4. c. Assessment of whether you will meet the relevant quantitative, as well as narrative BAT requirements – notably for the LCP component of the proposal against BATc BAT-AEL and AEEL, or justification that these are not relevant. If you intend to meet them, briefly explain how you will demonstrate achievement of the standard, if integration of the LCP into the cement process complicates this (e.g. BAT-AEL).

The LCP BAT AELS have been reviewed and are either not relevant (eg apply to coal fired LCP) or are covered in the CCS-C3-3a-01 BAT assessment further information on BAT 40, 41 and 44 is given below.

Conclusions on BAT	Applicability Assessment	In place or to be implemented
BAT-AEELs		
BAT 40. In order to increase the energy efficiency of natural gas combustion, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.		
a. Combined cycle	n/a to boilers	n/a to boilers
BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas (Table 23)		
BAT-AEELs	n/a Net electrical efficiency (%) - 39–42,5	The purpose of the CHP is for both heat and electricity. Electrical efficiency alone cannot be measured. The estimated electrical output from the steam turbine generator is 22.4 MWe.
	Net total fuel utilisation (%) - 78–95	The CHP has been designed with a turndown of 35% of full load and a maximum continuous rating of 132 MWth input and is estimated to be between 80 to 85% efficient. At 80% efficiency the thermal output is 106 MWth. Slight variation in efficiency will be observed due to the different modes of operation of the cement kiln delivering marginally different flue gas parameters e.g. temperature.
	n/a Net mechanical energy efficiency (%) - No BAT-AEEL.	n/a
BAT-AEL		
BAT 41. In order to prevent or reduce NOX emissions to air from the combustion of natural gas in boilers, BAT is to use one or a combination of the techniques given below.		
Technique		
a. Air and/or fuel staging	Yes	Burner management system will be installed to control the fuel mixing.
b. Flue-gas recirculation	Yes	Not directly, however, some of the kiln flue gas will be used in the CHP creating the same effect as flue gas recirculation.
c. Low-NOX burners (LNB)	n/a gas turbines only, although a low NOx burner will be installed	Low NOx burner to be installed

d. Advanced control system	Yes	Burner management system will be installed.
e. Reduction of the combustion air temperature	n/a Combustion air will be preheated prior to entry into CHP.	n/a
f. Selective non–catalytic reduction (SNCR)	n/a as SCR installed	n/a
g. Selective catalytic reduction (SCR)	Yes	SCR will be installed.
BAT-associated emission levels (BAT-AELs) for NOX emissions to air from the combustion of natural gas in boilers and engines (Table 25)		
NOx emissions	n/a as CHP is using the cement kiln flue gases and is integrated with the Carbon Capture plant Daily average: 30 –85 mg/Nm3 n/a as CHP is using the cement kiln flue gases and is integrated with the Carbon Capture plant Yearly average: 10 –60 mg/Nm3	Adding a CHP/LCP to the process will not increase NOx emissions at the stack. NOx emissions of the combined (kiln & CHP) flue gas will be lower than kiln only operation. As all the flue gases from the kiln system and CHP are combined it is not possible to monitor NOx emissions from the CHP alone
BAT 44. In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT is to ensure optimised combustion and/or to use oxidation catalysts.		
CO emissions	n/a as CHP using the cement kiln flue gases and is integrated with the Carbon Capture plant Yearly average: < 5 –15 mg/Nm3	Adding a CHP/LCP to the process will not increase CO emissions at the stack. NOx emissions of the combined (kiln & CHP) flue gas will be lower than kiln only operation. As all the flue gases from the kiln system and CHP are combined it is not possible to monitor NOx emissions from the CHP alone