

4f. Assessment of whether you meet the quantitative and qualitative Energy efficiency requirements to demonstrate BAT. To ensure comprehensive response, however, ensure that the requirements of the following are addressed/considered:

i. Energy efficiency requirements (inc AEEL) in LCP and other sector-specific BATc (largely addressed by information already provided and additional requests already laid out above)

Further details on LCP BAT AEEL can be found in the response to Action 4c of not duly made letter.

ii. Energy efficiency for combustion and energy from waste power plants - GOV.UK (www.gov.uk)
“Good quality CHP guidance”

CHP-R Assessment:

The CHP-R guidance is not easily applicable to the Padeswood project.

Requirement 1: Plant, Plant Location and Potential Heat Loads

Natural gas powered plant designed to provide the heat and most of the electrical load of the carbon capture plant (CCP). The CHP is integrated into the design and is solely for consumption within the premises. CHP is required due to insufficient waste heat required to run the CCP and the grid connection is insufficient to provide the power required.

Requirement 2: Identification of ‘CHP Envelope’

The CHP has been sized to meet the demand of the CCP and sufficient electricity to minimise grid power requirements.

Requirement 3: Operation of Plant with the Identified Heat Load

The CHP has been sized so there is sufficient heat is available for each of the four operating mode of the kiln which have different gas volumes and waste heat availability.

Requirement 4: Technical Provisions and Space Requirements

Steam produced in the CHP will be used in the amine regenerator and reclaimers.

A connection point has been provided for potential future district heating for low grade (warm water) heat.

Requirement 5: Integration of CHP and Carbon Capture

The output of CHP is far below the 300MW power output requirement to install carbon capture; however, the purpose of the CHP is to power the carbon capture plant.

Requirement 6: Economics of CHP-R

The guidance is aimed at producing energy for the grid. This section is not applicable for the Padeswood project.

iii. Energy efficiency directive (Article 14:5) Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC with EEA relevance (europa.eu)

Heidelberg Materials operates under ISO 50001 certification. This energy management system is a globally accepted framework to increase energy efficiency, reduce costs and improve environmental performance.

iv. Energy efficiency standards for industrial plants to get environmental permits - GOV.UK (www.gov.uk)

To maximise energy efficiency, the plant has been designed with the following key energy topics in mind:

Energy-Efficient Equipment:

Modern, energy-efficient machinery and equipment that require less energy to perform the same tasks will be sourced. For example, using high-efficiency motors and variable speed drives where possible to reduce energy use.

Waste Heat Recovery:

A Waste Heat Recovery Unit (WHRU) will be installed to capture the heat from the kiln. The heat will be used in the Combined Heat and Power (CHP) plant to produce steam, thus reducing the volume of natural gas required.

Energy Management Practices:

Energy management systems that monitor energy use across the operation will be installed. Energy audits, such as those for ISO 50001, will be conducted and best practices for energy use is already embedded within Heidelberg Materials.

Process Optimisation:

Streamlining operations to minimise energy consumption while maintaining output quality to ensure that energy is used only when necessary. An example of such control is the startup / shutdown / standby procedure which will be developed as the project matures.