



Document Ref: 6.3.9
PINS Ref: EN010082

Tees CCPP Project

The Tees Combined Cycle Power Plant Project
Land at the Wilton International Site, Teesside

Volume 2 - Annex E2

Regulations – 6(1)(b) and 8(1)

Applicant: Sembcorp Utilities UK
Date: November 2017

Annex E2

Greenhouse Gas Statement

E.1 GREENHOUSE GAS EMISSION AND CLIMATE CHANGE

- E1.1 Greenhouse gas emissions for the Project Site were calculated on the basis of the expected electrical output, 1700 MWe and the cited efficiency of 63.7%, based on the lower heating value (net calorific value) of natural gas. Continuous operation was assumed.
- E1.2 Calculations were performed using the GHG Protocol Tool for Stationary Combustion (World Resource Institute, 2015) in the interests of using a well-established methodology. The Tool calculates total greenhouse gas emissions based on the total quantities of carbon dioxide, methane and nitrous oxide produced as a result of combustion and global warming potential factors from the 2014 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. Methane and nitrous oxide have relatively high global warming potentials (GWPs) compared to carbon dioxide but the latter gas hugely predominates in natural gas combustion emissions, and over 99.9% of the overall GWP of the emitted gases is attributable to carbon dioxide.
- E1.3 The plant thermal rating was calculated from the electrical output and efficiency and was taken to represent the highest likely energy input, which was then converted to gigajoules per year to be compatible with the Tool.
- E1.4 The Project Site is unlikely to operate continuously at the maximum installed capacity; hence the greenhouse gas emissions, seen in *Table E3.1* calculated represent a highly robust case.

Table E3.1 Greenhouse Gas Emissions Calculation, Project Site

Factor	
Plant electrical rating, megawatts (MW electrical)	1700
Plant thermal rating, megawatts (MW thermal)	2949
Energy input, gigajoules (GJ) to the nearest thousand	93,007,000
GHG Emissions, million tonnes of carbon dioxide equivalent (MtCO ₂ e)	4.70
Approximate kg CO ₂ e / kWh	0.316

- E1.5 For context, the most recent Department for Business, Energy and Industrial Strategy (BEIS) data, for 2015, show the overall UK greenhouse gas emissions as 496 million tonnes of carbon dioxide equivalent (MtCO₂e), of which 29% or 144 (MtCO₂e) is attributable to the energy industry. The calculated contributions from the Project Site appear proportionate to this sector total given the size of the plant.
- E1.6 The very high (63.7%) efficiency of the Project illustrates that mitigation of greenhouse gases has been at least in part achieved by design, and the factor for greenhouse gas emissions per unit of electrical energy exported is correspondingly low for UK thermal plant. It is also worth noting that the

Project Site will include provisions for Carbon Capture Readiness and Combined Heat and Power.