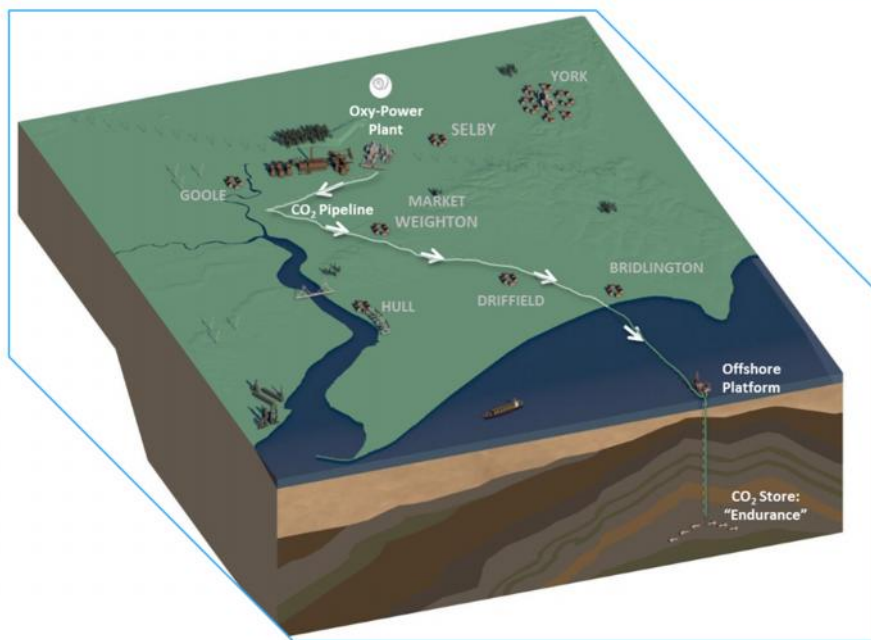




## K.15 Full chain FEED cost breakdown

*Project Management: Full Chain*



### IMPORTANT NOTICE

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# Key Words

Key Word	Description
Cost	Monetary value of items, or estimates of such
Key Knowledge	Information that may be useful if not vital in understanding how some enterprise may be successfully undertaken
White Rose	The White Rose Carbon Capture and Storage project

# Executive Summary

The Full Chain FEED cost breakdown was generated as part of the Front End Engineering Design (FEED) contract with the Department of Energy and Climate Change (DECC) for White Rose, an integrated full chain Carbon Capture and Storage (CCS) Project. This document is one of a series of Key Knowledge Deliverables (KKDs) from White Rose to be issued by DECC for public information.

White Rose comprises a new coal-fired ultra-supercritical Oxy Power Plant (OPP) of up to 448 MWe (gross) and a Transport and Storage (T&S) network that will transfer the carbon dioxide from the OPP by pipeline for permanent storage under the southern North Sea. The OPP captures around 90% of the carbon dioxide emissions and has the option to co-fire biomass.

Delivery of the project is through Capture Power Limited (CPL), an industrial consortium formed by General Electric (GE), BOC and Drax, and National Grid Carbon Limited (NGC), a wholly owned subsidiary of National Grid.

Her Majesty's Government (HMG) Autumn Statement and Statement to Markets on 25 November 2015 regarding the Carbon Capture and Storage Competition confirmed that the £1 billion ring-fenced capital budget for the Carbon Capture and Storage Competition was no longer available. This meant that the Competition could not proceed on the basis previously set out. A notice of termination of the White Rose FEED Contract was issued to CPL on 23 December 2015 and the FEED Contract was terminated on 25 January 2016; a date which was earlier than the expected completion date. The Government, CPL and National Grid are committed to sharing the knowledge from UK CCS projects, and this Key Knowledge Deliverable represents the learning achieved up to the cancellation of the CCS Competition and termination of the FEED Contract and therefore does not necessarily represent the final and completed constructible project.

This full chain FEED cost breakdown summarises the costs incurred by CPL and its Key Sub-Contractors (KSC) GE, BOC, Drax and NGC in executing the FEED contract.

This document should be read in conjunction with the following documents:

- K.01 Full chain FEED summary report

# 1 Introduction

## 1.1 Background

The White Rose Carbon Capture and Storage (CCS) Project (White Rose) is an integrated full chain CCS project comprising a new coal-fired Oxy Power Plant (OPP) and a Transport and Storage (T&S) network that will transfer the carbon dioxide from the OPP by pipeline for permanent storage under the southern North Sea.

The OPP is a new ultra-supercritical power plant with oxyfuel technology of up to 448 MWe gross output that will capture around 90% of carbon dioxide emissions and also have the option to co-fire biomass.

One of the first large scale demonstration plants of its type in the world, White Rose aims to prove CCS technology at commercial scale as a competitive form of low-carbon power generation and as an important technology in tackling climate change. The OPP will generate enough low carbon electricity to supply the equivalent needs of over 630,000 homes.

White Rose is being developed by Capture Power Limited, a consortium of GE, BOC and Drax. The project will also establish a CO<sub>2</sub> transportation and storage network in the region through the Yorkshire and Humber CCS pipeline being developed by National Grid Carbon Ltd (NGC).

This Full Chain FEED cost summary includes all reimbursable costs reported to DECC on a quarterly basis from December 2013 to the end of November 2015, i.e. up to the point at which competition funding was withdrawn. The costs exclude ineligible costs borne fully by the Project's sponsor organisations.

## 2 Cost Breakdown

### 2.1 Project Management

#### 2.1.1 FEED Management (Design / Technical / Support Services / Government Liaison)

This item includes the costs of CPL's team engaged in managing all aspects of FEED execution by the KSC, CPL's technical advisor and other engineering consultants, and KSC costs for managing their FEED design activities. It also includes costs incurred in developing Key Knowledge.

#### **CPL**

The CPL FEED Team comprises shareholder employed staff engaged as secondees, and consultants either directly contracted by CPL or through an agency. CPL had no directly employed resource within the FEED team.

Design and Technical management covers full chain integration and coordination, including assurance, risk management and knowledge transfer activities.

Support Services included KSC administration, project control, (cost, planning and document control), and project administration.

Government liaison covered the interface with DECC.

Any travel or miscellaneous expenses directly associated with FEED management are included in this item.

#### **KSC**

This item includes KSC costs for managing their FEED design activities. This includes the management of internal (staff and agency) and external (sub-contractor) FEED engineering, including integration and interface management where engineering is performed by an affiliate or in different locations. It also includes costs incurred in developing Key Knowledge.

Any travel or miscellaneous expenses directly associated with KSC FEED Management are included in this item.

#### 2.1.2 EPC Contract Tendering Process

This item includes the costs of NGC internal staff and agency personnel in developing tender enquiries and subsequent tender documents, (the latter including terms and conditions), for the Engineering, Procurement and Construction (EPC) Contracts anticipated for the Implementation Phase. It also includes the costs of managing the tendering process including pre-qualification, supplier events and assessment of tender submissions.

### 2.1.3 Project Development (Commercial / Legal / Financial)

This item includes CPL and NGC commercial, financial and legal costs associated with structuring the project framework, developing Heads of Terms for the supply chain contracts and other services/trading agreements, pursuing land and property agreements, engaging with CPL's lenders and advisors with regard to securing project funding, (including third party equity), engaging with external partners, development of a business financial model, and managing the external consultants engaged to support these activities, (see Section 2.3).

## 2.2 FEED Engineering

### 2.2.1 KSC FEED Engineering

This item heading includes FEED discipline engineering by the KSCs including by affiliates and sub-contractors excluding engineering management which is included in FEED Management, see Section 2.1.1).

Any travel or miscellaneous expenses directly associated with FEED engineering are included in this item.

### 2.2.2 Consultant FEED Engineering and Technical Support

This item includes the costs of CPL's technical advisor providing full chain discipline engineering and assurance, and other specialist consultant engineering. The latter includes architectural and socio-economic work for the White Rose Visitor Centre excluded from KSC scope of work.

Any travel or miscellaneous expenses directly associated with consultant FEED engineering and technical support are included in this item.

## 2.3 Project Commercial and Financial Advisors

This item includes the costs of external consultants engaged to support the work of CPL's Project Commercial and Financial team. These consultants provided legal, financial, insurance and tax structuring advice, market data to underpin CPL's financial model and audit of the financial model, specialist trading advice and due diligence.

Any travel or miscellaneous expenses directly associated with Bidder's commercial and financial advisors are included in this item.

This item also includes the costs of engagement of legal, technical and insurance advisors who performed due diligence on behalf of CPL's lending community, paid for by CPL. This also included the provision of a secure data room for the sharing and management of necessary confidential information between the parties.



### 2.4 Other Costs

#### 2.4.1 Office and Running Costs

This item includes all rental, statutory insurance and running costs for CPL's office in central London.

#### 2.4.2 Land Acquisition, Permitting and Consents

This item includes costs of legal and application fees incurred by CPL and NGC associated with obtaining those permits and consents required for the Implementation Phase of the Project, including for example the Development Consent Orders, storage permit and offshore consents, and the fees involved in securing the land necessary for the Project.

### 3 Cost Table

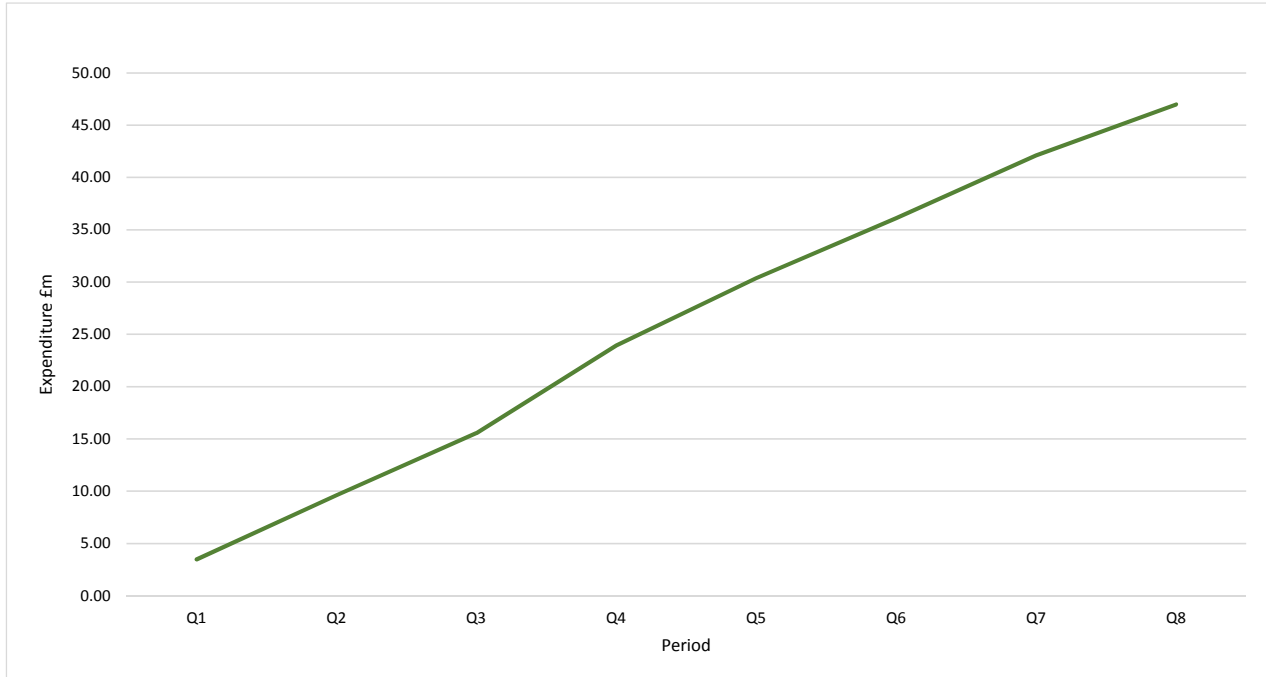
**Table 3.1: Full Chain FEED Cost Breakdown**

Section	Cost Item	Value £m
<b>2.1</b>	<b>Project Management</b>	18.90
2.1.1	• FEED Management (Design / Technical / Support Services / Government Liaison)	11.94
2.1.2	• EPC Contract Tendering Process	1.37
2.1.3	• Project Development (Commercial / Legal / Financial)	5.59
<b>2.2</b>	<b>FEED Engineering</b>	22.68
2.2.1	• KSC FEED Engineering	20.52
2.2.2	• Consultant FEED Engineering & Technical Support	2.16
<b>2.3</b>	<b>Project Commercial &amp; Financial Advisors</b>	2.15
<b>2.4</b>	<b>Other Costs</b>	3.25
2.4.1	• Office & Running Costs	0.83
2.4.2	• Land Acquisition, Permitting and Consents	2.42
	<b>Overall Total</b>	46.98

Source: Capture Power Limited

# 4 Expenditure Profile

Figure 4.1: Full Chain FEED Cost Expenditure Profile



Source: Capture Power Limited

## 5 Glossary

Abbreviation	Meaning or Explanation
CCS	Carbon Capture and Storage
CO <sub>2</sub>	Carbon Dioxide
CPL	Capture Power Limited
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
EPC	Engineering, Procurement and Construction
FEED	Front End Engineering Design
KSC	Key Sub-Contractor
OPP	Oxy Power Plant
T&S	Transport and Storage