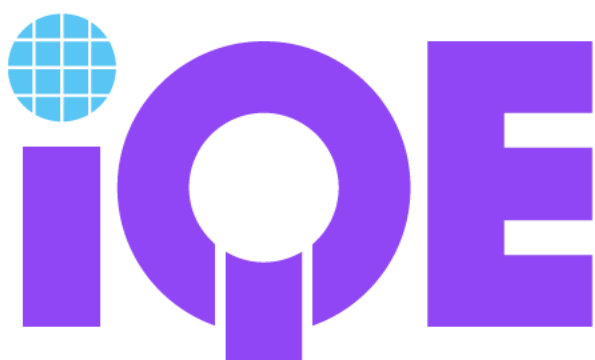


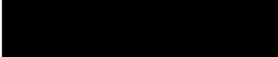


IQE Europe performance review 2023.
Environmental Operating Permit
EPR/KP3235SS

January 1 2024

2023

Prepared on behalf of IQE Europe Ltd.


IQE Group HSE Manager.

Introduction

This report has been prepared for Natural Resources Wales “*the regulator*” in line with the requirements of IQE EU “*the operator*” environmental operating permit EPR/KP3235SS to satisfy permit condition 4.2.2.

General Information

This is the 7th report submitted by IQE since the issue of the consolidated operating permit by the regulator on 25th July 2017. Last year we announced that this facility was moving away from production and into an innovation space for future product development. In the past year it has been decided that both sites should be operating under a single management team and this site should be used for production as well. During this transition period and remerging period no activities were affected that would change our environmental risks or impact.

During 2023 IQE sites across South Wales have engaged with Achilles to maintain accreditation to ISO 14064-1. The standard specifies principles and requirements at the organization level for the quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory.

With IQE Newport’s mass-manufacturing plant operating with ten reactors significant VCSEL R&D and some legacy products remain prevalent at the IQE Europe plant, along with GaAs edge-emitter products, using arsine and will remain roughly in line with 2023 production figures. Phosphine-related production is also looking similar to 2023 levels and has been captured wholly by the IQE Europe plant. As a result, phosphine-related production will remain here for the foreseeable future. G5+ ammonia-based reactor is projected to become more productive, having been largely in R&D mode, hence ammonia-related use will also continue for the foreseeable future.

We had applied for two research exemptions during this period to allow the use of Tertiary-butyl Hydrazine and Tertbutyl Arsine under one exemption and Propane use under a separate exemption. Both exemptions are now past their open window and activities related to these have been stopped.

Monitoring Results (Condition 4.2.2 (a))

The table below summarises the results from the latest round of emission monitoring conducted in line with the requirements of permit condition 3.3.1 (a) and table S3.1 of KP3235SS for emission points A1 and A3.

Emissions to Air			
Emission Point	Substance/Parameter	Emission Limit Value	Result ^[1]
A1	Ammonia ⁽⁷⁾	10 mg/m ³	0.17mg/m ³
A1	Hydrogen Chloride	10 mg/m ³	0.04mg/m ³
A3	Arsine ⁽⁶⁾	0.42 mg/m ³	0.013mg/m ³
A3	Phosphine ⁽⁶⁾	0.42 mg/m ³	0.002mg/m ³
A3	Ammonia ⁽⁷⁾	9 mg/m ³	0.014mg/m ³

2021 v 2022 Comparison

Emission Point	Substance	Emission Limit Value	2022 Result	2023 Result	+ / - Balance
A1	Ammonia	10mg/m ³	0.03mg/m ³	0.017mg/m ³	-0.013mg/m ³
A1	Hydrogen Chloride	10mg/m ³	0.008mg/m ³	0.04mg/m ³	+0.032mg/m ³
A3	Arsine	0.42mg/m ³	0.01mg/m ³	0.013mg/m ³	+0.003mg/m ³
A3	Phosphine	0.42mg/m ³	0.01mg/m ³	0.002mg/m ³	-0.008mg/m ³
A3	Ammonia	9mg/m ³	0.13mg/m ³	0.014mg/m ³	-0.116mg/m ³

As we can see from the data table 'Emissions to Air' IQE EU remains significantly lower than the emission limit value of 10mg/m³ for ammonia & hydrogen chloride for emissions point A1.

Emission point A3 for Arsine, Phosphine & Ammonia limits are also significantly lower than the ELV's.

2023 Data Review

Evaluation of 2022 monitoring results for arsine emissions via point A3 against 2021 show a very slight increase in emissions in the June readings from 0.01mg/m³ to 0.04mg/m³ but have then drop back down to 0.01 mg/m³ in the results obtained on the 14th December 2022.

Arsine emission from A3 shows a steady value with a very slight increase that it well within the accuracy limits of the testing (14%). The steady value gives us confidence that the scrubber system and other environmental controls are operating well and don't show immediate signs of losing control over the control measures. The emissions continue to remain significantly lower than the limit value of 0.42 mg/m³.

Phosphine maintains a very small reduction in detected values which is also within tolerance of the measurement (42%) showing that our controls are still working as designed and intended. We remain below the limit value of 0.42 mg/m³.

2022 to 2023 ammonia emissions show a decrease in emissions by almost a half. This is likely due to a downturn in the industry resulting in order books not reflecting what occurred in 2022. Emissions to air remain well below the prescribed limit.

As required under permit condition 4.2.2 (table S4.2) for the period 01/01/23 – 31/12/23 the annual amount of raw ammonia used was 800kg / 0.8tonnes.

All emissions to atmosphere from emission point A3 are significantly below prescribed limits and IQE EU continues to operate in compliance with the conditions laid down in EPR/KP3235SS.