

Net Zero Teesside

Designing and delivering the world's first commercial scale gas-fired power station with carbon capture and storage in UK.





Overview



The Carbon Capture Alliance is supporting BP in the design and development of Net Zero Teesside Power for a cleaner, lower carbon energy future.

Net Zero Teesside Power's (NZN Power) electricity generating station with carbon capture and storage (CCS) will power up to 1.3 million homes and capture up to two million tonnes of CO₂ a year. This CO₂ is to be exported and stored via the Northern Endurance Partnership carbon transportation and storage infrastructure. Technip Energies is a leading member of the Carbon Capture Alliance (CCA), which includes GE Vernova and Balfour Beatty and is supported by Shell in the UK.

Throughout the process of FEED and EPC tendering, the Carbon Capture Alliance has been working to make NZN Power a commercial reality with the Final Investment Decision targeted for Q1 2024. NZN Power will enable greater deployment of renewable energy such as wind and solar by providing flexible, dispatchable low-carbon electricity generation that secures reliable power to the grid in conjunction with intermittent renewables. The project leads the way in supporting the UK government's commitment to fully decarbonize the power system by 2035.



£3.5BN TO UK ECONOMY
TO 2050



POWER TO
1.3 MILLION HOMES



UP TO 2 MTPA CO₂
TO BE CAPTURED



3,000 – 4,000 JOBS
DURING CONSTRUCTION

Challenge

Capturing opportunity with a first-of-its-kind power station

Gas-fired power at commercial scale is a new area for carbon capture with Net Zero Teesside Power set to be a world class example. NZT Power is a new-build facility, which must successfully integrate the combined cycle gas turbine generating electricity in dispatchable operation with a highly efficient carbon capture plant. This world-first application at scale leverages the best of global technology and expertise while meeting expectations on UK content and social values.

Additional challenges of this project involve the requirement for a synergistic solution with the wider Northern Endurance Partnership network and site integration within the Teesside industrial area and surrounding communities.



Technologies

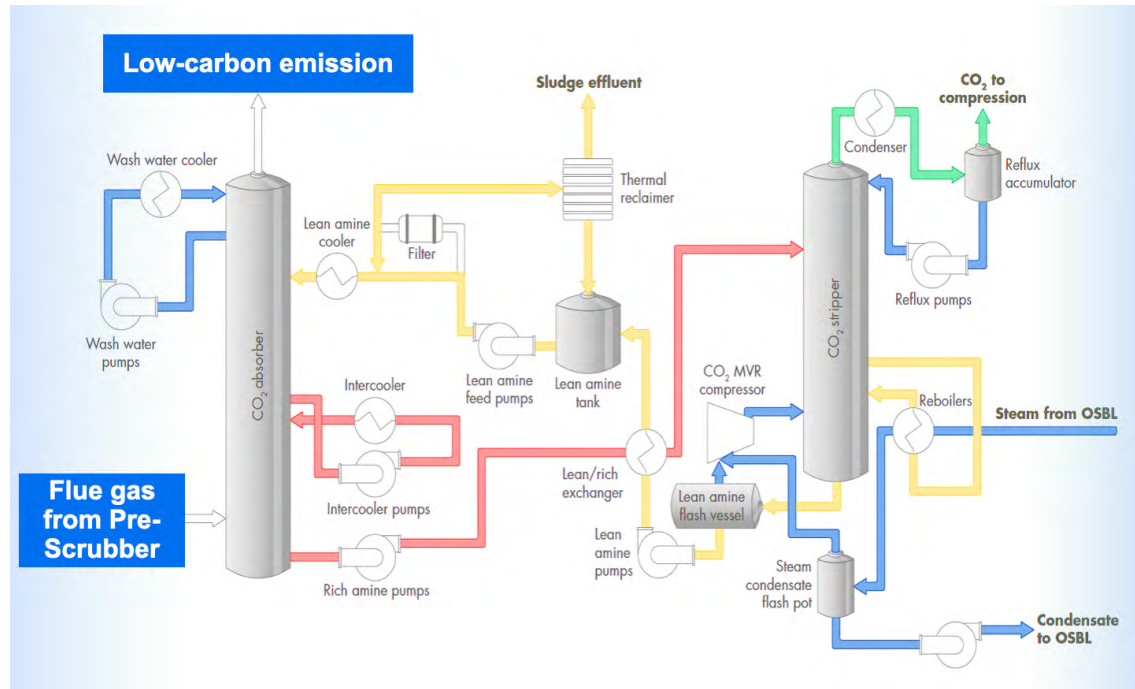
Tackling low CO₂ concentrations with Shell CANSOLV® CO₂ Capture Technology

Gas-fired power stations typically produce flue gas with very dilute concentrations of CO₂, which many carbon capture technologies are unable to accommodate. Technip Energies

worked with our long-term alliance partner Shell to apply their CANSOLV® CO₂ Capture Technology to the NZT Power development. Shell CANSOLV® is an amine-based capture technology well-proven to manage the challenges presented by low CO₂ concentration

flue gases with successful technology performance demonstrated in the design process. As amine-based capture technologies utilize heat to regenerate the solvent, optimum energy integration with the new power plant design has been critical to successful technology deployment.

SHELL CANSOLV® CO₂ CAPTURE SYSTEM, A LEADING AMINE-BASED TECHNOLOGY



Solution



Working as a team for smart solutions

In partnership with Shell CANSOLV®, the CCA has developed an advanced integrated solution that provides a facility that is easy to operate while optimizing the balance between capital and operating expenditures. The CCA has used innovative approaches to maintain a low-carbon project with

the successful integration of commercial-scale CCS technology with gas-fired power.

The project team has closely managed the requirements of the wider Northern Endurance Partnership transportation and storage project, to enable the CO₂ to be successfully sequestered. Captured CO₂ from the power station is first conditioned

and compressed before entering the pipeline system. The NZT Power project then feeds into the wider Northern Endurance Partnership gathering network, which connects to CO₂ injection wells located at the offshore Endurance reservoir at a 100m water depth in the UK Central North Sea.



Results

Boosting UK's economy and low-carbon energy future

The NZT Power project will generate 3,000 to 4,000 UK jobs during construction, power about 1.3 million homes and contribute £3.5 billion to the economy by 2050. The project is expected to capture up to 2 mtpa CO₂, bringing the UK closer to using CCS as a successful tool against climate change and demonstrating that carbon capture can become a practical solution for large-scale power generation.