



Making a Lower Carbon World a Reality

Xodus Group is actively applying its capability and expertise gained in the energy industries to carbon capture, transportation and storage.

The company's talent and experience encompass the range of disciplines and skill sets required to successfully evaluate, select and plan the optimum Carbon Capture & Storage (CCS) technique, site or facility.

Broad skills for the CCS challenge

- › Process and facilities engineering expertise and experience provides high quality, multidiscipline consultancy advice.
- › World-class subsea and pipeline engineers with well proven capabilities in materials and corrosion protection, hardware and control systems, rigid and flexible pipeline systems and project delivery.
- › Leading-edge analysis for dynamic pipeline and plant modelling, enabling fast, informed decision-making for engineering and operations.
- › Environmental services provide comprehensive support for compliance with environmental legislation and managing environmental impacts.
- › Risk management expertise provides an unbiased and independent approach to technical safety, risk and reliability.

Xodus Group services assist clients across the CCS project lifecycle:

Capture

Pre-combustion fuel or post combustion flue gas from power stations can be processed to remove the CO₂. The gas is then dried and compressed ready for transport. Several technologies are available or in the process of being developed to improve efficiency and reduce energy consumption.

Recent project experience: Xodus has assisted the design and operation of several of these systems including large scale amine plants. The company has successfully applied its oil and gas industry knowledge to these low pressure, low temperature gas sweetening systems to minimise energy consumption, select suitable solvent(s) and avoid common design and operational pitfalls.

Transportation

Managing and optimising the CO₂ phase change to/from liquid and gas is key to developing an energy efficient transportation system particularly for low pressure storage systems such as depleted Southern North Sea gas basins. Xodus personnel have successfully applied their thermodynamic expertise in modelling this transition to provide practical solutions.

Relevant experience: Xodus Subsea consultants have a reputation for providing high value solutions for every phase of the oil and gas development cycle. Coupled with expertise and experience from the Xodus Integrated Technology Division (e.g. flow assurance) and other disciplines, Xodus has provided optimised, technical solutions to both conventional and renewable energy industries.

Storage

Xodus Group works independently and with its subsurface partners to identify, select and define optimum, robust development

schemes for oil and gas opportunities. Xodus personnel fully understand the interfaces and dependencies between surface facilities and subsurface resources. The company has adapted its integrated approach to the storage of CO₂ and has successfully tailored it to suit the scale, maturity, region and specifics of the required storage facilities.

Recent project experience: Evaluation of potential carbon storage sites in the Southern North Sea in conjunction with the UK Government's CCS competition for a major power company. Xodus added significant value by providing important insight and understanding of the cultural interfaces between power and conventional oil and gas industries.

Monitoring

Avoiding carbon leakage during and long after the CCS project is paramount. Xodus solutions are geared to providing clients with facilities that satisfy integrity requirements as well as providing cost effective long term monitoring.

Enhanced Oil Recovery (EOR)

The market price of carbon in the Emissions Trading Scheme currently offers limited incentive for power companies. The injection of CO₂ into mature oil fields for EOR has the potential to improve the field's overall recovery factor by 3% to 15%[†]. Xodus process and facilities engineers offer clients transferable experience and expertise in the design and operation of sour gas systems.

EOR also poses some unique HSE hazards, which need a novel approach to long established methods, for example dispersion modelling and relief systems. Xodus consultants offer clients the ingenuity to challenge conventional thinking and to develop new bespoke solutions.

Climate Change

Carbon dioxide (CO₂) emissions are widely accepted as being a key contributor to the threat of climate change—one of the key environmental concerns facing modern society.

International agreements, in particular the UN Framework Convention on Climate Change 1992 and the Kyoto Protocol 1997, commit industrialised countries to reducing emissions of greenhouse gases. The UK Government has set itself tougher national targets of 34% reduction by 2020 against 1990 levels with a longer term target of 80% reduction in UK emissions of CO₂ by 2050*.

Geological storage of CO₂ is of immediate relevance to achieving these targets. Depleted oil and gas fields are an obvious and leading option as they have already retained hydrocarbons deep underground over geological timescales (5-15 million years).

Capturing and storing CO₂ efficiently will require us to apply existing technologies and develop new methods.



For more information on Carbon Capture & Storage services contact:

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