Peterhead CCS Project

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Executive Summary

The purpose of this document is to:

- Provide key information on advance payments, reservation fees, down payments and deposits on long lead items, vessel charters and rigs, and a list of major cost components which are likely to carry cost uncertainty beyond Final Investment Decision (FID) into the Project phase; and
- Provide information necessary to understand the remaining capital cost uncertainty of the Project at FID, and the likely portion of the total investment cost which will carry some uncertainty and which shall only be known during Project Execution.

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. In accordance with the agreements with DECC, the Peterhead FEED was completed as planned in December 2015. The Government and Shell are committed to sharing the knowledge from UK CCS projects, and this Key Knowledge Deliverable represents the evolution and achievement of learning throughout the Peterhead FEED and Shell's intentions for the detailed design, construction and operating phases of the project at the time of HMG's Statement to Markets.

At the start of Q4 2015 the key information on major cost component uncertainty for each sub-contract or supply contract applicable to the Execute phase could not be confirmed, however the information which was available is provided below. At the time the Project was cancelled, there were no known advance payments, reservation fees, down payments or deposits on long lead items, vessel charters and rigs arising from the Supply Chain.

1. Introduction

1.1. Project Introduction

The Peterhead Carbon Capture and Storage (CCS) Project aims to capture around one million tonnes of CO_2 per annum, over a period of up to 15 years, from an existing combined cycle gas turbine (CCGT) located at SSE's Peterhead Power Station in Aberdeenshire, Scotland. This would be the world's first commercial-scale demonstration of post combustion CO_2 capture, transport and offshore geological storage from a gas-fired power station.

As the Goldeneye gas-condensate field has ceased production, the production facility will be modified to allow the injection of dense phase CO_2 captured from the post-combustion gases of Peterhead Power Station into the depleted Goldeneye reservoir.

The CO_2 will be captured from the flue gas produced by one of the gas turbines at Peterhead Power Station (GT13) using amine-based technology provided by Cansolv (a wholly-owned subsidiary of Shell). After capture the CO_2 will be routed to a compression facility, where it will be compressed, cooled and conditioned for water and oxygen removal to meet suitable transportation and storage specifications. The resulting dense phase CO_2 stream will be transported direct offshore to the wellhead platform via a new offshore pipeline which will tie in subsea to the existing Goldeneye pipeline.

Once at the platform the CO_2 will be injected into the Goldeneye CO_2 Store (a depleted hydrocarbon gas reservoir), more than 2 km under the seabed of the North Sea. The project layout is depicted in Figure 1-1 below:

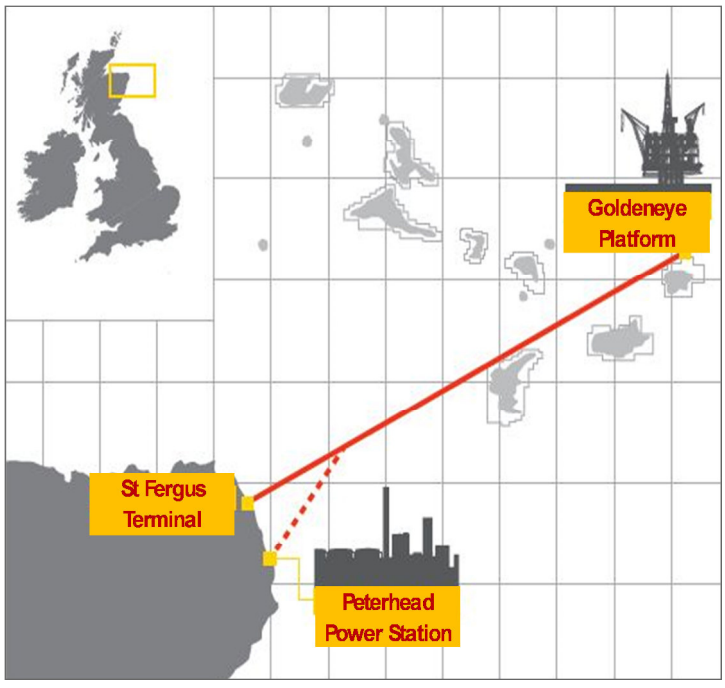

Figure 1-1: Project Location

2. Key Information on Major Costs Component Uncertainty

Table 2-1 shows major cost components identified which carry cost uncertainty beyond FID into the Execute phase (cost greater than 5% share).

Table 2-1: Major Costs Components

	Major Costs Component	% of Project Cost	Description of Uncertainty
1	Onshore CCCC Plant Engineering Procurement and Construction (EPC) Contract – Construction and Commissioning Target Cost	17%	A construction Target price Incentive mechanism for the construction & commissioning element of the EPC Contract where a pain/gain share mechanism has been agreed with the Contractor
2	Onshore Power station modifications EPC Contract	15%	A mixture of Fixed cost Lump Sum and Target price Incentive mechanism was being discussed for the PS EPC Contract at the time the project was cancelled
3	Hire of Jack-Up Rig – Costs	6%	The Jack-up rig will be tendered in 2016 – day-rate costs will be confirmed then. The industry typically tenders rig requirements no more than 2 years ahead of requirements
4	Owners Costs (including SSE costs)	13%	Owners costs are finalised and will be provided in the Bid Update, end of December 2015.

2.1. Onshore CCCC Plant EPC Contract – Construction and Commissioning Target Cost

The Target Cost Incentive mechanism for the construction (and commissioning) work was based on an established UK engineering model of a construction and commissioning target cost plus fee. The Contractor is paid the defined cost of construction (and commissioning) work which comprises:

1) Amounts due to subcontractors in accordance with subcontracts approved by Shell.
2) Cost components based on pre agreed rates for contractor personnel, project site overhead and construction equipment all listed in the contract.
3) Certain charges at cost (e.g. utilities charges).
4) Minus disallowed costs (e.g. costs not justified by contractor records, books, accounts or for remedying defects).

The incentive arrangement included features that would drive the contractor to control and keep the defined cost of construction and commissioning work under the construction and commissioning target cost. The fee was reduced in direct proportion to the amount the defined cost of construction and commissioning work was greater than the construction and commissioning target cost.

2.2. Onshore Power Station Modifications EPC Contract

The onshore Power Station Modifications EPC contract was still progressing to a finalised position in Q4 2015. The discussion that was currently ongoing with the supply chain in respect of the respective packages was as follows.

- Powertrain – Lump sum fixed Price based on a NEC option A.

- Balance of Plant – Target Cost based on a NEC Option C, with Lump Sum elements for the Engineering and Procurement of Major Items of Plant, All construction Target Cost. The basis of the terms and conditions were broadly in line with those included in the ITT issued, with amendment to be made to accommodate the Payment terms associated with a Target Cost contract.
- Demolition – Target Cost based on a NEC option C.
- Long Term Service Agreement (LTSA) – This was on a fixed price basis for identified pre agreed services for the equivalent operating hours (EOH), with variable element dependant on the running hours.

2.3. Hire of Jack-Up Rig - Costs

A Jack-Up Rig can only be secured when funding is available to make a commitment. The tendering for this was not due to take place until Q2 2016. The industry typically tenders rig requirements no more than 2 years ahead of requirements.

2.4. Owners Costs

Owner's costs were being finalised and were to be provided at the end of December 2015. Owners Costs include the Owners Team Costs, Licence Fees and Insurance. Since most of the owners' costs were reimbursable and made up of many elements still to be procured, this element was to remain uncertain into the Execution phase.

3. Conclusion

The approach to contracting in the Supply Chain is in line with Shell's business as usual contracting approach and also in line with the industry standard approach.

The PCCS project, like all projects, had its own unique features which may have deserved special treatment with respect to certain contractual arrangements.

However it was recognised that there were no unique characteristics of CCS that would have required a wholesale re-think on how Shell should contract with the supply chain.

4. Glossary of Terms

Term	Definition
CCCC	Carbon Capture, Compression and Conditioning
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CO_2	Carbon dioxide
DECC	Department of Energy and Climate Change
EOH	Equivalent Operating Hours
EPC	Engineering, Procurement and Construction
FEED	Front End Engineering Design
FID	Final Investment Decision
GT13	Gas Turbine 13
HMG	Her Majesty's Government
ITT	Invitation to Tender
LTSA	Long Term Service Agreement
NEC	New Engineering Contract
PCCS	Peterhead Carbon Capture and Storage
PS	Power Station
UK	United Kingdom