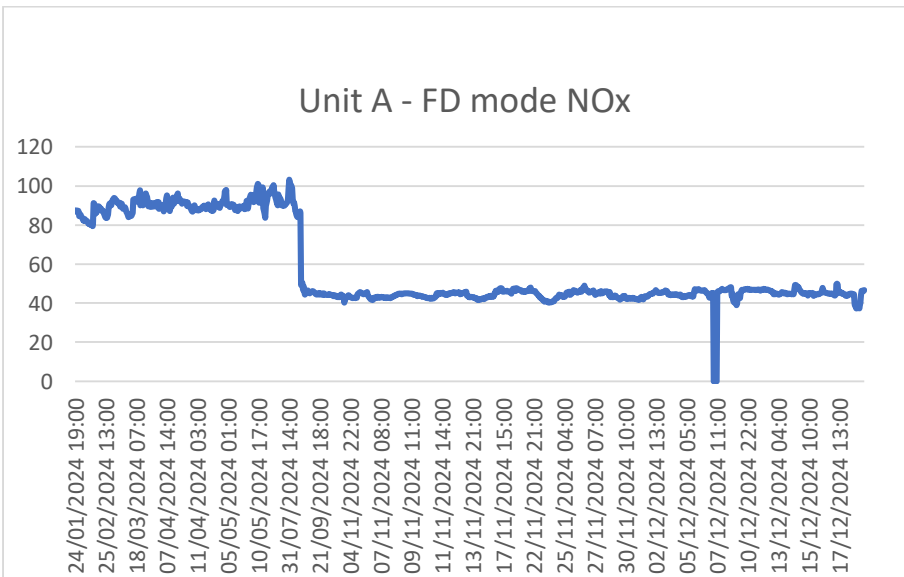
Permit limit:
 Monthly ave 80mg/m3
 Annual ave 30 mg/m3
 *O2 ref 15%

UNIT A

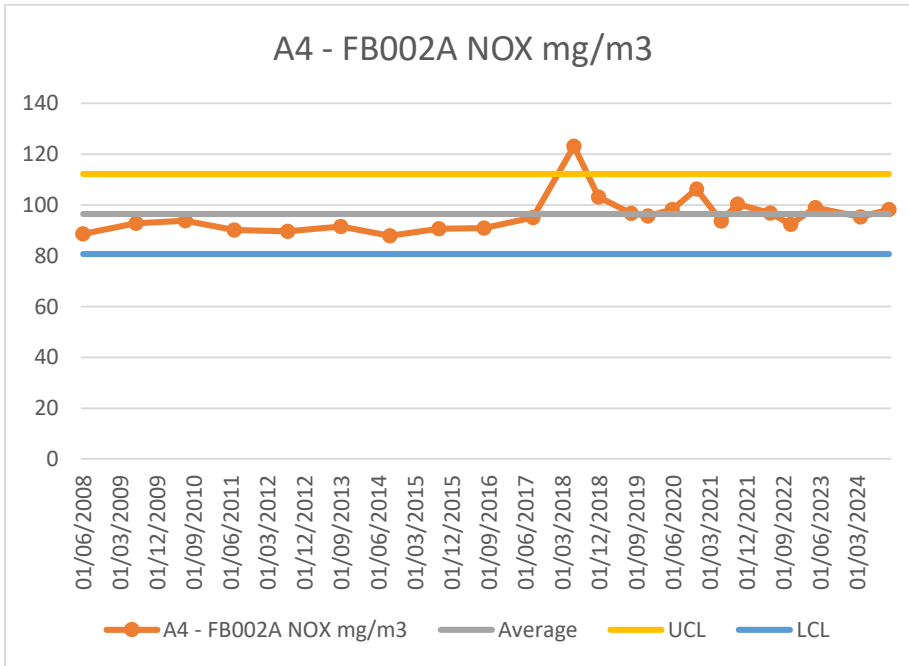
Run chart of hourly data for 2024 – GT running



Run chart of hourly data for 2024 – GT not running

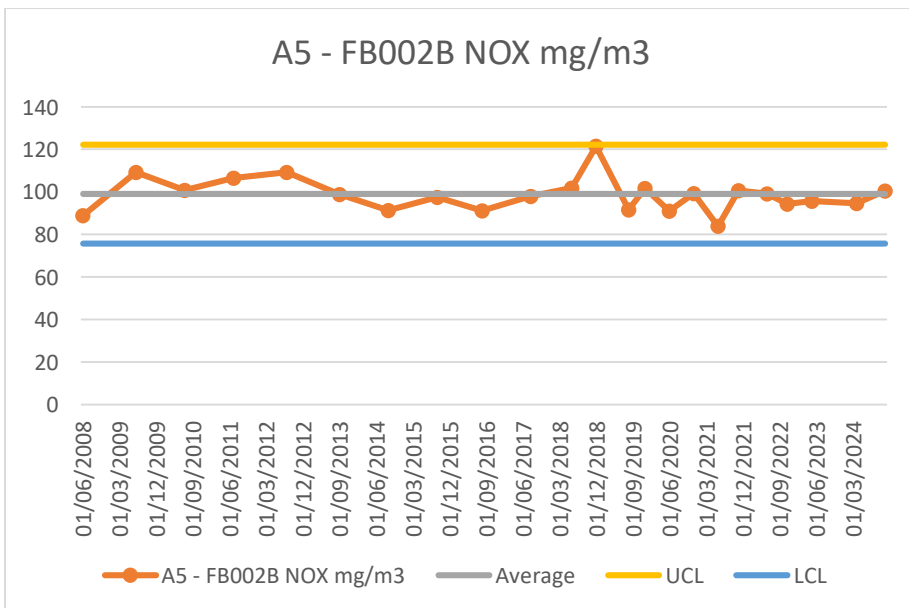


Periodic extractive sampling
NOX



Results within permit limit.

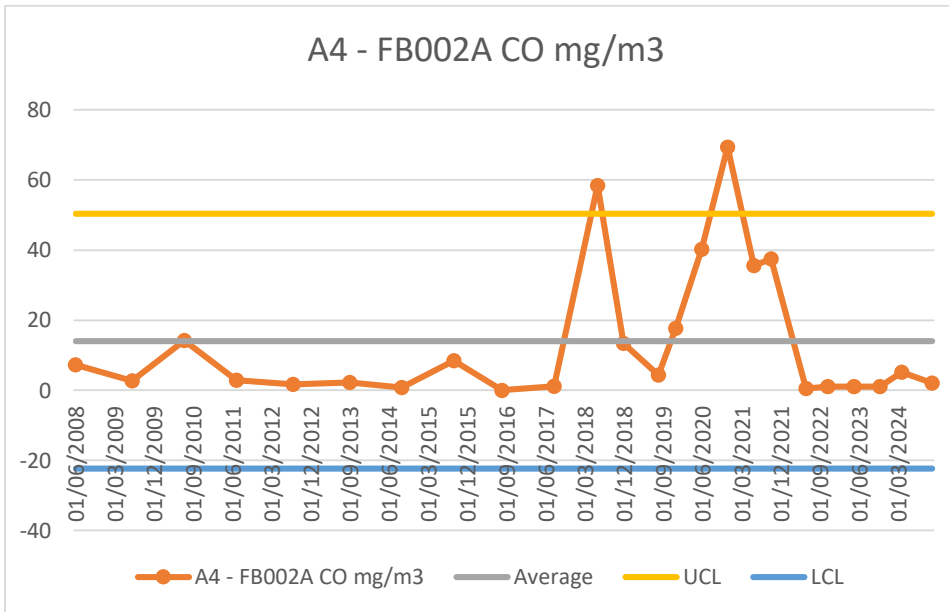
Permit limit:
6 monthly extractive sample 110 mg/m3
*O2 ref 3%



Results within permit limit.

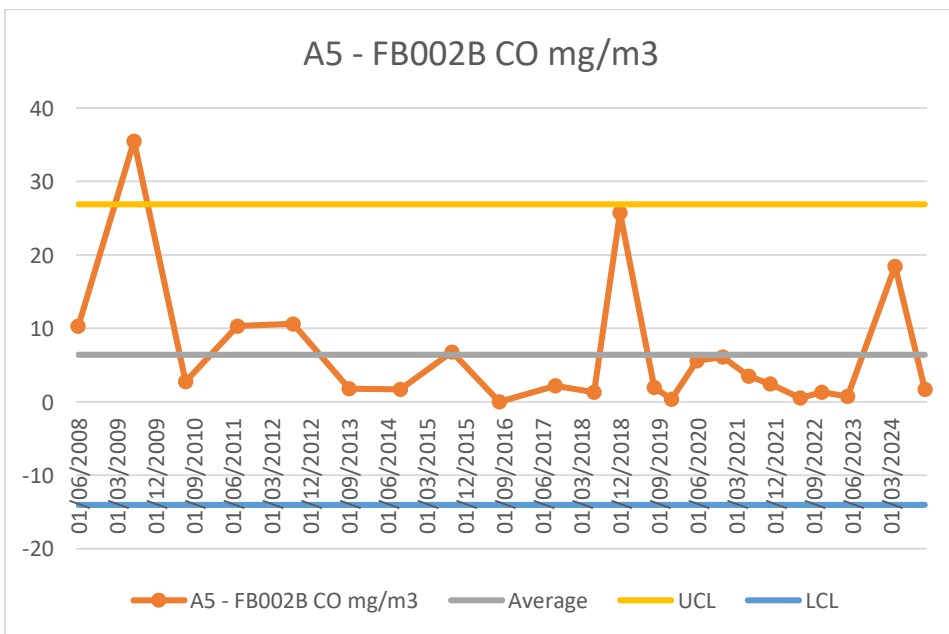
Permit limit:
6 monthly extractive sample 110 mg/m3
*O2 ref 3%

CO



Results within permit limit.

Permit limit:
6 monthly extractive sample 100 mg/m3
*O2 ref 3%



Results within permit limit.

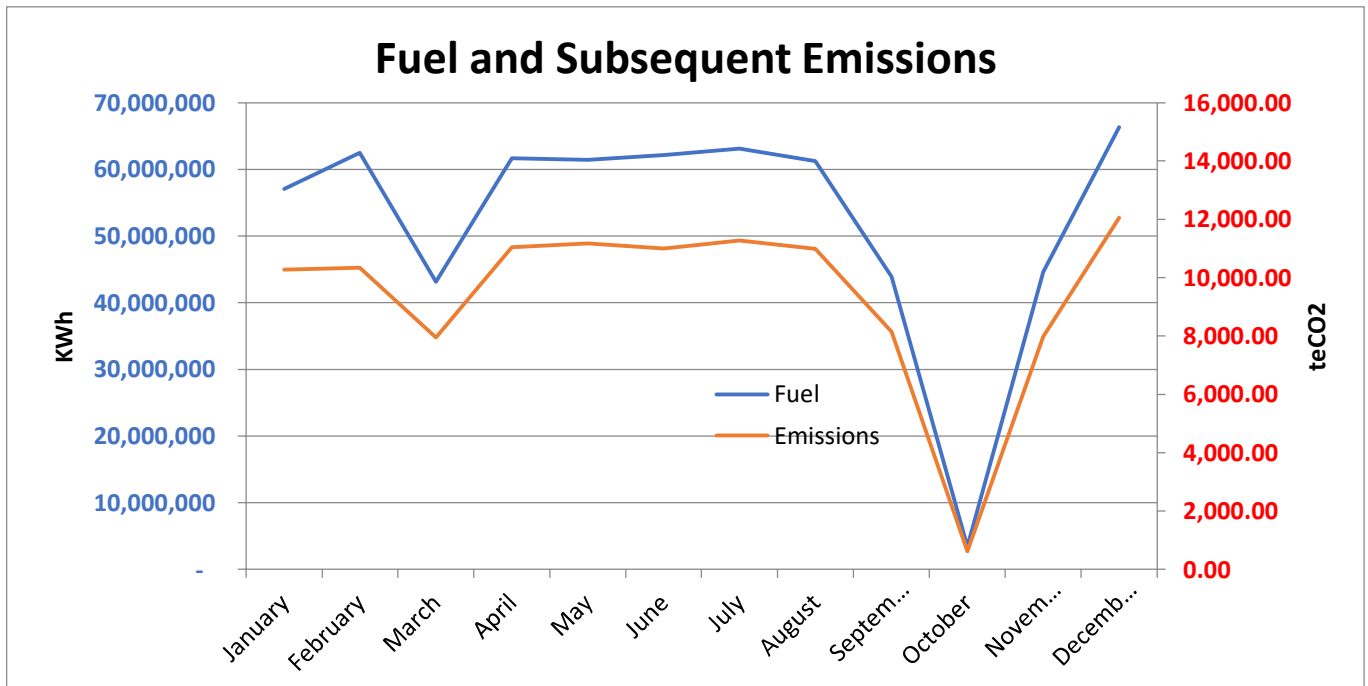
Permit limit:
6 monthly extractive sample 100 mg/m3
*O2 ref 3%

Fuel and Subsequent Emissions

Fuel and emissions were slightly higher than 2023. This was mainly due to producing electricity for export during 2024

Average fuel consumption for the year was 52,535 MWh per month compared to 49,823 MWh per month for 2022.

Average CO2 emissions for the year were 9,404 tCO2 per month compared to 8,899 tCO2 per month for 2023



Running Hours

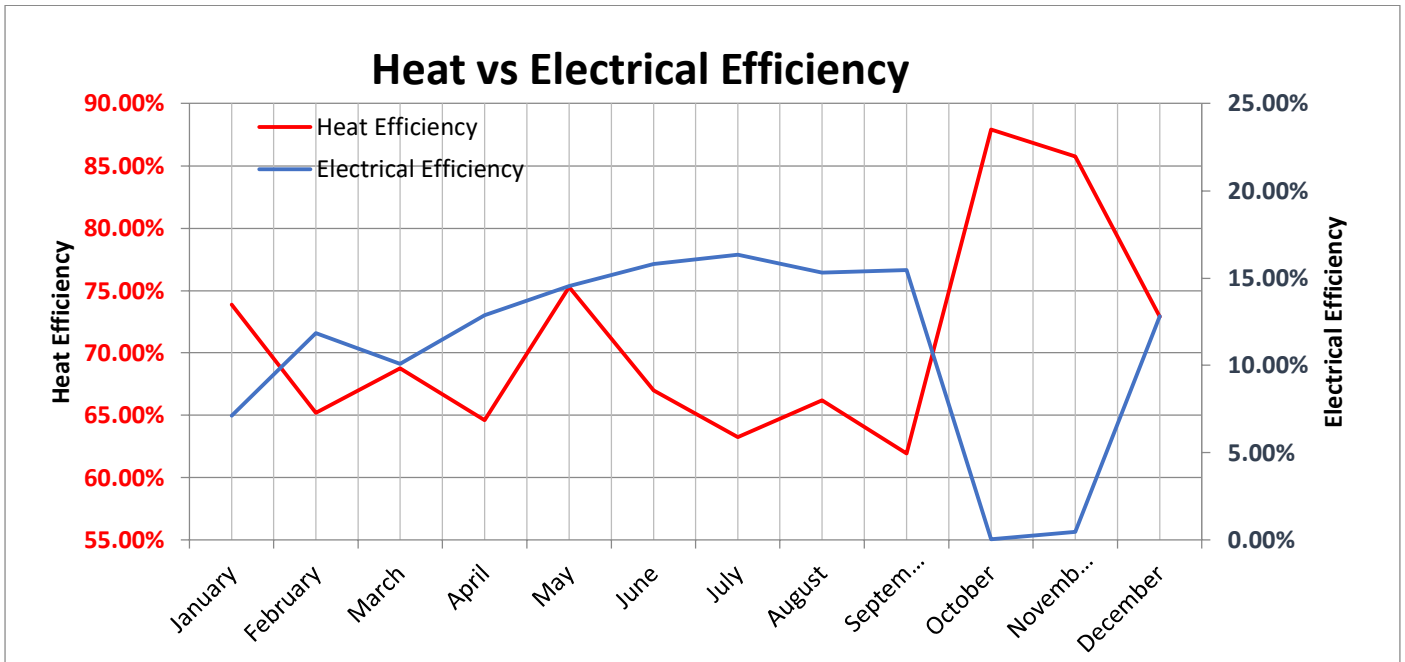
	Year:	A1 (hours)	A2 (hours)	A3 (hours)	A4 (hours)	A5 (hours)
Annual Operating Hours	2024	5277.559	598.5597	3900.621	675	835

The annualised hours reflect a general running philosophy that the gas turbines and heat recovery units are used as base generating units for both electricity and steam, with the fired boiler/MP boilers taking up the rest of the plant demand.

The MP boilers are kept ready to go, should they be needed, so the hours have been calculated based on hours that each MP boiler is running above 20%. The MP boilers were operational just before the site shutdown and they were the first boilers to be up and running afterwards due to low steam demand.

Heat vs Electrical Efficiency

The heat efficiency was higher during periods of the year where the GT's were not running. The electrical efficiency was higher during periods of the year where the GT's were running. This graph reflects the site shutdown in October, where the high pressure boilers did not run at all and November where the turbines were not operational.



CHP efficiency

CHP efficiency was variable during the year. This efficiency is calculated as a sum of the electrical and heat output divided by the fuel input. The efficiency measured in this way shows as higher at periods when there is higher heat efficiency.

