GHG Emissions Reduction Programme

Supply Chain Opportunity 2

Rotating Equipment Efficiency and Fuel Consumption Improvements

Introduction

North East Scotland has a clear ambition to transform into a globally recognised integrated energy cluster, focussed on accelerating net-zero emissions through energy transition activities.

Energy Transition Zone (ETZ) Limited is a private sector led, not for profit company, which was incorporated in April 2021 to drive forward the vision of transforming North East Scotland to become a global leader in energy transition activities and a net exporter of energy transition technologies and skills.

ETZ Limited has engaged with nineteen United Kingdom Continental Shelf (UKCS) oil and gas operators and identified key greenhouse gas (GHG) emission challenge areas that are being presented through this programme to the supply chain as opportunities on a quarterly basis. In response to the published opportunities, supply chain companies are invited to propose existing products and services that can materially contribute to reducing operators' GHG emissions and help meet UK net zero targets. Prioritisation will be given to companies with an operational presence in the North East of Scotland.

The first opportunity launched was around reducing flaring and venting and a successful pitching session was held in January 2022. This, the second opportunity will be focussed on reducing GHG emissions through rotating equipment efficiency and fuel consumption improvements

Context

The North Sea Transition Deal [1](NSTD), agreed between government and the oil and gas industry in March 2021, sets out an ambitious plan to transform the sector in preparation for a net zero future and catalyse growth throughout the UK economy. Specifically, the NSTD includes targets for early reductions in GHG emissions from offshore production, of 10% by 2025, 25% by 2027, and 50% by 2030, against a 2018 baseline, to meet the aim of creating a net zero basin by 2050.

Combustion related emissions result from the use of petroleum-derived fuels and natural gas as fuel in equipment. Carbon Dioxide ($C0_2$) is the predominant combustion-related emission. Methane (CH_4) and other unburned hydrocarbons are emitted too, because combustion equipment is less than 100% efficient, Nitrogen Oxide (NO_x) emissions also result from combustion of hydrocarbon-based fluids.

The Oil and Gas Authority (OGA) Emissions Monitoring Report: October 2021 cites the following statistics:

- CO_2 emissions comprised 88% of industry GHG emissions in 2018, with three quarters of these originating from fuel combustion, mostly from offshore facilities.

[1] https://www.gov.uk/government/publications/north-sea-transition-deal

- Nitrous Oxide (N_2O) emissions make up 2% of UK upstream oil and gas industry emissions. 90% of N_2O emissions are from fuel combustion with the remainder due to gas flaring.

The most recent data (2020) from the UK Department for Business, Energy and Industrial Strategy's (BEIS) Environmental Emissions and Monitoring System (EEMS) show that out of 125 facilities on the UKCS, the majority were powered by gas supplemented with some diesel. Thirty-four facilities were powered fully by diesel fuel.

ETZ Limited's strategic drivers include stimulating and creating new jobs through investment, and accelerating, growing, and transforming the region's energy supply chain. The GHG Emissions Reduction Programme provides a major opportunity for supply chain companies to position themselves to bid for and secure contracts relating to rotating equipment efficiency and fuel consumption improvements in the UK and, by extension, internationally.

Opportunity and Scope

Championed by operators including Serica Energy and Neptune Energy, on behalf of the operator cohort, the second opportunity presented to the supply chain is to identify **existing products and services** that can materially contribute to reducing GHG emissions through rotating equipment efficiency and fuel consumption improvements. The scope relates to UKCS production facilities and associated infrastructure.

Note - prioritisation will be given to companies with an operational presence in the North East of Scotland and solutions that offer quick wins.

<u>Rotating Equipment and Ancillary Equipment Solutions</u>
Examples may include:

- Innovative solutions to retrofit ageing assets with more energy efficient equipment, which potentially have a short time to recoup investments, for example:
- Methods to monitor and manage fuel consumption
- Low CH_4 emission dry gas seals
- Innovative solutions to turn down oversized equipment
- Reduce the energy/ electrical load of artificial lift systems
- Use of battery storage and possibly super capacitors to even out/ reduce turbine load
- Heat to power/ waste heat recovery using organic Rankine cycle (or other) technology to harness power from hot exhaust gases
- Solutions to improve gas turbine efficiency, including High Efficiency Particulate Air (HEPA) Filter upgrades and lubrication oil choice optimisation.

<u>Reducing, measuring and controlling NO_x</u>
Examples may include:

- Innovative solutions to reduce NO_x emissions
- Use of catalysts to clean exhaust gas emissions
- Innovative monitoring systems for CO_2 and NO_x, including Predictive Emissions Monitoring Systems (PEMS)
- Solutions to help operators model NO_x emissions and better understand them.

Fuel consumption improvements

Examples may include:

- Input sought from Original Equipment Manufacturers (OEMs) on innovative solutions for switching fuel from diesel to 'greener' fuels, including methanol and biofuels. Note that operators cannot accept a fuel for fire pumps and emergency generators that presents a loss in power. Products also need to be capable of being shipped offshore.
- Solutions to gather/ analyse data to give an understanding of how power is used and allow optimisation.

Digitalisation

Digital solutions that enable GHG emission reductions in the areas of rotating equipment and fuel consumption, such as:

- Novel uses of edge devices and (small scale) cloud-based analytics
- Hybrid modelling (mix of physical models and Machine Learning)
- Innovative solutions that lead to both environmental and reliability performance.

This is a non-exhaustive listing and propositions are encouraged for other solutions that will materially contribute to solving the challenge to reduce emissions from rotating equipment in line with UK net zero targets.

Proposition review and benefit to successful applicants

Propositions will be received and reviewed in confidence against key criteria by an industry panel, with successful applicants being selected to pitch directly to a cohort of operators and potentially industry bodies, Government Agencies and Government Companies. If a proposition highlights a requirement for a partner(s) to provide a comprehensive solution, this dialogue will be encouraged and, if required, can be facilitated by ETZ Limited.

Please note that this is not an invitation to tender for a specific piece of work, but instead is to bring operators and the supply chain together in the form of a pitching process to raise awareness of existing products and solutions, provide feedback and support, and to encourage operators to engage further with the supply chain.

Support will be provided to successful applicants, including one-to-one support, to build the business case and to develop the pitch. In addition, successful applicants will benefit by getting:

- access to, and feedback from, operators
- improved understanding of operator needs
- improved business cases and business development support
- targeted business support

Operators will gain access to targeted solutions focused on their operational challenges and may potentially pursue further dialogue with successful applicants.

Who can apply?

Applicants from all industries are welcome. Entrants do not require to be currently engaged in the oil and gas industry.

How to apply

Please email ghg@etzltd.com to register your interest and request an application pack. The pack contains a proposition submissions form and Non-Disclosure Agreement.

The deadline for applications is **17:00 on 11 April 2022.**

Send any questions or requests for clarification to ghg@etzltd.com by **17:00 on 4 April 2022,** and a response will be emailed back to the sender within three working days.

ETZ Limited takes appropriate measures to ensure that the personal information disclosed to us is kept secure, accurate and up to date and kept for only as long as necessary for the purpose which it is used. Information received will be treated in confidence and used exclusively for the purpose of assessing the submitted proposition.

Please read the Non-Disclosure Agreement carefully before returning a signed copy alongside your submission.

Process Timeline

Depending on changing circumstances, this process may either be run on an entirely remote basis, or may be run on a partial remote/partial face to face basis.

- 14 March 2022 - Application opens for Opportunity 2
- 4 April 2022 - Deadline for any clarifications required
- 7 April 2022 - Answers to clarifications issued by ETZ Limited
- 11 April 2022 - Deadline for submission of proposition
- w/c 9 May 2022 - Propositions review. Companies informed of outcome
- w/c 16 & 30 May 2022 - Pre-pitch support for successful companies
- 9 June 2022 - Pitch session meeting
- From 27 June 2022 - Feedback to companies, including any next steps

The 6 key steps of the process: