



# UK Carbon Capture and Storage Demonstration Competition

UKCCS - KT - S5.1 - E2E - 001

Post-FEED Cost Schedule

April 2011

ScottishPower CCS Consortium



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ScottishPower CCS Consortium

ScottishPower Generation Limited  
Longannet Power Station  
Kincardine on Forth  
Clackmannanshire  
Scotland

## IMPORTANT NOTICE

**Information provided further to UK Government's Carbon Capture and Storage ("CCS") competition to develop a full-scale CCS facility (the "Competition")**

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CAPEX

units: 1,000,000 s

(£m)

(Em)

Chain Segment:	SPS	CCP	Comp.	BoP	Site - Other	NewPipe	Onshore Pipe	StFergus	FEED Extension	Surveys / Licences	St Fergus	Pipeline prep	Topsides/ Platform	Subsea	Wells	Pre-Injection	TOTAL	
Mobilisation & Enabling	-	-	-	20.0	4.8	1.3	0.8	0.8	-	12.3	5.9	0.4	51.9	5.2	19.1	9.1	131.4	
Land	-	-	-	-	-	1.7	33.1	0.1	-	-	-	-	-	-	-	-	35.0	
Equipment	48.1	39.9	20.5	5.4	1.5	17.3	4.6	23.9	-	-	0.3	0.0	2.1	3.0	8.1	2.5	177.4	
Civil works	11.4	30.1	2.6	27.6	-	15.9	8.9	20.9	-	-	0.3	-	1.3	-	-	-	119.0	
Mechanical	16.0	72.1	7.5	19.5	-	23.8	13.3	25.5	-	-	2.7	0.0	17.0	-	-	4.4	201.9	
Electrical	9.5	23.5	5.2	14.3	2.4	0.5	2.0	4.8	-	-	1.9	0.0	0.6	-	-	-	64.6	
Buildings	2.6	0.7	-	6.6	-	-	-	3.1	-	-	-	-	-	-	-	-	13.0	
Testing & Commissioning	2.9	11.6	1.0	1.2	-	1.0	1.0	2.8	-	-	-	3.2	0.1	0.1	-	-	25.0	
Strategic Spares	2.9	3.5	1.3	1.0	-	0.8	0.8	4.4	-	-	-	-	-	-	-	-	14.6	
First-fill chemicals	-	4.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	
Insurance	>>	>>	>>	>>	5.1	0.5	0.4	1.7	-	-	0.2	-	-	-	-	-	7.9	
Legal, Permits, Licence fees	>>	>>	>>	>>	18.1	0.3	2.4	0.0	-	-	-	-	-	-	-	-	20.8	
Interconnections	>>	>>	>>	>>	included	-	-	7.5	-	-	-	-	-	-	-	-	7.5	
Other	21.3	41.7	9.1	24.2	10.3	13.5	8.4	17.2	-	9.7	0.7	0.1	4.8	-	7.3	-	168.4	
Contractors Fees	>>	>>	>>	>>	104.5	4.7	3.1	8.3	12.5	-	2.9	0.8	13.6	0.6	3.0	-	154.0	
Core Capex:	114.8	228.1	47.2	119.7	146.7	81.3	78.9	121.0	12.5	22.1	14.9	4.6	91.3	8.9	37.5	16.0	1,145.5	
	509.8				146.7	281.2			207.8								0.0	
Core Capex estimate range:																		
%	Upper:	20.0%	10.0%	10.0%	10.0%	10.0%	15.0%	15.0%	15.0%	30.0%	30.0%	25.0%	30.0%	30.0%	30.0%	25.0%	25.0%	15.6%
	Lower:	-20.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-25.0%	-25.0%	-15.0%	-25.0%	-15.0%	-15.0%	-15.0%	-15.0%	-12.3%
Risk & Contingency:																		
Consortium (estimate, tbc)		23.0	45.6	9.4	23.9	29.3	8.2	4.3	7.1	3.1	5.5	3.0	1.1	21.9	2.1	3.8	3.2	194.8
Authority (tbc)																		tbc
		23.0	45.6	9.4	23.9	29.3	8.2	4.3	7.1	3.1	5.5	3.0	1.1	21.9	2.1	3.8	3.2	194.8
	Upper:	864.9				343.0			310.6								1,518.5	
Total Project Capex	Mid:	787.8				300.8			251.7								1,340.3	
	Lower:	710.7				272.7			216.6								1,200.0	

Spend profile:																		
	2010						-	-	-	-	-	-	-	-	-	-	-	
	2011						4.9%	2.6%	3.4%	16.4%	-	-	-	-	-	-	1.0%	
	2012	34.0%	28.0%	28.0%	18.0%	25.0%	24.8%	13.8%	20.4%	36.1%	75.8%	25.0%	-	25.0%	-	-	24.5%	
	2013	44.0%	27.0%	27.0%	47.0%	25.0%	45.2%	33.0%	32.0%	29.1%	12.1%	75.0%	25.0%	50.0%	25.0%	25.0%	35.3%	
	2014	17.0%	29.0%	29.0%	34.0%	25.0%	22.1%	21.2%	34.5%	18.4%	12.1%	-	75.0%	25.0%	75.0%	75.0%	28.4%	
	2015	5.0%	16.0%	16.0%	1.0%	25.0%	2.1%	28.5%	8.2%	-	-	-	-	-	-	-	10.5%	
	2016						0.9%	0.8%	1.5%	-	-	-	-	-	-	-	0.3%	
	2017									-	-	-	-	-	-	-	-	
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Core Capex £m:																		
	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2011	-	-	-	-	-	4.3	2.2	4.3	2.6	-	-	-	-	-	-	13.4	
	2012	46.8	76.6	15.9	25.9	44.0	22.2	11.5	26.1	5.7	20.9	4.5	-	28.3	-	-	328.3	
	2013	60.6	73.9	15.3	67.5	44.0	40.5	27.5	41.0	4.6	3.3	13.4	1.4	56.6	2.8	10.3	472.5	
	2014	23.4	79.4	16.4	48.9	44.0	19.8	17.7	44.2	2.9	3.3	-	4.3	28.3	8.3	31.0	381.3	
	2015	6.9	43.8	9.1	1.4	44.0	1.9	23.7	10.6	-	-	-	-	-	-	-	141.4	
	2016	-	-	-	-	-	0.8	0.7	1.9	-	-	-	-	-	-	-	3.4	
	2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		137.7	273.7	56.7	143.7	176.0	89.5	83.2	128.1	15.7	27.6	17.8	5.7	113.3	11.1	41.4	1,340.3	
Currency split:																		
	GBP	50.0%	83.7%	72.5%	100.0%	100.0%	100.0%	100.0%	100.0%	75.0%	100.0%	100.0%	100.0%	68.0%	100.0%	57.0%	100.0%	86.1%
	EUR	20.0%	9.5%	27.5%	-	-				25.0%	-	-	-	-	-	-	-	5.5%
	USD									-	-	-	-	32.0%	-	43.0%	-	4.0%
	NOK	-	6.7%	-	-	-				-	-	-	-	-	-	-	-	1.4%
	SEK	30.0%	-	-	-	-				-	-	-	-	-	-	-	-	3.1%
	(other)									-	-	-	-	-	-	-	-	-
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Core Capex £m:																		
	GBP	68.9	229.2	41.1	143.7	176.0	89.5	83.2	128.1	11.8	27.6	17.8	5.7	77.0	11.1	23.6	19.2	1,153.4
	EUR	27.5	26.1	15.6	-	-	-	-	-	3.9	-	-	-	-	-	-	-	73.2
	USD	-	-	-	-	-	-	-	-	-	-	-	-	36.2	-	17.8	-	54.0
	NOK	-	18.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.4
	SEK	41.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.3
	(other)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		137.7	273.7	56.7	143.7	176.0	89.5	83.2	128.1	15.7	27.6	17.8	5.7	113.3	11.1	41.4	19.2	1,340.3

## OPEX

= manual entry  
 = per ISOS costs

units: as specified

### Capture

(£m)

Segment:

	Steam & Power Supply		Carbon Capture Process		Compression & Drying		Balance of Plant		Site - Other		wners Engineer / Proj Delive		Knowledge Share	
	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver
Fuel / Power / Energy		therms /hr												
Consumables		>>	4.86	£/t CO2		<<		<<						
Waste disposal		>>	0.31	£/t CO2		<<		<<						
Maintenance		>>	505,251	£/mth		<<		<<						
Staff		>>	296,333	£/mth		<<		<<			125,000	£/mth		
Rates		>>				<<		<<	424,856	£/mth				
Insurance		>>				<<		<<	424,856	£/mth				
Overheads		>>	200,396	£/mth		<<		<<			125,000	£/mth		
Lease Costs		>>				<<		<<						
Other Fixed Costs		>>				<<		<<					238,492	£/mth
Provision for Decommissioning														

### Transport

(£m)

Segment:

	New Pipeline		Feeder10		St Fergus		Project Management		Advance Works	
	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver
Fuel / Power / Energy					0.04533	MWh/t CO2				
Consumables										
Waste disposal										
Maintenance			58,333	£/mth						
Staff							350,000	£/mth		
Rates			4,167	£/mth						
Insurance			33,333	£/mth						
Overheads							602,000	£/mth		
Lease Costs										
Other Fixed Costs										
Provision for Decommissioning										

#### Inputs to Pricing Model:

0.04533	MWh/t CO2
	£/t CO2
	£/t CO2
58,333	£/mth
350,000	£/mth
4,167	£/mth
33,333	£/mth
602,000	£/mth
	£/mth
	£/mth

### Storage

(£m)

Segment:

	Offshore Pipeline		Facilities & Logistics		Wells & Reservoir		Monitoring		Contingency	
	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver	Unit Price	Driver
Fuel / Power / Energy			4,169	£/mth						
Consumables			7,850	£/mth						
Waste disposal			1,667	£/mth						
Maintenance	manual profile		manual profile		manual profile					
Staff			177,682	£/mth			25,000	£/mth		
Rates										
Insurance			manual profile							
Overheads			178,233	£/mth						
Lease Costs					8,333	£/mth				
Other Fixed Costs			95,858	£/mth			manual profile		manual profile	
Provision for Decommissioning										

#### Inputs to Pricing Model:

4,169	£/mth
7,850	£/mth
1,667	£/mth
202,682	£/mth
	£/mth
178,233	£/mth
8,333	£/mth
95,858	£/mth

NB Operating costs will be imported into the Pricing Model. This will apply various macroeconomic forecasts and operating profiles to calculate the annual costs

ABEX units: 1,000,000 s

		SPS	CCP	Comp.	BoP	Site - Other	NewPipe	Feeder10	StFergus (Blackhill)	Offshore Topsides & Substructure	Wells	Pipelines	Onshore Facilities	Post COP	Total
(£m)	Segment:														
	Abandonment Expenditure	23.0	45.6	9.4	23.9		16.3	15.8	24.2	25.7	39.3	31.4	1.5	25.2	281.3
	[Category 2]														0.0
	[Category 3]														0.0
	[Category 4]														0.0
	[Category 5]														0.0
	[Category 6]														0.0
	Total AbEx:	23.0	45.6	9.4	23.9	-	16.3	15.8	24.2	25.7	39.3	31.4	1.5	25.2	281.3
		102.0					56.2			123.1					0.0