

Permitting Decisions- Bespoke Permit

We have decided to grant the permit for KN Energy Centre operated by KN Energy Centre Ltd.

The permit number is EPR/SP3927SL.

The permit was granted on 03/12/2024.

The application is to operate two combined heat and power (CHP) units to provide electricity and steam to a plasterboard manufacturing installation operated by Knauf (UK) GmbH. The CHP are Medium Combustion Plant (MCP) and are permitted as a Directly Associated Activity (DAA) to the Knauf (UK) GmbH permit (reference EPR/JP3531PD).

CHP1 is 4.75MWth input, while CHP2 is 3.56MWth input. Both are run on natural gas only for up to 8760 hours per year and are classified as new plant under the Environmental Permitting (England and Wales) (Amendment) Regulations 2018.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision-making process. It:

- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- highlights key issues in the determination

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit.

Key issues of the decision

Air emissions

The CHP1 has a thermal input of 4.75MWth, and CHP2 has a thermal input of 3.56MWth making them both MCP. This means emission limit values and monitoring requirements from the Medium Combustion Plan Directive 2015 apply.

The CHP will release oxides of nitrogen dioxide (NO_x) and carbon monoxide (CO) into the atmosphere which have the potential to adversely impact human health and ecological receptors.

While the site itself is part of a large industrial area, there are residential properties in the town of Immingham nearby, along with playing fields and a school. There is also the Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar sites within 10km screening distance, as well as the Humber Estuary Site of Special Scientific Interest (SSSI) and two Local Wildlife Sites within 2km screening distance.

The potential impact of NO_x and CO upon sensitive receptors was considered by the applicant who submitted an air dispersion modelling report titled 'Air Quality Assessment, Knauf, Immingham' reference 6640-2r3, Version 3, dated 23rd July 2024. This model was based on the CHPs operating continuously at 8760 hours per year at an Emission Limit Value (ELV) of 95mg/Nm³ (at 273 kelvin (k), dry and 15% Oxygen (O₂)). This ELV is applicable to new engines under the Medium Combustion Plant Directive (MCPD) to prevent breaches of environment standards (ES) at any sensitive receptor. It should be noted that this assessment was based on both CHPs being 4.75MWth thermal input. Monitoring of CO and NO_x is required by MCPD and is included in this permit.

Methodology:

We expect the risk assessment of point source emissions to meet the requirements of the guidance set out at [Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit), and to include the following:

- Describe emissions and receptors
- Calculate process contributions
- Calculate predicted environmental concentrations
- Screen out insignificant emissions that do not warrant further investigation

- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions

This methodology uses a concept of 'process contribution' (PC), which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the concentration is greatest. There is a simple method of calculating the PC which is mainly used for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors which assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise – this means the PCs calculated are likely to be conservative. More accurate calculations of PCs can be achieved by using mathematical dispersion models which take into account parameters such as release and surrounding conditions such as local meteorology.

Air dispersion enables the PC to be predicted at any environmental receptor that might be impacted by emissions from a plant. Once short-term (ST) and long-term (LT) PCs have been calculated in this way, they are then compared with Environmental Standards (ES).

PCs are considered insignificant if:

- The LT PC is less than 1% of the relevant ES; and
- The ST PC is less than 10% of the relevant ES.

The LT 1% PC insignificance threshold is based on the judgements that:

- It is unlikely that an emissions at this level will make a significant impact contribution to air quality; and
- The threshold provides a substantial safety margin to protect health and the environment.

The ST 10% PC insignificance threshold is based on the judgements that:

- Spatial and temporal conditions mean that short term PCs are transient and limited in comparison with the LT PCs; and
- The threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the applicant's proposals for the prevention and control of emissions to be acceptable. However, where an emission cannot be screened out as insignificant, it does not necessarily mean it will be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the applicant's air dispersion modelling, taking background concentrations and modelling uncertainties into account.

Where the PC is greater than these thresholds, the assessment must continue to determine the impact by considering the Predicted Environmental Concentration (PEC). The PEC is the combination of the PC substance to air and the background concentration of that same substance which is already present in the environment. The PECs can be considered 'not significant' if the assessment has shown that both the following apply:

- Proposed emissions comply with associated emissions levels (AELs) or the equivalent requirements where there is no AEL; and
- The resulting PECs will not exceed 100% of the ES.

As the ES are often given for NO₂ rather than NO_x, for combustion processes where no more than 10% of nitrogen oxides are emitted as nitrogen dioxide, worst case scenario ratios to nitrogen dioxide of the following apply:

- 35% for ST average concentrations; and
- 70% for LT average concentrations

For guidance on this, please see [Environmental permitting: air dispersion modelling reports - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/environmental-permitting-air-dispersion-modelling-reports) .

Methodology for local nature sites:

Emissions at local nature sites (including ancient woods, local wildlife sites and national/local nature reserves) can be considered insignificant if the ST and LT PCs are less than 100% of the ES. The release of NO_x can impact ecological receptors directly, but also indirectly through the deposition of acid and nitrogen. ES for acid and nitrogen deposition are location and habitat-specific and can be found using the Air Pollution Information System (APIS) at [Air Pollution Information System | Air Pollution Information System \(apis.ac.uk\)](https://apis.ac.uk) .

Air Quality Assessment:

The AQA modelling was undertaken using ADMS-6.0. The decision to permit the CHPs to operator under the conditions specified in the permit was made based on the following considerations within the report:

Human receptors:

- 7 human receptors were used in the model. The maximum predicted LT NO₂ PCs are 11.2% of the ES with the PECs predicted to be 47.7% of the ES. The maximum predicted ST NO₂ PCs are 18.9% of the ES with the PECs predicted to be 33.0%. The ES used is 40µg/m³ of NO₂ for LT impacts, and 200µg/m³ of NO₂ for ST impacts.
- While our audit did not fully agree with the numerical values used in the modelling report, we do agree with the applicant's conclusions that the relevant ES will not be exceeded at any sensitive human health receptor when using an emission limit of 95mg/Nm³ of NO_x.

Ecological receptors:

The applicant modelled the potential impact upon 10 ecological receptors identified within the screening distance and we agree that these are the only ecological designations which need to be considered here. The impact on these sites was found to be not significant.

- The modelling report's LT and ST NO_x PCs are above 1% and 10% respectively for the relevant ecological sites, however the PECs are within the critical levels for the SAC, SPA, Ramsar and SSSI sites. Nutrient Nitrogen PCs are above 1% of the critical local of 20kg N/ha/yr, however the PECs do not exceed the critical load for the SAC, SPA, Ramsar and SSSI sites.
- The modelling report's LT and ST PCs for the Local Wildlife Sites are less than 100% for all critical levels and loads and are therefore insignificant.
- While our audit did not fully agree with the numerical values used in the modelling report, we do agree with the applicant's conclusions that the relevant ecological critical levels and loads will not be exceeded at any sensitive human health receptor when using an emission limit of 95mg/Nm³ of NO_x.

Change of MWth input of CHP2

In the modelling report assessed, both CHPs had an input of 4.75MWth. Post-assessment, the operator decided to reduce the thermal input of CHP2 from 4.75MW to 3.56MW. While downsizing one of the CHPs to 3.56MWth is a small change, it could result in a lower flow rate and less effective plume dispersion. However, the impact of this should be negligible. Therefore, re-modelling was not required and the decision to permit the adjusted size stands.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of part of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', and Appendix 1 of RGN 2 'Interpretation of Schedule 1'.

The operator has provided the grid reference for the emission points from the medium combustion plants.

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

This permit applies to only one part of the installation – the operation of the tow CHP plant located within the existing boundary of the manufacturing installation.

The names and permit numbers of the operators of other parts of the installation are detailed in the permit's introductory note.

The site

The operator has provided a plan which we consider to be satisfactory.

These show the extent of the site of the facility

The plans show the location of the part of the installation to which this permit applies on that site.

The plan is included in the permit.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England as the air quality assessment (as described in **Key Issues** above) was assessed for this application and we agreed with the consultant's conclusions that any impact by this application on the relevant habitat sites is not significant. In addition, a habitats assessment was undertaken and approved after consultation with Natural England during a previous variation application for the wider installation (the air quality assessment included oxides of nitrogen, see permit reference EPR/JP3531PD/V004). There was a variation to the wider installation (EPR/JP3531PD/V005) which did not require consultation with Natural England because overall emissions assessed during the V004 variation were reduced as a result of the changes made in V005. Note that V005 only affected PM10 particulates – these do not require assessment for MCPs running off natural gas. Also note that EPR/JP3531PD/V006 for the wider installation is a minor variation, in which a habitats assessment was not required.

The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

Operating techniques

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

Operating techniques for emissions that do not screen out as insignificant

Emissions of oxides of nitrogen (NO and NO₂) cannot be screened out as insignificant at all sensitive receptors. We have assessed whether the proposed techniques are Best Available Techniques (BAT).

The proposed techniques/emission levels for emissions that do not screen out as insignificant are in line with the techniques and benchmark levels contained in the technical guidance and we consider them to represent appropriate techniques for the facility. The permit conditions enable compliance with relevant BAT reference documents (BREFs) and BAT Conclusions, and MCPD Emission Limit Values (ELVs).

Operating techniques for emissions that screen out as insignificant

Emissions of carbon monoxide have been screened out as insignificant, and so we agree that the applicant's proposed techniques are Best Available Techniques (BAT) for the installation.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Raw materials

We have specified limits and controls on the use of raw materials and fuels.

The fuel for both CHPs is restricted to natural gas.

Emission Limits

Emission Limit Values (ELVs) have been added for the following substances:

- Oxides of nitrogen (NO and NO₂ expressed as NO₂). ELVs have been set at 95 mg/Nm³ at an oxygen reference condition of 15%, which are in line with Schedule 25A (Medium Combustion Plant) of the Environmental Permitting (England and Wales) (Amendment) Regulations 2018.

ELVs are set in accordance with MCPD requirements for new natural gas-fired CHP plant.

Monitoring

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. The following substances will be monitored:

- Oxides of nitrogen (NO_x)
- Carbon monoxide (CO)

These monitoring requirements have been included in line with Schedule 25A (Medium Combustion Plant) of the Environmental Permitting (England and Wales) (Amendment) Regulations 2018.

We made these decisions in accordance with MCP technical guidance which provides a minimum standard for monitoring under MCPD.

Reporting

We have specified reporting in the permit for the following parameters:

- Oxides of nitrogen (NO_x)
- Carbon monoxide (CO)

These reporting requirements have been included in order for the Operator to demonstrate compliance with the emission limits specified in the permit for both CHPs.

We have also specified reporting in the permit of annual water use in m³ and energy usage in KWh.

Water is required by the CHP and as the site will be providing energy and heat to the main Knauf installation, it will help both sites to comply with their obligations to regularly review water and energy consumption in accordance with the Reference Document on Best Available Techniques for Large Combustion Plans (BREF) 2017.

Management System

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.