

APPENDIX 14: TEESSIDE NET ZERO - DCO - BRIEFING NOTE

TEESSIDE NET ZERO
Briefing Note
30 January 2020

Introduction

This note has been prepared by Rapleys LLP for Peter Roberts of DWD to provide a summary brief of the Teesside Net Zero Project at Teesside.

The project has been known by a variety of names, though these all refer to the same initiative. Names include:

- OGCI;
- Teesside Cluster;
- Teesside Collective;
- Teesside Carbon Capture;
- Clean Gas Project; and
- Teesside Net Zero.

Developer

Oil and Gas Climate Initiative (OGCI) seeks to drive the industry response to climate change, and supports the OGCI Investment Holdings LLP - an investment fund worth in excess of \$1bn. The Initiative is led by the CEOs of the member companies, which number thirteen and include BP, ExxonMobil, Total, Shell, Saudi Aramco and CNPC. Collectively, members account for 30% of world's oil and gas production. The principal objectives of OGCI are reducing methane leakage, and reducing/recycling CO₂. OGCI was announced in September 2014, and in November 2016 1\$bn was committed to the investment fund. It became operational in June 2017, and their support for the Net Zero Teesside project was announced in November 2018. They have 14 other investments in their portfolio.

OGCI state a clear commitment to Carbon Capture Usage and Storage (CCUS) systems. They are seeking to kickstart 5 emerging CCUS hubs around the world, one of which is Teesside.

Project

OGCI Climate Investment Holdings LLP submitted, in February 2019, an application for a Scoping Opinion for what was then known as the *Teesside Cluster Carbon & Usage Project*. It is now known as *The Net Zero Teesside Project*.

The scheme is a full chain Carbon Capture Usage and Storage (CCUS). This, in effect, is a gas-fired power station attached to which is a system that allows the CO₂ produced as a by-product to be captured, compressed and stored off-site (in this case somewhere under the North Sea). The proposal also allows for the additional capacity of c.4m tonnes per annum of CO₂ to be gathered from third party operators elsewhere. For comparative purposes, the proposed power station (comprised of 3 turbines) is expected to produce 6m tonnes per annum.

It is the potential for other carbon capture systems to be connected to the system that allows it to be called the Teesside Cluster. It is hoped that the Project will lead to the development of other CCUS schemes in Teesside.

The description of development, as set out on the National Infrastructure Planning webpage is:

A full chain carbon capture, utilisation and storage ('CCUS') project, comprising a CO₂ gathering network, including CO₂ pipeline connections from industrial facilities on Teesside to transport the captured CO₂ (including the connections under the tidal River Tees); a combined cycle gas turbine ('CCGT') electricity generating station with an abated capacity of up to 2.1 gigawatts output (gross), cooling water, gas and electricity grid connections and CO₂ capture; a CO₂ gathering/booster station to receive the captured CO₂ from the gathering network and CCGT generating station; and the onshore section of a CO₂ transport pipeline for the onward transport of the captured CO₂ to a suitable offshore geological storage site in the North Sea

It will be the UK's first commercial scale, full chain CCUS project.

Site

The site is comprised of two components, the red line within which the power station will be constructed, and the significantly large tracts of land required for water, electric and CO₂ connection.

The proposed power station is located in Site 1 of the Order Land.

Status of Scheme as DCO

The status of the project as requiring a Development Consent Order (DCO) was confirmed by a letter sent by the Department for Business, Energy & Industrial Strategy (BEIS) to Geoff Bullock at DWD on 17 January 2020.

The letter states that there are Specified Elements of the project that should be treated as development for which development consent is required. The Specified Elements are:

- A CO₂ gathering network, including the CO₂ pipeline connections from the proposed Combined Cycle Gas Turbine electricity generating station and industrial facilities on Teesside to transport the captured CO₂ (including the connections in the tidal River Tees);
- A CO₂ gathering/booster station to receive captured CO₂ from the gathering network; and
- A CO₂ transport pipeline for the onward transport of the capture CO₂ to a suitable offshore geological storage site [This does not include the complete connection to the offshore storage site itself].

Timeline

The latest update on the DCO website states that an application is expected 'Q4 2020.' After receipt of an application, the Planning Inspectorate will have 28 days to review the submission and decide whether to accept it. If the application is accepted, timescales within which people can register to become an Interested Party will be confirmed by the Inspectorate.

Previous Events

- Submission of Scoping Opinion application - February 2018;
- Stage 1 consultation - 07 October to 12 November 2019;
- Stage 2 consultation - late Spring 2020;

The Stage 1 consultation document includes a timeline for future action:

- Submission/Acceptance - Q3 2020;
- Pre-examination - Q3 2020;
- Examination - Q4 2020;
- PINS Recommendation - Q2 2021;
- Decision - Q4 2021.

The move of a submission date from Q3 2020 to Q4 2020 shows there has already been some slippage. At the date of the Scoping Opinion application being made, submission was targeted for Q2 2020.

Details of Scheme

Generating Station

Three Combined Cycle Gas Turbine (CCGT) units 'power islands', each containing:

- One gas turbine;
- One steam turbine;
- One heat recovery steam generator (HRSG);
- Selective catalytic reduction (SCR) equipment for the removal of nitrogen oxides from the flue gas;
- One or two stacks for the discharge of emissions to air;
- Natural gas conditioning equipment;
- One or more auxiliary boilers and/ or diesel generators;
- Transformers (for the import and export of electricity); and
- Ancillary equipment (e.g. air compressors, pumps, chemical storage, fan coolers)

Natural gas is burned in the turbine, the resultant energy being captured by the turbine. Additional heat energy from the process is used to power the steam turbine, thereby ensuring that as much energy is captured as possible. The energy generated should be sufficient for the plant to power itself, but boilers/generators may be needed for start-up and shutdown.

Selective Catalytic Reduction (SCR)

This is a secondary control measure for reducing the amount of NO_x released into the atmosphere as a result of burning natural gas. Whilst primary measures have been thought suitable on their own, revised guidance in July 2017 set new Achievable Emission Levels, and it may not be possible for the CCGT to meet these standards with primary measures alone.

The SCR works by injecting ammonia into the flue gas, causing the NO_x to react in the presence in a catalyst. It can be accommodated within the HRSG and therefore within the building footprint.

Capture Plant

One per CCGT, capable of capturing 90% of CO₂ emitted by the generating station (1.7m to 2m tonnes per power island per year, 5.1m to 6m tonnes per annum in total).

Each facility includes:

- flue gas pre-treatment, including cooling/ scrubbing;
- CO₂ absorption column (absorber);
- CO₂ removal column (stripper);
- one or more auxiliary boilers and/ or diesel generators; and
- ancillary equipment (e.g. air compressors, pumps, chemical storage, external pipework).

The system works by cooling the flue gas and introducing an absorption solvent to it. The make-up of this solvent is to be determined, but it will be alkaline in order to selectively absorb acidic gasses (such as CO₂). The solvent is then heated to strip the CO₂ gas from it.

Conditioning/Compressor Station

The CO₂ is conditioned in order to maximise its purity. The equipment required was subject to ongoing study as of February 2019. It is then compressed and cooled to a liquid 'dense' phase.

CO₂ Transport

The liquid 'dense' phase CO₂ will be transported via an onshore pipeline (installed below ground) offshore for onwards transmission to the storage site. This was yet to be identified as of February 2019, but will be somewhere under the North Sea.

Industrial CO₂ Connectivity

The proposal will also include the capacity for third party industrial carbon capture operations to connect to the CO₂ transport pipeline. This may require a compression booster station to be installed on the DCO site. In addition to the CO₂ capture from the three on-site CCGT, the gather network will have capacity for 4m tonnes per annum.

Connections

Significantly large tracts of land are required to provide connection corridors for electricity, water, and CO₂. Potential route corridors were included in the Scoping Opinion Application.

Sources

- DCO application webpage - <https://infrastructure.planninginspectorate.gov.uk/projects/north-east/the-net-zero-teesside-project/>
 - Scoping Opinion Application - https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-000005-EN010103_Scoping%20Report.pdf
 - Direction Decision Letter, 17 January 2019 - <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-000057-Letter%20and%20S35.pdf>
- OGCI website - <https://oilandgasclimateinitiative.com/>
 - 2019 Annual Report - <https://oilandgasclimateinitiative.com/annual-report/>
 - Clean Gas Project - <https://oilandgasclimateinitiative.com/clean-gas-project/>
- Net Zero Teesside website - <https://www.netzeroteesside.co.uk/>
 - Stage 1 Consultation document - <https://www.netzeroteesside.co.uk/wp-content/uploads/2019/10/Stage-1-Consultation-Display-Boards.pdf>
- Teesside Collective - <http://www.teessidecollective.co.uk/>